Edinburgh Airport Airspace Change Programme 2023

Stage 2 Develop and Assess

Design Principle Evaluation **Updated**

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Edinburgh Airport: Airspace Change Programme

Stage 2: Develop and Assess

ACP-2019-32

Design Principle Evaluation Updated

Amendments in v 1.2

Amendment	Option	Page
RAG Status DP 13 amended amber to green	1	16,17. 201
RAG Status DP13 amended amber to green	13	66 and 201
Deletion of incorrect text	15	-
RAG status DP 11 amended amber to green	32	143
RAG status DP 10 amended amber to red and DP 11 amended amber to green	34	151
RAG status DP 5 amended green to amber	37	163, 165, 202
RAG status DP 5 amended green to amber	38	167, 170, 202
RAG status DP 5 amended green to amber	39	172,174, 202
RAG status DP 5 amended green to amber	41	182, 185, 202
RAG status DP 5 amended green to amber	42	188, 190, 202
RAG status DP 5 amended green to amber	43	192, 195, 202
RAG Status DP 9 amended red to amber	18	86, 87, 201
RAG Status DP, 7,8,9,10 amended green to amber	31	138, 139, 140, 202
Clarification of baseline throughout document (do nothing)	1,13,37,41	14,64,161,181
Clarification of modernised baseline throughout document (do minimum)	2,14,38,42	18,68,166,186
Review of the list of accepted and rejected options		208,209
Addition of paragraph on Airspace Modernisation Strategy		209

Preamble

This document is the Design Principle Evaluation required by CAP1616 Stage 2 Develop and Assess, Step 2A (ii) Design Principle Evaluation. The evaluation provides consideration of how Edinburgh Airport's airspace change proposal departure and arrivals options perform against the 16 design principles developed in consultation with key stakeholders. The evaluation provides a qualitative assessment mechanism to identify those options that are both least and most suitable to be taken forward for further, more detailed, design and assessment in Stage 2B and Stage 3.

The evaluation provides a high-level qualitative assessment against design principle metrics (detailed in the table below) that have been developed to reflect the design principles and provide a framework against which the options can be assigned a red, amber or green (RAG) score. The metrics and RAG scoring approach have been designed to facilitate a consistent approach to the evaluation.

The RAG rating approach has been used to assess whether, in the opinion of the design team, each design principle has been met (green), partially met (orange) or not met (red). During development of the design principles, it was agreed that DPs one to six, which relate to core elements including safety and flyability, 'must' be achieved, while DPs seven to 16 'should' be achieved – reflecting that these are sometimes conflicting, and a balance must be achieved.

The options include the current flightpaths and airspace design as a baseline (which is rejected as it doesn't conform with CAP1616 and modern requirements), and a modernised version of the current baseline that will incorporate RNAV. The modernised baseline is adopted as the baseline option required by CAP1616.

Design Principles and Metrics

Design Principle Number	Design principle & typical metric(s)	Notes on the design principle evaluation metrics and RAG rating
DP1	The airspace design and its operation must be as safe or safer than it is today.	The changes proposed in this airspace change shall all meet the international and national requirements that are applicable. This includes the requirement for ATCOs to be trained on any new procedures. As the procedures are all compliant, airline flight crews will have been trained on these procedures. The infrastructure associated with air traffic management is subject to approval and oversight by the regulator; in this case, the CAA. This airspace change proposes no changes to hardware or software installed at Edinburgh Airport. The use of satellite-based systems is, in principle, already
	Compliance with national and international standards for airspace design	
DP2	Flight paths must be flyable and technically supported by air traffic	

Design Principle Number	Design principle & typical metric(s)	Notes on the design principle evaluation metrics and RAG rating
	control and airport technical management systems.	accepted by the CAA. The final procedure design – the path to be followed by the aeroplane when making use of satellite signals – will be approved by the Civil Aviation Authority before it is put into place. EAL will engage an approved instrument flight procedure design bureau to prepare these designs. The baseline arrival options are scored red for FDP3 as they do not facilitate the use of PBN.
	Compliance with national and international standards for airspace design	
DP3	Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy	
	Compliance with national and international standards for airspace design, plus PBN-routes are required to be designed	
DP4	Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Work continues with GLA, ANS and NATS to achieve this. EAL is confident that this will be achievable for any possible route design in Stage 3 of the ACP.
	Compliance with ANSP procedures	
DP5	The predictability of flight tracks must be maximised for consistency of operations.	PBN operations keep aircraft within 1 NM of the prescribed track 90% of the time. For the great majority of the time, this margin of error is much smaller. This results in track concentration; see FDP 11 below. In addition, for arrivals, systemisation creates consistency of operation whereas vectoring is less consistent. The options containing vectoring are scored as orange – partly met.
	The use of PBN ensures this	
DP6	Collaborate with other Scottish airports and NATS to ensure that the airspace design options are compatible with the wider	Work continues with NATS to achieve this. EAL is confident that this will be achievable for any possible route design in Stage 3 of the ACP.

Design Principle Number	Design principle & typical metric(s)	Notes on the design principle evaluation metrics and RAG rating
	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.	As a result, and with the exception of Options 1,2, 13 and 14 (the baselines) these are all scored Green – FDP is met. The baselines (departures and arrivals) are scored as red – not met – as they have not been designed to meet CAP1711.
	Compliance with national and international standards (CAP 1711)	
DP7	Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	This is especially of interest when departing traffic is still at a low level i.e. below 4000 ft. The current procedure whereby runway 06 departures make a small turn to the north to avoid Cramond has been included in all of the runway 06 options. A number of notes regarding the scoring of this FDP follow: • Baseline departure routes from both runway 06 and runway 24 are scored red as they were designed prior to the development of CAP1616 and the Government's Altitude Based Priorities and therefore do not meet current requirements. • Departures from runway 06 along the Firth of Forth are scored green – FDP is met – as they generally avoid areas of population. • Early left turns from runway 06 are scored red – FDP not met – as they newly fly low over populated areas. • Left hand turns from runway 06 that are made later are scored orange – partly met – as there is more opportunity to route the SID between population centres and any affected populations / communities would be overflown by aircraft at a higher altitude. • Right turns from runway 06 – generally towards TALLA – are as per the current procedures and are scored green. Due to the location of Cramond and the city centre, no early turns to the right from runway 06 are planned. • Any options for runway 24 with an early turn to the north will newly overfly population centres at a low level and are here scored red. This includes Winchburgh, which is a growth area with significant planned new housing development.
	The avoidance of population by lateral paths and/or rapid climb & descent profiles	

Design Principle Number	Design principle & typical metric(s)	Notes on the design principle evaluation metrics and RAG rating
		• Departures from runway 24 with an early turn to the south will newly fly over less densely populated areas than the baseline and are scored orange – partly met. • Departure routes from runway 24 that proceed along the M8 corridor score well for this FDP – green. • As the departures options consist of multiple SIDs, the lowest score of all SIDs is taken for the purpose of the evaluation. • All arrival options are scored orange – partly met – as the final approach is fixed from approximately 3000ft and there is little opportunity to further minimise impacts between 3000 and 4000ft.
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 CO2 emissions.	This FDP is only applied to swathes where they are between 4000 and 7000 ft. Baseline departure routes from both runway 06 and runway 24 are scored red as they were designed prior to the development of CAP1616 and the Government's Altitude Based Priorities and therefore do not meet current requirements. EAL considers that, with one exception, the FDP is met for all other options and procedure design will ensure the optimum path for noise minimisation. These options are therefore scored green – FDP is met. Departures from runway 06 turning right to TALLA are more complex based on the point at which the route crosses back over the Midlothian coast as it contains a number of populated areas between which a route could be designed to pass. Optimising noise and distance flown is an issue here; hence the score of partly met - orange. Arrivals are scored orange – partly met other than for the fully systemised options which will result in track concentration of aircraft within 1 NM of the prescribed track 90% of the time – these are scored green.
	The shortest reasonable distance from the point at which 4,000ft is reached to the edge of Edinburgh's airspace whilst minimising the impact of noise to communities.	
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	The FDP is scored in a similar fashion to FDP 7 for departures. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc. During the design stage, specific attention will be given to these facilities.

Design Principle Number	Design principle & typical metric(s)	Notes on the design principle evaluation metrics and RAG rating
	impact, due to those overflown having protected characteristics, as defined by the Equalities Act 2010.	Arrivals are scored orange – partly met other than for the fully systemised options which will result in track concentration of aircraft within 1 NM of the prescribed track 90% of the time – these are scored green.
	The avoidance of population by lateral paths and/or rapid climb & descent profiles	
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).	Most noise sensitive locations and receptors (such as educational and healthcare facilities, places of worship, etc) will be co-located in the communities they serve. For departures, this FDP has therefore been assessed using the criteria developed for FDP7. Some noise sensitive locations, such as areas of tranquillity including the Pentland and Moorfoot Hills and the Firth of Forth coast, will not be co-located with communities; the potential impacts on tranquillity are considered in later stages of the project. Arrivals are scored orange – partly met other than for the fully systemised options which will result in track concentration of aircraft within 1 NM of the prescribed track 90% of the time – these are scored green.
	The avoidance of such receptors by lateral paths	
DP11	Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals through vectoring – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. This means that night flights would depart using the new EAST SID from runway 06 and GOSAM when runway 24 is in use. The additional track miles that this creates are considered to be less important than the respite offered to those living under the other routes. In Stage 3, specific design choices will investigate how best to develop this concept. In the meantime, all departures and arrivals, bar the baseline scenarios are scored green – FDP is met. The baseline options are scored red – FDP not met.
	The use of PBN will, on the whole concentrate flight tracks. Respite will be investigated by the consideration of multiple flight paths to the edge of Edinburgh's airspace	

Design Principle Number	Design principle & typical metric(s)	Notes on the design principle evaluation metrics and RAG rating
		The baseline and full systemisation arrivals options are scored orange – partly met – as they provide less flexibility to provide respite. The other arrivals options are scored green – met, as they provide greater flexibility.
DP12	Flight paths should be designed with routes that minimise track miles and fuel burn. The shortest reasonable distance will be considered	Contrary to the community centric FDPs above, early turns are beneficial for reducing track miles. It is part of this ACP to balance this FDP with the others, remembering that minimising noise below 7000 ft is a priority. Runway 06 • Departures from runway 06 towards TALLA are longer than they might have been, but the early right turn has not been considered in this ACP as it would entail flying over Edinburgh. Most runway 06 departure options are scored orange – partly met – to reflect this. • This is despite the addition of the new route along the Firth of Forth which reduces track miles for about 15% of the planned traffic, all of which would have otherwise used TALLA to the south before routing east to northern Europe. • If an option includes an additional late turn, it is scored red. Runway 24 • Any option with three departure routes including two early turns (GOSAM 24 is always straight ahead) are green – FDP met. • Any option with four departure routes including three early turns is green – FDP met. • All options with moderate turns to reduce community impacts will slightly increase track miles and are scored orange – partly met. • All options with later turns designed to further reduce community impacts will further increase track miles and are scored red. Arrivals • Options that provide least flexibility to efficiently manage peak movements, which will result in increased use of the holds and hence increased track miles and fuel burn, are scored orange – partly met. • Options that provide greatest operational flexibility and efficiency are scored green – FDP met.

Design Principle Number	Design principle & typical metric(s)	Notes on the design principle evaluation metrics and RAG rating
DP13	Flight paths should be designed to ensure efficient and effective route management. Flight paths should be designed to ensure efficient and effective route management.	This FDP is scored in a similar fashion to FDPs 1 and 2. EAL anticipates that the route design in Stage 3 will achieve this for all of the options bar the baseline options. The addition of the new route along the Firth of Forth reduces track miles for about 15% of the planned traffic, all of which would have otherwise used TALLA to the south before routing east to northern Europe. This is a positive element to this FDP.
DP14	Requirements of airspace users should be taken into account when designing flight paths. Access to airspace by specific groups, gliders, GA-aeroplanes, military, etc. will be considered when designing flight paths	Whilst these groups have been consulted already, it cannot be stated with certainty that all of the swathes described at Stage 2 will fully consider these other airspace users. All departure and arrival options have therefore been scored as orange – partly met. In Stage 3, specific design choices will show how well this FDP has been met.
DP15	Flight paths should be designed to minimise adverse local air quality impacts. Continuous climb, continuous descent and shortest reasonable distance to the edge of Edinburgh's airspace	CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' • Any option with all routes replicating the existing straight-ahead departure alignment will meet the FDP – and are scored green. • Departure options with a single early turn, which may increase the area overflown beneath 1,000ft, are scored orange. • Departure options with early turns in two directions may further increase the area overflown beneath 1,000ft and are scored red. • Arrival options are scored green – FDP met, as there is no flexibility to modify the final approach alignment below 1000ft.
DP16	Airspace should be designed to maximise capacity in order to contribute economic benefits to	Achieving this relies on three drivers: • Reduced departure interval, and

Design Principle Number	Design principle & typical metric(s)	Notes on the design principle evaluation metrics and RAG rating
	Scotland, including tourism and trade.	• Early turn after take-off, and/or • An additional SID along the Firth of Forth. EAL has confidence, based on our own analysis and the results of stakeholder discussions, that the reduced departure interval and SID along the Firth of Forth can be implemented and therefore options with these features have been given a green score. The driver of having the departing aircraft turn immediately after take-off, whilst permitted by international guidance, is novel to the UK and EAL is less certain of its ability to implement this with our stakeholders. Where such options have been considered, they are scored in orange to reflect this uncertainty. The baseline options for departures make no use of these drivers and are scored red. Arrival options that provide least flexibility to efficiently manage peak capacity are scored orange – partly met. Arrival options that provide greatest operational flexibility and efficiency to manage peak capacity are scored green – FDP met.
	The efficiency with which the peak traffic can be accommodated is key to maximising capacity	

Discounting Methodology

Our Airspace change has 3 drivers, namely modernisation capacity and the environment. When we developed our options, we always had these drivers in mind and how they related to our design principles. Options were developed as swathes to give us the most flexible and efficient system moving forward, and this enables us to analyse and choose flightpaths that can comply with our design principles and also take into account the connections with the airspace above the airport as well as the demands of other airspace users.

When developing a discounting methodology, we have qualitatively assessed our departure and arrival options that had been introduced to our stakeholders through engagement sessions and meetings and the results of this can be seen in our RAG assessments of each option with comments about how our design principles affect each option.

Modernisation as a driver:

When we look at modernisation as a driver then we are unable to take the unmodernised version of the baseline through as this would not be an operational possibility in the future because of the DVOR rationalisation programme. We would lose the GOSAM SID to RNAV substitution which is only a temporary solution to the DVOR issue. Instead, we need to take through the option of the modernised baseline as this option could be operational in the year of implementation (currently 2025) and for 10 years beyond that. All other options are designed using RNAV and so we can discount the unmodernised baselines for arrivals and departures. The modernised baselines will be taken through to be analysed as options and compared against the shortlist of options as we work towards a final design solution.

Unmodernised baselines to be discounted:

These are options 1 and 13 (departures) along with options 37 and 41 (arrivals).

Capacity as a driver:

When we look at capacity as a driver there are three ways to optimise departure throughput. These are creating more SIDs, giving SIDs early turns in order to disperse traffic quickly, or finally reducing the time interval allowed between departures. We looked at creating more SIDs and our preferred option would be to add one more SID to the East. This increases capacity, opens up an area of minimal population to be overflown (the Firth of Forth) and also reduces the track miles that aircraft departing this way will need to fly., We have also looked at reducing the time interval between departures if safe and possible. When combined, our options of 4 SIDs with no early turns would be preferred options as they give us capacity and also overfly less people. The forth SID is dependent upon more controlled airspace to the East and there is the possibility that this added volume of airspace may not be achievable. Also, there will be times when this airspace is clawed by for military exercises, so we need to be wary of this.

Our preferred options then are those with four SIDs from each runway and no early turns. These preferred departure options are numbers 8 and 22.

We would also discount departure options that increase track miles or add to the complexity of airspace if alternatives are available. These preferred departure options are numbers 8 and 22. We also need to include options with 3 SIDs if our additional CAS is not forthcoming so these departure options taken forward are 3 and 15.Finally we also need to think about our capacity requirements in the reduced departure interval is deemed to be unworkable. In this case we would need to implement an early turn on one of our SIDs and this SID would nominally be TALLA from Rwy24 or GOSAM from Rwy 06 to provide this capacity. These options are numbers 9 and 25 with four SIDs and numbers 4 and 17 with three SIDs.

We also need to take through the modernised departure baseline for comparison and these options are 2 and 14.

With arrivals the preference from our ANSP was systemisation with the opportunity to vector. This is covered by options 39 and 43, with options 38 and 42 taken forward in the shortlist for modernised baseline comparison.

We rejected the options of full systemisation for arrivals, and also the option of an unmodernised baseline.

The accept and reject sentences at the end of each option in the DPE detail the reason why a particular option has been retained or discounted in accordance with our discounting methodology. We did not give priority to any particular design principle but all of our options are compliant with the first six design principles with the exception of the baselines for arrivals and departures, and the modernised baselines for departures. We gave priority to noise, air quality, sensitive areas and environmental concerns along with track miles and airspace complexity.

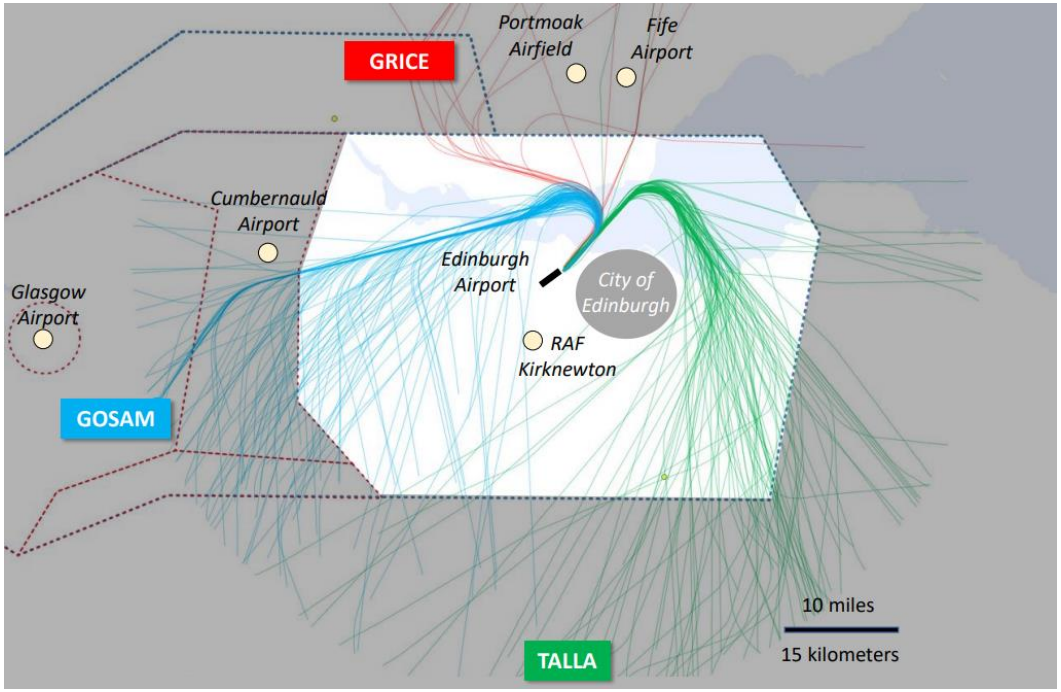
The reasons for accepting or rejecting each option are given at the end of the DPE for the option.

Additionally, the reasons for accepting or rejecting an option can be found in tabulated form on Page 203.

The shortlist of options to be taken forward is on page 207 and the list of rejected options on page 209.

Long List of Options

Rwy 06 Departures

Design Principle Evaluation	Option No: 1
Rwy 06 Baseline	Accept
 **This departure option looks at three SID's connecting with the en-route network at GRICE, GOSAM and TALLA. This is the do-nothing option. The departure routes from Rwy 06 are designed to route to the north of Cramond and then split over the Firth of Forth. The TLA SID routes towards Kinghorn before turning. The community do experience aircraft noise due to the aircraft turning in close proximity to them even**	**Alignment with Design Principles**

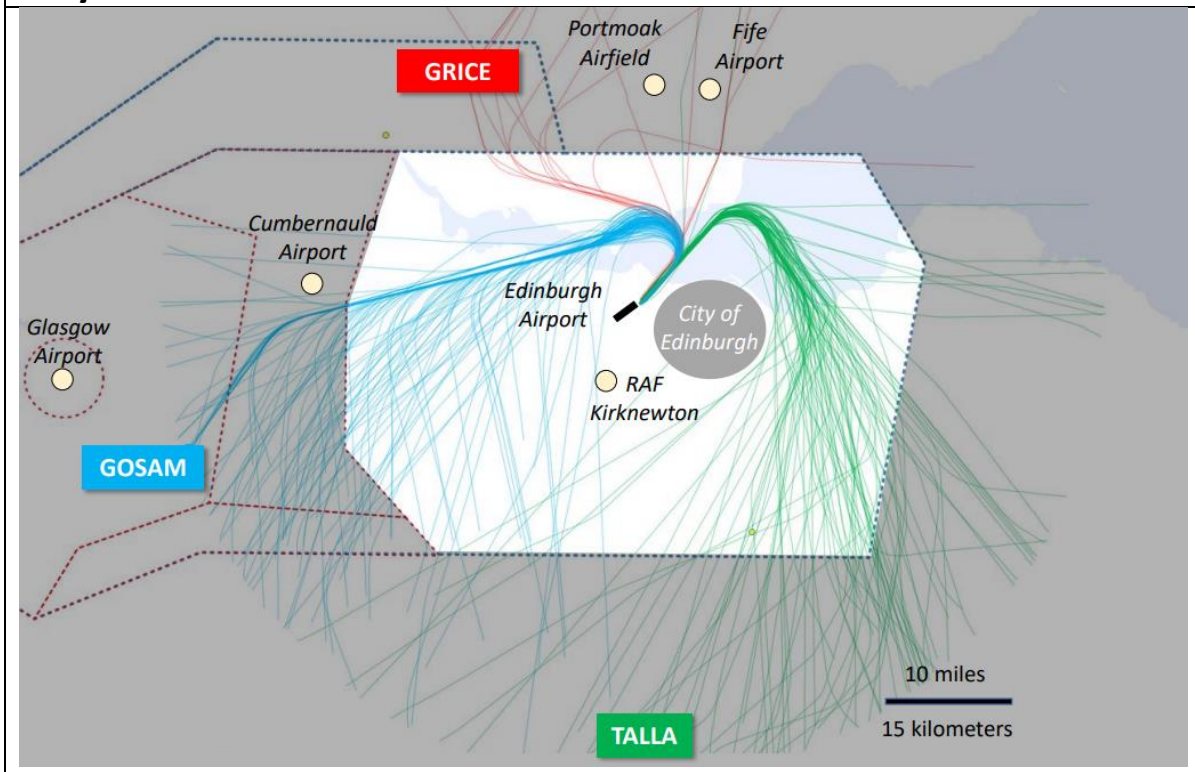
though the aircraft remain over the water. The GRICE and GOSAM SIDs take the same flight path before splitting adjacent to the South Fife coast. The spread of aircraft in this area affects the communities of Dalgety Bay, Inverkeithing and North Queensferry. These SIDs operate as one route and departing aircraft are generally spaced 2 minutes apart in agreement with NERL. These flight paths were designed a considerable length of time ago (at least 30 years) and it is good that this ACP looks to improve the situation.			
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to act as one route and are subject to a timed departure table.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy	Not met	Partial	Met
Qualitative Assessment: This baseline does not include PBN SID's (The do-nothing option).			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are approved for use and are deconflicted with prior coordination.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: These routes are not PBN routes and are not compatible with the CAA's published AMS (CAP 1711).			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: The existing flight paths were designed prior to the development of CAP1616 and the Government's Altitude Based Priorities and therefore do not meet current requirements. The existing GOSAM and GRICE flight paths have a relatively broad swathe across southern Fife and may affect a larger number of people than could be achieved with more modern designs. TALLA affects the Fife coast near Kinghorn and this may be avoidable.			

Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: The existing flight paths were designed prior to the development of CAP1616 and the Government's Altitude Based Priorities and therefore do not meet current requirements. While the flight paths diverge and follow relatively efficient tracks, the routes affect population centres in Fife and were not designed to minimise the impact of aviation noise.			
Design Principle 9: 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	Not met	Partial	Met
Qualitative Assessment: The existing flight paths were designed prior to the development of CAP1616 and the Government's Altitude Based Priorities and therefore do not meet current requirements. The routes affect large and smaller population centres in Fife and were not designed to minimise the population overflown below an altitude of 7000ft. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: The existing flight paths were designed prior to the development of CAP1616 and the Government's Altitude Based Priorities and therefore do not meet current requirements. The routes affect population centres in southern Fife including a number of sensitive locations and receptors including educational, health care and aged care facilities.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: CAP1616 defines respite as 'planned and notified periods where overflight or noise impact are reduced or halted to allow communities undisturbed time.' The existing flight paths provide track concentration and track dispersal but do not provide opportunities for respite.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: While the routes are relatively direct and track miles are therefore not excessive, the existing flight paths were designed prior to the development of CAP1616 and the Government's Altitude Based Priorities and therefore do not meet current requirements.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met

Qualitative Assessment: CAS remains the same volume and is Class D airspace. Other airspace users do have access in accordance with national guidance. Also there is an LoA with Kirknewton.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.'			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design does not bring a capacity increase as the traffic situation remains the same.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 1																
Option RWY06 Baseline																
This option is accepted as the do-nothing baseline option for the IOA.																

Design Principle Evaluation	Option No: 2
Rwy 06 Baseline Modernisation	**Accept**
 **This departure option looks at three SID's connecting with the en-route network at GRICE, GOSAM and TALLA. This is the baseline option with modernisation of the routes with RNAV navigation. The departure routes from Rwy 06 are designed to route to the north of Cramond and then split over the Firth of Forth. The TALLA SID routes towards Kinghorn before turning. The community do experience aircraft noise due to the aircraft turning in close proximity to them even though the aircraft remain over the water. The GRICE and GOSAM SIDs take the same flight path before splitting adjacent to the South Fife coast. The spread of aircraft in this area affects the communities of Dalgety Bay, Inverkeithing and North Queensferry. These SIDs operate as one route and departing aircraft are generally spaced 2 minutes apart in agreement with NERL. These flight paths were designed a considerable length of time ago (at least 30 years) and it is good that this ACP looks to improve the situation with this option modernising the method of navigation.**	**Alignment with Design Principles**

Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split, and these departures will be subject to a timed departure table.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are approved for use and are deconflicted with prior coordination.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Modernisation of the existing flight paths, which were designed prior to the development of CAP1616 and the Government's Altitude Based Priorities and therefore do not meet current requirements, will not deliver improvements. The existing GOSAM and GRICE flight paths have a relatively broad swathe across southern Fife and may affect a larger number of people than could be achieved with more modern designs. TALLA affects the Fife coast near Kinghorn and this may be avoidable.			
Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met

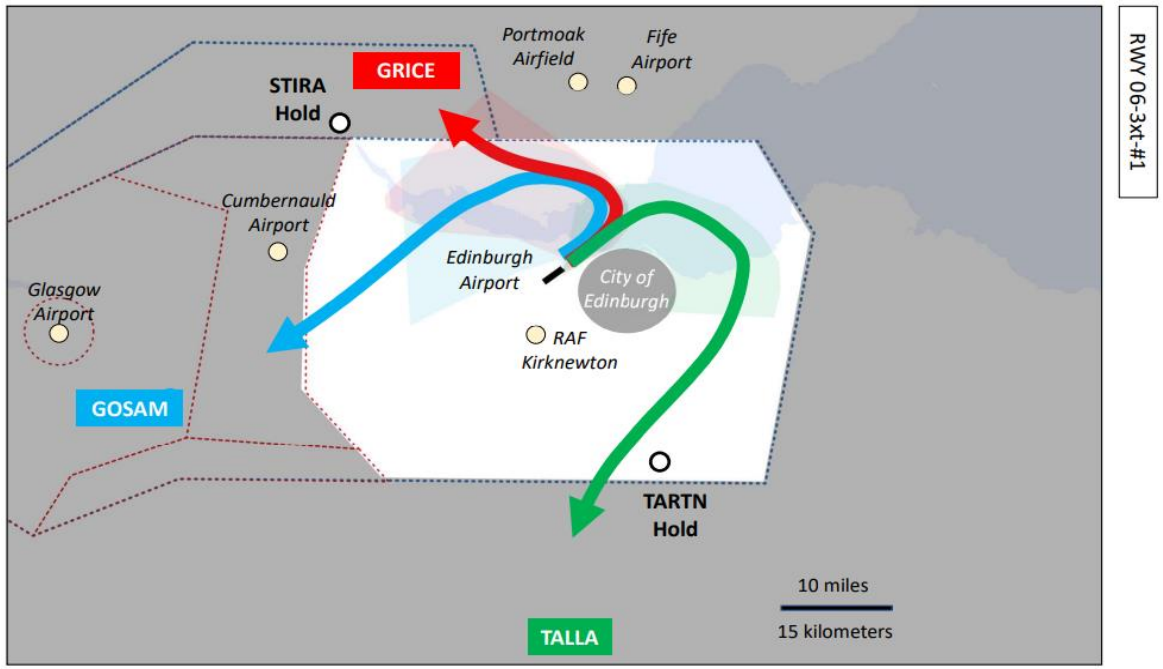
Qualitative Assessment: Modernisation of the existing flight paths, which were designed prior to the development of CAP1616 and the Government's Altitude Based Priorities and therefore do not meet current requirements, will not deliver improvements. While the flight paths diverge and follow relatively efficient tracks, the routes affect population centres in Fife and were not designed to minimise the impact of aviation noise.			
Design Principle 9: 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.	Not met	Partial	Met
Qualitative Assessment: Modernisation of the existing flight paths, which were designed prior to the development of CAP1616 and the Government's Altitude Based Priorities and therefore do not meet current requirements, will not deliver improvements. The routes affect large and smaller population centres in Fife and were not designed to minimise the population overflown below an altitude of 7000ft. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Modernisation of the existing flight paths, which were designed prior to the development of CAP1616 and the Government's Altitude Based Priorities and therefore do not meet current requirements, will not deliver improvements. The routes affect population centres in southern Fife including a number of sensitive locations and receptors including educational, health care and aged care facilities.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: CAP1616 defines respite as 'planned and notified periods where overflight or noise impact are reduced or halted to allow communities undisturbed time.' Modernisation of the existing flight paths, which provide track concentration and track dispersal but do not provide opportunities for respite, will not deliver improvements.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: While the routes are relatively direct and track miles are therefore not excessive, the existing flight paths were designed prior to the development of CAP1616 and the Government's Altitude Based Priorities and therefore do not meet current requirements. Modernisation of the existing routes will not deliver improvements.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume and is Class D airspace. Other airspace users do have access in accordance with national guidance. Also, there is an LoA with Kirknewton.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met

Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.'			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design does not bring a capacity increase as the traffic situation remains the same.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 2																
Option RWY06 Baseline Modernisation																
The modernised baseline (do minimum option) is accepted and taken forward to the shortlist of options. The modernised baseline would be RNAV compatible.																

Design Principle Evaluation	Option No: 3
Rwy 06 3xt #1	**Accept**



This departure option looks at three SID's connecting with the en-route network at GRICE, GOSAM and TALLA. The departure routes from Rwy 06 are designed to route to the north of Cramond and then split over the Firth of Forth. The TALLA SID would route along the Firth of Forth to the east overflying the water to keep the population overflown to a minimum. GRICE and GOSAM are coincident until they turn left and split in the area of Dalgety Bay. The main difference between this and the modernisation of the baseline is the fact that the TLA SID will turn along the Firth of Forth and not affect Kinghorn on the South Fife Coast. Capacity is increased with possible approval of the reduction of our departure interval from 2 minutes to 1.5 minutes.

Alignment with Design Principles

Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split, and these departures will be subject to a timed departure table.			

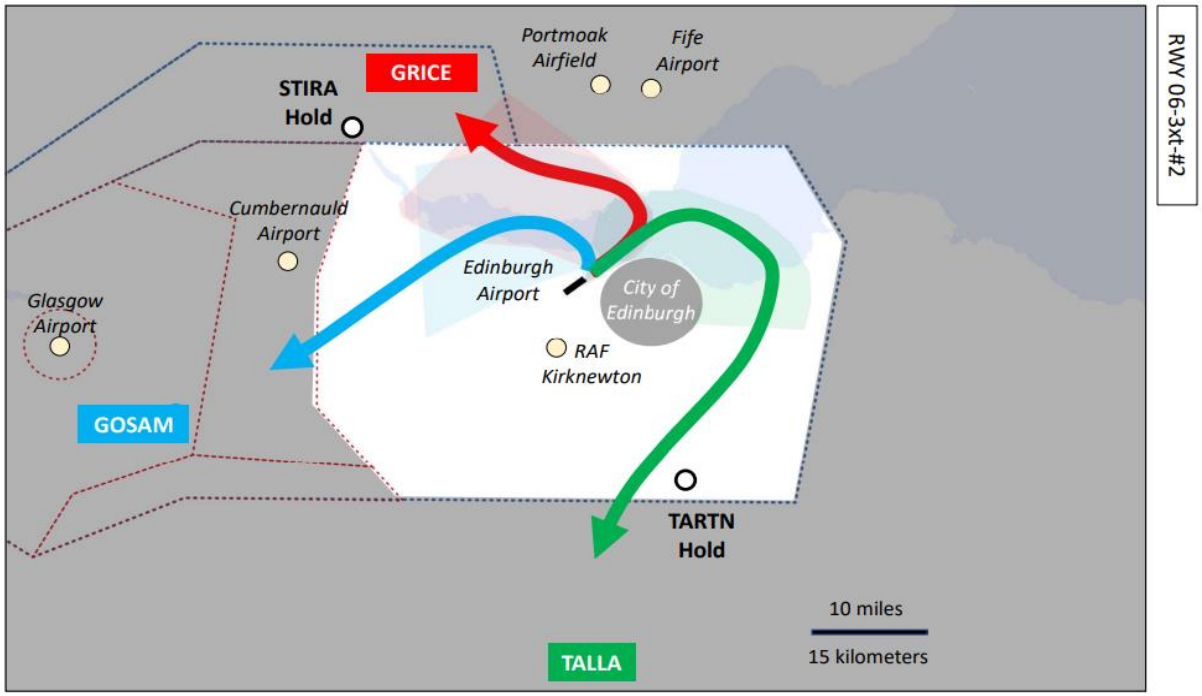
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing GOSAM and GRICE between population centres in southern Fife before turning GOSAM in a location that will minimise overflown communities. TALLA will be routed further away from the Fife coast than the existing flightpath, reducing impacts to the Fife coastal communities, and would cross the Lothian coastal communities above 7000ft.			
Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing GOSAM and GRICE between population centres in southern Fife before turning GOSAM in a location that will minimise overflown communities. TALLA will be routed further away from the Fife coast than the existing flightpath, reducing impacts to the Fife coastal communities, and would cross the Lothian coastal communities above 7000ft. The flightpaths would minimise the impact of aviation noise without disproportionately increasing track mileage and CO2 emissions.			

Design Principle 9: 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	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing GOSAM and GRICE between population centres in southern Fife before turning GOSAM in a location that will minimise overflown communities. TALLA will be routed further away from the Fife coast than the existing flightpath, reducing impacts to the Fife coastal communities, and would cross the Lothian coastal communities above 7000ft. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc. Further assessments in Stage 2B and Stage 3 will consider in more detail the potential impact of flight paths on people with protected characteristics.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to noise sensitive sites and receptors by routeing GOSAM and GRICE between population centres in southern Fife before turning GOSAM in a location that will minimise overflown communities. TALLA will be routed further away from the Fife coast than the existing flightpath, reducing impacts to the Fife coastal communities, and would cross the Lothian coastal communities above 7000ft. Further assessment will be provided in Stage 2B.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. In Stage 3, specific design choices will investigate how best to develop this concept.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option includes efficient routes for GOSAM, GRICE and TALLA.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume unless we increase airspace to the north-west to allow for a straighter routing of the GRICE SID in which case this DP is only partially met.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' The initial straight-ahead routeing of all flights, replicating the existing routes, will minimise the footprint of aircraft emission impacts on local air quality.			

Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 3																
Option RWY06 3xt #1																
This option is accepted and taken forward to the shortlist of options. This option provides benefits over the modernised baseline but is dependent on achieving a 90 second departure separation to deliver the capacity requirements. This option would be designed to minimise overflying communities.																

Design Principle Evaluation	Option No: 4
Rwy 06 3xt #2	**Accept**
 **This departure option looks at three SID's connecting with the en-route network at GRICE, GOSAM and TALLA. The departure routes from Rwy 06 are designed to route to the north of Cramond and then split over the Firth of Forth. The TALLA SID would route along the Firth of Forth to the east overflying the water to keep the population overflown to a minimum. GRICE and GOSAM are coincident until they turn left and split in the area of Dalgety Bay. The main difference between this and the modernisation of the baseline is the fact that the TLA SID will turn along the Firth of Forth and not affect Kinghorn on the South Fife Coast. Capacity is increased with possible approval of the reduction of our departure interval from 2 minutes to 1.5 minutes. This option also has an early left turn to GOSAM which increases capacity but changes to profile of people overflown from options 1, 2 and 3.**	**Alignment with Design Principles**

Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split, and these departures will be subject to a timed departure table.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing GRICE between population centres in southern Fife, with TALLA routed further away from the Fife coast than the existing flightpath, reducing impacts to the Fife coastal communities and crossing the Lothian coastal communities above 7000ft. In contrast, the early turn for GOSAM (50% of flights) may have a wide swathe (because of differential aircraft performance characteristics) and affect new areas including the southern coastline of the Firth of Forth and the coastal communities in southern Fife at a low altitude.			
Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met

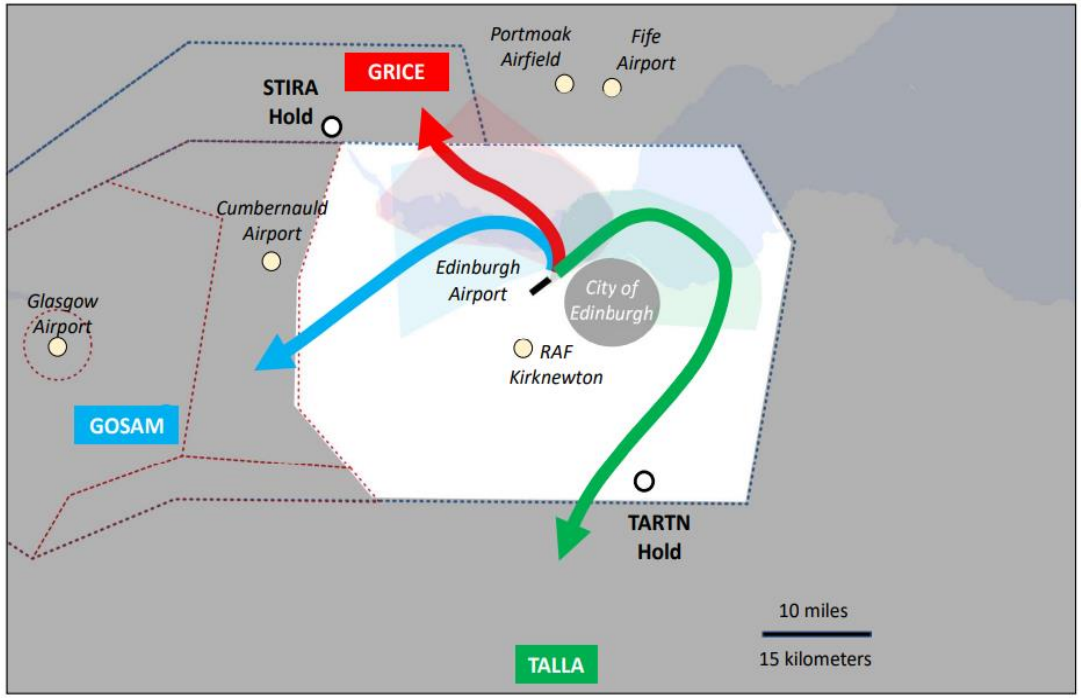
Qualitative Assessment: Compared to the baseline, the flight paths will reduce noise impacts to overflown communities by routeing GRICE between population centres in southern Fife, with TALLA routed further away from the Fife coast than the existing flightpath, reducing impacts to the Fife coastal communities and crossing the Lothian coastal communities above 7000ft. However, the early turn for GOSAM (50% of flights) may have a wide swathe and may affect new areas including the southern coastline of the Firth of Forth and the coastal communities in southern Fife. None of the flight paths would have disproportionate track mileage.			
Design Principle 9: 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.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce overflown communities by routeing GRICE between population centres in southern Fife, with TALLA routed further away from the Fife coast than the existing flightpath, reducing impacts to the Fife coastal communities and crossing the Lothian coastal communities above 7000ft. However, the early turn for GOSAM (50% of flights) may have a wide swathe and may affect new populations around the southern coastline of the Firth of Forth and the coastal communities in southern Fife. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce overflown noise sensitive receptors and sites by routeing GRICE between population centres in southern Fife, with TALLA routed further away from the Fife coast than the existing flightpath, reducing impacts to the Fife coastal communities and crossing the Lothian coastal communities above 7000ft. However, the early turn for GOSAM may have a wide swathe and may affect new noise sensitive receptors and sites around the southern coastline of the Firth of Forth and the coastal communities in southern Fife at a low altitude. These may include the Dalmeny Estate and Firth of Forth coastlines (important open spaces), heritage sites and medical, educational and community facilities.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. In Stage 3, specific design choices will investigate how best to develop this concept.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option includes the most efficient route for GOSAM and TALLA, and an efficient route for GRICE.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume unless we increase airspace to the north west to allow for a straighter routing of the GRICE SID in which case this DP is only partially met.			

Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' The early turn for GOSAM may slightly increase the footprint of aircraft emission impacts on local air quality.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 4																
Option RWY06 3xt #2																
This option is accepted and taken forward to the shortlist of options. This option is taken forward as it would provide the required capacity should the 90 second departure interval not be achieved (which is required to increase capacity for Option 3 – 06 3xt #1). This option may overfly new, not currently overflown communities.																

Design Principle Evaluation	Option No: 5
Rwy 06 3xt #3	**Reject**



This departure option looks at three SID's connecting with the en-route network at GRICE, GOSAM and TALLA. The departure routes from Rwy 06 are designed to route to the north of Cramond and then split over the Firth of Forth. The TALLA SID would route along the Firth of Forth to the east overflying the water to keep the population overflown to a minimum. GRICE and GOSAM turn immediately to the left, increasing capacity but they have a different spread and noise profile over the southern fife coast when options 1,2,3 and 4 are taken into consideration. This early turn increases capacity as well as the possibility of reducing our departure interval from 2 minutes to 1.5 minutes.

Alignment with Design Principles

Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split and these departures will be subject to a timed departure table.			

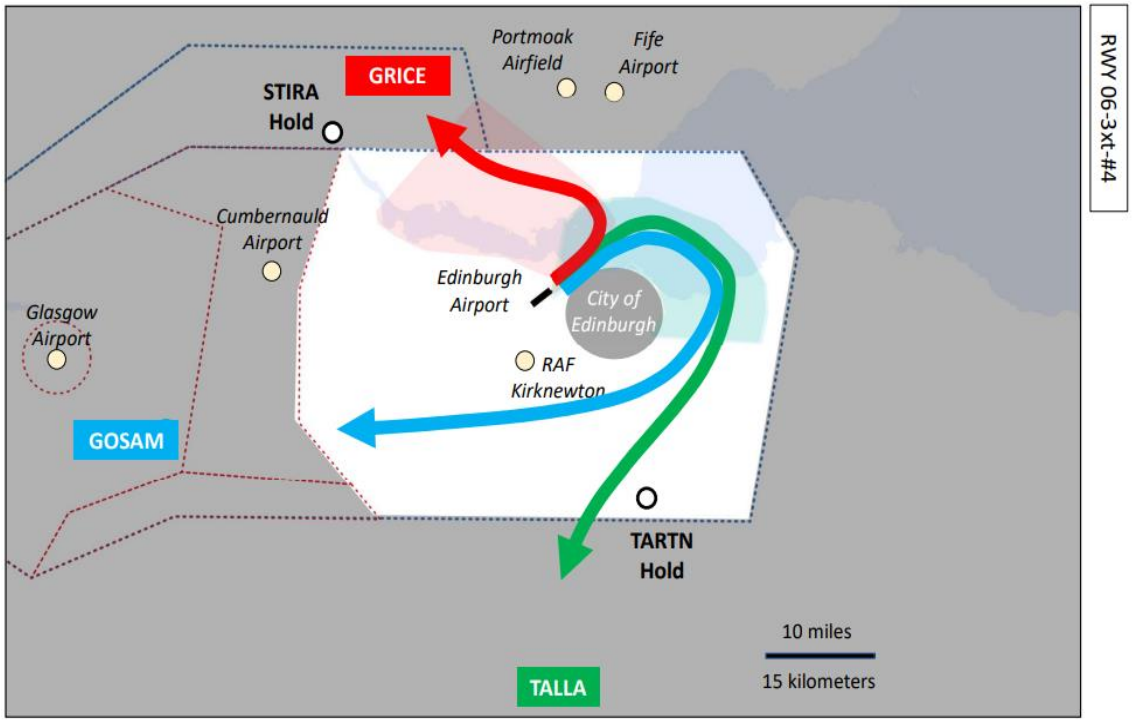
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator session. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing TALLA further away from the Fife coast than the existing flightpath, reducing impacts to the Fife coastal communities and crossing the Lothian coastal communities above 7000ft. In contrast, the early turns for both GOSAM (50% of flights) and GRICE (5% of flights) may have a wide swathe (because of differential aircraft performance characteristics) and affect new areas including the southern coastline of the Firth of Forth and the coastal communities in southern Fife at a low altitude. The early turn for GRICE does not increase capacity and so unnecessarily affects more people than required.			
Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing TALLA further away from the Fife coast than the existing flightpath, reducing impacts to the Fife coastal communities and crossing the Lothian coastal communities above 7000ft. In contrast, the early turns for both GOSAM and GRICE may have a wide swathe (because of differential aircraft performance characteristics) and would affect new areas including the southern coastline of the Firth of Forth and			

the coastal communities in southern Fife at a low altitude. GOSAM and GRICE are likely to affect communities in Fife and West Lothian between 4000ft and 7000ft. The early turn for GRICE does not increase capacity and so unnecessarily affects more people than required. None of the flight paths would have disproportionate track mileage			
Design Principle 9: 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	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce overflown communities by routeing TALLA further away from the Fife coast than the existing flightpath, reducing impacts to the Fife coastal communities and crossing the Lothian coastal communities above 7000ft. However, the early turns for GOSAM and GRICE may have a wide swathe and would affect new populations around the southern coastline of the Firth of Forth and the coastal communities in southern Fife at a low altitude. The early turn for GRICE does not increase capacity and so unnecessarily affects more people than required. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce overflown noise sensitive receptors and sites by routeing TALLA further away from the Fife coast, reducing impacts to the Fife coastal communities and crossing the Lothian coastal communities above 7000ft. However, the early turns for GOSAM and GRICE may have a wide swathe and would affect new noise sensitive receptors and sites around the southern coastline of the Firth of Forth and the coastal communities in southern Fife at a low altitude. These may include the Dalmeny Estate and Firth of Forth coastlines (important open spaces), heritage sites and medical, educational and community facilities. The early turn for GRICE does not increase capacity and so unnecessarily affects more receptors than required.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. In Stage 3, specific design choices will investigate how best to develop this concept.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option includes the most efficient route for GOSAM, GRICE and TALLA.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume unless we increase airspace to the north west to allow for a straighter routing of the GRICE SID in which case this DP is only partially met.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met

Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' The early turns for GOSAM and GRICE may slightly increase the footprint of aircraft emission impacts on local air quality.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 5																
Option RWY06 3xt #3																
This option is rejected. The early left turn over GRICE is unnecessary and is likely to generate a wide swathe of flight paths over more populated and newly overflown areas. Other options are preferable.																

Design Principle Evaluation	Option No: 6
Rwy 06 3xt #4	**Reject**
 **This departure option looks at three SID's connecting with the en-route network at GRICE, GOSAM and TALLA. The departure routes from Rwy 06 are designed to route to the north of Cramond and then split over the Firth of Forth. The TALLA and GOSAM SIDs would route along the Firth of Forth to the east overflying the water to keep the population overflown to a minimum. GRICE would turn left at an appropriate point, designed to overfly the minimum population on the south fife coast. TALLA and GOSAM would cross the East Lothian coast at a point of minimum population and would then be assessed for their altitude. GOSAM could continue to the west once above all of the inbound traffic routing from the south which would need to be designed appropriately to route above inbounds for Rwy 24 from the south.**	**Alignment with Design Principles**

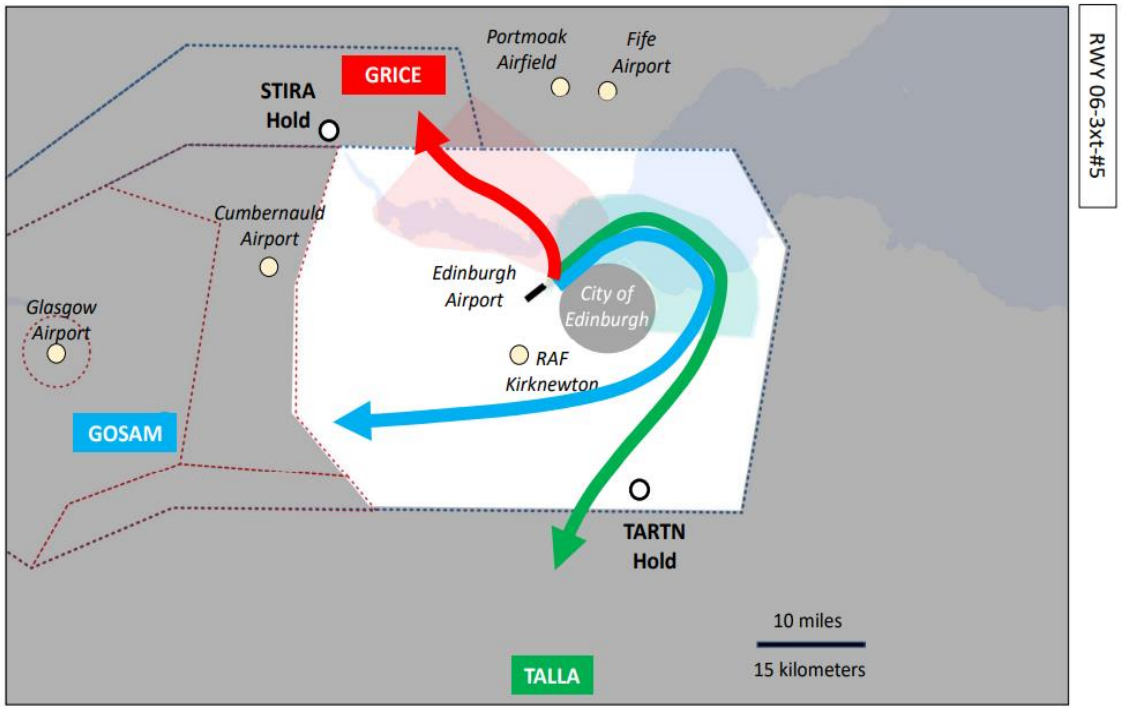
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split, and these departures will be subject to a timed departure table.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing GRICE between population centres in southern Fife, by routeing TALLA further away from the Fife coast, and by routeing GOSAM along the same track as TALLA, reducing impacts to the Fife coastal communities, and crossing the Lothian coastal communities above 7000ft.			
Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities between 4000ft and 7000ft by routeing GRICE between population centres in southern Fife, by routeing TALLA further away from the Fife coast, and by routeing GOSAM along the same track as TALLA, reducing impacts to the Fife			

coastal communities, and crossing the Lothian coastal communities above 7000ft. While this would minimise aviation noise impacts to communities, the GOSAM route would result in a significant increase in track miles and CO2 emissions (for approximately 50% of all flights) compared to a left turn for GOSAM. Whether this constitutes a 'disproportionate increase' will be assessed in more detail in subsequent stages of the project.			
Design Principle 9: 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.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities below 7000ft by routeing GRICE between population centres in southern Fife, by routeing TALLA further away from the Fife coast, and by routeing GOSAM along the same track as TALLA, reducing impacts to the Fife coastal communities, and crossing the Lothian coastal communities above 7000ft. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to noise sensitive receptors and sites by routeing GRICE between population centres in southern Fife, by routeing TALLA further away from the Fife coast, and by routeing GOSAM along the same track as TALLA, reducing impacts to the Fife coastal communities, and crossing the Lothian coastal communities above 7000ft.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. In Stage 3, specific design choices will investigate how best to develop this concept.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option includes efficient routes for GRICE and TALLA, and an inefficient route for GOSAM (approximately 50% of all flights).			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume unless we increase airspace to the northwest to allow for a straighter routing of the GRICE SID in which case this DP is only partially met.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met

Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' The initial straight-ahead routeing of all flights, replicating the existing routes, will minimise the footprint of aircraft emission impacts on local air quality.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 6																
Option RWY06 3xt #4																
This option is rejected. While this option could be designed safely, the concentration of traffic in one place increases the complexity of managing the airspace. This option also increases track miles and doesn't meet DP12.																

Design Principle Evaluation	Option No: 7
Rwy 06 3xt #5	**Reject**
 **This departure option looks at three SID's connecting with the en-route network at GRICE, GOSAM and TALLA. The departure routes from Rwy 06 are designed to route to the north of Cramond and then split over the Firth of Forth. The TALLA and GOSAM SIDs would route along the Firth of Forth to the east overflying the water to keep the population overflown to a minimum. GRICE would turn left immediately to give the maximum split for following departures. GRICE would be designed to overfly the minimum population on the south fife coast. TALLA and GOSAM would cross the East Lothian coast at a point of minimum population and would then be assessed for their altitude. GOSAM could continue to the west once above all of the inbound traffic routing from the south which would need to be designed appropriately to route above inbounds for Rwy 24 from the south.**	**Alignment with Design Principles**

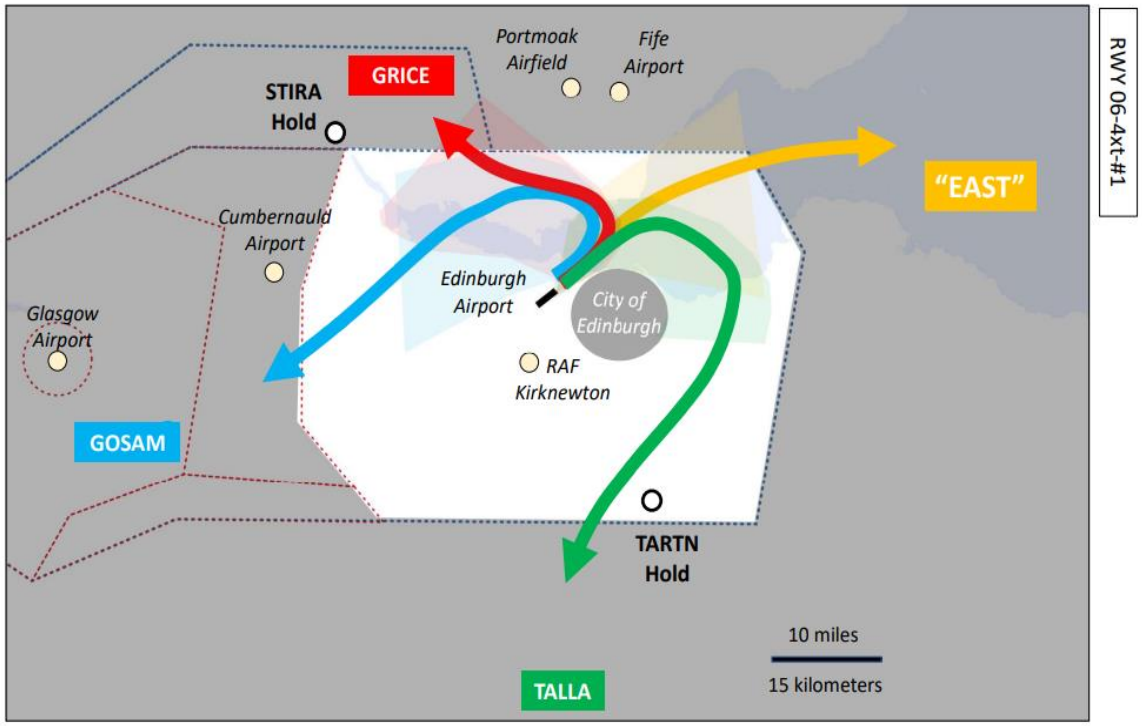
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split and these departures will be subject to a timed departure table.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing TALLA (45% of flights) further away from the Fife coast, and by routeing GOSAM (50% of flights) along the same track as TALLA, substantially reducing impacts to the Fife coastal communities, and crossing the Lothian coastal communities above 7000ft. While the early turn for GRICE (5% of flights) may have a wide swathe (because of differential aircraft performance characteristics) and would unnecessarily affect new areas including the southern coastline of the Firth of Forth and the coastal communities in southern Fife at a low altitude without delivering greater capacity, the net reduction in flights over southern Fife would be substantial.			
Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met

Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing TALLA further away from the Fife coast, and by routeing GOSAM along the same track as TALLA, substantially reducing impacts to the Fife coastal communities, and crossing the Lothian coastal communities above 7000ft. While the early turn for GRICE (5% of flights) may have a wide swathe (because of differential aircraft performance characteristics) and would unnecessarily affect new areas including the southern coastline of the Firth of Forth and the coastal communities in southern Fife at a low altitude without delivering greater capacity, the net reduction in flights over southern Fife would be substantial. While GOSAM would minimise aviation noise impacts to communities, it would result in a significant increase in track miles and CO2 emissions (for approximately 50% of all flights) compared to a left turn for GOSAM.			
Design Principle 9: 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	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will substantially reduce impacts to overflown communities below 7000ft by routeing TALLA further away from the Fife coast, and by routeing GOSAM along the same track as TALLA, reducing impacts to the Fife coastal communities, and crossing the Lothian coastal communities above 7000ft. While the early turn for GRICE (5% of flights) may have a wide swathe (because of differential aircraft performance characteristics) and would unnecessarily affect new areas including the southern coastline of the Firth of Forth and the coastal communities in southern Fife at a low altitude without delivering greater capacity, the net reduction in flights over southern Fife would be substantial. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will substantially reduce overflown noise sensitive receptors and sites by routeing TALLA further away from the Fife coast, and by routeing GOSAM along the same track as TALLA, reducing impacts to the Fife coastal communities and crossing the Lothian coastal communities above 7000ft. While the early turn for GRICE may have a wide swathe and would affect new noise sensitive receptors and sites around the southern coastline of the Firth of Forth and the coastal communities in southern Fife at a low altitude without delivering additional capacity, the net reduction in flights over southern Fife would be substantial.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. In Stage 3, specific design choices will investigate how best to develop this concept.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option includes the most efficient route for GRICE and TALLA, but an inefficient route for GOSAM (approximately 50% of all flights).			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			

Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume unless we increase airspace to the north west to allow for a straighter routing of the GRICE SID in which case this DP is only partially met.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' The early left turn for GRICE may slightly increase the footprint of aircraft emission impacts on local air quality.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 7																
Option RWY06 3xt #5																
This option is rejected. While this option could be designed safely, the concentration of traffic in one place increases the complexity of managing the airspace. This option also increases track miles and doesn't meet DP12.																

Design Principle Evaluation	Option No: 8
Rwy 06 4xt #1	**Accept**
 **This departure option looks at three SID's connecting with the en-route network at GRICE, GOSAM and TALLA. There is the addition of a fourth departure route, nominally called "East". The departure routes from Rwy 06 are designed to route to the north of Cramond and then split over the Firth of Forth. The TALLA and East SIDs would route along the Firth of Forth to the east overflying the water to keep the population overflown to a minimum. The TALLA SID would turn and cross the coast in an area of minimal population on the East Lothian coast. The East SID would continue over the water and connect with the ATC system as some point over the water to the east northeast of the airport. GRICE and GOSAM are coincident until they turn left and split in the area of Dalgety Bay. Again, we note that the TALLA and EAST SIDs will turn along the Firth of Forth and not affect Kinghorn on the South Fife Coast. Capacity is increased with possible approval of the reduction of our departure interval from 2 minutes to 1.5 minutes.**	**Alignment with Design Principles**

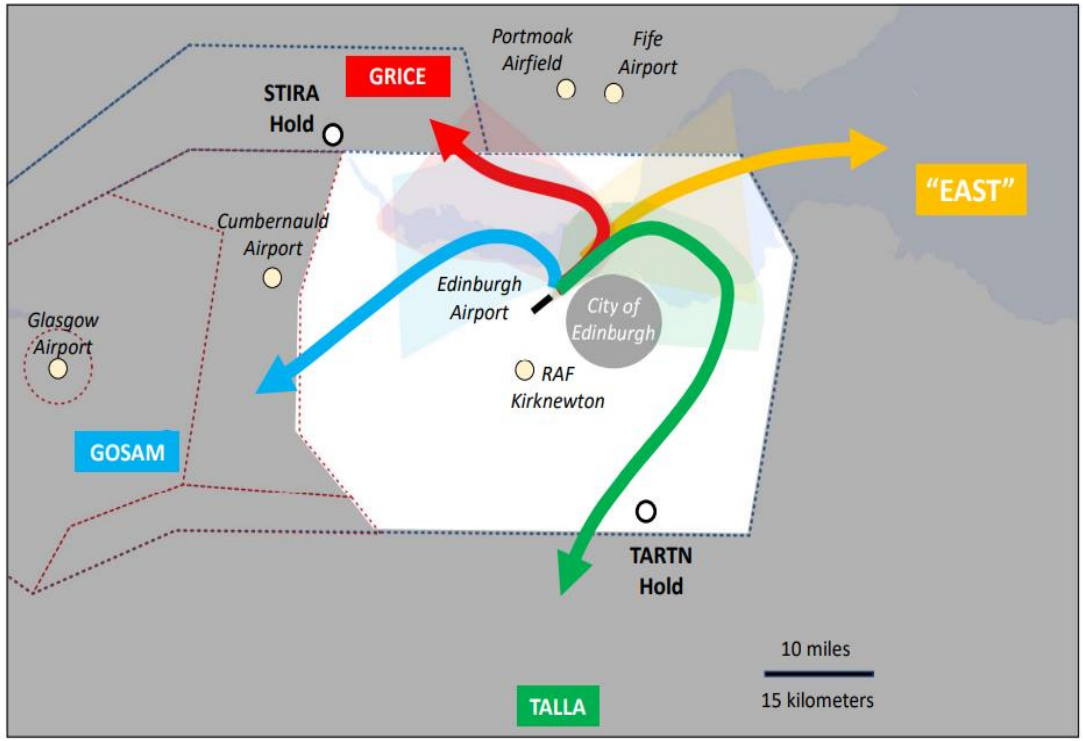
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split and these departures will be subject to a timed departure table.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing GOSAM and GRICE between population centres in southern Fife before turning GOSAM in a location that will minimise overflown communities. TALLA will be routed further away from the Fife coast than the existing flightpath, reducing impacts to the Fife coastal communities, and would cross the Lothian coastal communities above 7000ft. The new EAST would be routed along the Firth of Forth and would take a proportion of movements off TALLA.			
Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met

Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing GOSAM and GRICE between population centres in southern Fife before turning GOSAM in a location that will minimise overflown communities. TALLA will be routed further away from the Fife coast than the existing flightpath, reducing impacts to the Fife coastal communities, and would cross the Lothian coastal communities above 7000ft. The new EAST would be routed along the Firth of Forth and would take a proportion of movements off TALLA. The flightpaths would minimise the impact of aviation noise without disproportionately increasing track mileage and CO2 emissions.			
Design Principle 9: 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	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing GOSAM and GRICE between population centres in southern Fife before turning GOSAM in a location that will minimise overflown communities. TALLA will be routed further away from the Fife coast than the existing flightpath, reducing impacts to the Fife coastal communities, and would cross the Lothian coastal communities above 7000ft. The new EAST would be routed along the Firth of Forth and would take a proportion of movements off TALLA. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to noise sensitive sites and receptors by routeing GOSAM and GRICE between population centres in southern Fife before turning GOSAM in a location that will minimise overflown communities. TALLA will be routed further away from the Fife coast than the existing flightpath, reducing impacts to the Fife coastal communities, and would cross the Lothian coastal communities above 7000ft. The new EAST would be routed along the Firth of Forth and would take a proportion of movements off TALLA.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. In Stage 3, specific design choices will investigate how best to develop this concept.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option includes efficient routes for GOSAM, GRICE and TALLA and a very efficient route for the aircraft on EAST that would otherwise have been routed on TALLA.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met

Qualitative Assessment: CAS remains the same volume unless we increase airspace to the northwest to allow for a straighter routing of the GRICE SID in which case this DP is only partially met.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' The initial straight-ahead routeing of all flights, replicating the existing routes, will minimise the footprint of aircraft emission impacts on local air quality.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 8																
Option RWY06 4xt #1																
This option is accepted and taken forward to the shortlist of options. This option is the same as Option 3 – 06 3xt #1 with the addition of the EAST SID which would reduce track miles and the frequency communities are overflown.																

Design Principle Evaluation	Option No: 9
Rwy 06 4xt #2	**Accept**
	**Alignment with Design Principles**
This departure option looks at three SID's connecting with the en-route network at GRICE, GOSAM and TALLA. There is the addition of a fourth departure route, nominally called "East". The departure routes from Rwy 06 are designed to route to the north of Cramond and then split over the Firth of Forth. The TALLA and East SIDs would route along the Firth of Forth to the east overflying the water to keep the population overflown to a minimum. The TALLA SID would turn and cross the coast in an area of minimal population on the East Lothian coast. The East SID would continue over the water and connect with the ATC system as some point over the water to the east northeast of the airport. GRICE is coincident with the TALLA and EAST SIDs and takes a path to overfly the south fife coast in an area of minimum population. GOSAM turns early to give a departure split of more than 45 degrees with possible issues for the population centres on the South Fife coast. Again, we note that the TALLA and EAST SIDs will turn along the Firth of Forth and not affect Kinghorn on the South Fife	

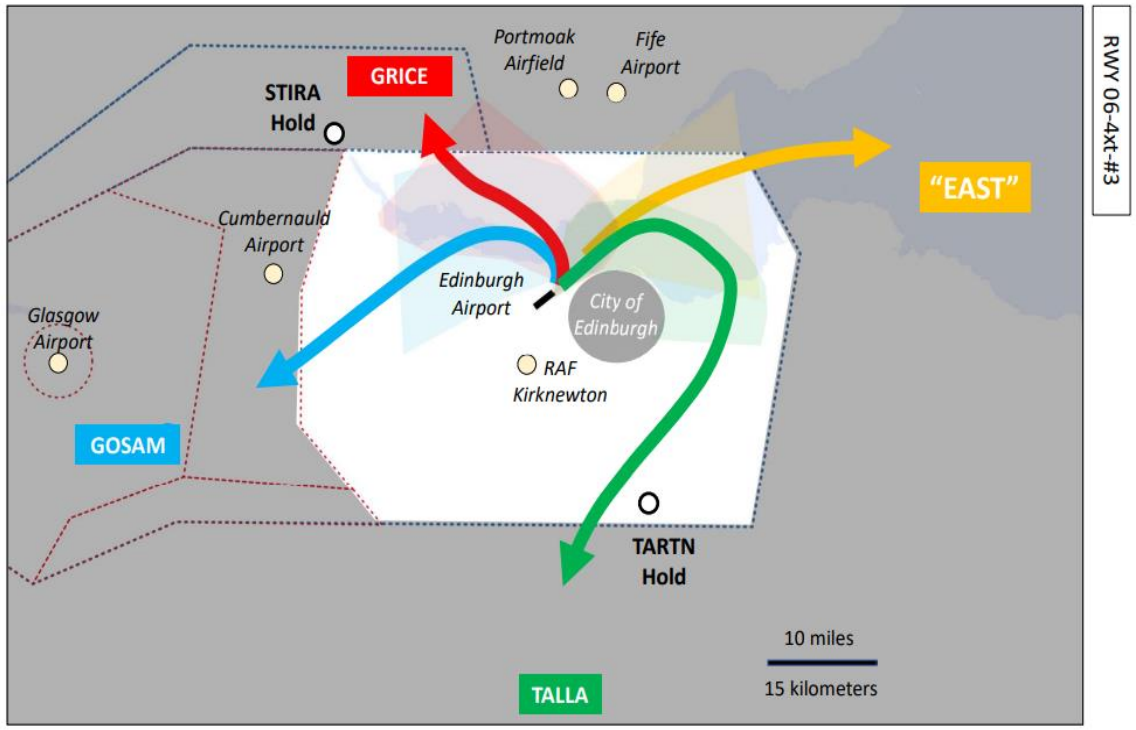
Coast. Capacity is increased with possible approval of the reduction of our departure interval from 2 minutes to 1.5 minutes and also the early turn of GOSAM.			
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split and these departures will be subject to a timed departure table.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing GRICE between population centres in southern Fife, with TALLA routed further away from the Fife coast than the existing flightpath, reducing impacts to the Fife coastal communities and crossing the Lothian coastal communities above 7000ft. The new EAST would take a proportion of flights from TALLA and be routed down the Firth of Forth, avoiding impacts to communities. In contrast, the early turn for GOSAM may have a wide swathe (because of differential aircraft performance characteristics) and affect new areas including the southern coastline of the Firth of Forth and the coastal communities in southern Fife at a low altitude.			

Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce noise impacts to overflown communities by routeing GRICE between population centres in southern Fife, with TALLA routed further away from the Fife coast than the existing flightpath, reducing impacts to the Fife coastal communities and crossing the Lothian coastal communities above 7000ft. The new EAST would take a proportion of flights from TALLA and be routed down the Firth of Forth, avoiding impacts to communities. However, the early turn for GOSAM may have a wide swathe and would affect new areas including the southern coastline of the Firth of Forth and the coastal communities in southern Fife at a low altitude. None of the flight paths would have disproportionate track mileage.			
Design Principle 9: 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	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce overflown communities by routeing GRICE between population centres in southern Fife, with TALLA routed further away from the Fife coast than the existing flightpath, reducing impacts to the Fife coastal communities and crossing the Lothian coastal communities above 7000ft. The new EAST would take a proportion of flights from TALLA and be routed down the Firth of Forth, avoiding impacts to communities. However, the early turn for GOSAM may have a wide swathe and would affect new populations around the southern coastline of the Firth of Forth and the coastal communities in southern Fife at a low altitude. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce overflown noise sensitive receptors and sites by routeing GRICE between population centres in southern Fife, with TALLA routed further away from the Fife coast than the existing flightpath, reducing impacts to the Fife coastal communities and crossing the Lothian coastal communities above 7000ft. The new EAST would take a proportion of flights from TALLA and be routed down the Firth of Forth, avoiding impacts to communities. However, the early turn for GOSAM may have a wide swathe and would affect new noise sensitive receptors and sites around the southern coastline of the Firth of Forth and the coastal communities in southern Fife at a low altitude. These may include the Dalmeny Estate and Firth of Forth coastlines (important open spaces), heritage sites and medical, educational and community facilities.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. In Stage 3, specific design choices will investigate how best to develop this concept.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option includes the most efficient route for GOSAM, TALLA and EAST and an efficient route for GRICE.			

Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume unless we increase airspace to the north west to allow for a straighter routing of the GRICE SID in which case this DP is only partially met.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' The early turn for GOSAM may slightly increase the footprint of aircraft emission impacts on local air quality.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 9																
Option RWY06 4xt #2																
This option is accepted and taken forward to the shortlist of options. This option is taken forward as a contingency to provide the required capacity should the 90 second departure interval not be achieved (which is required to deliver the increased capacity for Option 8 – 06 4xt #1). This option may overfly new not currently overflown communities.																

Design Principle Evaluation	Option No: 10
Rwy 06 4xt #3	**Reject**
 **This departure option looks at three SID's connecting with the en-route network at GRICE, GOSAM and TALLA. There is the addition of a fourth departure route, nominally called "East". The departure routes from Rwy 06 are designed to route to the north of Cramond and then split over the Firth of Forth. The TALLA and East SIDs would route along the Firth of Forth to the east overflying the water to keep the population overflown to a minimum. The TALLA SID would turn and cross the coast in an area of minimal population on the East Lothian coast. The East SID would continue over the water and connect with the ATC system as some point over the water to the east northeast of the airport. GRICE and GOSAM turn early to give a departure split of more than 45 degrees with possible issues for the population centres on the South Fife coast. Again, we note that the TALLA and EAST SIDs will turn along the Firth of Forth and not affect Kinghorn on the**	**Alignment with Design Principles**

South Fife Coast. Capacity is increased with possible approval of the reduction of our departure interval from 2 minutes to 1.5 minutes and also the early turn of GOSAM.			
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split and these departures will be subject to a timed departure table.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing TALLA further away from the Fife coast than the existing flightpath, reducing impacts to the Fife coastal communities and crossing the Lothian coastal communities above 7000ft. The new EAST would take a proportion of flights from TALLA and be routed down the Firth of Forth, avoiding impacts to communities. In contrast, the early turns for both GOSAM (50% of the flights) and GRICE (5% of flights) may have a wide swathe (because of differential aircraft performance characteristics) and affect new areas including the southern coastline of the Firth of Forth and the coastal communities in southern Fife at a low altitude. The early turn for GRICE does not increase capacity and so unnecessarily affects more people than required.			

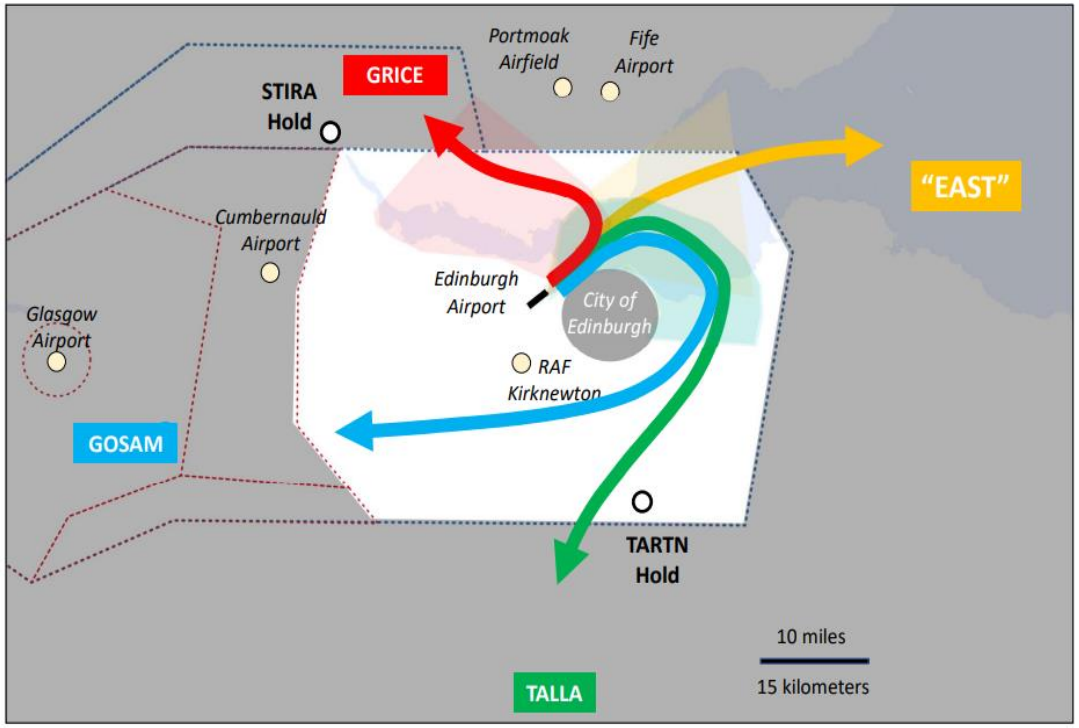
Design Principle 8: For flightpaths at or above 4,000ft to below 7,000ft, the environmental priority should continue to be minimising the impact of aviation noise in a manner consistent with the government's overall policy on aviation noise, unless this would disproportionately increase CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing TALLA further away from the Fife coast than the existing flightpath, reducing impacts to the Fife coastal communities and crossing the Lothian coastal communities above 7000ft. The new EAST would take a proportion of flights from TALLA and be routed down the Firth of Forth, avoiding impacts to communities. In contrast, the early turns for both GOSAM and GRICE may have a wide swathe and would affect new areas including the southern coastline of the Firth of Forth and the coastal communities in southern Fife at a low altitude. GOSAM and GRICE are likely to affect communities in Fife and West Lothian between 4000ft and 7000ft. The early turn for GRICE does not increase capacity and so unnecessarily affects more people than required. None of the flight paths would have disproportionate track mileage.			
Design Principle 9: 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.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce overflown communities by routeing TALLA further away from the Fife coast than the existing flightpath, reducing impacts to the Fife coastal communities and crossing the Lothian coastal communities above 7000ft. The new EAST would take a proportion of flights from TALLA and be routed down the Firth of Forth, avoiding impacts to communities. However, the early turns for GOSAM and GRICE may have a wide swathe and would affect new populations around the southern coastline of the Firth of Forth and the coastal communities in southern Fife at a low altitude. The early turn for GRICE does not increase capacity and so unnecessarily affects more people than required. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce overflown noise sensitive receptors and sites by routeing TALLA further away from the Fife coast, reducing impacts to the Fife coastal communities and crossing the Lothian coastal communities above 7000ft. The new EAST would take a proportion of flights from TALLA and be routed down the Firth of Forth, avoiding impacts to communities. However, the early turns for GOSAM and GRICE may have a wide swathe and would affect new noise sensitive receptors and sites around the southern coastline of the Firth of Forth and the coastal communities in southern Fife at a low altitude. These may include the Dalmeny Estate and Firth of Forth coastlines (important open spaces), heritage sites and medical, educational and community facilities. The early turn for GRICE does not increase capacity and so unnecessarily affects more receptors than required.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. In Stage 3, specific design choices will investigate how best to develop this concept.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option includes the most efficient route for GOSAM, GRICE, TALLA and EAST.			

Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume unless we increase airspace to the northwest to allow for a straighter routing of the GRICE SID in which case this DP is only partially met.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' The early turns for GOSAM and GRICE may slightly increase the footprint of aircraft emission impacts on local air quality.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 10																
Option RWY06 4xt #3																
This option is rejected. The early left turn over GRICE is unnecessary and is likely to generate a wide swathe of flight paths over more populated and newly overflown areas. Other options are preferable.																

Design Principle Evaluation	Option No: 11
Rwy 06 4xt #4	Reject
	Alignment with Design Principles



RWY 06-4xt-#4

This departure option looks at three SID's connecting with the en-route network at GRICE, GOSAM and TALLA. There is the addition of a fourth departure route, nominally called "East". The departure routes from Rwy 06 are designed to route to the north of Cramond and then split over the Firth of Forth. The TALLA and East SIDs would route along the Firth of Forth to the east overflying the water to keep the population overflown to a minimum. The TALLA and GOSAM SIDs in this option would turn right and cross the coast in an area of minimal population on the East Lothian coast. The East SID would continue over the water and connect with the ATC system as some point over the water to the east northeast of the airport. GRICE would turn left as appropriate to cross the South Fife coast minimise overflying population centres. Again, we note that the TALLA, GOSAM and EAST SIDs will turn along the Firth of Forth and not affect Kinghorn on the

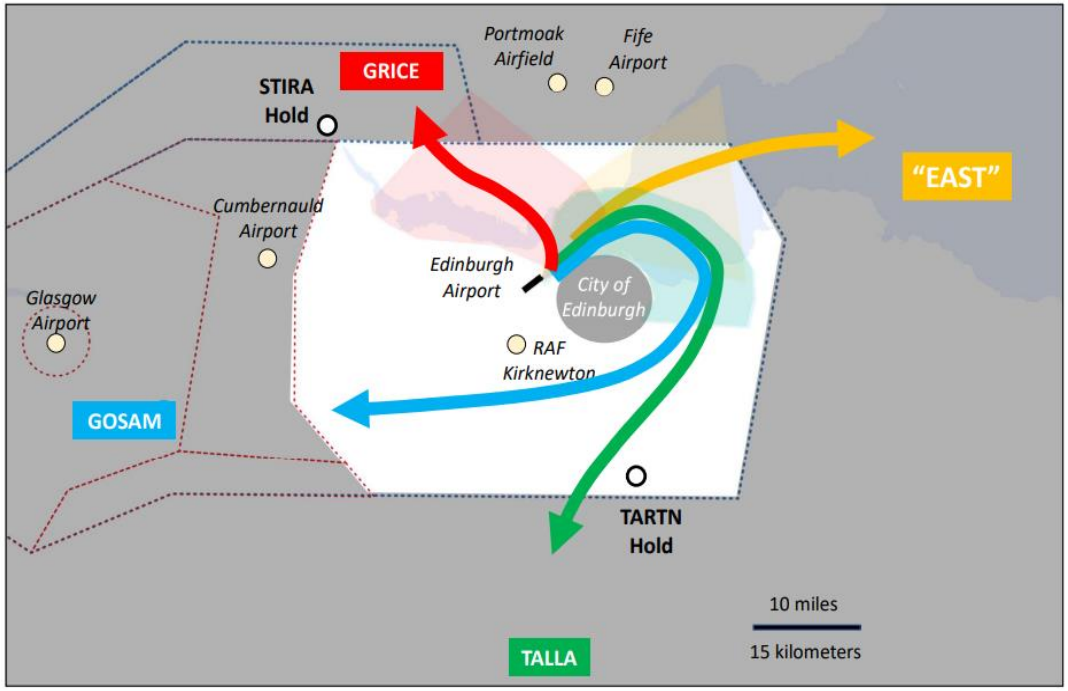
South Fife Coast. Capacity is increased with possible approval of the reduction of our departure interval from 2 minutes to 1.5 minutes. On crossing the coast GOSAM would be designed to route above the inbounds from the south of the airfield.			
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split, and these departures will be subject to a timed departure table.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing GRICE between population centres in southern Fife, routeing TALLA further away from the Fife coast, routeing GOSAM along the same track as TALLA, and introducing a new EAST flightpath to take a proportion of flight from TALLA along the Firth of Forth. These changes would reduce impacts to the Fife coastal communities, and TALLA and GOSAM would cross the Lothian coastal communities above 7000ft.			
Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met

Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities between 4000ft and 7000ft by routeing GRICE between population centres in southern Fife, routeing TALLA further away from the Fife coast, routeing GOSAM along the same track as TALLA, and introducing a new EAST flightpath to take a proportion of flight from TALLA along the Firth of Forth. While this would minimise aviation noise impacts to communities, the GOSAM route would result in a significant increase in track miles and CO2 emissions (for approximately 50% of all flights) compared to a left turn for GOSAM. Whether this constitutes a 'disproportionate increase' will be assessed in more detail in subsequent stages of the project. This is the only reason this criterion has been assessed at this stage as 'partially met'.			
Design Principle 9: 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	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities below 7000ft by routeing GRICE between population centres in southern Fife, routeing TALLA and GOSAM further away from the Fife coast (crossing the Lothian coast above 7000ft) and introducing a new EAST flightpath to take a proportion of flight from TALLA along the Firth of Forth. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to noise sensitive receptors and sites by routeing GRICE between population centres in southern Fife, routeing TALLA and GOSAM further away from the Fife coast (crossing the Lothian coast above 7000ft) and introducing a new EAST flightpath to take a proportion of flight from TALLA along the Firth of Forth.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. In Stage 3, specific design choices will investigate how best to develop this concept.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option includes the most efficient route for EAST, efficient routes for GRICE and TALLA, and an inefficient route for GOSAM (approximately 50% of all flights).			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume unless we increase airspace to the northwest to allow for a straighter routing of the GRICE SID in which case this DP is only partially met.			

Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' The initial straight-ahead routeing of all flights, replicating the existing routes, will minimise the footprint of aircraft emission impacts on local air quality.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 11																
Option RWY06 4xt #4																
This option is rejected. While this option could be designed safely, the concentration of traffic in one place increases the complexity of managing the airspace. This option also increases track miles and doesn't meet DP12.																

Design Principle Evaluation	Option No: 12
Rwy 06 4xt #5	**Reject**
 **This departure option looks at three SID's connecting with the en-route network at GRICE, GOSAM and TALLA. There is the addition of a fourth departure route, nominally called "East". The departure routes from Rwy 06 are designed to route to the north of Cramond and then split over the Firth of Forth. The TALLA and East SIDs would route along the Firth of Forth to the east overflying the water to keep the population overflown to a minimum. The TALLA and GOSAM SIDs in this option would turn right and cross the coast in an area of minimal population on the East Lothian coast. The East SID would continue over the water and connect with the ATC system as some point over the water to the east northeast of the airport. GRICE would turn left immediately to allow for a 45 degree departure split and route over the south Fife coast. Again, we note that the TALLA, GOSAM and EAST SIDs will turn along the Firth of Forth and not affect Kinghorn on the South Fife Coast. Capacity is increased with possible approval of the reduction of our departure interval from 2 minutes to 1.5 minutes and also with the early left turn for GRICE. On crossing the coast GOSAM would be designed to route above the inbounds from the south of the airfield.**	**Alignment with Design Principles**

Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split, and these departures will be subject to a timed departure table.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will substantially reduce impacts to overflown communities by routeing TALLA (45% of flights) and GOSAM (50% of flights) further away from the Fife coast (crossing the Lothian coast above 7000ft) and introducing a new EAST flightpath to take a proportion (~15%) of flights from TALLA along the Firth of Forth. While the early turn for GRICE (5% of flights) may have a wide swathe (because of differential aircraft performance characteristics) and affect new areas including the southern coastline of the Firth of Forth and the coastal communities in southern Fife at a low altitude without delivering additional capacity, the net reduction in flights over southern Fife would be substantial.			
Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met

Qualitative Assessment: Compared to the baseline, the flight paths will substantially reduce impacts to overflown communities by routeing TALLA and GOSAM further away from the Fife coast (crossing the Lothian coast above 7000ft) and introducing a new EAST flightpath to take a proportion of flights from TALLA along the Firth of Forth. These will account for approximately 95% of all flights. While the early turn for GRICE (5% of flights) may have a wide swathe (because of differential aircraft performance characteristics) and affect new areas including the southern coastline of the Firth of Forth and the coastal communities in southern Fife at a low altitude without delivering additional capacity, the net reduction in flights over southern Fife would be substantial. While GOSAM would minimise aviation noise impacts to communities, it would result in a significant increase in track miles and CO2 emissions (for approximately 50% of all flights) compared to a left turn for GOSAM.			
Design Principle 9: 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	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will substantially reduce impacts to overflown communities below 7000ft by routeing TALLA and GOSAM further away from the Fife coast (crossing the Lothian coast above 7000ft) and introducing a new EAST flightpath to take a proportion of flights from TALLA along the Firth of Forth. While the early turn for GRICE (5% of flights) may have a wide swathe (because of differential aircraft performance characteristics) and affect new areas including the southern coastline of the Firth of Forth and the coastal communities in southern Fife at a low altitude without delivering additional capacity, the net reduction in flights over southern Fife would be substantial. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will substantially reduce overflown noise sensitive receptors and sites by routeing TALLA and GOSAM further away from the Fife coast (crossing the Lothian coast above 7000ft) and introducing a new EAST flightpath to take a proportion of flight from TALLA along the Firth of Forth. While the early turn for GRICE (5% of flights) may have a wide swathe (because of differential aircraft performance characteristics) and affect new areas including the southern coastline of the Firth of Forth and the coastal communities in southern Fife at a low altitude without delivering additional capacity, the net reduction in flights over southern Fife would be substantial.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. In Stage 3, specific design choices will investigate how best to develop this concept.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option includes the most efficient route for GRICE, TALLA and EAST, but an inefficient route for GOSAM (approximately 50% of all flights).			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			

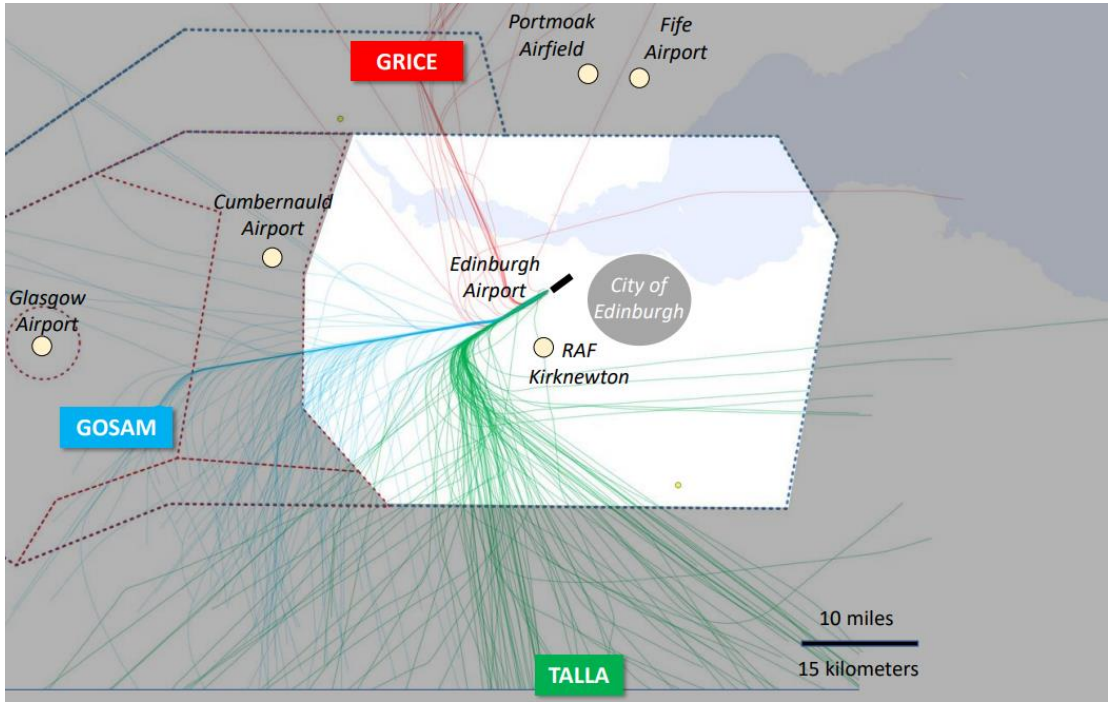
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume unless we increase airspace to the northwest to allow for a straighter routing of the GRICE SID in which case this DP is only partially met.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' The early left turn for GRICE may slightly increase the footprint of aircraft emission impacts on local air quality.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 12																
Option RWY06 4xt #5																

This option is rejected.
The early left turn for GRICE is unnecessary and is likely to generate a wide swathe of flightpaths over more populated and newly overflown areas, other options are preferable. While this option could be designed safely, the concentration of traffic in one place increases the complexity of managing the airspace. This option also increases track miles and doesn't meet DP12.

Rwy 24 Departures

Design Principle Evaluation	Option No: 13
Rwy 24 Baseline	**Accept**
 **This departure option looks at three SID's connecting with the en-route network at GRICE, GOSAM and TALLA. This is the do-nothing option. The departure routes from Rwy 24 are designed to route to west of the airport and then split over the UW beacon affecting the communities of Livingston, Broxburn and Blackness. The UW is approximately 6 miles on the extended centreline so these communities experience aircraft noise from both arrivals for Rwy06 and departures from Rwy24. At the UW GRICE splits to the North, GOSAM continues to the west and TALLA turns to the south. These SIDs operate as one route and departing aircraft are generally spaced 2 minutes apart in agreement with NERL. These flight paths were designed a considerable length of time ago (at least 30 years) and it is good that this ACP looks to improve the situation.**	**Alignment with Design Principles**

Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to act as one route and are subject to a timed departure table.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: This baseline does not include PBN SID's (The do-nothing option).			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are approved for use and are deconflicted with prior coordination.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: These routes are not PBN routes and are not compatible with the CAA's published AMS (CAP 1711.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: The existing flight paths were designed prior to the development of CAP1616 and the Government's Altitude Based Priorities and therefore do not meet current requirements. All three flight paths affect the same population centres in West Lothian prior to diverging, with other, smaller, population centres affected particularly by GRICE after the routes split.			
Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: The existing flight paths were designed prior to the development of CAP1616 and the Government's Altitude Based Priorities and therefore do not meet current requirements. While the flight paths diverge between the 4,000-7,000ft contours and follow relatively efficient tracks, the routes affect large and smaller population centres in West Lothian and were not designed to minimise the impact of aviation noise.			

Design Principle 9: 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	Not met	Partial	Met
Qualitative Assessment: The existing flight paths were designed prior to the development of CAP1616 and the Government's Altitude Based Priorities and therefore do not meet current requirements. The routes affect large and smaller population centres in West Lothian and were not designed to minimise the population overflown below an altitude of 7000ft. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: The existing flight paths were designed prior to the development of CAP1616 and the Government's Altitude Based Priorities and therefore do not meet current requirements. The routes affect large and smaller population centres in West Lothian including a number of sensitive locations and receptors. These include St John's Hospital (with a 24hr A&E), Five Sisters Zoo, formal and informal green spaces including Almondell and Calderwood Country Park and Eliburn Park, and educational facilities including nurseries and schools.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: CAP1616 defines respite as 'planned and notified periods where overflight or noise impact are reduced or halted to allow communities undisturbed time.' The existing flight paths provide track concentration and track dispersal but do not provide opportunities for respite.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: While the routes are relatively direct and track miles are therefore not excessive, the existing flight paths were designed prior to the development of CAP1616 and the Government's Altitude Based Priorities and therefore do not meet current requirements.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume and is Class D airspace. Other airspace users do have access in accordance with national guidance. Also, there is an LoA with Kirknewton.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.'			

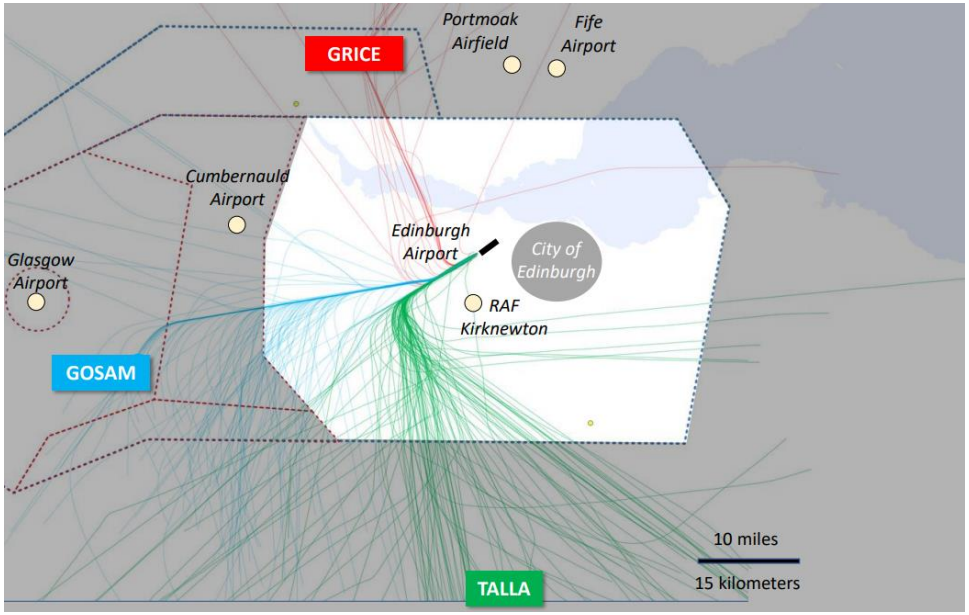
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design does not bring an increase in capacity as the traffic situation remains the same.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 13																
Option RWY 24 Baseline																
This option is accepted as the do nothing baseline option for the IOA.																

Design Principle Evaluation	Option No: 14
Rwy 24 Baseline Modernised	**Accept**

Alignment with Design Principles



This departure option looks at three SID's connecting with the en-route network at GRICE, GOSAM and TALLA. This is the baseline option with the routes being modernised to accept RNAV navigation. The departure routes from Rwy 24 are designed to route to west of the airport and then split over the UW beacon affecting the communities of Livingston, Broxburn and Blackness. The UW is approximately 6 miles on the extended centreline so these communities experience aircraft noise from both arrivals for Rwy06 and departures from Rwy24. At the UW GRICE splits to the North, GOSAM continues to the west and TALLA turns to the south. These SIDs operate as one route and departing aircraft are generally spaced 2 minutes apart in agreement with NERL. These flight paths were designed a considerable length of time ago (at least 30 years) and it is good that this ACP looks to improve the situation.

Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met

Qualitative Assessment: The SIDs are designed to split and these departures will be subject to a timed departure table.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are approved for use and are deconflicted with prior coordination.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Modernisation of the existing flight paths, which were designed prior to the development of CAP1616 and the Government's Altitude Based Priorities and therefore do not meet current requirements, will not deliver improvements. All three flight paths affect the same population centres in West Lothian prior to diverging, with other, smaller, population centres affected particularly by GRICE after the routes split.			
Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: Modernisation of the existing flight paths, which were designed prior to the development of CAP1616 and the Government's Altitude Based Priorities and therefore do not meet current requirements, will not deliver improvements. While the flight paths diverge between the 4,000-7,000ft contours and follow relatively efficient tracks, the routes affect large and smaller population centres in West Lothian and were not designed to minimise the impact of aviation noise.			

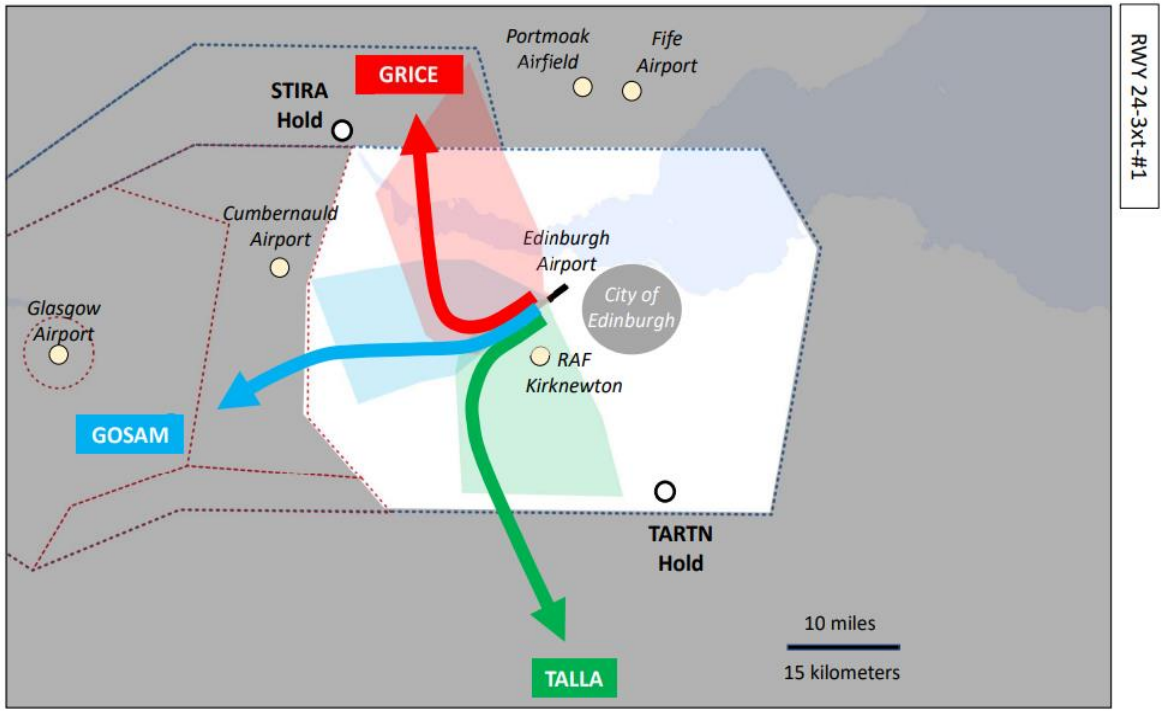
Design Principle 9: Flight paths should be designed to minimise population overflown below 4,000ft and, between 4,000ft and 7,000ft, taking into account any potential adverse impact, due to those overflown having protected characteristics, as defined by the Equalities Act 2010	Not met	Partial	Met
Qualitative Assessment: Modernisation of the existing flight paths, which were designed prior to the development of CAP1616 and the Government's Altitude Based Priorities and therefore do not meet current requirements, will not deliver improvements. The routes affect large and smaller population centres in West Lothian and were not designed to minimise the population overflown below an altitude of 7000ft. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Modernisation of the existing flight paths, which were designed prior to the development of CAP1616 and the Government's Altitude Based Priorities and therefore do not meet current requirements, will not deliver improvements. The routes affect large and smaller population centres in West Lothian including a number of sensitive locations and receptors. These include St John's Hospital (with a 24hr A&E), Five Sisters Zoo, formal and informal green spaces including Almondell and Calderwood Country Park and Eliburn Park, and educational facilities including nurseries and schools.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: CAP1616 defines respite as 'planned and notified periods where overflight or noise impact are reduced or halted to allow communities undisturbed time.' Modernisation of the existing flight paths, which provide track concentration and track dispersal but do not provide opportunities for respite, will not deliver improvements.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: While the routes are relatively direct and track miles are therefore not excessive, the existing flight paths were designed prior to the development of CAP1616 and the Government's Altitude Based Priorities and therefore do not meet current requirements. Modernisation of the existing routes will not deliver improvements.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume and is Class D airspace. Other airspace users do have access in accordance with national guidance. Also there is an LoA with Kirknewton.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.'			

Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design does not bring a capacity increase as the traffic situation remains the same.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 14																
Option RWY24 Baseline modernised																
The modernised baseline (do minimum option) is accepted and taken forward to the shortlist of options. The modernised baseline would be RNAV compatible.																

Design Principle Evaluation	Option No: 15
Rwy 24 3xt #1	**Accept**



This departure option looks at three SID's connecting with the en-route network at GRICE, GOSAM and TALLA. These SIDs operate as one route and departing aircraft are generally spaced 2 minutes apart in agreement with NERL. As these routes will be designed to incorporate PBN the turns for TALLA and GRICE will take place with due consideration to minimising the effect of aircraft noise on population centres. Also the routing straight ahead for GOSAM will take account of the opportunity to route along the M8 corridor. With the possibility of reducing the time taken between departures from 2 minutes to 1.5 minutes this will increase capacity as seen in the illustration above.

Alignment with Design Principles

Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split and these departures will be subject to a timed departure table.			

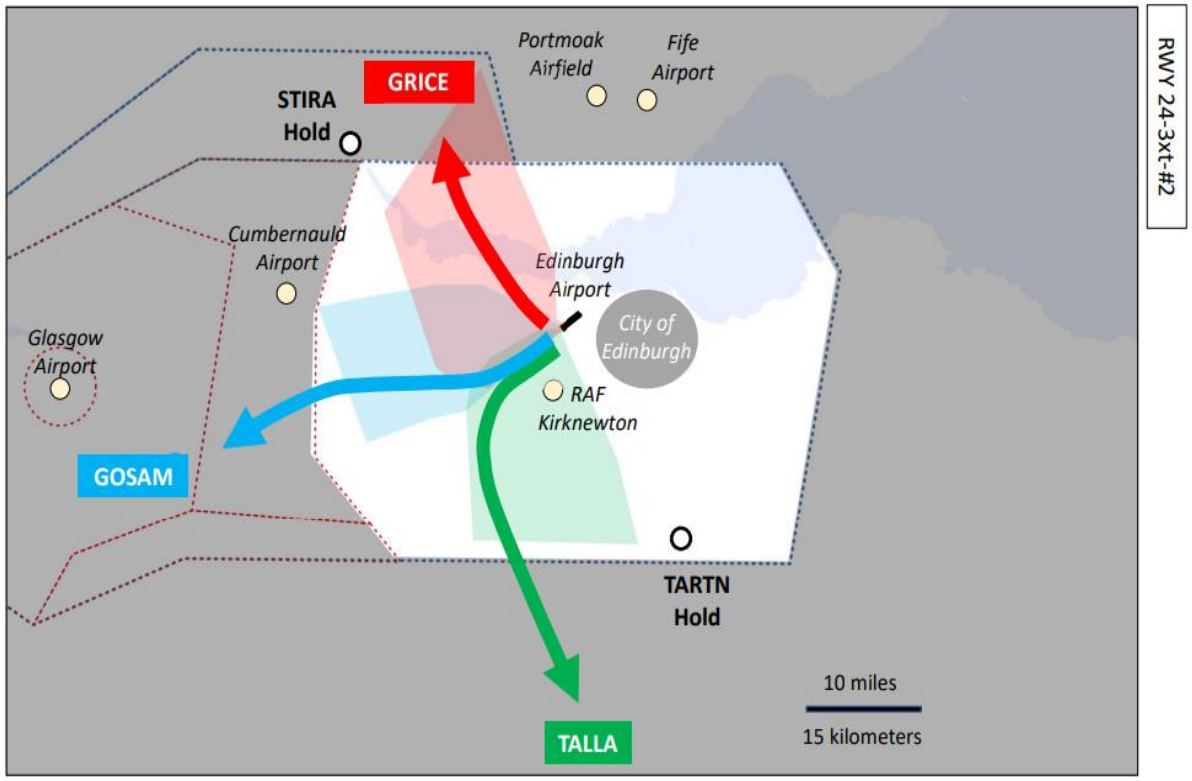
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing GOSAM along the M8 corridor, and by turning GRICE and TALLA in locations that will minimise overflown communities.			
Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce noise impacts to overflown communities by routeing GOSAM along the M8 corridor, and by turning GRICE and TALLA in locations that will minimise overflown communities. The flight paths will be relatively direct and the prioritisation of noise minimisation is unlikely to have a disproportionate impact on CO2 emissions.			
Design Principle 9: 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.	Not met	Partial	Met

Qualitative Assessment: Compared to the baseline, the flight paths will reduce the overflown population by routeing GOSAM along the M8 corridor, and by turning GRICE and TALLA in locations that will minimise overflown communities. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing GOSAM along the M8 corridor, and by turning GRICE and TALLA in locations that will minimise overflown communities. This will reduce the number of overflown sensitive locations and receptors.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. In Stage 3, specific design choices will investigate how best to develop this concept.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option includes the most efficient route for GOSAM plus moderate improvements for both GRICE and TALLA.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume or may reduce, and this option takes account of Kirknewton.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' The initial straight-ahead routeing of all flights, replicating the existing routes, will minimise the footprint of aircraft emission impacts on local air quality.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP

	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 15																
Option RWY24 3xt #1																
This option is accepted and taken forward to the shortlist of options. This option provides benefits over the modernised baseline but is dependent on achieving a 90 second departure separation to deliver the capacity requirements. This option would be designed to minimise overflying communities.																

Design Principle Evaluation	Option No: 16
Rwy 24 3xt #2	**Reject**
 **This departure option looks at three SID's connecting with the en-route network at GRICE, GOSAM and TALLA from Rwy 24. This option looks at GRICE turning as early as possible to give a 45-degree split from the other 2 departure routes. This affects the community of Winchburgh which is increasing in size and gives a small increase to our runway capacity numbers. These flight paths will be designed to be RNAV capable and improve the situation of population overflown to the west. As these routes will be designed to incorporate PBN the turns for TALLA will take place with due consideration to minimising the effect of aircraft noise on population centres. Also, the routing straight ahead for GOSAM will take account of the opportunity to route along the M8 corridor. With the possibility of reducing the time taken between departures from 2 minutes to 1.5 minutes this will increase capacity as seen in the illustration above.**	**Alignment with Design Principles**

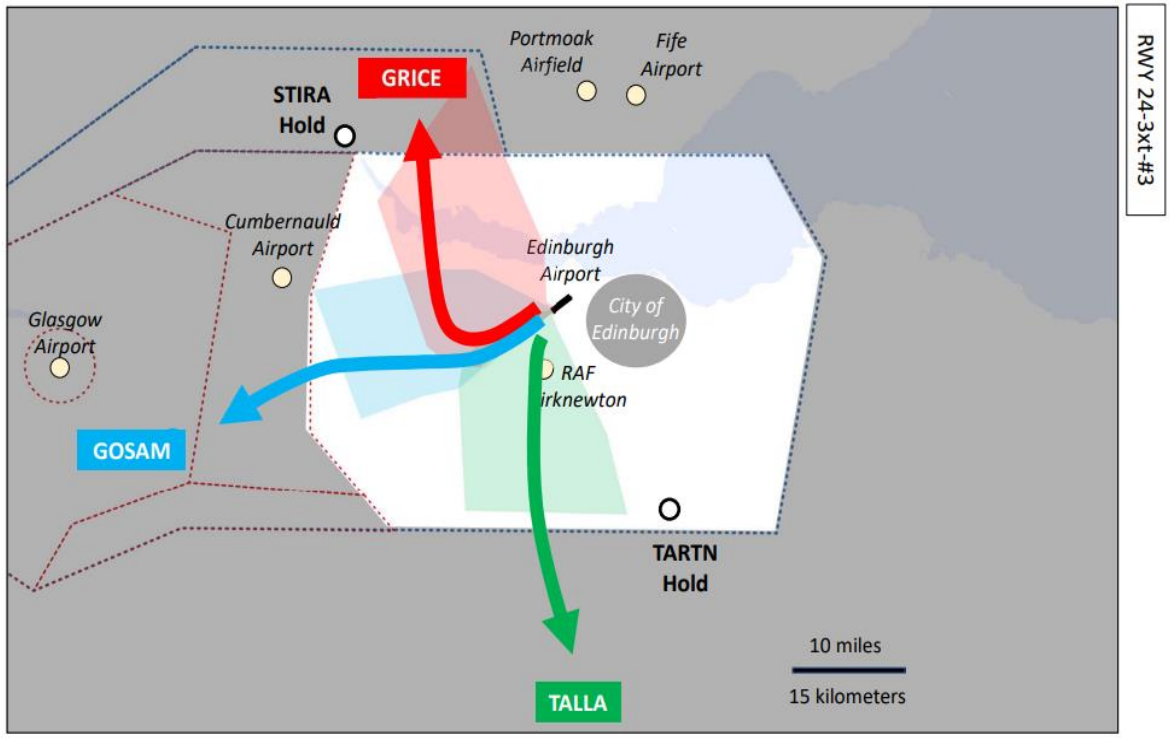
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split, and these departures will be subject to a timed departure table.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option will reduce impacts to overflown communities by routeing GOSAM along the M8 corridor, and by turning TALLA in a location that will minimise overflown communities. However, the early turn for GRICE (5% of flights) will newly affect existing communities and population growth areas in West Lothian at a relatively low altitude.			
Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce noise impacts to overflown communities between 4000ft and 7000ft by routeing GOSAM along the M8 corridor, and by turning TALLA in a location that will minimise overflown communities – delivering reduced noise impacts and more direct routeing. However, despite the			

GRICE flight path being more direct than the baseline because of the early turn, it will result in noise impacts at a relatively low altitude to newly overflown communities and growth areas in West Lothian (for 5% of flights).			
Design Principle 9: 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.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing GOSAM along the M8 corridor, and by turning TALLA in a location that will minimise overflown communities. However, the early turn for GRICE (5% of flights) will newly affect existing communities and growth areas in West Lothian at a relatively low altitude. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing GOSAM along the M8 corridor, and by turning TALLA in a location that will minimise overflown communities. This will reduce the number of overflown sensitive locations and receptors along these routes. However, the early turn for GRICE (5% of flights) will newly affect existing communities and growth areas in West Lothian at a relatively low altitude and will affect sensitive locations and receptors including nurseries, primary and secondary schools and medical surgeries.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. In Stage 3, specific design choices will investigate how best to develop this concept.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option includes the most efficient routes for GOSAM and GRICE plus a moderate improvement for TALLA.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume with Class D airspace. We also take account of Kirknewton in this option.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met

Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' Compared to the baseline, the early turn for GRICE may increase the footprint of aircraft emission impacts on local air quality.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 16																
Option RWY 24 3xt #2																
This option is rejected. This option wouldn't increase capacity and would unnecessarily overfly not currently overflown communities.																

Design Principle Evaluation	Option No: 17
Rwy 24 3xt #3	**Accept**
 **This departure option looks at three SID's connecting with the en-route network at GRICE, GOSAM and TALLA from Rwy 24. This option looks at TALLA turning as early as possible to give a 45-degree split from the other 2 departure routes. This affects the users of Kirknewton airfield and would only be available if Kirknewton was inactive. These flight paths will be designed to be RNAV capable and improve the situation of population overflown to the west. As these routes will be designed to incorporate PBN the turns for GRICE and GOSAM will take place with due consideration to minimising the effect of aircraft noise on population centres. Also, the routing straight ahead for GOSAM will take account of the opportunity to route along the M8 corridor. With the possibility of reducing the time taken between departures from 2 minutes to 1.5 minutes this will increase capacity as seen in the illustration above.**	**Alignment with Design Principles**

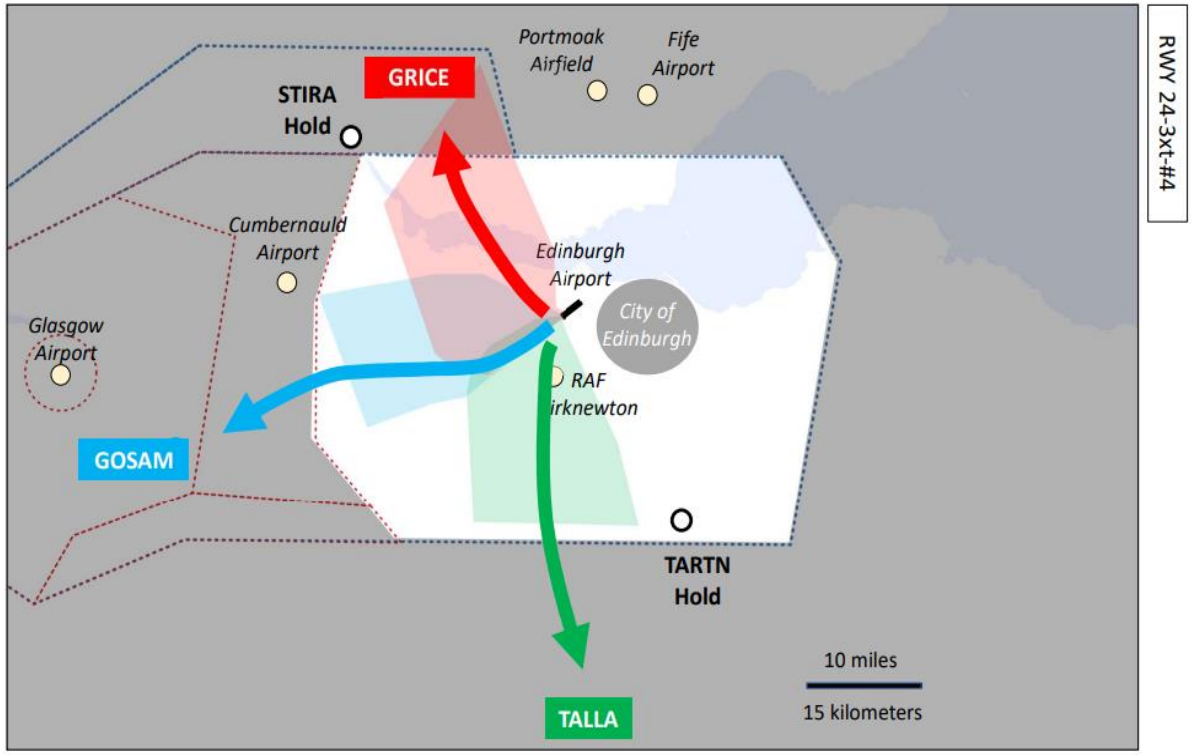
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split and these departures will be subject to a timed departure table.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option will reduce impacts to overflown communities by routeing GOSAM along the M8 corridor, and by turning GRICE in a location that will minimise overflown communities. The early turn for TALLA will avoid approximately 45% of all departures currently overflying the large population in Livingston but will affect a smaller number of people in small communities at a relatively low altitude.			
Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met

Qualitative Assessment: Compared to the baseline, this option will reduce noise impacts between 4000ft to 7000ft by routeing GOSAM along the M8 corridor, and by turning GRICE in a location that will minimise overflown communities. The early turn for TALLA will provide a more direct route while avoiding approximately 45% of all departures currently overflying the large population in Livingston but will affect a smaller number of people in small communities at a relatively low altitude.			
Design Principle 9: 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.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing GOSAM along the M8 corridor, and by turning GRICE in a location that will minimise overflown communities. However, the early turn for TALLA will newly affect small communities in West Lothian at a relatively low altitude and may affect the Sight Scotland Veterans' centre at Kirknewton. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing GOSAM along the M8 corridor, and by turning GRICE in a location that will minimise overflown communities. This will reduce the number of overflown sensitive locations and receptors along these routes. However, the early turn for TALLA (45% of flights) may newly affect sensitive locations & receptors in West Lothian at a relatively low altitude including a nursery, primary school, community centre, Sight Scotland Veterans' centre, Cyrenians Farm and Jupiter Artland.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. In Stage 3, specific design choices will investigate how best to develop this concept.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option includes the most efficient routes for GOSAM and TALLA plus a moderate improvement for GRICE.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume and Class D. Kirknewton is overflown in this option. We have the option to design two SIDs with one finishing point in order to facilitate Kirknewton being active. This principle already exists at particular airports in the UK.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met

Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' Compared to the baseline, the early turn for TALLA may increase the footprint of aircraft emission impacts on local air quality.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 17																
Option RWY 24 3xt #3																
This option is accepted and taken forward to the shortlist of options. This option is taken forward as it would provide the required capacity should the 90 second departure interval not be achieved (which is required to deliver the increased capacity for Option 15 – 24 3xt #1). This option may overfly new not currently overflown communities. This option has greater complexity as the TALLA SID could only be flown when RAF Kirknewton is not in operation, and an alternative TALLA would be required during those periods.																

Design Principle Evaluation	Option No: 18
Rwy 24 3xt #4	**Reject**
	**Alignment with Design Principles**
This departure option looks at three SID's connecting with the en-route network at GRICE, GOSAM and TALLA from Rwy 24. This option looks at TALLA turning as early as possible to give a 45-degree split from the other 2 departure routes. This affects the users of Kirknewton airfield and would only be available if Kirknewton was inactive. The turn for GRICE is also immediate to the north giving a 45-degree split to the other departure routes. These turns to GRICE and TALLA are without due consideration for minimising the number of people overflown but they do contribute to a maximum hourly departure figure for runway utilisation. The routing straight ahead for GOSAM will take account of the opportunity to route along the M8 corridor. With the possibility of reducing the time taken between departures from 2 minutes to 1.5 minutes this will increase capacity as seen in the illustration above.	

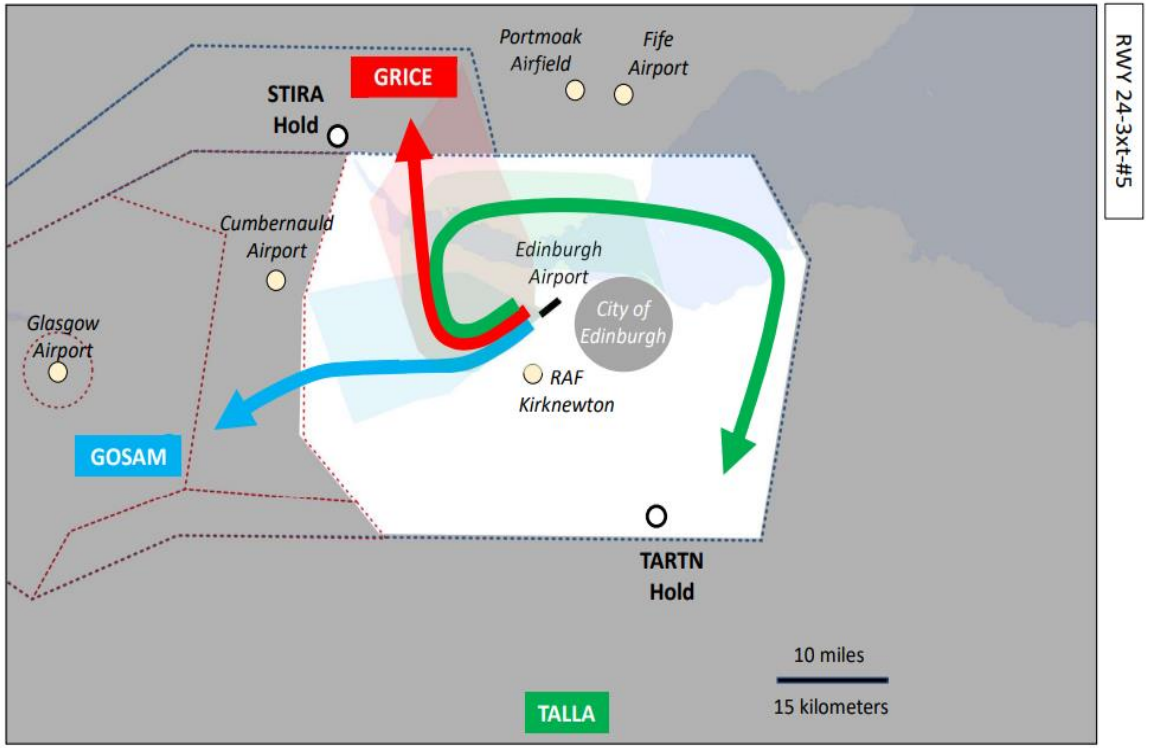
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split and these departures will be subject to a timed departure table.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option will reduce impacts to currently overflown communities and large population centres in West Lothian by routeing GOSAM along the M8 corridor, and by having early turns for both TALLA and GRICE. The early turn for GRICE (5% of flights) will unnecessarily newly affect smaller existing communities and population growth areas in West Lothian without delivering additional capacity, while the early turn for TALLA (45% of flights) will affect a relatively smaller number of people in small communities than the baseline, both at a relatively low altitude.			
Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met

Qualitative Assessment: Compared to the baseline, the flight paths will reduce noise impacts to currently overflown large communities between 4000ft and 7000ft by routeing GOSAM along the M8 corridor, and by early turns for TALLA and GRICE. The early turn for GRICE (5% of flights) will unnecessarily newly affect smaller existing communities and population growth areas in West Lothian without delivering additional capacity, while the early turn for TALLA (45% of flights) will affect a relatively smaller number of people in small communities than the baseline, both at a relatively low altitude. While the routes are the most direct and efficient, and the aggregate overflown population is likely to be smaller than the baseline, the newly overflown communities may be more sensitive to aircraft noise.			
Design Principle 9: 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	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to currently overflown large communities by routeing GOSAM along the M8 corridor, and by turning TALLA and GRICE before they overfly Livingston. The early turn for GRICE (5% of flights) will unnecessarily newly affect smaller existing communities and population growth areas in West Lothian without delivering additional capacity, while the early turn for TALLA (45% of flights) will affect a relatively smaller number of people in small communities than the baseline, both at a relatively low altitude. While the routes are the most direct and efficient, and the aggregate overflown population is likely to be smaller than the baseline, the newly overflown communities may be more sensitive to aircraft noise. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to currently overflown large communities by routeing GOSAM along the M8 corridor, and by early turns for TALLA and GRICE before they overfly Livingston. The early turn for GRICE (5% of flights) will unnecessarily newly affect sensitive locations and receptors such as nurseries, primary & secondary schools and medical surgeries in West Lothian, without delivering additional capacity. The early turn for TALLA (45% of flights) will affect a relatively smaller number of sensitive locations & receptors in West Lothian (compared to the baseline) including a nursery, primary school, community centre and, potentially, Sight Scotland Veterans' centre, Cyrenians Farm and Jupiter Artland.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. In Stage 3, specific design choices will investigate how best to develop this concept.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option provides the most efficient routes for GOSAM, TALLA and GRICE.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met

Qualitative Assessment: CAS remains the same volume and Class D. Kirknewton is overflown in this option. We have the option to design two SIDs with one finishing point in order to facilitate Kirknewton being active. This principle already exists at particular airports in the UK.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' Compared to the baseline, the early turns for TALLA and GRICE may increase the footprint of aircraft emission impacts on local air quality.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 18																
Option RWY 24 3xt #4																
This option is rejected. While this option increases capacity, the early GRICE turn would overfly new not currently overflown communities and better options are available.																

Design Principle Evaluation	Option No: 19
Rwy 24 3xt #5	Reject
 **This departure option looks at three SID's connecting with the en-route network at GRICE, GOSAM and TALLA from Rwy 24. This option looks at TALLA turning to the right, along with GRICE but taking into account the population overflown at Broxburn. This later turn does not give a 45-degree split from the GOSAM SID early enough and so cannot be considered as a departure split. The routing straight ahead for GOSAM will take account of the opportunity to route along the M8 corridor. With the possibility of reducing the time taken between departures from 2 minutes to 1.5 minutes this will increase capacity as seen in the illustration above. The right turn for TALLA increases track miles and also affects more of the population to the north of the airfield. There is also an issue in that this SID would need to be designed to climb enough to overfly inbounds from the south.**	**Alignment with Design Principles**

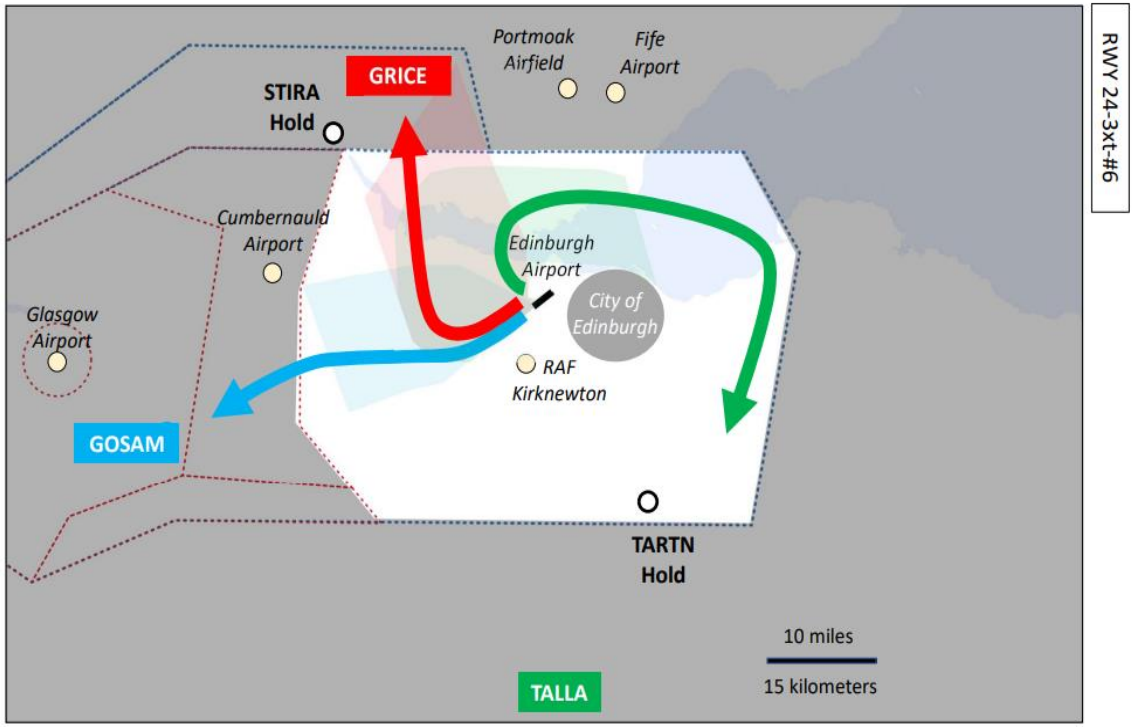
Conversely, the TALLA SID flown in this way would reduce to zero the number of people overflown to the southwest of the airfield when Rwy 24 was in use.			
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split and these departures will be subject to a timed departure table.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option will reduce impacts to currently overflown large communities by routeing GOSAM along the M8 corridor, and by turning GRICE in a location that will minimise overflown communities. While the right turn for TALLA will avoid approximately 45% of all departures currently overflying Livingston, it will newly affect multiple population centres along the Forth of Forth coast and southern Fife.			

Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option will reduce noise impacts between 4000ft to 7000ft to the currently overflown large communities by routeing GOSAM along the M8 corridor, and by turning GRICE in a location that will minimise overflown communities. However, the right turn for TALLA will result in a disproportionate increase in track miles and CO2 emissions plus an increase in noise-affected communities compared to a left turn.			
Design Principle 9: 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	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to currently overflown large communities by routeing GOSAM along the M8 corridor, and by turning GRICE in a location that will minimise overflown communities. While the right turn for TALLA will avoid approximately 45% of all departures currently overflying Livingston, it will newly affect population centres along the Forth of Forth coast and southern Fife resulting in an increase in noise-affected communities compared to a left turn. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to currently overflown large communities by routeing GOSAM along the M8 corridor, and by turning GRICE in a location that will minimise overflown communities. This will reduce the number of overflown sensitive locations and receptors along these routes. However, the right turn for TALLA will newly affect multiple communities and sensitive locations & receptors along the Forth of Forth coast and southern Fife including sites with nature designations (SSSIs, Ramsar, SPAs), scheduled monuments plus community receptors including nurseries, schools and community centres.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. In Stage 3, specific design choices will investigate how best to develop this concept.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option includes the most efficient route for GOSAM, with a moderate improvement for GRICE. In contrast, the TALLA right turn results in a very large increase in track miles, fuel burn and CO2 emissions for approximately 45% of all departures.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met

Qualitative Assessment: CAS remains the same volume and Class D airspace.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' Compared to the baseline, the initial straight-ahead routes for all three SIDS would result in no change to the existing footprint of aircraft emission impacts on local air quality.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 19																
Option RWY24 3xt #5																
This option is rejected. This option would entail excessive track miles on TALLA, and the traffic would unnecessarily overfly not currently overflown communities to the north of the airport, while the traffic destination is to the south. This option also does not increase capacity.																

Design Principle Evaluation	Option No: 20
Rwy 24 3xt #6	**Reject**
 **This departure option looks at three SID's connecting with the en-route network at GRICE, GOSAM and TALLA from Rwy 24. This option looks at TALLA turning immediately to the right, and GRICE turning right further to the west taking into account the population overflown at Broxburn. This TALLA turn gives a 45-degree split from the GOSAM SID and so gives an associated increase in capacity. The routing straight ahead for GOSAM will take account of the opportunity to route along the M8 corridor. With the possibility of reducing the time taken between departures from 2 minutes to 1.5 minutes these factors will increase capacity as seen in the illustration above. The right turn for TALLA increases track miles and also affects more of the population to the north of the airfield. There is also an issue in that this SID would need to be designed to climb enough to overfly inbounds from the south.**	**Alignment with Design Principles**

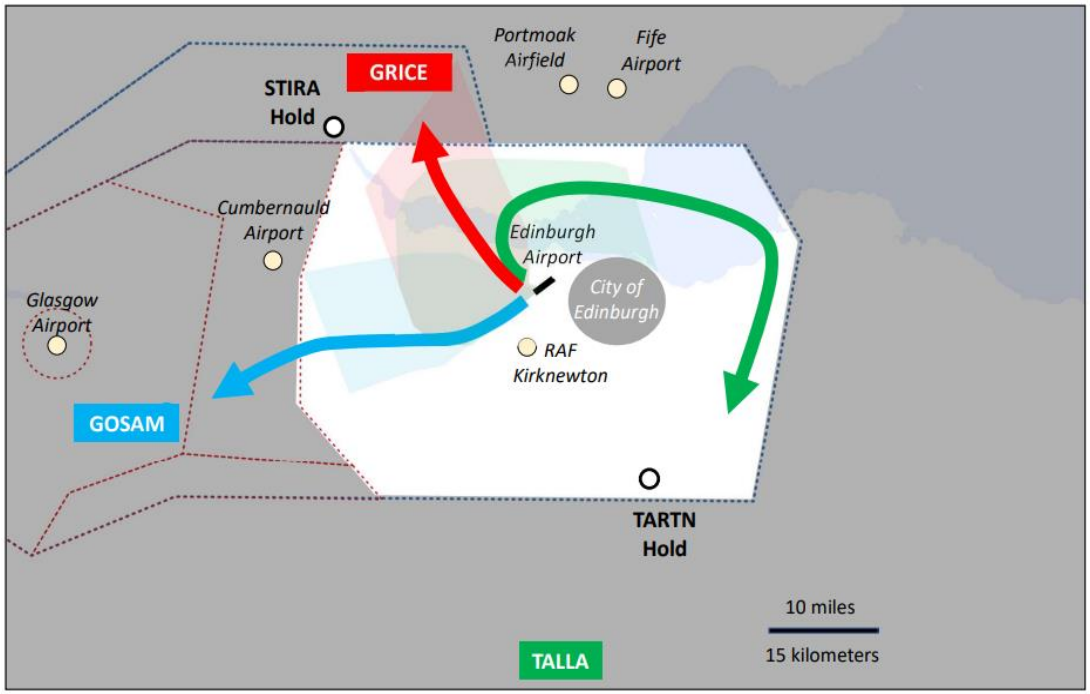
Conversely, the TALLA SID flown in this way would reduce to zero the number of people overflown to the southwest of the airfield when Rwy 24 is in use.			
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split, and these departures will be subject to a timed departure table.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option will reduce impacts to currently overflown large communities by routeing GOSAM along the M8 corridor, and by turning GRICE in a location that will minimise overflown communities. While the early right turn for TALLA will avoid approximately 45% of all departures currently overflying Livingston, it will newly affect existing communities and population growth areas in West Lothian at a relatively low altitude plus communities along the Firth of Forth coast and southern Fife.			

Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option will reduce noise impacts between 4000ft to 7000ft to the currently overflown large communities by routeing GOSAM along the M8 corridor, and by turning GRICE in a location that will minimise overflown communities. However, the early right turn for TALLA will result in a disproportionate increase in track miles and CO2 emissions plus an increase in noise-affected existing communities and population growth areas in West Lothian at a relatively low altitude and communities along the Firth of Forth coast and southern Fife, compared to a TALLA left turn.			
Design Principle 9: 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	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to currently overflown large communities by routeing GOSAM along the M8 corridor, and by turning GRICE in a location that will minimise overflown communities. While the early right turn for TALLA will avoid approximately 45% of all departures currently overflying Livingston, it will newly affect existing communities and population growth areas in West Lothian at a relatively low altitude and communities along the Firth of Forth coast and southern Fife, compared to a TALLA left turn. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to currently overflown large communities by routeing GOSAM along the M8 corridor, and by turning GRICE in a location that will minimise overflown communities. This will reduce the number of overflown sensitive locations and receptors along these routes. However, the early right turn for TALLA will newly affect multiple communities and sensitive locations & receptors along the Forth of Forth coast and southern Fife including sites with nature designations (SSSIs, Ramsar, SPAs), scheduled monuments plus community receptors including nurseries, schools and community centres.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. In Stage 3, specific design choices will investigate how best to develop this concept.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option includes the most efficient route for GOSAM, with a moderate improvement for GRICE. In contrast, the TALLA early right turn results in a very large increase in track miles, fuel burn and CO2 emissions for approximately 45% of all departures.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			

Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume and Class D airspace.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' Compared to the baseline, the early right turn for TALLA may increase the existing footprint of aircraft emission impacts on local air quality.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 20																
Option RWY 24 3xt #6																
This option is rejected. This option would entail excessive track miles on TALLA, and the traffic would unnecessarily overfly not currently overflown communities to the north of the airport, while the traffic destination is to the south.																

Design Principle Evaluation	Option No: 21
Rwy 24 3xt #7	**Reject**
 **This departure option looks at three SID's connecting with the en-route network at GRICE, GOSAM and TALLA from Rwy 24. This option looks at TALLA turning immediately to the right, coincident with GRICE also turning immediately to the right. This TALLA and GRICE turn gives a 45-degree split from the GOSAM SID and so gives an associated increase in capacity. The routing straight ahead for GOSAM will take account of the opportunity to route along the M8 corridor. With the possibility of reducing the time taken between departures from 2 minutes to 1.5 minutes these factors will increase capacity as seen in the illustration above. The right turn for TALLA increases track miles and also affects more of the population to the north of the airfield. There is also an issue in that this SID would need to be designed to climb enough to overfly inbounds from the south.** **Conversely, the TALLA SID flown in this way would reduce to zero the number of people overflown to the southwest of the airfield when Rwy 24 is in use.**	**Alignment with Design Principles**

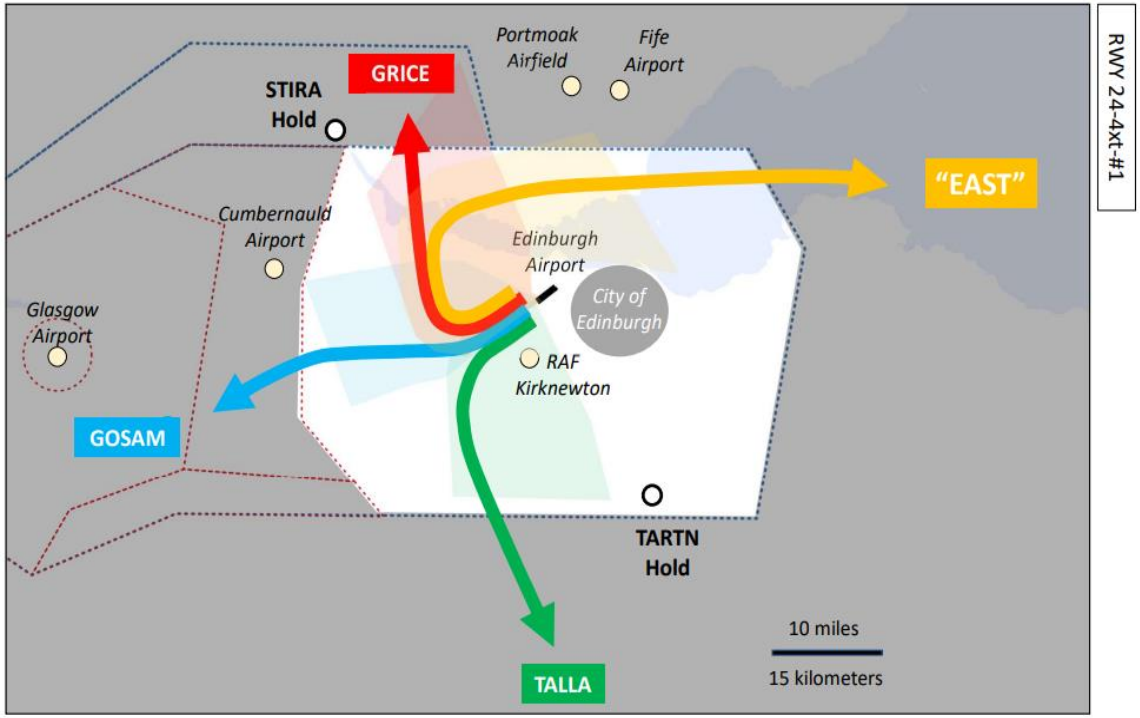
The immediate turn for both TALLA and GRICE also affect population centres to the northwest of the airfield and then in the south of Fife.			
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split, and these departures will be subject to a timed departure table.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option will reduce impacts to currently overflown large communities by routeing GOSAM along the M8 corridor. While the early right turn for GRICE and TALLA will avoid approximately 50% of all departures currently overflying Livingston, it will newly affect existing communities and population growth areas in West Lothian at a relatively low altitude plus communities along the Firth of Forth coast and southern Fife.			
Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met

Qualitative Assessment: Compared to the baseline, this option will reduce noise impacts between 4000ft to 7000ft to the currently overflown large communities by routeing GOSAM along the M8 corridor, and through the early right turns for GRICE and TALLA. The early right turn for GRICE is the most efficient route but would newly affect multiple small communities and population growth areas in West Lothian at a relatively low altitude. The early right turn for TALLA will result in a disproportionate increase in track miles and CO2 emissions plus an increase in noise-affected existing communities and population growth areas in West Lothian at a relatively low altitude and communities along the Firth of Forth coast and southern Fife, compared to a TALLA left turn.			
Design Principle 9: 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	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to currently overflown large communities by routeing GOSAM along the M8 corridor, and through early right turns for GRICE and TALLA. While the early right turns for GRICE and TALLA will avoid approximately 50% of all departures currently overflying Livingston, it will newly affect existing communities and population growth areas in West Lothian at a relatively low altitude and communities along the Firth of Forth coast and southern Fife. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to currently overflown large communities by routeing GOSAM along the M8 corridor, and through early right turns for GRICE and TALLA. This will reduce the number of overflown sensitive locations and receptors along the existing routes. However, the early right turns for GRICE and TALLA will newly affect multiple communities and sensitive locations & receptors along the Forth of Forth coast and southern Fife including sites with nature designations (SSSIs, Ramsar, SPAs), scheduled monuments plus community receptors including nurseries, schools and community centres.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. In Stage 3, specific design choices will investigate how best to develop this concept.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option includes the most efficient route for GOSAM, with an improvement for the early right turn for GRICE. In contrast, the TALLA early right turn results in a very large increase in track miles, fuel burn and CO2 emissions for approximately 45% of all departures.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume and Class D airspace.			

Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' Compared to the baseline, the early right turns for GRICE and TALLA may increase the existing footprint of aircraft emission impacts on local air quality.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 21																
Option RWY 24 3xt #7																
This option is rejected. This option would significantly increase the population overflown in new communities while only slightly increasing capacity. The early turn would potentially overfly new and not currently overflown communities below 1000ft.																

Design Principle Evaluation	Option No: 22
Rwy 24 4xt #1	**Accept**
 **This departure option looks at four SID's connecting with the en-route network at GRICE, GOSAM and TALLA with an additional SID to the East. These SIDs operate as one route and departing aircraft are generally spaced 2 minutes apart in agreement with NERL. As these routes will be designed to incorporate PBN the turns for TALLA, GOSAM, GRICE and EAST will take place with due consideration to minimising the effect of aircraft noise on population centres. Also, the routing straight ahead for GOSAM will take account of the opportunity to route along the M8 corridor. With the possibility of reducing the time taken between departures from 2 minutes to 1.5 minutes this will increase capacity as seen in the illustration above.** **In this option we also illustrate the possibility of the new SID to the EAST. This would initially depart along the same route as the other 3 SIDs and take into account population centres before turning to the East in order to join the network out to the northeast of the airport giving fuel savings to aircraft routing out in that direction. The capacity increases this new SID gives is minimal in this option.**	**Alignment with Design Principles**

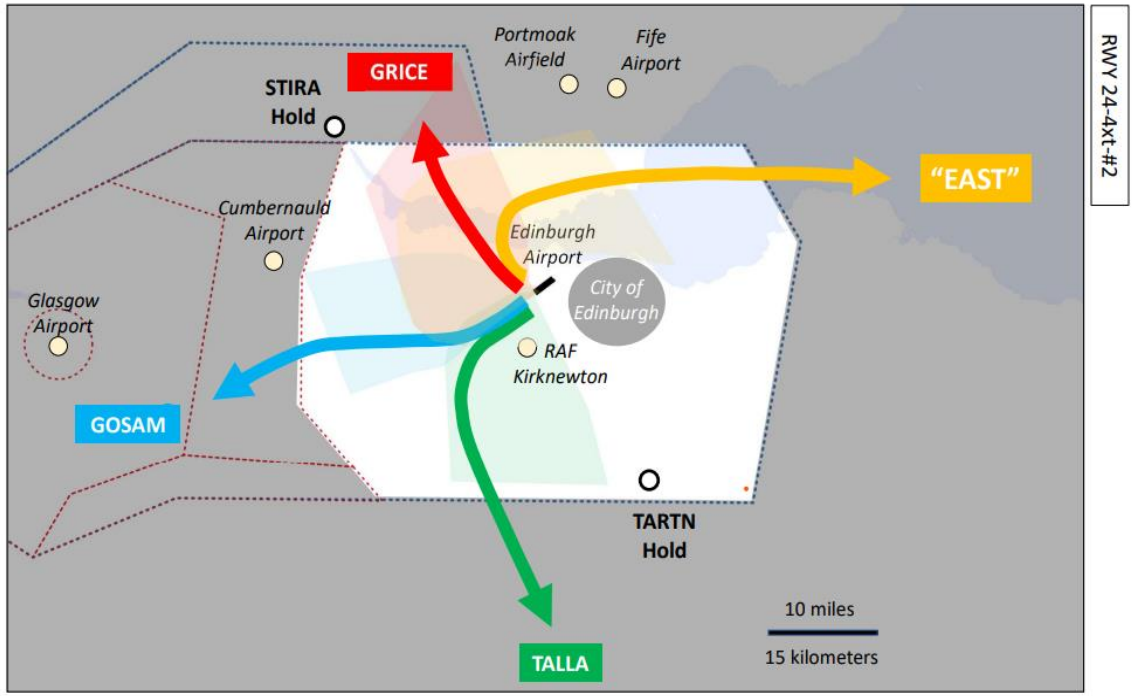
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split, and these departures will be subject to a timed departure table.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing GOSAM along the M8 corridor, and by turning GRICE and TALLA in locations that will minimise overflown communities. However, the new EAST flight path will increase the number of affected communities and the size of affected populations by introducing a new route that overflies the Firth of Forth and the southern Fife Coast.			
Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce noise impacts between 4000ft and 7000ft to currently overflown large communities by routeing GOSAM along the M8 corridor, and by turning GRICE and TALLA in locations that will minimise overflown communities. However, while the new EAST flight path will be more			

efficient that routing to TALLA, it will increase the number of communities and the size of populations affected by the flightpath between 4000ft and 7000ft by introducing a new route that overflies the Firth of Forth and the southern Fife Coast.			
Design Principle 9: 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.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce the overflown population below 4000ft and between 4000ft and 7000ft by routeing GOSAM along the M8 corridor, and by turning GRICE and TALLA in locations that will minimise overflown communities. However, the new EAST flight path will increase the number of communities and the size of population affected by flightpaths up to 7000ft by introducing a new route that overflies the Firth of Forth and the southern Fife Coast. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to currently overflown large communities by routeing GOSAM along the M8 corridor, and by turning GRICE and TALLA in locations that will minimise overflown communities. This will reduce the number of overflown sensitive locations and receptors. However, the new EAST flight path will increase the number of communities and the size of populations affected by the flightpath by introducing a new route that overflies the Firth of Forth and the southern Fife Coast, and this will increase the number of overflown sensitive locations and receptors.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. In Stage 3, specific design choices will investigate how best to develop this concept.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option includes the most efficient route for GOSAM, moderate improvements for both GRICE and TALLA and a very significant reduction in track miles and fuel burn for the proportion of flights using the new EAST route.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume and Class D airspace.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met

Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' The initial straight-ahead routeing of all flights, replicating the existing routes, will minimise the footprint of aircraft emission impacts on local air quality.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 22																
Option RWY 24 4xt #1																
This option is accepted and taken forward to the shortlist of options. This option is the same as Option 15 24 – 3xt #1 with the addition of an EAST SID to the north which would reduce track miles and the frequency of overflown communities.																

Design Principle Evaluation	Option No: 23
Rwy 24 4xt #2	**Reject**
 **This departure option looks at four SID's connecting with the en-route network at GRICE, GOSAM and TALLA, with an additional SID connecting with a point to the northeast of the airport. These routes will be designed to incorporate PBN and the turns for TALLA and GOSAM will take place with due consideration to minimising the effect of aircraft noise on population centres. Also the routing straight ahead for GOSAM will take account of the opportunity to route along the M8 corridor. With the possibility of reducing the time taken between departures from 2 minutes to 1.5 minutes this will increase capacity as seen in the illustration above.** **In this option we also illustrate the possibility of a new SID to the EAST. This would initially depart along the same route as GRICE and take an immediate right turn before turning to the East in order to join the network out to the northeast of the airport giving fuel savings to aircraft routing out in that direction. The capacity increases this new SID in combination with GRICE can be seen in the illustration above.**	**Alignment with Design Principles**

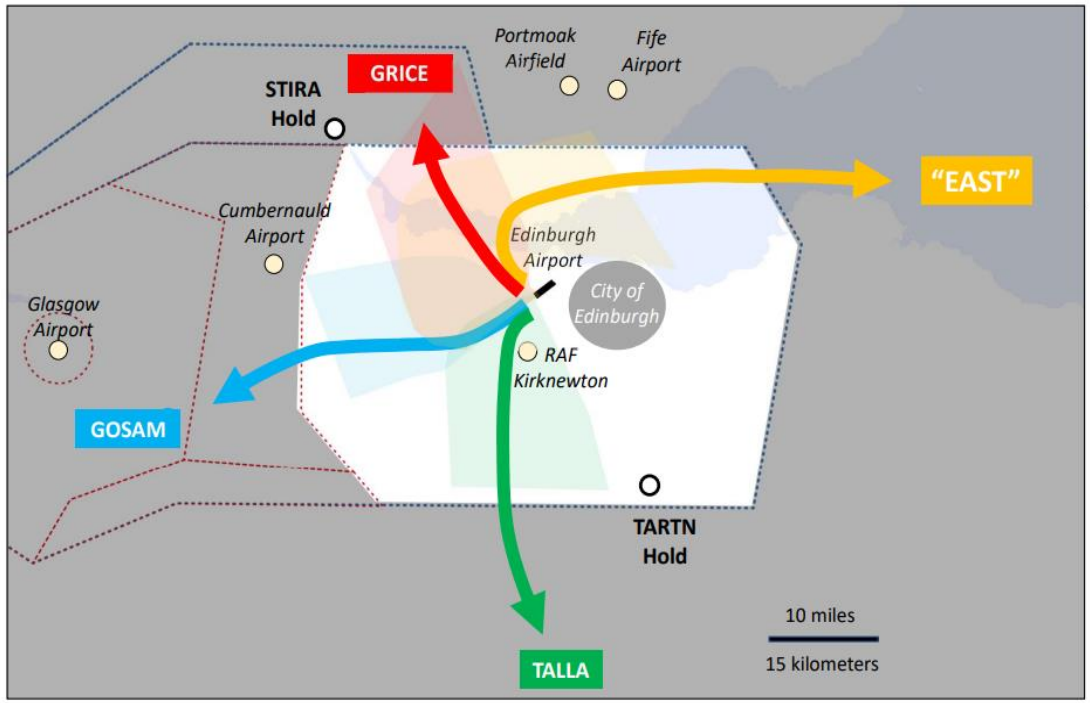
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split and these departures will be subject to a timed departure table.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option will reduce impacts to overflown communities by routeing GOSAM along the M8 corridor, and by turning TALLA in a location that will minimise overflown communities. However, the early turn for GRICE and the introduction of a new EAST route will newly affect existing communities and population growth areas in West Lothian at a relatively low altitude, and communities along the Firth of Forth and in southern Fife at a slightly higher altitude.			
Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce noise impacts to overflown communities between 4000ft and 7000ft by routeing GOSAM along the M8 corridor, and by turning TALLA in a location that will minimise overflown communities – delivering reduced noise impacts and more direct routeing. However, despite the			

GRICE flight path being more direct than the baseline because of the early turn, it will result in noise impacts at a relatively low altitude to newly overflown communities and growth areas in West Lothian. While the new EAST flight path will provide route efficiency, it will increase the impact to the newly affected communities described above and will also impact population centres along the Firth of Forth and southern Fife.			
Design Principle 9: 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	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing GOSAM along the M8 corridor, and by turning TALLA in a location that will minimise overflown communities. However, the early turn for GRICE and the introduction of a new EAST route will newly affect existing communities and population growth areas in West Lothian at a relatively low altitude, and communities along the Firth of Forth and in southern Fife at a slightly higher altitude. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing GOSAM along the M8 corridor, and by turning TALLA in a location that will minimise overflown communities. This will reduce the number of overflown sensitive locations and receptors along these routes. However, the early turns for GRICE and the new EAST route will newly affect existing communities and growth areas in West Lothian at a relatively low altitude and will affect sensitive locations and receptors including nurseries, primary and secondary schools and medical surgeries.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. In Stage 3, specific design choices will investigate how best to develop this concept.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option provides the most efficient routes for GOSAM and GRICE, a moderate improvement for TALLA and a significant reduction in track miles and fuel burn for the flights on EAST that would otherwise have been routed to TALLA.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume and Class D airspace.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met

Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' Compared to the baseline, the early turns for GRICE and EAST may slight increase the footprint of aircraft emission impacts on local air quality.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 23																
Option RWY 24 4xt #2																
This option is rejected. Other options provide greater opportunities to reduce overflown populations, with an EAST SID option that avoids newly overflying communities.																

Design Principle Evaluation	Option No: 24
Rwy 24 4xt #3	**Reject**
 **This departure option looks at four SID's connecting with the en-route network at GRICE, GOSAM and TALLA, with an additional SID connecting with a point to the northeast of the airport. These routes will be designed to incorporate PBN and the turn for GOSAM will take place with due consideration to minimising the effect of aircraft noise on population centres. Also, the routing straight ahead for GOSAM will take account of the opportunity to route along the M8 corridor.** **In this option we also illustrate the possibility of a new SID to the EAST. This would initially depart along the same route as GRICE and take an immediate right turn before turning to the East in order to join the network out to the northeast of the airport giving fuel savings to aircraft routing out in that direction. The capacity increases this new SID in combination with GRICE can be seen in the illustration above.**	**Alignment with Design Principles**

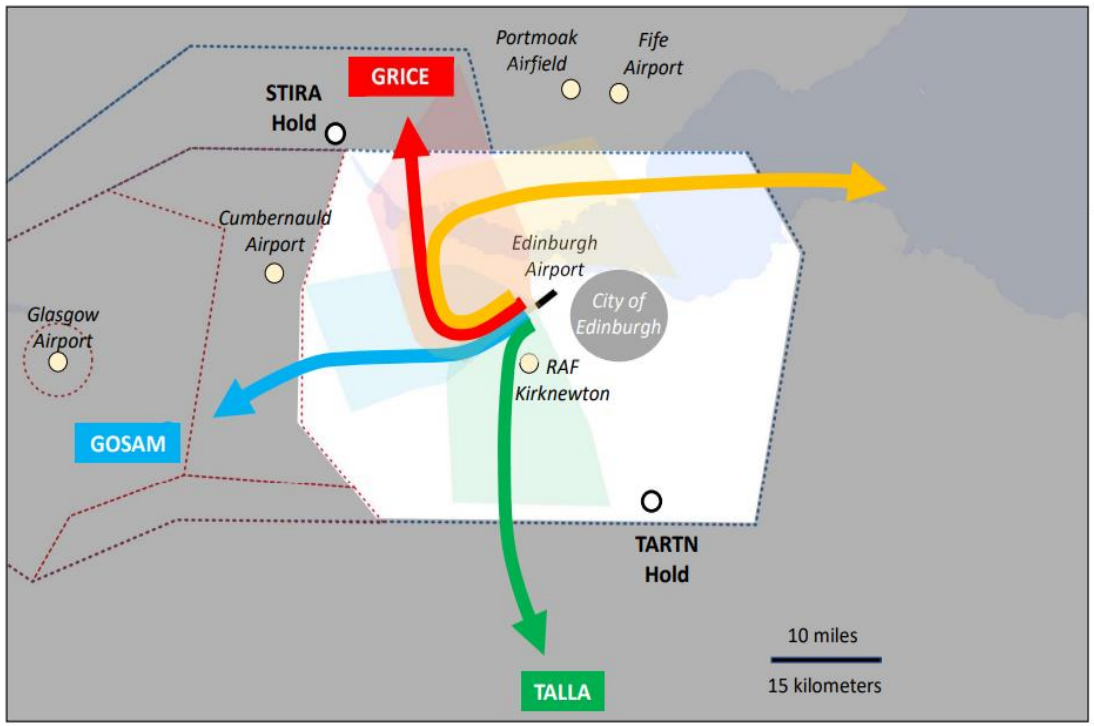
This option also contains an early turn for TALLA to maximise capacity. Unfortunately, this route also overflies Kirknewton and would only be available if Kirknewton was inactive. With the possibility of reducing the time taken between departures from 2 minutes to 1.5 minutes this will increase capacity as seen in the illustration above.			
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split and these departures will be subject to a timed departure table.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option will reduce impacts to currently overflown communities and large population centres in West Lothian by routeing GOSAM along the M8 corridor, and by having early turns for both TALLA and GRICE and a new EAST flight path. However, the early turns for GRICE and EAST will newly affect smaller existing communities and population growth areas in West Lothian, the Firth of Forth and southern Fife, while the early turn for TALLA will affect a number of small communities to the south of the airport, all at a relatively low altitude.			

Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce noise impacts to currently overflown large communities between 4000ft and 7000ft by routeing GOSAM along the M8 corridor, and by turning TALLA and GRICE before they overfly Livingston. However, the early turns for TALLA, GRICE and the new EAST route will result in newly overflown communities (albeit smaller) at relatively low altitudes. While the routes are the most direct and efficient and the aggregate overflown population may be smaller than the baseline, the newly overflown communities may be more sensitive to aircraft noise.			
Design Principle 9: 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	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to currently overflown large communities by routeing GOSAM along the M8 corridor, and by turning TALLA and GRICE before they overfly Livingston. However, the early turns for TALLA, GRICE and the new EAST route will result in newly overflown communities (albeit smaller) at relatively low altitudes and the TALLA flight path may affect the Sight Scotland Veterans' centre at Kirknewton. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to currently overflown large communities by routeing GOSAM along the M8 corridor, and by early turns for TALLA and GRICE before they overfly Livingston. The early turn for GRICE and the new EAST route will newly affect existing communities and growth areas in West Lothian, the Firth of Forth and southern Fife at a relatively low altitude and may affect sensitive locations and receptors including nurseries, primary and secondary schools and medical surgeries. The early turn for TALLA will newly affect small communities and sensitive locations & receptors in West Lothian at a relatively low altitude including a nursery, primary school, community centre, Sight Scotland Veterans' centre, Cyrenians Farm and Jupiter Artland.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. In Stage 3, specific design choices will investigate how best to develop this concept.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option provides the most efficient routes for GOSAM, GRICE and TALLA and a significant reduction in track miles and fuel burn for the flights on EAST that would otherwise have been routed to TALLA.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			

Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume and is Class D airspace. Kirknewton is overflown in this option.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' Compared to the baseline, the early turns for GRICE, TALLA and EAST may slight increase the footprint of aircraft emission impacts on local air quality.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 24																
Option RWY 24 4xt #3																
This option is rejected. The three early turns would overfly new communities close to the airfield without a significant improvement in capacity.																

Design Principle Evaluation	Option No: 25
Rwy 24 4xt #4	**Accept**
 **This departure option looks at four SID's connecting with the en-route network at GRICE, GOSAM and TALLA, with an additional SID connecting with a point to the northeast of the airport. These routes will be designed to incorporate PBN and the turn for GOSAM, GRICE and EAST will take place with due consideration to minimising the effect of aircraft noise on population centres. Also, the routing straight ahead for these 3 SIDs will take account of the opportunity to route along the M8 corridor.** **The EAST SID would initially depart along the same route as GRICE and take a right turn before turning to the East in order to join the network out to the northeast of the airport giving fuel savings to aircraft routing out in that direction. The capacity increases this new SID in combination with GRICE can be seen in the illustration above.**	**Alignment with Design Principles**

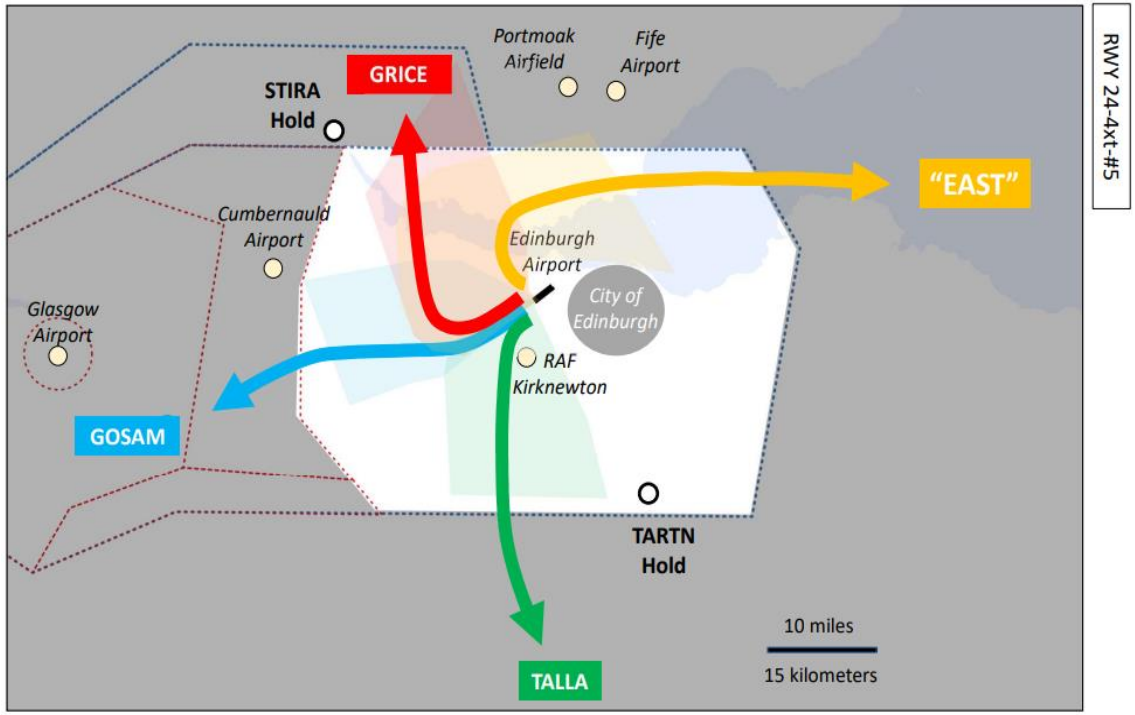
This option also contains an early turn for TALLA to maximise capacity. Unfortunately, this route also overflies Kirknewton and would only be available if Kirknewton was inactive. With the possibility of reducing the time taken between departures from 2 minutes to 1.5 minutes this will increase capacity as seen in the illustration above.			
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split, and these departures will be subject to a timed departure table.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option will reduce impacts to currently overflown large communities by routeing GOSAM along the M8 corridor, and by turning GRICE in a location that will minimise overflown communities. The early turn for TALLA will avoid approximately 45% of all departures currently overflying Livingston but will affect a smaller number of people in small communities at a relatively low altitude. The new EAST flight path will initially follow GRICE before heading east and affecting additional communities along the Firth of Forth and southern Fife.			

Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option will reduce noise impacts between 4000ft to 7000ft by routeing GOSAM along the M8 corridor, and by turning GRICE in a location that will minimise overflown communities. The early turn for TALLA will provide a more direct route while avoiding approximately 45% of all departures currently overflying Livingston but will affect a smaller number of people in small communities at a relatively low altitude. The new EAST route will be more efficient for aircraft that would otherwise be routed on TALLA but would increase the impact of aircraft noise to additional communities along the Firth of Forth and in southern Fife.			
Design Principle 9: 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.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing GOSAM along the M8 corridor, and by turning GRICE in a location that will minimise overflown communities. However, the early turn for TALLA will newly affect small communities in West Lothian at a relatively low altitude and may affect the Sight Scotland Veterans' centre at Kirknewton. The new EAST flight path will initially follow GRICE before heading east and affecting additional communities along the Firth of Forth and southern Fife. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing GOSAM along the M8 corridor, and by turning GRICE in a location that will minimise overflown communities. This will reduce the number of overflown sensitive locations and receptors along these routes. However, the early turn for TALLA will newly affect small communities and sensitive locations & receptors in West Lothian at a relatively low altitude including a nursery, primary school, community centre, Sight Scotland Veterans' centre, Cyrenians Farm and Jupiter Artland. The new EAST flight path would similarly affect additional communities and noise sensitive locations and receptors along the Firth of Forth and southern Fife including nature conservation sites, heritage sites, medical and educational facilities.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. In Stage 3, specific design choices will investigate how best to develop this concept.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option includes the most efficient routes for GOSAM and TALLA, a moderate improvement for GRICE and a significant improvement in track miles for aircraft on EAST that would otherwise have been routed on TALLA.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met

Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume and is Class D airspace. Kirknewton is overflown in this option.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' Compared to the baseline, the early turn for TALLA may slightly increase the footprint of aircraft emission impacts on local air quality.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 25																
Option RWY 24 4xt #4																
This option is accepted and taken forward to the shortlist of options. While the slightly later turns would slightly increase track miles, this option is considered likely to overfly fewer newly overflown communities than previous options.																

Design Principle Evaluation	Option No: 26
Rwy 24 4xt #5	**Reject**
 **This departure option looks at four SID's connecting with the en-route network at GRICE, GOSAM and TALLA, with an additional SID connecting with a point to the northeast of the airport. These routes will be designed to incorporate PBN and the turn for GOSAM, and GRICE will take place with due consideration to minimising the effect of aircraft noise on population centres. Also, the routing straight ahead for these 2 SIDs will take account of the opportunity to route along the M8 corridor.** **The EAST SID would take an early right turn to enable a departure split from the other 3 SIDs. This turn would not take account of population centres close by to the northeast of the airport and it would join the network out to the northeast of the airport giving fuel savings to aircraft routing out in that direction. The capacity increases this new SID in combination with GRICE can be seen in the illustration above.**	**Alignment with Design Principles**

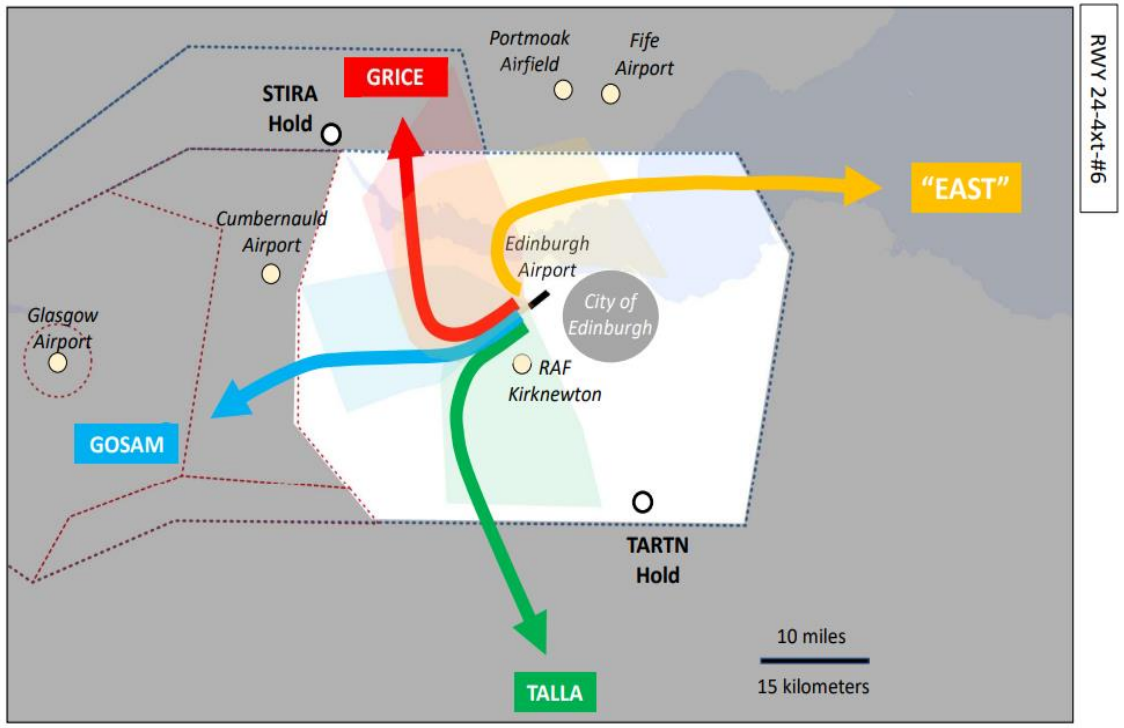
This option also contains an early turn for TALLA to maximise capacity. Unfortunately, this route also overflies Kirknewton and would only be available if Kirknewton was inactive. With the possibility of reducing the time taken between departures from 2 minutes to 1.5 minutes this will increase capacity as seen in the illustration above.			
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split and these departures will be subject to a timed departure table.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option will reduce impacts to overflown communities by routeing GOSAM along the M8 corridor, and by turning GRICE in a location that will minimise overflown communities. The early turn for TALLA will avoid approximately 45% of all departures currently overflying Livingston but will affect a smaller number of people in small communities at a relatively low altitude. The early turn for the new EAST flight path will affect additional communities and growth areas in West Lothian at low altitude and along the Firth of Forth and southern Fife.			

Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option will reduce noise impacts between 4000ft to 7000ft by routeing GOSAM along the M8 corridor, and by turning GRICE in a location that will minimise overflown communities. The early turn for TALLA will provide a more direct route while avoiding approximately 45% of all departures currently overflying Livingston but will affect a smaller number of people in small communities at a relatively low altitude. The early turn for the new EAST flight path will affect additional communities and growth areas in West Lothian at low altitude and along the Firth of Forth and southern Fife.			
Design Principle 9: 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	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing GOSAM along the M8 corridor, and by turning GRICE in a location that will minimise overflown communities. However, the early turn for TALLA will newly affect small communities in West Lothian at a relatively low altitude and may affect the Sight Scotland Veterans' centre at Kirknewton. The early turn for the new EAST flight path will affect additional communities and growth areas in West Lothian at low altitude and along the Firth of Forth and southern Fife. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing GOSAM along the M8 corridor, and by turning GRICE in a location that will minimise overflown communities. This will reduce the number of overflown sensitive locations and receptors along these routes. However, the early turn for TALLA will newly affect small communities and sensitive locations & receptors in West Lothian at a relatively low altitude including a nursery, primary school, community centre, Sight Scotland Veterans' centre, Cyrenians Farm and Jupiter Artland. The early turn for the new EAST flight path will affect additional communities and growth areas in West Lothian at low altitude, including community, medical and educational receptors in Kirkliston, Winchburgh and along the Firth of Forth and southern Fife.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. In Stage 3, specific design choices will investigate how best to develop this concept.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option includes the most efficient routes for GOSAM, TALLA and EAST plus a moderate improvement for GRICE.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			

Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume and is class D airspace. Kirknewton is overflown in this option.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' Compared to the baseline, the early turns for TALLA and EAST may slightly increase the footprint of aircraft emission impacts on local air quality.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 26																
Option RWY 24 4xt #5																
This option is rejected. The early turns may increase the area overflown below 1000ft and significantly increase the population overflown in new communities for little increase in capacity.																

Design Principle Evaluation	Option No: 27
Rwy 24 4xt #6	**Reject**
 **This departure option looks at four SID's connecting with the en-route network at GRICE, GOSAM and TALLA, with an additional SID connecting with a point to the northeast of the airport. These routes will be designed to incorporate PBN and the turn for GOSAM, GRICE and TALLA will take place with due consideration to minimising the effect of aircraft noise on population centres. Also, the routing straight ahead for these 3 SIDs will take account of the opportunity to route along the M8 corridor.** **The EAST SID would turn right after departure and route to the northeast before turning to the East in order to join the network out to the northeast of the airport giving fuel savings to aircraft routing out in that direction. The capacity increases this new SID in combination with GRICE, GOSAM and TALLA can be seen in the illustration above.**	**Alignment with Design Principles**

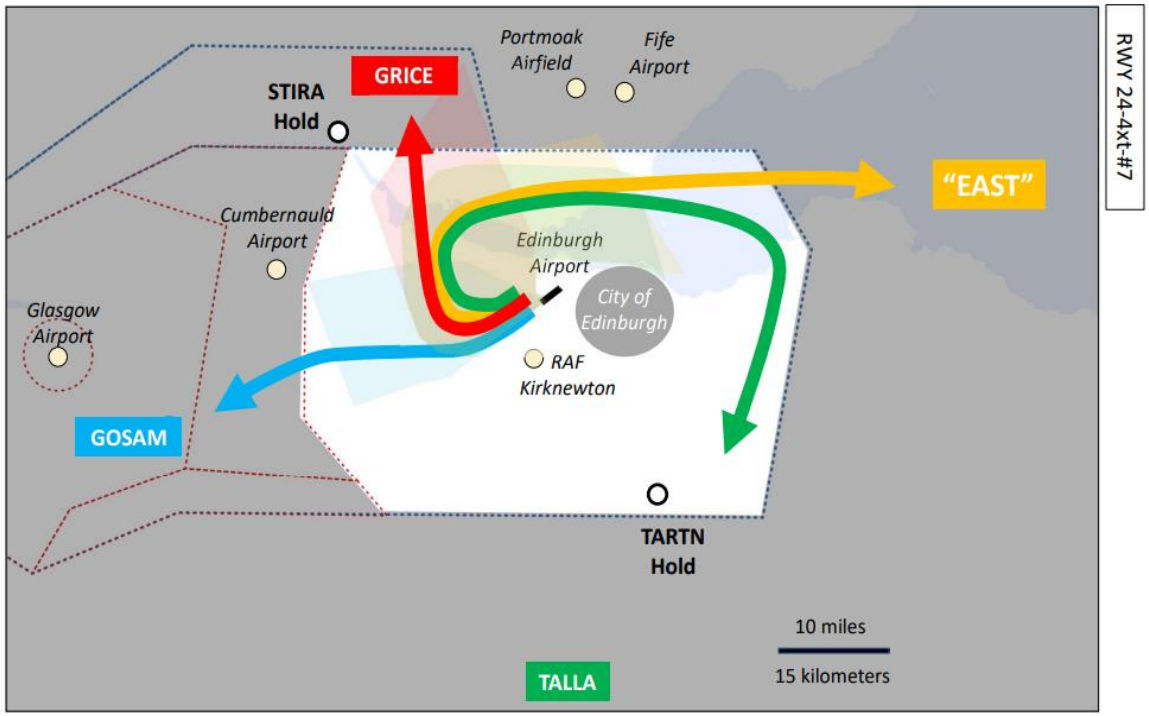
The right turn for GRICE and the left turn for TALLA would be after due consideration for population centres that are affected. With the possibility of reducing the time taken between departures from 2 minutes to 1.5 minutes this will increase capacity as seen in the illustration above.			
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split and these departures will be subject to a timed departure table.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option will reduce impacts to overflown communities by routeing GOSAM along the M8 corridor, and by turning GRICE and TALLA in locations that will minimise overflown communities. The early turn for the new EAST flight path will affect additional communities and growth areas in West Lothian at low altitude and along the Firth of Forth and southern Fife.			

Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option will reduce impacts to overflown communities by routeing GOSAM along the M8 corridor, and by turning GRICE and TALLA in locations that will minimise overflown communities. The early turn for the new EAST flight path will affect additional communities and growth areas in West Lothian at low altitude and along the Firth of Forth and southern Fife.			
Design Principle 9: 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	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce the overflown population by routeing GOSAM along the M8 corridor, and by turning GRICE and TALLA in locations that will minimise overflown communities. The early turn for the new EAST flight path will affect additional communities and growth areas in West Lothian at low altitude and along the Firth of Forth and southern Fife. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing GOSAM along the M8 corridor, and by turning GRICE and TALLA in locations that will minimise overflown communities. This will reduce the number of overflown sensitive locations and receptors. However, the early turn for the new EAST route, may newly affect small population centres and growth areas in West Lothian, including noise-sensitive locations and receptors including community, educational, medical and heritage sites.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. In Stage 3, specific design choices will investigate how best to develop this concept.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option includes the most efficient route for GOSAM and EAST plus moderate improvements for GRICE and TALLA.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume and is Class D airspace.			

Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' Compared to the baseline, the early turn for EAST may slightly increase the footprint of aircraft emission impacts on local air quality.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 27																
Option RWY24 4xt #6																
This option is rejected. This option would generate unnecessary overflight of newly overflown populations for little increase in capacity.																

Design Principle Evaluation	Option No: 28
Rwy 24 4xt #7	Reject
 **This departure option looks at four SID's connecting with the en-route network at GRICE, GOSAM and TALLA, with an additional SID connecting with a point to the northeast of the airport. These routes will be designed to incorporate PBN and the turn for GOSAM, GRICE, TALLA and EAST will take place with due consideration to minimising the effect of aircraft noise on population centres. Also, the routing straight ahead for these 4 SIDs will take account of the opportunity to route along the M8 corridor.** **The capacity increases this new SID in combination with GRICE, GOSAM and TALLA can be seen in the illustration above.** **The right turn for GRICE, EAST and TALLA would be after due consideration for population centres that are affected. EAST and TALLA would turn further right with TALLA coasting in over East Lothian above 7000 feet. This route would ensure that aircraft on the TALLA SID would be above inbounds from the south and this would also increase track miles for departures on this SID. With the possibility of reducing the time taken between departures from 2 minutes to 1.5 minutes this will increase capacity as seen in the illustration above.**	**Alignment with Design Principles**

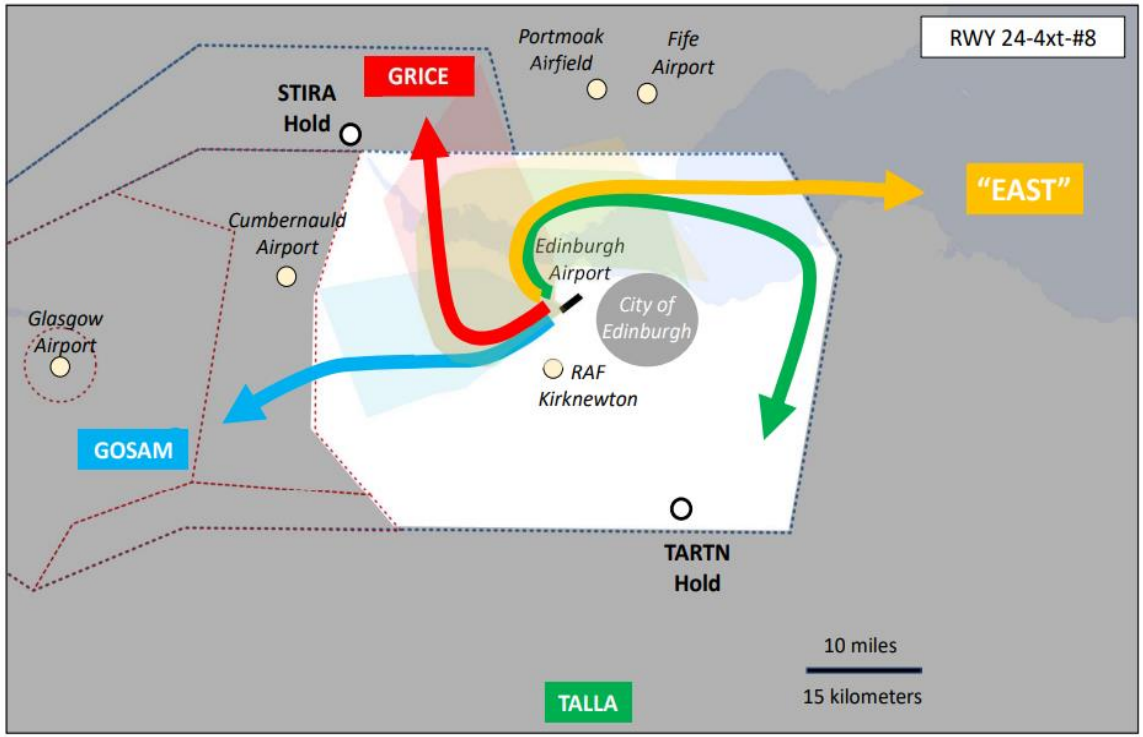
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split and these departures will be subject to a timed departure table.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option will reduce impacts to currently overflown large communities by routeing GOSAM along the M8 corridor and by turning GRICE in a location that will minimise overflown communities. While the right turn for TALLA will avoid approximately 45% of all departures currently overflying Livingston, it will newly affect multiple population centres and growth areas in West Lothian and along the Forth of Forth coast and southern Fife. The addition of a new EAST flightpath will increase this impact.			
Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met

Qualitative Assessment: Compared to the baseline, this option will reduce noise impacts between 4000ft to 7000ft to the currently overflown large communities by routeing GOSAM along the M8 corridor, turning GRICE in a location that will minimise overflown communities, and turning TALLA and EAST before Livingston. How, the right turn to TALLA will result in a disproportionate increase in track miles and CO2 emissions plus an increase in noise-affected communities compared to an early left turn. The addition of EAST to the initial TALLA flightpath will increase the impact on communities but provide a relatively efficient route.			
Design Principle 9: 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	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to currently overflown large communities by routeing GOSAM along the M8 corridor, turning GRICE in a location that will minimise overflown communities, and turning TALLA and EAST before Livingston. While the earlier right turn for TALLA will avoid approximately 45% of all departures currently overflying Livingston, it will newly affect population centres in West Lothian, along the Forth of Forth coast and in southern Fife resulting in an increase in noise-affected communities compared to a left turn. The right turn for EAST would increase the impact associated with TALLA. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc. Further assessments in Stage 2B and Stage 3 will consider in more detail the potential impact of flight paths on people with protected characteristics.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to currently overflown large communities by routeing GOSAM along the M8 corridor, turning GRICE in a location that will minimise overflown communities, and turning TALLA and EAST before Livingston. This will reduce the number of currently overflown sensitive locations and receptors along these routes. However, the right turn for TALLA and EAST will newly affect multiple communities and sensitive locations & receptors in West Lothian, along the Forth of Forth coast and in southern Fife including sites with nature designations (SSSIs, Ramsar, SPAs), scheduled monuments plus community receptors including nurseries, schools and community centres.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: CAP1616 defines respite as '*planned and notified periods where overflight or noise impact are reduced or halted to allow communities undisturbed time*.' The flight paths will provide track concentration and track dispersal. In comparison to the baseline, routeing GOSAM along the M8 corridor with right turns for GRICE TALLA and EAST will provide some relief for the West Lothian communities currently overflown by both departures and arrivals but will increase overflight of communities elsewhere in West Lothian, along the Firth of Forth and in southern Fife.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option includes the most efficient route for GOSAM, with a moderate improvement for GRICE and a moderately efficient route for EAST. In contrast, the TALLA right turn results in a very large increase in track miles, fuel burn and CO2 emissions for approximately 45% of all departures.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			

Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume and is Class D airspace.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' Compared to the baseline, the initial straight-ahead routes for all four SIDS would result in no change to the existing footprint of aircraft emission impacts on local air quality. Further assessment of local air quality will be undertaken at Stage 2B (qualitative) and Stage 3 (quantitative).			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 28																
Option RWY24 4xt #7																
This option is rejected. This option would entail excessive track miles on TALLA, and the traffic would unnecessarily overfly not currently overflown communities to the north of the airport, while the traffic destination is to the south. This option also does not significantly increase capacity.																

Design Principle Evaluation	Option No: 29
Rwy 24 4xt #8	**Reject**
 **This departure option looks at four SID's connecting with the en-route network at GRICE, GOSAM and TALLA, with an additional SID connecting with a point to the northeast of the airport. These routes will be designed to incorporate PBN and the turn for GOSAM, and GRICE will take place with due consideration to minimising the effect of aircraft noise on population centres. Also, the routing straight ahead for these 2 SIDs will take account of the opportunity to route along the M8 corridor.** **The right turn for EAST and TALLA would be immediately after departure ensuring at least a 45-degree split from the other 2 SIDs. EAST and TALLA would turn further right with TALLA coasting in over East Lothian above 7000 feet. This route would ensure that aircraft on the TALLA SID would be above inbounds from the south and this would also increase track miles for departures on this SID. The capacity increases this new SID in combination with GRICE, GOSAM and TALLA can be seen in the illustration above.**	**Alignment with Design Principles**

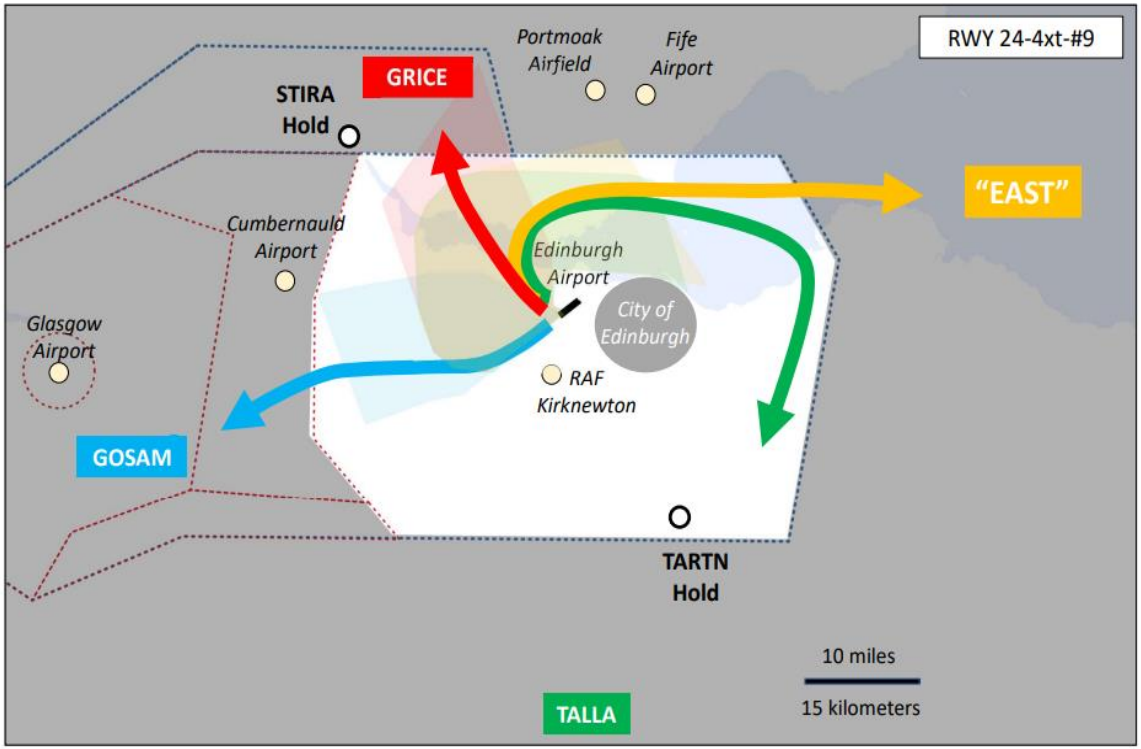
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split, and these departures will be subject to a timed departure table.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option will reduce impacts to currently overflown large communities by routeing GOSAM along the M8 corridor, and by turning GRICE in a location that will minimise overflown communities. While the early right turn for TALLA will avoid approximately 45% of all departures currently overflying Livingston, it will newly affect existing communities and population growth areas in West Lothian at a relatively low altitude plus communities along the Firth of Forth coast and southern Fife. The early right turn for the new EAST route will increase the new impacts on these communities.			
Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met

Qualitative Assessment: Compared to the baseline, this option will reduce noise impacts between 4000ft to 7000ft to the currently overflown large communities by routeing GOSAM along the M8 corridor, turning GRICE in a location that will minimise overflown communities and TALLA and EAST having early turns. However, the early right turn for TALLA will result in a disproportionate increase in track miles and CO2 emissions plus an increase in noise-affected existing communities and population growth areas in West Lothian at a relatively low altitude and communities along the Firth of Forth coast and southern Fife, compared to a TALLA left turn. The aircraft on EAST are likely to have otherwise been on TALLA and so there is no additional impact from this SID compared to the 3 SID option (Rwy 24 3xt #6).			
Design Principle 9: 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.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to currently overflown large communities by routeing GOSAM along the M8 corridor, turning GRICE in a location that will minimise overflown communities and TALLA and EAST having early turns. While the early right turn for TALLA will avoid approximately 45% of all departures currently overflying Livingston, it will newly affect existing communities and population growth areas in West Lothian at a relatively low altitude and communities along the Firth of Forth coast and southern Fife, compared to a TALLA left turn. The aircraft on EAST are likely to have otherwise been on TALLA and so there is no additional impact from this SID compared to the 3 SID option (Rwy 24 3xt #6). People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to currently overflown large communities by routeing GOSAM along the M8 corridor, turning GRICE in a location that will minimise overflown communities and TALLA and EAST having early turns. This will reduce the number of currently overflown sensitive locations and receptors along the existing routes. However, the early right turns for TALLA and EAST will newly affect multiple communities and sensitive locations in West Lothian & receptors along the Forth of Forth coast and southern Fife including sites with nature designations (SSSIs, Ramsar, SPAs), scheduled monuments plus community receptors including nurseries, schools and community centres. The aircraft on EAST are likely to have otherwise been on TALLA and so there is no additional impact from this SID compared to the 3 SID option (Rwy 24 3xt #6).			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: CAP1616 defines respite as '*planned and notified periods where overflight or noise impact are reduced or halted to allow communities undisturbed time*.' The flight paths will provide track concentration and track dispersal. In comparison to the baseline, routeing GOSAM along the M8 corridor with an optimised right turn for GRICE and early right turns for TALLA and EAST will provide some relief for the West Lothian communities currently overflown by both departures and arrivals but will increase overflight of newly affected communities in West Lothian, along the Firth of Forth and in southern Fife.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option includes the most efficient route for GOSAM and EAST, with a moderate improvement for GRICE. In contrast, the TALLA early right turn results in a very large increase in track miles, fuel burn and CO2 emissions for approximately 45% of all departures (minus those aircraft that would be switched to EAST).			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met

Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume and is Class D airspace.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' Compared to the baseline, the early right turns for TALLA and EAST may slightly increase the existing footprint of aircraft emission impacts on local air quality. However, the aircraft on EAST are likely to have otherwise been on TALLA and so there is no additional impact from this SID compared to the 3 SID option (Rwy 24 3xt #6).			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 29																
Option RWY24 4xt #8																
This option is rejected. This option would entail excessive track miles on TALLA, and the traffic would unnecessarily overfly not currently overflown communities to the north of the airport, while the traffic destination is to the south.																

Design Principle Evaluation	Option No: 30
Rwy 24 4xt #9	**Reject**
 **This departure option looks at four SID's connecting with the en-route network at GRICE, GOSAM and TALLA, with an additional SID connecting with a point to the northeast of the airport. These routes will be designed to incorporate PBN and the turn for GOSAM, will take place with due consideration to minimising the effect of aircraft noise on population centres. Also, the routing straight ahead for this SID will take account of the opportunity to route along the M8 corridor.** **The right turn for GRICE, EAST and TALLA would be immediately after departure ensuring at least a 45-degree split from the GOSAM SID. EAST and TALLA would turn further right with TALLA coasting in over East Lothian above 7000 feet. This route would ensure that aircraft on the TALLA SID would be above inbounds from the south and this would also increase track miles for departures on this SID. The capacity increases this new SID in combination with GRICE, GOSAM and TALLA can be seen in the illustration above.**	**Alignment with Design Principles**

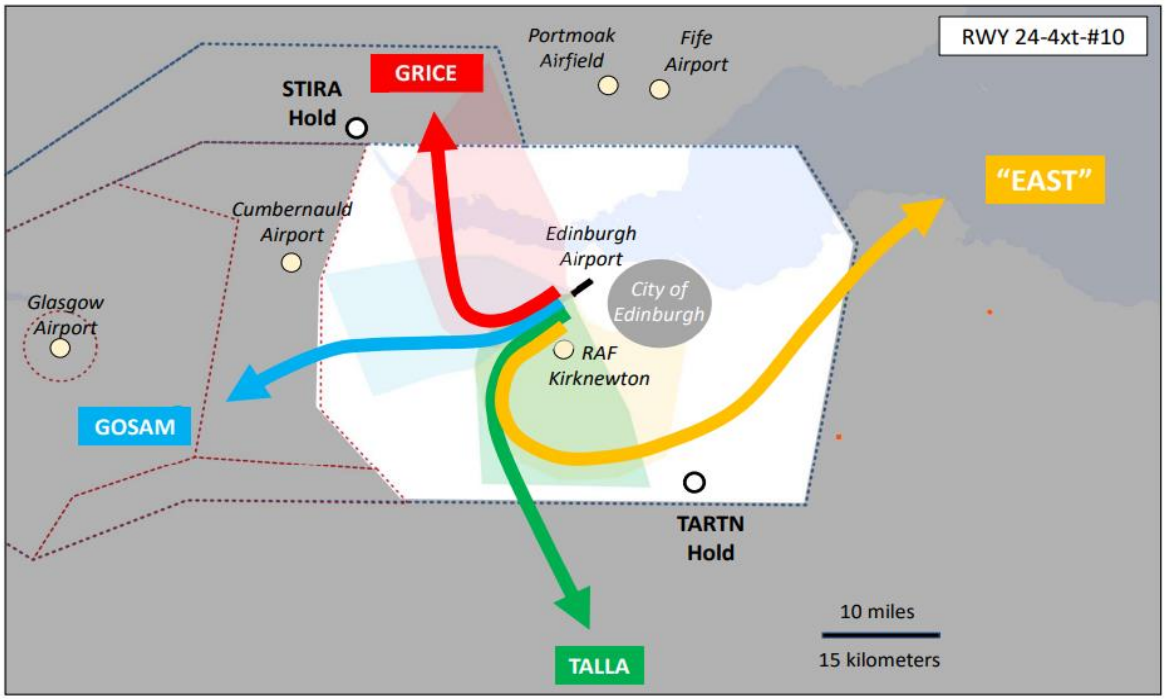
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split and these departures will be subject to a timed departure table.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option will reduce impacts to currently overflown large communities by routeing GOSAM along the M8 corridor. While the early right turn for GRICE, TALLA and the new EAST route will avoid approximately 50% of all departures currently overflying Livingston, it will newly affect existing communities and population growth areas in West Lothian at a relatively low altitude plus communities along the Firth of Forth coast and southern Fife. The aircraft on EAST are likely to have otherwise been on TALLA and so there is no additional impact from this SID compared to the 3 SID option (Rwy 24 3xt #7).			
Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met

Qualitative Assessment: Compared to the baseline, this option will reduce noise impacts between 4000ft to 7000ft to the currently overflown large communities in West Lothian by routeing GOSAM along the M8 corridor, and through early right turns for GRICE, TALLA and the new EAST route. The early right turns for GRICE and EAST are the most efficient routes but would newly affect multiple small communities and population growth areas in West Lothian at a relatively low altitude. The early right turn for TALLA will result in a disproportionate increase in track miles and CO2 emissions plus an increase in noise-affected existing communities and population growth areas in West Lothian at a relatively low altitude and communities along the Firth of Forth coast and southern Fife.			
Design Principle 9: 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	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to currently overflown large communities by routeing GOSAM along the M8 corridor, and through early right turns for GRICE and TALLA. While the early right turns for GRICE and TALLA will avoid approximately 50% of all departures currently overflying Livingston, it will newly affect existing communities and population growth areas in West Lothian at a relatively low altitude and communities along the Firth of Forth coast and southern Fife. The aircraft on EAST are likely to have otherwise been on TALLA and so there is no additional impact from this SID compared to the 3 SID option (Rwy 24 3xt #7). People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc. Further assessments in Stage 2B and Stage 3 will consider in more detail the potential impact of flight paths on people with protected characteristics.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to currently overflown large communities by routeing GOSAM along the M8 corridor, and through early right turns for GRICE, TALLA and the new EAST route. This will reduce the number of currently overflown sensitive locations and receptors along the existing routes. However, the early right turns for GRICE, TALLA and EAST will newly affect multiple communities and sensitive locations in West Lothian & receptors along the Forth of Forth coast and southern Fife including sites with nature designations (SSSIs, Ramsar, SPAs), scheduled monuments plus community receptors including nurseries, schools and community centres.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: CAP1616 defines respite as '*planned and notified periods where overflight or noise impact are reduced or halted to allow communities undisturbed time*.' The flight paths will provide track concentration and track dispersal. In comparison to the baseline, routeing GOSAM along the M8 corridor with early right turns for GRICE, TALLA and EAST will provide some relief for the West Lothian communities currently overflown by both departures and arrivals but will increase overflight of newly affected communities in West Lothian, along the Firth of Forth and in southern Fife.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option includes the most efficient route for GOSAM, GRICE and EAST. In contrast, the TALLA early right turn results in a very large increase in track miles, fuel burn and CO2 emissions for approximately 45% of all departures (minus those that would be directed to EAST).			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			

Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume and is Class D airspace.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' Compared to the baseline, the early right turns for GRICE, TALLA and EAST may slightly increase the existing footprint of aircraft emission impacts on local air quality. Further assessment of local air quality will be undertaken at Stage 2B (qualitative) and Stage 3 (quantitative).			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 30																
Option RWY24 4xt #9																
This option is rejected. This option would have three SIDS with an early turn overflying newly affected communities and excessive track miles for TALLA.																

Design Principle Evaluation	Option No: 31
Rwy 24 4xt #10	Reject
 **This departure option looks at four SID's connecting with the en-route network at GRICE, GOSAM and TALLA, with an additional SID connecting with a point to the northeast of the airport. These routes will be designed to incorporate PBN and initial proportion of the departure route for all 4 SIDs, will take place with due consideration to minimising the effect of aircraft noise on population centres. Also, the routing straight ahead for this SID will take account of the opportunity to route along the M8 corridor.** **The right turn for GRICE will take place with due consideration given to local population centres. The left turns for TALLA and EAST will also take place with due consideration for local population centres. The EAST SID will turn further left once clear of Kirknewton which will give this routing increased track miles. There is also an issue with the EAST SID and inbound traffic from the south and this SID would be designed to be above this traffic to the southeast of the airfield. Capacity is increased with possible approval of the reduction of our departure interval from 2 minutes to 1.5 minutes.**	**Alignment with Design Principles**

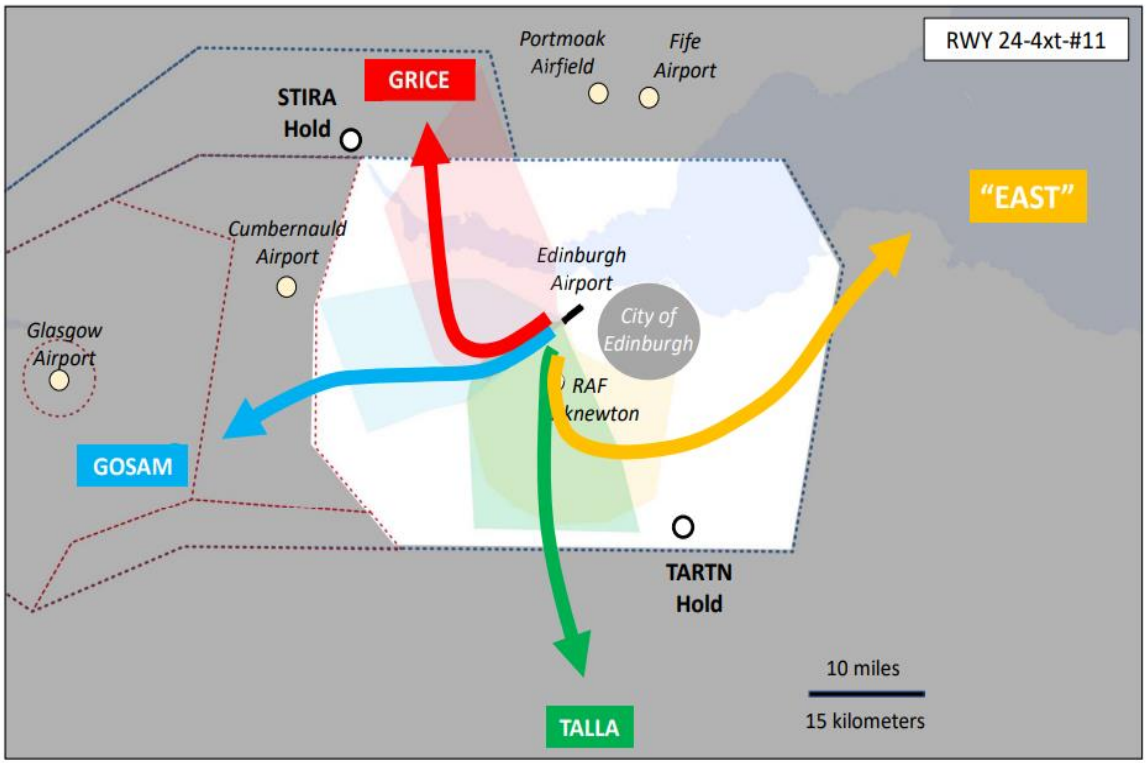
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split, and these departures will be subject to a timed departure table. The East SID will be designed to route above inbounds from the south.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option will reduce impacts to currently overflown large communities in West Lothian by routeing GOSAM along the M8 corridor and through earlier turns for GRICE and TALLA. While this will reduce impacts to the currently affected populations, these routes may affect previously unaffected smaller communities in West Lothian. The left turn for the new EAST route may significantly increase the overflown population by routeing over southern Edinburgh. The aircraft on EAST are likely to have otherwise been on TALLA and so this new route would affect additional communities and populations compared to the 3 SID option (Rwy 24 3xt #1).			
Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met

Qualitative Assessment: Compared to the baseline, this option will reduce impacts to currently overflown large communities in West Lothian by routeing GOSAM along the M8 corridor and through earlier turns for GRICE and TALLA. While this will reduce impacts to the currently affected populations, these routes may affect previously unaffected smaller communities in West Lothian. The left turn for the new EAST route may significantly increase the overflown population by routeing over southern Edinburgh. The aircraft on EAST are likely to have otherwise been on TALLA and so this new route would affect additional communities and populations compared to the 3 SID option (Rwy 24 3xt #1). While the flight paths will be relatively direct, EAST would be detrimental to the minimisation of aircraft noise.			
Design Principle 9: 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	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce the overflown population by routeing GOSAM along the M8 corridor, and by turning GRICE and TALLA in locations that will minimise overflown communities. While this will reduce impacts to the currently affected populations, these routes may affect previously unaffected smaller communities in West Lothian. The left turn for the new EAST route may significantly increase the overflown population by routeing over southern Edinburgh. The aircraft on EAST are likely to have otherwise been on TALLA and so this new route would affect additional communities and populations compared to the 3 SID option (Rwy 24 3xt #1). People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing GOSAM along the M8 corridor, and by turning GRICE and TALLA in locations that will minimise overflown communities. This will reduce the number of currently overflown sensitive locations and receptors although the routes would overfly new communities with sensitive receptors including medical, community and educational facilities. The new EAST route would overfly densely populated areas in southern Edinburgh and would affect a larger number of noise-sensitive locations and receptors. Further assessment will be provided in Stage 2B.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. In Stage 3, specific design choices will investigate how best to develop this concept.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option includes the most efficient route for GOSAM plus moderate improvements for both GRICE and TALLA. The new EAST route isn't as direct as an earlier or a right turn EAST route.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met

Qualitative Assessment: CAS remains Class D airspace. We would require a connecting airway to the east of the zone.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' The initial straight-ahead routeing of all flights, replicating the existing routes, will minimise the footprint of aircraft emission impacts on local air quality.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 31																
Option RWY24 4xt #10																
This option is rejected. This option is the same as Option 15 24 3xt #1 with the addition of an EAST SID to the south, which would increase track miles. It would also overfly large areas of the Pentland Hills that are an area of tranquility. While this option could be designed safely to avoid conflicts with inbound aircraft, due to the concentration of traffic in one place it would increase the complexity of managing the airspace.																

Design Principle Evaluation	Option No: 32
Rwy 24 4xt #11	Reject
	Alignment with Design Principles
This departure option looks at four SID's connecting with the en-route network at GRICE, GOSAM and TALLA, with an additional SID connecting with a point to the northeast of the airport. These routes will be designed to incorporate PBN and the turn for GOSAM and GRICE, will take place with due consideration to minimising the effect of aircraft noise on population centres. Also, the routing straight ahead for these 2 SIDs will take account of the opportunity to route along the M8 corridor. GRICE will turn right after due consideration for population centres to the northwest of the airfield. The left turn for EAST and TALLA would be immediately after departure ensuring at least a 45-degree split from the GOSAM and GRICE SID. TALLA would have an issue with a direct routing over Kirknewton so would only be available when Kirknewton was not active. The EAST SID	

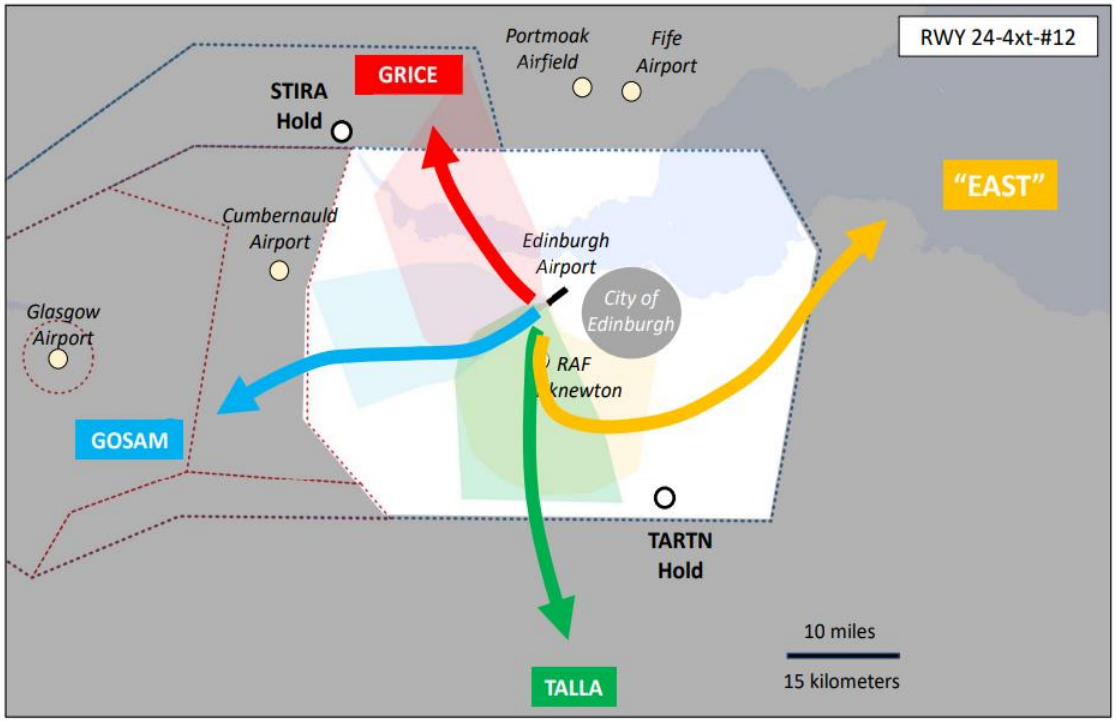
will turn further left overflying Kirknewton, so would only be available if Kirknewton were not active. There is also an issue with the EAST SID and inbound traffic from the south and this SID would be designed to be above this traffic to the southeast of the airfield. The capacity this new SID in combination with GRICE, GOSAM and TALLA can be seen in the illustration above.			
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split, and these departures will be subject to a timed departure table.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option will reduce impacts to overflown communities by routeing GOSAM along the M8 corridor and by turning GRICE in a location that will minimise overflown communities. The early turn for TALLA will avoid approximately 45% of all departures currently overflying Livingston but will affect a smaller number of people in small communities at a relatively low altitude. The early left turn for the new EAST route will result in an additional impact to a large population in southern Edinburgh compared to the 3-exit option (Rwy 24 3xt #3).			

Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option will reduce noise impacts between 4000ft to 7000ft by routeing GOSAM along the M8 corridor, and by turning GRICE in a location that will minimise overflown communities. The early turn for TALLA will provide a more direct route while avoiding approximately 45% of all departures currently overflying Livingston but will affect a smaller number of people in small communities at a relatively low altitude. The early left turn for the new EAST SID will result in an additional impact between 4000ft and 7000ft to a large population in southern Edinburgh compared to the 3-exit option (Rwy 24 3xt #3).			
Design Principle 9: 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.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing GOSAM along the M8 corridor, and by turning GRICE in a location that will minimise overflown communities. However, the early turn for TALLA will newly affect small communities in West Lothian at a relatively low altitude and may affect the Sight Scotland Veterans' centre at Kirknewton. These communities and sensitives will also be affected by the new EAST route. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing GOSAM along the M8 corridor, and by turning GRICE in a location that will minimise overflown communities. This will reduce the number of overflown sensitive locations and receptors along these routes. However, the early turn for TALLA will newly affect small communities and sensitive locations & receptors in West Lothian at a relatively low altitude including a nursery, primary school, community centre, Sight Scotland Veterans' centre, Cyrenians Farm and Jupiter Artland. These will also be affected by the new EAST route.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. In Stage 3, specific design choices will investigate how best to develop this concept.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option includes the most efficient routes for GOSAM and TALLA, a moderate improvement for GRICE and an EAST route that is slightly longer than an EAST early right turn.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met

Qualitative Assessment: CAS remains class D airspace. We would need a connecting airway to the east of the zone, and Kirknewton is overflown in this option.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' Compared to the baseline, the early turns for TALLA and EAST may slightly increase the footprint of aircraft emission impacts on local air quality.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 32																
Option RWY24 4xt #11																
This option is rejected. This option would have two SIDS with early turns overflying newly affected communities, with the EAST SID overflying the important recreational area of the Pentland Hills. This option has greater complexity as the TALLA and EAST SIDS could only be flown when RAF Kirknewton is not in operation, and alternative SIDS would be required during these periods. While this option could be designed safely to avoid conflicts with inbound aircraft, due to the concentration of traffic in one place it would increase the complexity of managing the airspace.																

Design Principle Evaluation	Option No: 33
Rwy 24 4xt #12	Reject
 **This departure option looks at four SID's connecting with the en-route network at GRICE, GOSAM and TALLA, with an additional SID connecting with a point to the northeast of the airport. These routes will be designed to incorporate PBN and the turn for GOSAM will take place with due consideration to minimising the effect of aircraft noise on population centres. Also, the routing straight ahead for this SID will take account of the opportunity to route along the M8 corridor. GRICE will turn right immediately to ensure a forty-five-degree split from the other departures without consideration for population centres to the northwest of the airfield.** **The left turn for EAST and TALLA would be immediately after departure ensuring at least a 45-degree split from the GOSAM and GRICE SID. TALLA would have an issue with a direct routing over Kirknewton so would only be available when Kirknewton was not active. The EAST SID will turn further left overflying Kirknewton, so would only be available if Kirknewton were not active. There is also an issue with the EAST**	**Alignment with Design Principles**

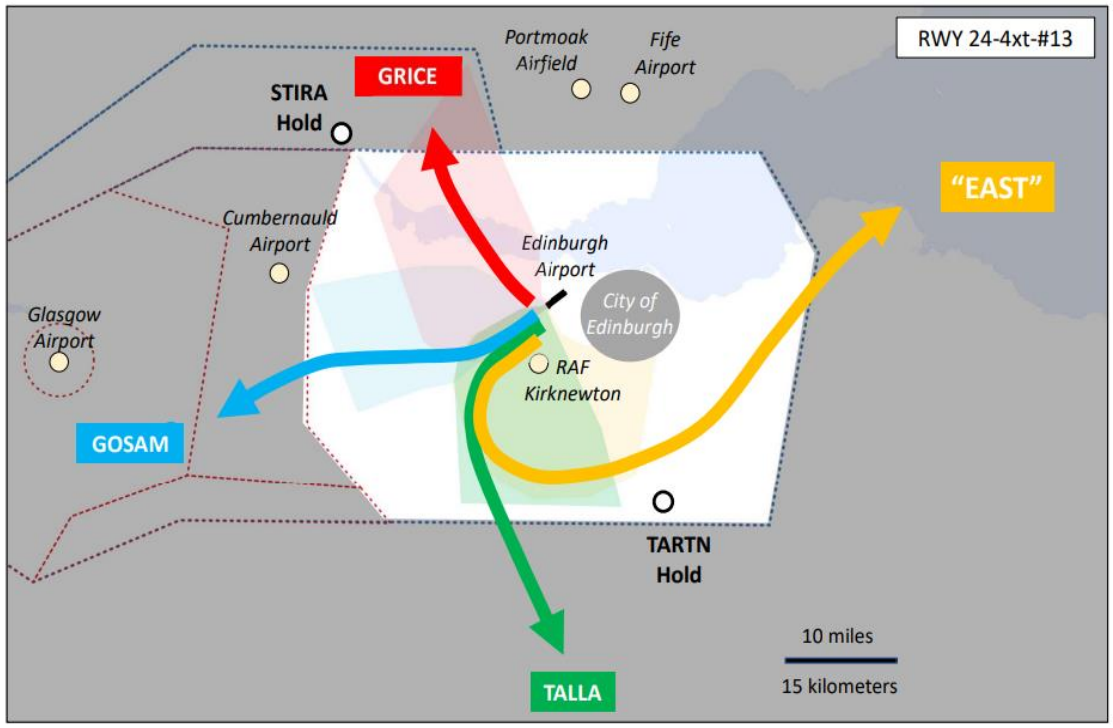
SID and inbound traffic from the south and this SID would be designed to be above this traffic to the southeast of the airfield. The capacity this new SID in combination with GRICE, GOSAM and TALLA can be seen in the illustration above.			
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split and these departures will be subject to a timed departure table.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option will reduce impacts to currently overflown communities and large population centres in West Lothian by routeing GOSAM along the M8 corridor, and by having early turns for both TALLA and GRICE. However, the early turn for GRICE will newly affect smaller existing communities and population growth areas in West Lothian, while the early turn for TALLA will affect a number of small communities, both at a relatively low altitude. The early left turn for EAST will affect the same populations as TALLA before diverging and affecting a large population across southern Edinburgh.			

Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce noise impacts to currently overflown large communities between 4000ft and 7000ft by routeing GOSAM along the M8 corridor, and by turning TALLA and GRICE before they overfly Livingston. However, the early turns for TALLA and GRICE will result in newly overflown communities (albeit smaller) at relatively low altitudes. The early left turn for EAST will affect the same populations as TALLA before diverging and affecting a large population across southern Edinburgh. While the routes are the most direct and efficient for GOSAM, GRICE and TALLA, and moderately direct for EAST, and the aggregate overflown population in West Lothian may be smaller than the baseline, although the population in southern Edinburgh may be much larger, and the newly overflown communities may be more sensitive to aircraft noise.			
Design Principle 9: 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.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to currently overflown large communities by routeing GOSAM along the M8 corridor, and by turning TALLA and GRICE before they overfly Livingston. However, the early turns for TALLA and GRICE will result in newly overflown communities (albeit smaller) at relatively low altitudes and the TALLA flight path may affect the Sight Scotland Veterans' centre at Kirknewton. The early left turn for EAST will affect the same populations as TALLA before diverging and affecting a large population across southern Edinburgh. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to currently overflown large communities by routeing GOSAM along the M8 corridor, and by early turns for TALLA and GRICE before they overfly Livingston. The early turn for GRICE will newly affect existing communities and growth areas in West Lothian at a relatively low altitude and will affect sensitive locations and receptors including nurseries, primary and secondary schools and medical surgeries. The early turn for TALLA will newly affect small communities and sensitive locations & receptors in West Lothian at a relatively low altitude including a nursery, primary school, community centre, Sight Scotland Veterans' centre, Cyrenians Farm and Jupiter Artland. These may also be affected by the new EAST, which will also overfly the Pentland Hills which is an important open green space for residents across the region.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. In Stage 3, specific design choices will investigate how best to develop this concept.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option provides the most efficient routes for GOSAM, GRICE and TALLA and a moderately efficient route for EAST.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met

Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains class D airspace. We would need a connecting airway to the east of the zone, and Kirknewton is overflown in this option.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' Compared to the baseline, the early left turns for TALLA and EAST and the early right turn for GRICE may slight increase the footprint of aircraft emission impacts on local air quality.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 33																
Option RWY24 4xt #12																
This option is rejected. This option has the same limitations as Option 32 24 4xt #11 plus the addition of an extra early turn on GRICE increasing the newly overflown population.																

Design Principle Evaluation	Option No: 34
Rwy 24 4xt #13	Reject
	Alignment with Design Principles
This departure option looks at four SID's connecting with the en-route network at GRICE, GOSAM and TALLA, with an additional SID connecting with a point to the northeast of the airport (EAST). These routes will be designed to incorporate PBN and the turn for GOSAM, TALLA and EAST will take place with due consideration to minimising the effect of aircraft noise on population centres. Also, the routing straight ahead for these 3 SIDs will take account of the opportunity to route along the M8 corridor. GRICE will turn right immediately to ensure a forty-five-degree split from the other departures without consideration for population centres to the northwest of the airfield. The left turn for EAST and TALLA would be after navigating around Kirknewton and with due consideration to population centres to the southwest of the airfield. EAST would turn further left when above traffic inbound to Edinburgh from the south. This overflight of inbound	

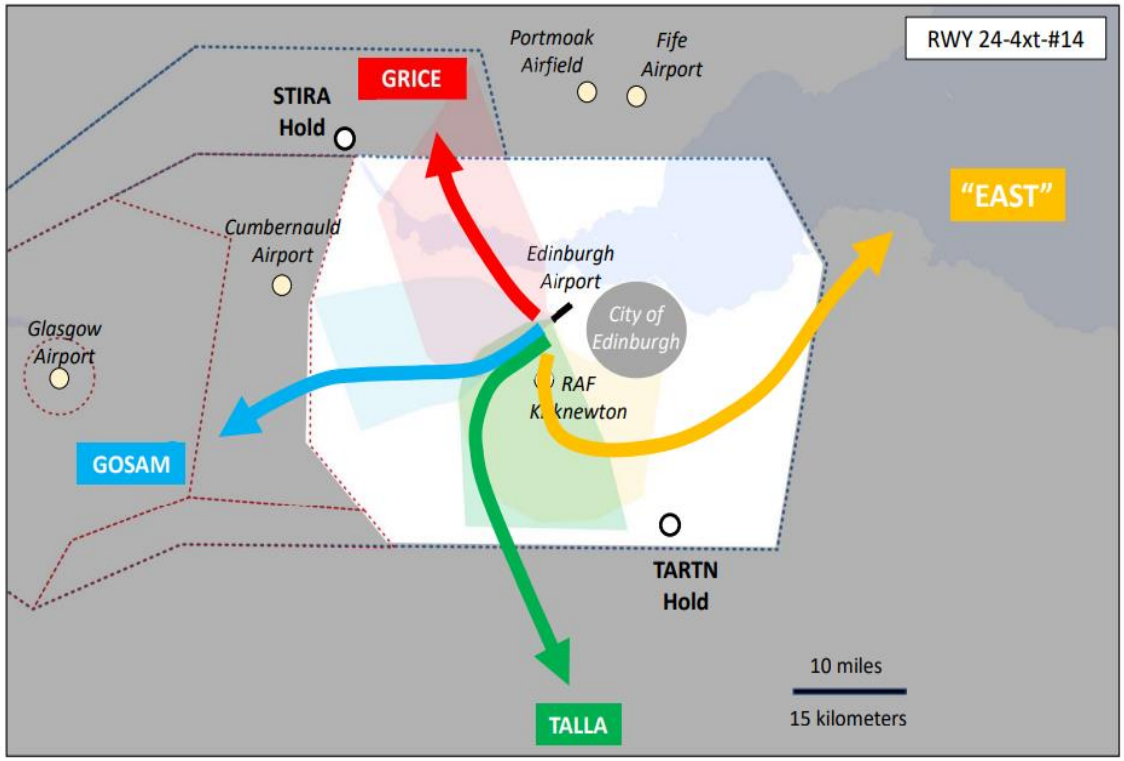
traffic would be designed into the SID. Capacity is increased with possible approval of the reduction of our departure interval from 2 minutes to 1.5 minutes.			
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split, and these departures will be subject to a timed departure table. The East SID will be designed to route above inbounds from the south.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SIDs will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option will reduce impacts to currently overflown communities by routeing GOSAM along the M8 corridor, and by turning TALLA in a location that will minimise overflown communities. However, the early turn for GRICE will newly affect existing communities and population growth areas in West Lothian at a relatively low altitude. The new EAST will take some traffic from TALLA and initially share the same flightpath before diverging and flying across a large population across southern Edinburgh, albeit likely to be over 7,000ft.			

Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce noise impacts to currently overflown communities between 4000ft and 7000ft by routeing GOSAM along the M8 corridor, and by turning TALLA in a location that will minimise overflown communities – delivering reduced noise impacts and more direct routeing. However, despite the GRICE flight path being more direct than the baseline because of the early turn, it will result in noise impacts at a relatively low altitude to newly overflown communities and growth areas in West Lothian. The new EAST will take some traffic from TALLA and initially share the same flightpath before diverging and flying across a large population across southern Edinburgh, albeit likely to be over 7,000ft.			
Design Principle 9: 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.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to currently overflown communities by routeing GOSAM along the M8 corridor, and by turning TALLA in a location that will minimise overflown communities. However, the early turn for GRICE will newly affect existing communities and growth areas in West Lothian at a relatively low altitude. The new EAST will take some traffic from TALLA and initially share the same flightpath before diverging and flying across a large population across southern Edinburgh, albeit likely to be over 7,000ft. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to currently overflown communities by routeing GOSAM along the M8 corridor, and by turning TALLA in a location that will minimise overflown communities. This will reduce the number of overflown sensitive locations and receptors along these existing routes. However, the early turn for GRICE will newly affect existing communities and growth areas in West Lothian at a relatively low altitude and will affect sensitive locations and receptors including nurseries, primary and secondary schools and medical surgeries. The new EAST will take some traffic from TALLA and initially share the same flightpath before diverging and flying across a large population across southern Edinburgh, albeit likely to be over 7,000ft. EAST will fly over the length of the Pentland Hills, mostly below 7,000ft.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. In Stage 3, specific design choices will investigate how best to develop this concept.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option includes the most efficient routes for GOSAM and GRICE, a moderate improvement for TALLA and a moderately efficient route for the new EAST route.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met

Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains class D and the same volume with the addition of an airway to the east.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' Compared to the baseline, the early turn for GRICE may slight increase the footprint of aircraft emission impacts on local air quality.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 34																
Option RWY 24 4xt #13																
This option is rejected. This option wouldn't increase capacity and would unnecessarily overfly not currently overflown communities because of the early turn for GRICE. While this option could be designed safely to avoid conflicts with inbound aircraft, due to the concentration of traffic in one place it would increase the complexity of managing the airspace.																

Design Principle Evaluation	Option No: 35
Rwy 24 4xt #14	**Reject**
 **This departure option looks at four SID's connecting with the en-route network at GRICE, GOSAM and TALLA, with an additional SID connecting with a point to the northeast of the airport (EAST). These routes will be designed to incorporate PBN and the turn for GOSAM and will take place with due consideration to minimising the effect of aircraft noise on population centres. Also, the routing straight ahead for these 2 SIDs will take account of the opportunity to route along the M8 corridor. GRICE will turn right immediately to ensure a forty-five-degree split from the other departures without consideration for population centres to the northwest of the airfield.** **TALLA would turn left once clear of Kirknewton and would also take account of population centres to the southwest of the airfield.** **The left turn for EAST will affect Kirknewton so will only be available in Kirknewton is not active. This turn would continue until the aircraft was established on a route to join the network to the northeast of the airport (EAST). The flight path would be designed to overfly inbound**	**Alignment with Design Principles**

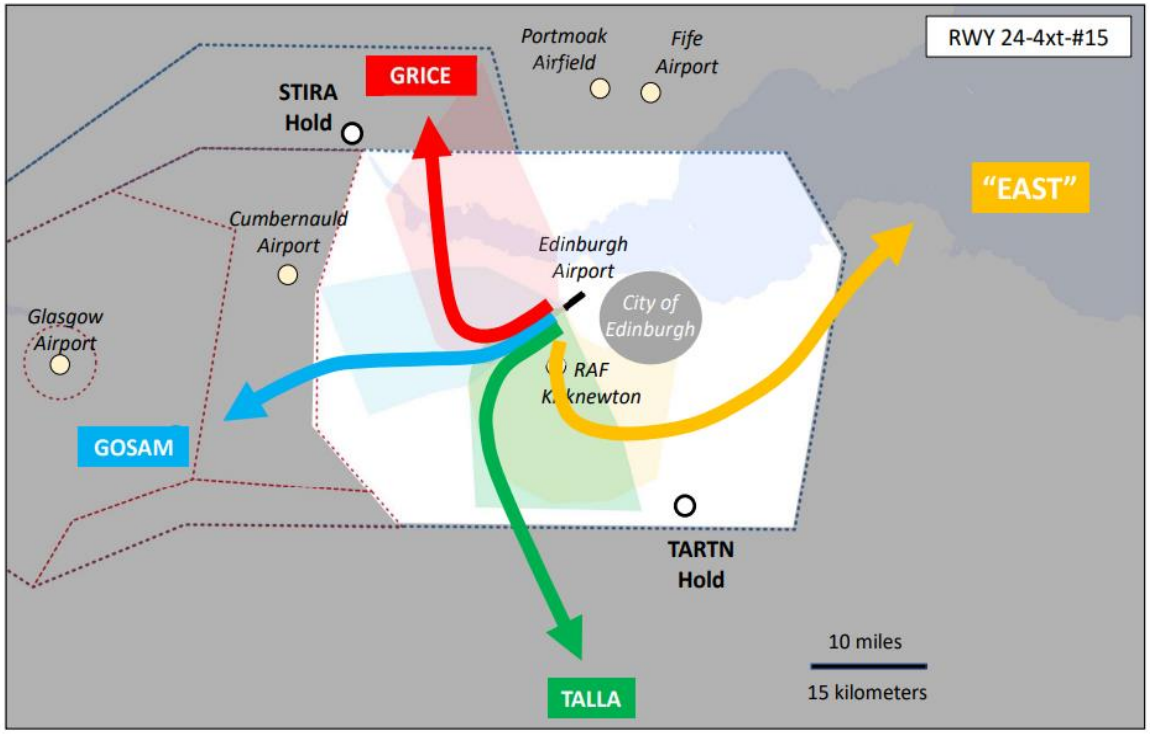
traffic to Edinburgh from the south. The capacity this new SID in combination with GRICE, GOSAM and TALLA can be seen in the illustration above.			
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split and these departures will be subject to a timed departure table. The EAST SID will be designed to overfly inbounds from the south.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option will reduce impacts to currently overflown communities by routeing GOSAM along the M8 corridor and turning TALLA in a location that will minimise overflown communities. However, the early turn for GRICE will newly affect existing communities and population growth areas in West Lothian at a relatively low altitude, while the early left for EAST will similarly affect new communities to the south of the airport before flying over a large population across southern Edinburgh, albeit likely to be above 7,000ft.			

Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce noise impacts to currently overflown communities between 4000ft and 7000ft by routeing GOSAM along the M8 corridor, and by turning TALLA in a location that will minimise overflown communities – delivering reduced noise impacts and more direct routeing. However, despite the GRICE flight path being more direct than the baseline because of the early turn, it will result in noise impacts at a relatively low altitude to newly overflown communities and growth areas in West Lothian, and the early left turn for EAST will similarly affect new communities to the south of the airport at relatively low altitudes.			
Design Principle 9: 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.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to currently overflown communities by routeing GOSAM along the M8 corridor, and by turning TALLA in a location that will minimise overflown communities. However, the early turn for GRICE will newly affect existing communities and growth areas in West Lothian at a relatively low altitude. Similarly, the early left for EAST will affect new communities to the south of the airport before flying over a large population across southern Edinburgh, albeit likely to be above 7,000ft. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to currently overflown communities by routeing GOSAM along the M8 corridor, and by turning TALLA in a location that will minimise overflown communities. This will reduce the number of overflown sensitive locations and receptors along these existing routes. However, the early turn for GRICE will newly affect existing communities and growth areas in West Lothian at a relatively low altitude and will affect sensitive locations and receptors including nurseries, primary and secondary schools and medical surgeries. The early left for EAST will affect new communities to the south of the airport at low altitude, affecting educational and community facilities, before flying over the Pentland Hills and a large population across southern Edinburgh, albeit likely to be above 7,000ft.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. In Stage 3, specific design choices will investigate how best to develop this concept.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option includes the most efficient routes for GOSAM and GRICE, a moderate improvement for TALLA and a relatively efficient route for EAST.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met

Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume with the addition of an airway to the East for the East SID. Kirknewton is overflown in this option.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' Compared to the baseline, the early turns for GRICE and EAST may slight increase the footprint of aircraft emission impacts on local air quality.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 35																
Option RWY24 4xt #14																
This option is rejected. The two early turns for GRICE and EAST, would unnecessarily overfly not currently overflown communities without significantly increasing capacity. The two early turns also increase the footprint overflown below 1000ft within which there is the potential for local air quality impacts. While this option could be designed safely to avoid conflicts with inbound traffic, due to the concentration of traffic in one place it increases the complexity of managing the airspace.																

Design Principle Evaluation	Option No: 36
Rwy 24 4xt #15	**Reject**
 **This departure option looks at four SID's connecting with the en-route network at GRICE, GOSAM and TALLA, with an additional SID connecting with a point to the northeast of the airport (EAST). These routes will be designed to incorporate PBN and the turn for GOSAM, GRICE and TALLA will take place with due consideration to minimising the effect of aircraft noise on population centres. Also, the routing straight ahead for these 3 SIDs will take account of the opportunity to route along the M8 corridor. GRICE will turn right after consideration has been given to population centres to the northwest of the airfield. TALLA would turn left once clear of Kirknewton and would also take account of population centres to the southwest of the airfield.** **The left turn for EAST will affect Kirknewton so will only be available in Kirknewton is not active. This turn would continue until the aircraft was established on a route to join the network to the northeast of the airport (EAST). The flight path would be designed to overfly inbound**	**Alignment with Design Principles**

traffic to Edinburgh from the south. The capacity this new SID in combination with GRICE, GOSAM and TALLA can be seen in the illustration above.			
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The SIDs are designed to split, and these departures will be subject to a timed departure table. The East SID will be designed to overfly inbounds from the south.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: Yes. All SIDs will be designed to use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are worked on in continuing workshops and simulator sessions. These SIDs will join the network in the climb and be safely deconflicted from GLA traffic.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: These SID's will follow a predictable flight path up to 7000ft.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve the best outcome for the Edinburgh ACP below 7000 ft. We are also part of the CAA's AMS and subject to those timescales.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to currently overflown communities by routeing GOSAM along the M8 corridor, and by turning GRICE and TALLA in locations that will minimise currently overflown communities although will affect new communities. The early left turn for EAST will newly affect small communities to the south of the airport at a relatively low altitude, before flying over a large population across southern Edinburgh, albeit likely to be above 7,000ft.			

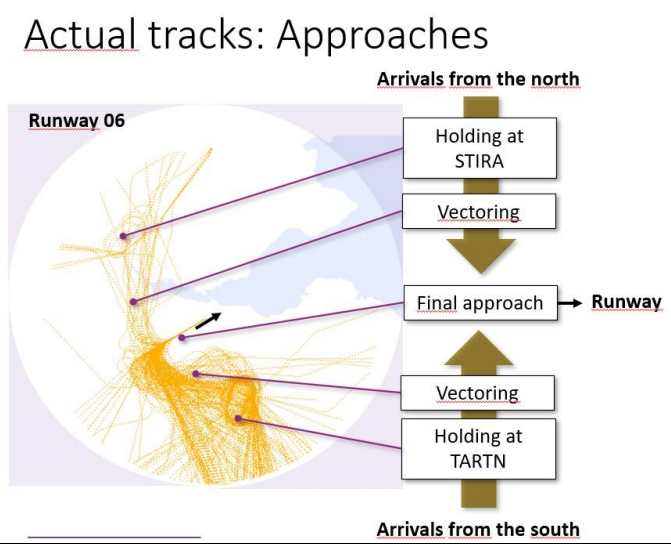
Design Principle 8: For flightpaths at or above 4,000ft to below 7,000ft, the environmental priority should continue to be minimising the impact of aviation noise in a manner consistent with the government's overall policy on aviation noise, unless this would disproportionately increase CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce noise impacts to currently overflown communities by routeing GOSAM along the M8 corridor, and by turning GRICE and TALLA in locations that will minimise currently overflown communities but will affect new, smaller, communities. The flight paths will be relatively direct and the prioritisation of noise minimisation is unlikely to have a disproportionate impact on CO2 emissions. The early left turn for EAST will newly affect small communities to the south of the airport at a relatively low altitude, before flying over a large population across southern Edinburgh, albeit likely to be above 7,000ft. The flight paths are relatively direct and unlikely to cause a disproportionate increase in CO2 emissions.			
Design Principle 9: 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.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce the currently overflown population by routeing GOSAM along the M8 corridor, and by turning GRICE and TALLA in locations that will minimise overflown communities. The early left turn for EAST will newly affect small communities to the south of the airport at a relatively low altitude, before flying over a large population across southern Edinburgh, albeit likely to be above 7,000ft. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, the flight paths will reduce impacts to overflown communities by routeing GOSAM along the M8 corridor, and by turning GRICE and TALLA in locations that will minimise overflown communities. This will reduce the number of overflown sensitive locations and receptors. The early left for EAST will affect new communities to the south of the airport at low altitude, affecting educational and community facilities, before flying over the Pentland Hills and a large population across southern Edinburgh, albeit likely to be above 7,000ft.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: PBN delivers concentration, especially on departures; dispersal is normally applied in the arrivals – up to the final approach path which is always aligned with the runway. Respite is possible at night for departures. It is considered feasible that, at night, the most advantageous SID for each runway end would be used for departures and that, once having reached 7000 ft, aeroplanes would be vectored en-route. In Stage 3, specific design choices will investigate how best to develop this concept.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Compared to the baseline, this option includes the most efficient route for GOSAM, moderate improvements for GRICE and TALLA, and a moderately efficient route for EAST.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			

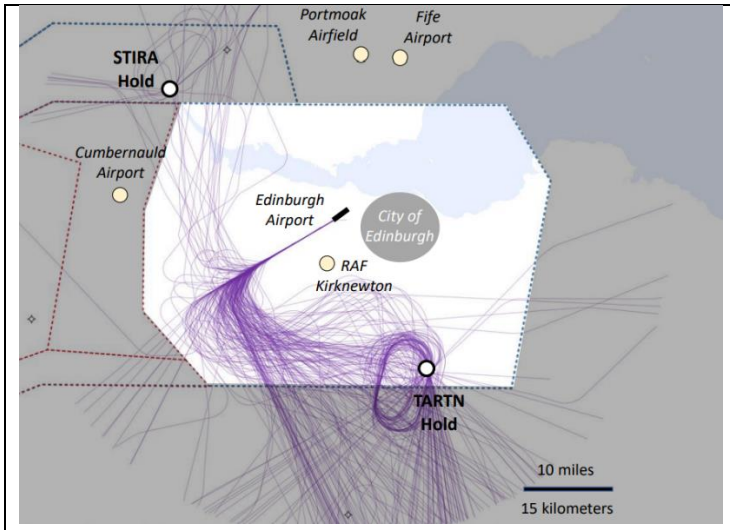
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume and Class D with the addition of an airway to contain the EAST SID to the northeast of the zone. Kirknewton is also overflown in this option.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' The early turn for EAST may slightly increase the footprint of aircraft emission impacts on local air quality.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This design brings an increase in capacity with a reduction in the interval between departures.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 36																
Option RWY24 4xt #15																
This option is rejected. The early turn for EAST would overfly new and not currently overflown communities and would overfly the Pentland Hills with potential effects on tranquility. While this option could be designed safely to avoid conflicts with inbound traffic, due to the concentration of traffic in one place it increases the complexity of managing the airspace.																

Rwy 06 Arrivals

Design Principle Evaluation	Option No: 37
Rwy 06 Baseline Approach	**Accept**
	**Alignment with Design Principles**



The baseline is the mode of operation that Edinburgh operates today in order to sequence and land arriving traffic. The majority of aircraft are taken from NERL when clear of conflicting traffic and given expeditious vectors to final approach on Rwy06 in order to fly an ILS or occasionally an NDB to land. During busy times aircraft are routed to the STIRA hold to the north or the TARTN hold to the south where they are held before being sequenced. As can be seen from the graphic most aircraft arrive from the south and because of the buffer zone to the west of Edinburgh's controlled airspace traffic is held frequently in the TARTN hold before being sequenced. The lowest levels to hold at STIRA and TARTN are chosen to keep aircraft above the initial level of the SIDs until both arriving and departing aircraft are identified on radar.

Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The holds at STIRA and TARTN are designed to be above the level any SID would climb to. Aircraft are vectored to final approach using approved equipment, licenced ATCO's and aircrew, as well as standardised procedures.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: This option is today's baseline and so will not use PBN.			

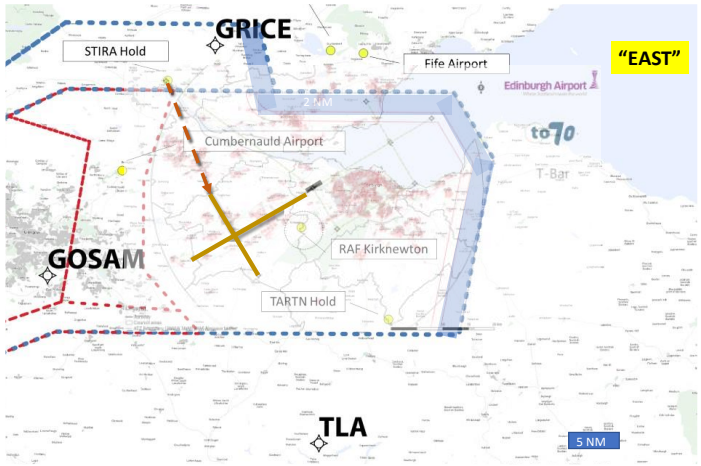
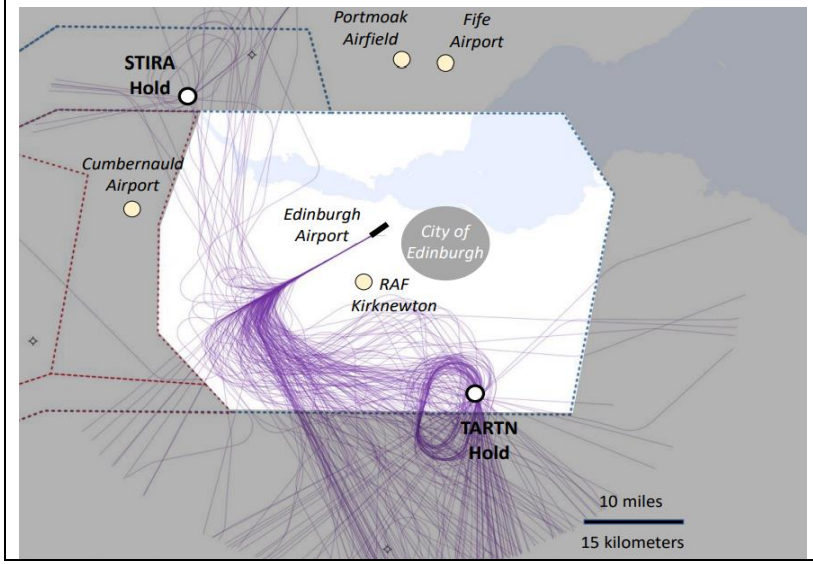
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are in use today with approved coordination procedures between EDI, GAL and Prestwick ATC.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: Arrivals are vectored from their handover point which could be the hold or a point en-route. This is not predictable and allows for dispersal.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve this, but today's operations are not PBN and also not part of the CAA's published modernisation strategy.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Descending aircraft, either routed directly or released from the STIRA or TARTN hold at approximately 8000ft, are vectored to the final approach and overfly small to medium communities and population centres in the Scottish Borders, South Lanarkshire and West Lothian (from the south / TARTN) and Stirling, Clackmannanshire, Falkirk and West Lothian (from the north / STIRA) at altitudes between approximately 3000ft to 8000ft. Aircraft join the final approach at approximately 8 miles distance from the airport and all overfly Livingston and Newbridge at an altitude of less than 3000 feet – this is unavoidable given the orientation of the 06 runway and aircraft operating rules. While the aircraft will be operating at a lower (and hence quieter) engine power than departing aircraft, the concentration of aircraft on the final approach provides no opportunity to minimise impacts to affected communities. Vectoring of aircraft between 3000ft and 8000ft will provide some track dispersion that will reduce impacts to affected communities.			
Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: Descending aircraft are vectored to the final approach and overfly small to medium communities and population centres in the Scottish Borders, South Lanarkshire and West Lothian (from the south / TARTN) and Stirling, Clackmannanshire, Falkirk and West Lothian (from the north / STIRA) at altitudes between approximately 3000ft to 8000ft. The aircraft will be operating at a lower (and hence quieter) engine power than departing aircraft, minimising the impact of aviation noise on overflown communities. Vectoring also provides a degree of track dispersal above 4000ft that will reduce the frequency of impacts to affected communities.			
Design Principle 9: 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	Not met	Partial	Met
Qualitative Assessment: Descending aircraft are vectored to the final approach and overfly small to medium communities and population centres in the Scottish Borders, South Lanarkshire and West Lothian (from the south / TARTN) and Stirling, Clackmannanshire, Falkirk and West Lothian (from the north / STIRA) at altitudes between approximately 3000ft to 8000ft. Vectoring of aircraft provides a degree of track dispersion that reduces the frequency of impacts to affected communities but may increase the total population			

overflown. It is not possible to further minimise the population overflown by aircraft on the final approach as this is fixed based on the orientation of the 06 runway and aircraft operating rules. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Descending aircraft are vectored to the final approach and overfly sensitive locations and noise-sensitive receptors in the Scottish Borders, South Lanarkshire and West Lothian (from the south / TARTN) and Stirling, Clackmannanshire, Falkirk and West Lothian (from the north / STIRA) at altitudes between approximately 3000ft to 8000ft. Vectoring of aircraft provides a degree of track dispersion that reduces the frequency of impacts to individual affected receptors but may increase the total number of overflown receptors. It is not possible to further minimise the overflight of sensitive locations and noise-sensitive receptors underneath the final approach as this is fixed based on the orientation of the 06 runway and aircraft operating rules.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: Vectoring of descending aircraft between approximately 3000ft to 8000ft provides a degree of track dispersion that reduces the frequency of impacts to individual affected receptors. The final approach provides track concentration.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Vectoring of descending aircraft between approximately 3000ft to 8000ft is used to deliver efficient route management that minimises track miles and fuel burn. In contrast, the use of the STIRA and TARTN holds during busy periods increases track miles and fuel burn. The final approach is fixed and provides the most efficient flight path to the runway.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the holds at STIRA and TARTN if necessary but vectoring allows for effective and efficient route management.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume as it is today. Class D rules apply.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' The final approach (the last approximately 8 miles and below 3000ft altitude) is fixed because of the runway orientation and aircraft operating rules – further minimisation of impacts from aircraft emissions is therefore not possible.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met

Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This baseline does not bring an increase in capacity but does facilitate economic benefits to Scotland including tourism.

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 37																
Option RWY06 Baseline Approach																
This option is accepted as the do-nothing baseline for the IOA.																

Design Principle Evaluation	Option No: 38
Rwy 06 Baseline and RNAV Approach	Reject
 	Alignment with Design Principles

The baseline is the mode of operation that Edinburgh operates today in order to sequence and land arriving traffic. The majority of aircraft are taken from NERL when clear of conflicting traffic and given expeditious vectors to final approach in order to fly an ILS or occasionally an NDB to land. During busy times aircraft are routed to the STIRA hold to the north or the TARTN hold to the south where they are held before being sequenced. As can be seen from the graphic most aircraft arrive from the south and because of the buffer zone to the west of Edinburgh's controlled airspace traffic is held frequently in the TARTN hold before being sequenced. The lowest levels to hold at STIRA and TARTN are chosen to keep aircraft above the initial level of the SIDs until both arriving and departing aircraft are identified on radar. **The difference in this option when compared to option 37 (Rwy 06 Baseline Approach) is that an RNAV approach will be incorporated and provide an alternative way of flying final approach to land.**			
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The holds at STIRA and TARTN are designed to be above the level any SID would climb to. Aircraft are vectored to final approach using approved equipment, licenced ATCO's and aircrew, as well as standardised procedures.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: This option is today's baseline but modernised and will be designed with PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are in use today with approved coordination procedures between EDI, GAL and Prestwick ATC.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: Arrivals are vectored from their handover point which could be the hold or a point en-route. This is not predictable and allows for dispersal.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve this through the CAA's AMS.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Descending aircraft will overfly small to medium communities and population centres in the Scottish Borders, South Lanarkshire and West Lothian (from the south / TARTN) and Stirling, Clackmannanshire, Falkirk and West Lothian (from the north / STIRRA) at altitudes between approximately 3000ft to 8000ft. Aircraft join the final			

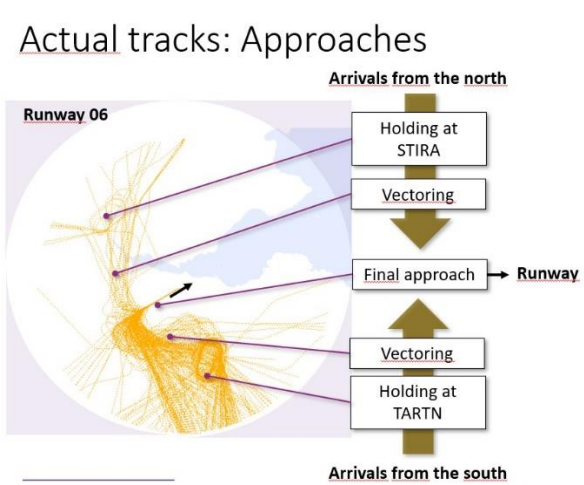
approach at approximately 8 miles distance from the airport and all overfly Livingston and Newbridge at an altitude of less than 3000 feet – this is unavoidable given the orientation of the 06 runway and aircraft operating rules. While the aircraft will be operating at a lower (and hence quieter) engine power than departing aircraft, the concentration of aircraft on the final approach provides no opportunity to minimise impacts to affected communities. Vectoring of aircraft between 3000ft and 8000ft will provide some track dispersion that will reduce impacts to affected communities. In contrast, the introduction and use of an RNAV overlay will generate greater track concentration when aircraft are not vectored.			
Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: Descending aircraft are vectored to the final approach and overfly small to medium communities and population centres in the Scottish Borders, South Lanarkshire and West Lothian (from the south / TARTN) and Stirling, Clackmannanshire, Falkirk and West Lothian (from the north / STIRA) at altitudes between approximately 3000ft to 8000ft. The aircraft will be operating at a lower (and hence quieter) engine power than departing aircraft, minimising the impact of aviation noise on overflown communities. Vectoring also provides a degree of track dispersal above 4000ft that will reduce the frequency of impacts to affected communities. In contrast, the introduction and use of an RNAV overlay will generate greater track concentration when aircraft are not vectored.			
Design Principle 9: 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.	Not met	Partial	Met
Qualitative Assessment: Descending aircraft are vectored to the final approach and overfly small to medium communities and population centres in the Scottish Borders, South Lanarkshire and West Lothian (from the south / TARTN) and Stirling, Clackmannanshire, Falkirk and West Lothian (from the north / STIRA) at altitudes between approximately 3000ft to 8000ft. Vectoring of aircraft provides a degree of track dispersion that reduces the frequency of impacts to affected communities but may increase the total population overflown. In contrast, the introduction and use of an RNAV overlay will generate greater track concentration when aircraft are not vectored. It is not possible to further minimise the population overflown by aircraft on the final approach as this is fixed based on the orientation of the 06 runway and aircraft operating rules. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Descending aircraft are vectored to the final approach and overfly sensitive locations and noise-sensitive receptors in the Scottish Borders, South Lanarkshire and West Lothian (from the south / TARTN) and Stirling, Clackmannanshire, Falkirk and West Lothian (from the north / STIRA) at altitudes between approximately 3000ft to 8000ft. Vectoring of aircraft provides a degree of track dispersion that reduces the frequency of impacts to individual affected receptors but may increase the total number of overflown receptors. In contrast, the introduction and use of an RNAV overlay will generate greater track concentration when aircraft are not vectored. It is not possible to further minimise the overflight of sensitive locations and noise-sensitive receptors underneath the final approach as this is fixed based on the orientation of the 06 runway and aircraft operating rules.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met

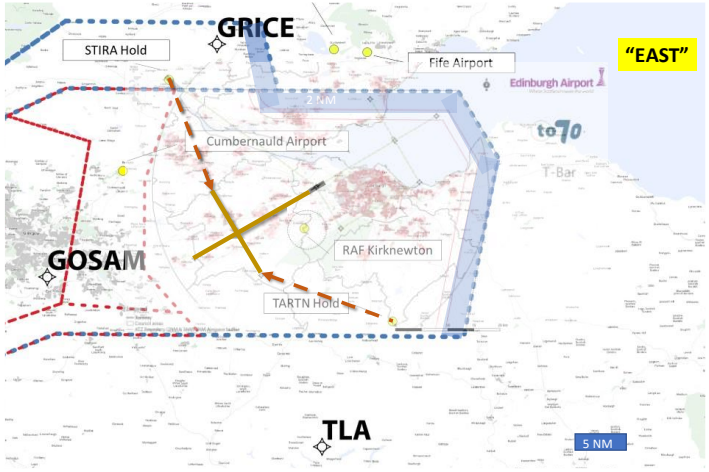
Qualitative Assessment: Vectoring of descending aircraft between approximately 3000ft to 8000ft provides a degree of track dispersion that reduces the frequency of impacts to individual affected receptors. In contrast, the introduction and use of an RNAV overlay will generate greater track concentration when aircraft are not vectored, and the final approach provides track concentration.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Vectoring of descending aircraft between approximately 3000ft to 8000ft is used to deliver efficient route management that minimises track miles and fuel burn. The introduction and use of an RNAV overlay will also deliver efficient route management when aircraft are not vectored. In contrast, the use of the STIRA and TARTN holds during busy periods increases track miles and fuel burn. The final approach is fixed and provides the most efficient flight path to the runway.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume as it is today. Class D rules apply.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' The final approach (the last approximately 8 miles and below 3000ft altitude) is fixed because of the runway orientation and aircraft operating rules – further minimisation of impacts from aircraft emissions is therefore not possible.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This baseline does not bring an increase in capacity but does facilitate economic benefits to Scotland including tourism.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 38																
Option RWY06 Baseline and RNAV Approach																
The modernised baseline (do minimum option) is accepted and taken forward to the shortlist of options. The modernised baseline would be RNAV compatible.																

Design Principle Evaluation	Option No: 39
Rwy 06 Vectoring and Approach transitions (Holds)	**Accept**





Alignment with Design Principles

This option for arrivals involves designing approach transitions from the holds at STIRA and TARTN that would link with the T-Bar for final approach to runway 06. This systemises the way traffic arrives reducing workload both in the cockpit and for the ATCO. We would also systemise arrivals inbound from the east which would involve the establishment of a stepped airway in order to contain the arrivals inside controlled airspace on the east side of the ScTMA. Arrivals from the east would join this system north or south of the airfield or indeed via the overhead with the path of this approach transition to be determined. For arrivals to approach from the east we would also need to establish a stepped airway in order to contain the arrivals inside controlled airspace.
This systemisation would be used during quiet traffic periods and vectoring would still be available to deal with busy traffic periods. Vectoring also offers increased coordination between the tower and approach controllers enabling more arrivals to be sequenced during busy traffic periods.

Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The holds at STIRA and TARTN are designed to be above the level any SID would climb to. Aircraft are vectored to final approach using approved equipment, licenced ATCO's and aircrew, as well as standardised procedures. Approach transitions would be designed to deconflict from SIDs.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met

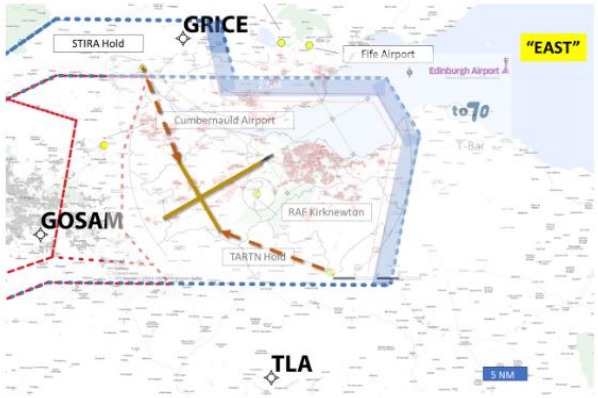
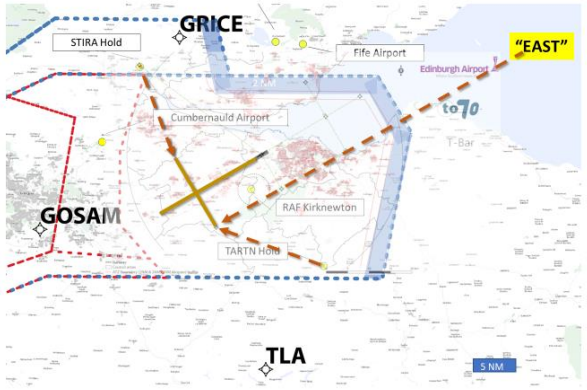
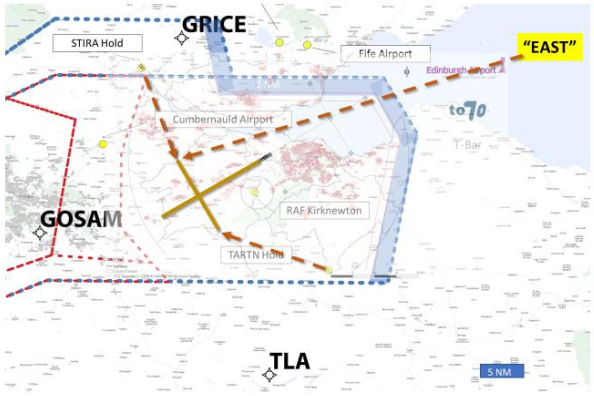
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: This option will include holds, approach transitions and RNAV approaches designed with PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes will be designed to be deconflicted and use approved coordination procedures between EDI, GLA and Prestwick ATC.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: Arrivals are vectored from their handover point which could be the hold or a point en-route. This is not predictable and allows for dispersal. However, the approach transitions do provide predictable flight paths.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve this, and this option will provide PBN procedures as part of the CAA's published modernisation strategy.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Descending aircraft will overfly small to medium communities and population centres in the Scottish Borders, South Lanarkshire and West Lothian (from the south / TARTN) and Stirling, Clackmannanshire, Falkirk and West Lothian (from the north / STIRRA) at altitudes between approximately 3000ft to 8000ft. Aircraft join the final approach at approximately 8 miles distance from the airport and all overfly Livingston and Newbridge at an altitude of less than 3000 feet – this is unavoidable given the orientation of the 06 runway and aircraft operating rules. While the aircraft will be operating at a lower (and hence quieter) engine power than departing aircraft, the concentration of aircraft on the final approach provides no opportunity to minimise impacts to affected communities. Vectoring of aircraft between 3000ft and 8000ft will provide some track dispersion that will reduce impacts to affected communities. In contrast, increased systemisation through the introduction and use of approach transitions to the t-bars will generate greater track concentration when aircraft are not vectored.			
Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: Descending aircraft will overfly small to medium communities and population centres in the Scottish Borders, South Lanarkshire and West Lothian (from the south / TARTN) and Stirling, Clackmannanshire, Falkirk and West Lothian (from the north / STIRA) at altitudes between approximately 3000ft to 8000ft. The aircraft will be operating at a lower (and hence quieter) engine power than departing aircraft, minimising the impact of aviation noise on overflown communities. Vectoring during busy periods			

will provide a degree of track dispersal above 4000ft that will reduce the frequency of impacts to affected communities. In contrast, increased systemisation through the introduction and use of approach transitions to the t-bars will generate greater track concentration when aircraft are not vectored.			
Design Principle 9: 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.	Not met	Partial	Met
Qualitative Assessment: Descending aircraft will overfly small to medium communities and population centres in the Scottish Borders, South Lanarkshire and West Lothian (from the south / TARTN) and Stirling, Clackmannanshire, Falkirk and West Lothian (from the north / STIRA) at altitudes between approximately 3000ft to 8000ft. Vectoring of aircraft will provide a degree of track dispersion that reduces the frequency of impacts to affected communities but may increase the total population overflown. In contrast, increased systemisation through the introduction and use of approach transitions to the t-bars will generate greater track concentration when aircraft are not vectored. It is not possible to further minimise the population overflown by aircraft on the final approach as this is fixed based on the orientation of the 06 runway and aircraft operating rules. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc. Further assessments in Stage 2B and Stage 3 will consider in more detail the potential impact of flight paths on people with protected characteristics.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Descending aircraft will overfly sensitive locations and noise-sensitive receptors in the Scottish Borders, South Lanarkshire and West Lothian (from the south / TARTN) and Stirling, Clackmannanshire, Falkirk and West Lothian (from the north / STIRA) at altitudes between approximately 3000ft to 8000ft. Vectoring of aircraft will provide a degree of track dispersion that reduces the frequency of impacts to individual affected receptors but may increase the total number of overflown receptors. In contrast, increased systemisation through the introduction and use of approach transitions to the t-bars will generate greater track concentration when aircraft are not vectored. It is not possible to further minimise the overflight of sensitive locations and noise-sensitive receptors underneath the final approach as this is fixed based on the orientation of the 06 runway and aircraft operating rules.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: Vectoring of descending aircraft between approximately 3000ft to 8000ft provides a degree of track dispersion that reduces the frequency of impacts to individual affected receptors. In contrast, increased systemisation through the introduction and use of approach transitions to the t-bars will generate greater track concentration when aircraft are not vectored, and the final approach provides track concentration.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Vectoring of descending aircraft between approximately 3000ft to 8000ft is used to deliver efficient route management that minimises track miles and fuel burn. The introduction and use of approach transitions to the t-bars will also deliver efficient route management when aircraft are not vectored. In contrast, the use of the STIRA and TARTN holds during busy periods increases track miles and fuel burn. The final approach is fixed and provides the most efficient flight path to the runway.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to allow for CDA.			

Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume as it is today. Class D rules apply.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' The final approach (the last approximately 8 miles and below 3000ft altitude) is fixed because of the runway orientation and aircraft operating rules – further minimisation of impacts from aircraft emissions is therefore not possible.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This combination of vectoring and systemisation will bring an increase in capacity and facilitate economic benefits to Scotland including tourism.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 39																
Option RWY06 Vectoring and Approach Transitions (Holds)																
This option is accepted and taken forward to the shortlist of options. This option provides greatest flexibility for capacity and dispersal of tracks. It also allows for track concentration during quieter periods as the approach transition can be designed with a view to minimise population overflown.																

Design Principle Evaluation	Option No: 40
Rwy 06 Holds Approach Transitions and Holds	Reject
   **This option for arrivals involves designing approach transitions from the holds at STIRA and TARTN that would link with the T-Bar for final approach to runway 06. This systemises the way traffic arrives reducing workload both in the cockpit and for the ATCO. We would also systemise arrivals inbound from the east which would involve the establishment of a stepped airway in order to contain the arrivals inside controlled airspace on the east side of the ScTMA. Arrivals from the east would join this system north or south of the airfield or indeed via the overhead with the path of this approach transition to be determined.**	**Alignment with Design Principles**

Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The holds at STIRA and TARTN are designed to be above the level any SID would climb to. Aircraft are vectored to final approach using approved equipment, licenced ATCO's and aircrew, as well as standardised procedures.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: This option is systemised and uses PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes would be developed to be procedurally deconflicted with approved procedures between EDI, GAL and Prestwick ATC.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: Arrivals would route using approach transitions or holds from their handover point which could be the hold or a point en-route. This is predictable and does not allow for dispersal.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve this. These PBN procedures do comply with the CAA's published modernisation strategy.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Descending aircraft will overfly small to medium communities and population centres in the Scottish Borders, South Lanarkshire and West Lothian (from the south / TARTN) and Stirling, Clackmannanshire, Falkirk and West Lothian (from the north / STIRRA) at altitudes between approximately 3000ft to 8000ft. Aircraft join the final approach at approximately 8 miles distance from the airport and all overfly Livingston and Newbridge at an altitude of less than 3000 feet – this is unavoidable given the orientation of the 06 runway and aircraft operating rules. While the aircraft will be operating at a lower (and hence quieter) engine power than departing aircraft, the concentration of aircraft on the final approach provides no opportunity to minimise impacts to affected communities. Full systemisation through the introduction and use of approach transitions to the t-bars will generate greater track concentration, while aircraft vectoring, which would generate a degree of track dispersal, will only be used in exceptional circumstances.			

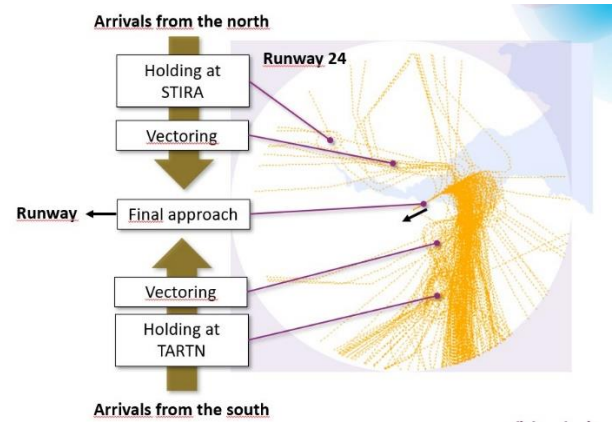
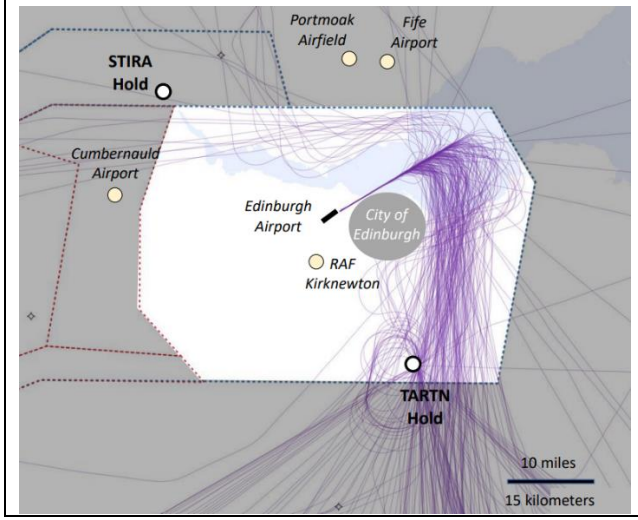
Design Principle 8: For flightpaths at or above 4,000ft to below 7,000ft, the environmental priority should continue to be minimising the impact of aviation noise in a manner consistent with the government's overall policy on aviation noise, unless this would disproportionately increase CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: Descending aircraft will overfly small to medium communities and population centres in the Scottish Borders, South Lanarkshire and West Lothian (from the south / TARTN) and Stirling, Clackmannanshire, Falkirk and West Lothian (from the north / STIRA) at altitudes between approximately 3000ft to 8000ft. The aircraft will be operating at a lower (and hence quieter) engine power than departing aircraft, minimising the impact of aviation noise on overflown communities. Vectoring will only be used in exceptional circumstances and full systemisation through the introduction and use of approach transitions to the t-bars will generate greater track concentration than the baseline.			
Design Principle 9: 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.	Not met	Partial	Met
Qualitative Assessment: Descending aircraft will overfly small to medium communities and population centres in the Scottish Borders, South Lanarkshire and West Lothian (from the south / TARTN) and Stirling, Clackmannanshire, Falkirk and West Lothian (from the north / STIRA) at altitudes between approximately 3000ft to 8000ft. Full systemisation through the introduction and use of approach transitions to the t-bars will generate greater track concentration that will minimise the overflown population, and vectoring will only be used in exceptional circumstances. It is not possible to further minimise the population overflown by aircraft on the final approach as this is fixed based on the orientation of the 06 runway and aircraft operating rules. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Descending aircraft will overfly sensitive locations and noise-sensitive receptors in the Scottish Borders, South Lanarkshire and West Lothian (from the south / TARTN) and Stirling, Clackmannanshire, Falkirk and West Lothian (from the north / STIRA) at altitudes between approximately 3000ft to 8000ft. Full systemisation through the introduction and use of approach transitions to the t-bars will generate greater track concentration that will minimise affected receptors. It is not possible to further minimise the overflight of sensitive locations and noise-sensitive receptors underneath the final approach as this is fixed based on the orientation of the 06 runway and aircraft operating rules.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: Full systemisation through the introduction and use of approach transitions to the t-bars will maximise track concentration. The final approach will also provide track concentration. The use of vectoring in only exceptional circumstances will minimise track dispersion.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Full systemisation through the introduction and use of approach transitions to the t-bars will deliver efficient route management that minimises track miles and fuel burn. However, potential capacity constraints associated with full systemisation, and the use of vectoring only under exceptional circumstances, may result in more aircraft being held in the STIRA or TARTN holds during busy periods, which will increase track miles and fuel burn. The final approach is fixed and provides the most efficient flight path to the runway.			

Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to achieve CDA.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume as it is today. Class D rules apply.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' The final approach (the last approximately 8 miles and below 3000ft altitude) is fixed because of the runway orientation and aircraft operating rules – further minimisation of impacts from aircraft emissions is therefore not possible.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This mode of operation may not bring an increase in capacity.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 40																
Option RWY06 Holds Approach Transitions and Holds																
This option is rejected. This option provides full systemisation which does not give flexibility for vectoring during busy periods and is likely to result in greater use of the holds, more track miles, fuel burn, and CO2 emissions. It also doesn't allow for respite and could constrain capacity.																

Rwy 24 Arrivals

Design Principle Evaluation	Option No: 41
Rwy 24 Baseline Approach	Accept
 	Alignment with Design Principles

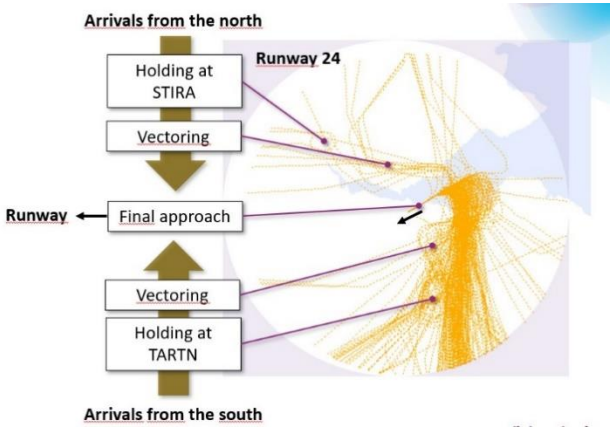
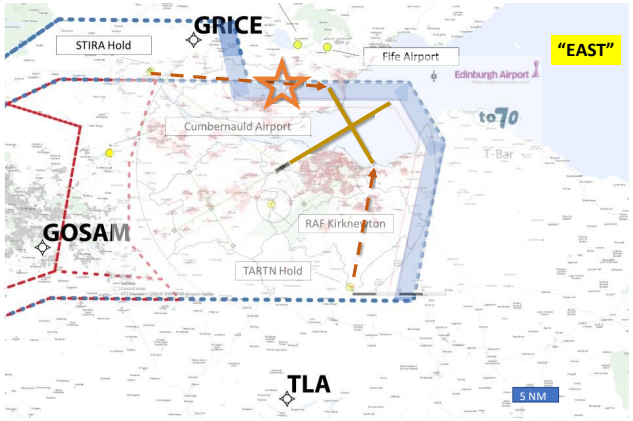
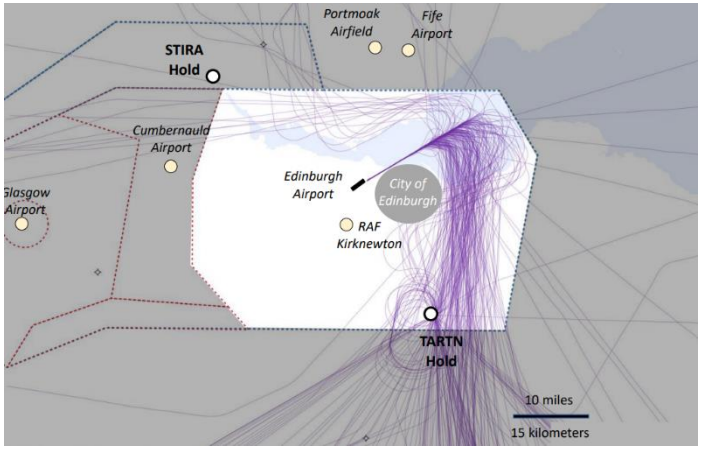
The baseline is the mode of operation that Edinburgh operates today in order to sequence and land arriving traffic. The majority of aircraft are taken from NERL when clear of conflicting traffic and given expeditious vectors to final approach in order to fly an ILS or occasionally an NDB to land. During busy times aircraft are routed to the STIRA hold to the north or the TARTN hold to the south where they are held before being sequenced. As can be seen from the graphic most aircraft arrive from the south and on Rwy 24 there is space to the east of the airfield for sequencing arriving aircraft to land with the use of the hold at TARTN less frequent then when Rwy 06 is in use. The lowest levels to hold at STIRA and TARTN are chosen to keep aircraft above the initial level of the SIDs until both arriving and departing aircraft are identified on radar.			
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The holds at STIRA and TARTN are designed to be above the level any SID would climb to. Aircraft are vectored to final approach using approved equipment, licenced ATCO's and aircrew, as well as standardised procedures.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: This option is today's baseline and so will not use PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are in use today with approved coordination procedures between EDI, GAL and Prestwick ATC.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: Arrivals are vectored from their handover point which could be the hold or a point en-route. This is not predictable and allows for dispersal.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve this, but today's operations are not PBN and also not part of the CAA's published modernisation strategy.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Descending aircraft, either routed directly or released from the STIRA or TARTN hold at approximately 8000ft, are vectored to the final approach and overfly small to large communities and population centres in the Scottish Borders, Midlothian, East Lothian and the City of Edinburgh. From the south / TARTN, aircraft cross the			

coast between Leith at approximately 3000ft altitude, Musselburgh at approximately 4000ft altitude and Longniddry at approximately 6,000ft altitude. From the north / STIRA, aircraft are routed across Stirling, Clackmannanshire, Fife and the City of Edinburgh, crossing the Fife coast approximately between Kinghorn and Kirkcaldy at an altitude of around 3000ft. Aircraft join the final approach at approximately 8 miles distance from the airport, over the Firth of Forth, and all arrivals overfly Cramond at an altitude of less than 1000ft; this is unavoidable given the orientation of the 24 runway and aircraft operating rules. While the aircraft will be operating at a lower (and hence quieter) engine power than departing aircraft, the concentration of aircraft on the final approach provides no opportunity to minimise impacts to the affected community in Cramond. Vectoring of aircraft between 3000ft and 8000ft provides some track dispersion that will reduce impacts to affected communities.			
Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: Descending aircraft are vectored to the final approach and overfly small to large communities and population centres in the Scottish Borders, Midlothian, East Lothian and the City of Edinburgh (from the south / TARTN) and Stirling, Clackmannanshire, Fife and the City of Edinburgh (from the north / STIRA) at altitudes between approximately 3000ft to 8000ft. The aircraft will be operating at a lower (and hence quieter) engine power than departing aircraft, minimising the impact of aviation noise on overflown communities. Vectoring also provides a degree of track dispersal above 4000ft that will reduce the frequency of impacts to affected communities.			
Design Principle 9: 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.	Not met	Partial	Met
Qualitative Assessment: Descending aircraft are vectored to the final approach and overfly small to large communities and population centres in in the Scottish Borders, Midlothian, East Lothian and the City of Edinburgh (from the south / TARTN) and Stirling, Clackmannanshire, Fife and the City of Edinburgh (from the north / STIRA) at altitudes between approximately 3000ft to 8000ft. Vectoring of aircraft provides a degree of track dispersion that reduces the frequency of impacts to affected communities but may increase the total population overflown. It is not possible to further minimise the population overflown at Cramond by aircraft on the final approach as this is fixed based on the orientation of the 24 runway and aircraft operating rules. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Descending aircraft are vectored to the final approach and overfly sensitive locations and noise-sensitive receptors in the Scottish Borders, Midlothian, East Lothian and the City of Edinburgh (from the south / TARTN) and Stirling, Clackmannanshire, Fife and the City of Edinburgh (from the north / STIRA) at altitudes between approximately 3000ft to 8000ft. Vectoring of aircraft provides a degree of track dispersion that reduces the frequency of impacts to individual affected receptors but may increase the total number of overflown receptors. It is not possible to further minimise the overflight of sensitive locations and noise-sensitive receptors at Cramond underneath the final approach as this is fixed based on the orientation of the 24 runway and aircraft operating rules.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: Vectoring of descending aircraft between approximately 3000ft to 8000ft provides a degree of track dispersion that reduces the frequency of impacts to individual affected receptors. The final approach provides track concentration.			

Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Vectoring of descending aircraft between approximately 3000ft to 8000ft is used to deliver efficient route management that minimises track miles and fuel burn. In contrast, the use of the STIRA and TARTN holds during busy periods increases track miles and fuel burn. The final approach is fixed and provides the most efficient flight path to the runway.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the holds at STIRA and TARTN if necessary, but vectoring allows for effective and efficient route management.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume as it is today. Class D rules apply.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' The final approach (the last approximately 8 miles and below 3000ft altitude) is fixed because of the runway orientation and aircraft operating rules – further minimisation of impacts from aircraft emissions is therefore not possible.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This baseline does not bring an increase in capacity but does facilitate economic benefits to Scotland including tourism.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 41																
Option RWY24 Baseline Approach																
This option is accepted as the do-nothing baseline for the IOA.																

Design Principle Evaluation	Option No: 42
Rwy 24 Baseline and RNAV Approach	Accept
  	Alignment with Design Principles

The baseline is the mode of operation that Edinburgh operates today in order to sequence and land arriving traffic. The majority of aircraft are taken from NERL when clear of conflicting traffic and given expeditious vectors to final approach in order to fly an ILS or occasionally an NDB to land. During busy times aircraft are routed to the STIRA hold to the north or the TARTN hold to the south where they are held before being sequenced. As can be seen from the graphic most aircraft arrive from the south and on Rwy 24 there is space to the east of the airfield for sequencing arriving aircraft to land with the use of the hold at TARTN less frequent then when Rwy 06 is in use. The lowest levels to hold at STIRA and TARTN are chosen to keep aircraft above the initial level of the SIDs until both arriving and departing aircraft are identified on radar. The difference in this option when compared to option 41 (Rwy 24 Baseline Approach) is that an RNAV approach will be incorporated and provide an alternative way of flying final approach to land.			
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The holds at STIRA and TARTN are designed to be above the level any SID would climb to. Aircraft are vectored to final approach using approved equipment, licenced ATCO's and aircrew, as well as standardised procedures.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: This option is todays baseline but modernised and will be designed with PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes are in use today with approved coordination procedures between EDI, GAL and Prestwick ATC.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: Arrivals are vectored from their handover point which could be the hold or a point en-route. This is not predictable and allows for dispersal.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve this through the CAA's AMS.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Descending aircraft, either routed directly or released from the STIRA or TARTN hold at approximately 8000ft, will overfly small to large communities and population centres in the Scottish Borders, Midlothian, East Lothian and the City of Edinburgh. From the south / TARTN, aircraft will cross the coast between Leith at approximately			

3000ft altitude, Musselburgh at approximately 4000ft and Longniddry at approximately 6,000ft. From the north / STIRA, aircraft will be routed across Stirling, Clackmannanshire, Fife and the City of Edinburgh, crossing the Fife coast approximately between Kinghorn and Kirkcaldy at an altitude of around 3000ft. Aircraft will join the final approach at approximately 8 miles distance from the airport, over the Firth of Forth, and all arrivals will overfly Cramond at an altitude of less than 1000ft; this is unavoidable given the orientation of the 24 runway and aircraft operating rules. While the aircraft will be operating at a lower (and hence quieter) engine power than departing aircraft, the concentration of aircraft on the final approach provides no opportunity to minimise impacts to the affected community in Cramond. Vectoring of aircraft between 3000ft and 8000ft will provide some track dispersion that will reduce impacts to affected communities. In contrast, the introduction and use of an RNAV overlay will generate greater track concentration when aircraft are not vectored.			
Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: Descending aircraft will overfly small to large communities and population centres in the Scottish Borders, Midlothian, East Lothian and the City of Edinburgh (from the south / TARTN) and Stirling, Clackmannanshire, Fife and the City of Edinburgh (from the north / STIRA) at altitudes between approximately 3000ft to 8000ft. The aircraft will be operating at a lower (and hence quieter) engine power than departing aircraft, minimising the impact of aviation noise on overflown communities. Vectoring will also provide a degree of track dispersal above 4000ft that will reduce the frequency of impacts to affected communities. In contrast, the introduction and use of an RNAV overlay will generate greater track concentration when aircraft are not vectored.			
Design Principle 9: 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.	Not met	Partial	Met
Qualitative Assessment: Descending aircraft will overfly small to large communities and population centres in the Scottish Borders, Midlothian, East Lothian and the City of Edinburgh (from the south / TARTN) and Stirling, Clackmannanshire, Fife and the City of Edinburgh (from the north / STIRA) at altitudes between approximately 3000ft to 8000ft. Vectoring of aircraft will provide a degree of track dispersion that will reduce the frequency of impacts to affected communities but may increase the total population overflown. In contrast, the introduction and use of an RNAV overlay will generate greater track concentration when aircraft are not vectored. It is not possible to further minimise the population overflown at Cramond by aircraft on the final approach as this is fixed based on the orientation of the 24 runway and aircraft operating rules. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc. Further assessments in Stage 2B and Stage 3 will consider in more detail the potential impact of flight paths on people with protected characteristics.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Descending aircraft will overfly sensitive locations and noise-sensitive receptors in the Scottish Borders, Midlothian, East Lothian and the City of Edinburgh (from the south / TARTN) and Stirling, Clackmannanshire, Fife and the City of Edinburgh (from the north / STIRA) at altitudes between approximately 3000ft to 8000ft. Vectoring of aircraft will provide a degree of track dispersion that will reduce the frequency of impacts to individual affected receptors but may increase the total number of overflown receptors. In contrast, the introduction and use of an RNAV overlay will generate greater track concentration when aircraft are not vectored. It is not possible to further minimise the overflight of sensitive locations and noise-sensitive receptors at Cramond underneath the final approach as this is fixed based on the orientation of the 24 runway and aircraft operating rules.			

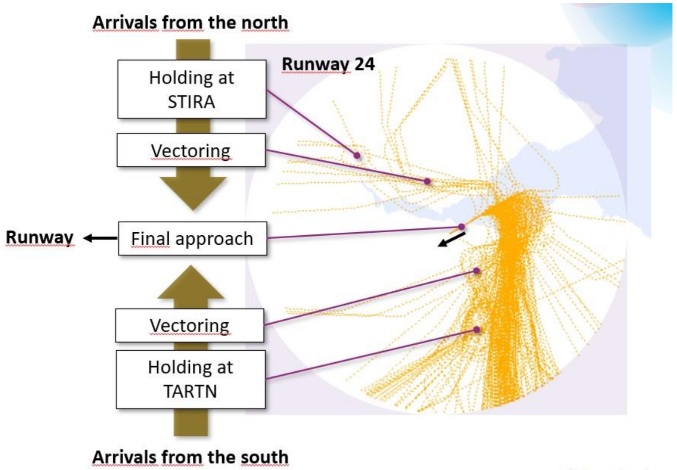
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: Vectoring of descending aircraft between approximately 3000ft to 8000ft will provide a degree of track dispersion that will reduce the frequency of impacts to individual affected receptors. In contrast, the introduction and use of an RNAV overlay will generate greater track concentration when aircraft are not vectored, and the final approach provides track concentration.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Vectoring of descending aircraft between approximately 3000ft to 8000ft will be used to deliver efficient route management that minimises track miles and fuel burn. The introduction and use of an RNAV overlay will also deliver efficient route management when aircraft are not vectored. In contrast, the use of the STIRA and TARTN holds during busy periods will increase track miles and fuel burn. The final approach is fixed and provides the most efficient flight path to the runway.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to route around any holding arrivals and achieve CCO.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume as it is today. Class D rules apply.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' The final approach (the last approximately 8 miles and below 3000ft altitude) is fixed because of the runway orientation and aircraft operating rules – further minimisation of impacts from aircraft emissions to Cramond is therefore not possible.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This baseline does not bring an increase in capacity but does facilitate economic benefits to Scotland including tourism.			

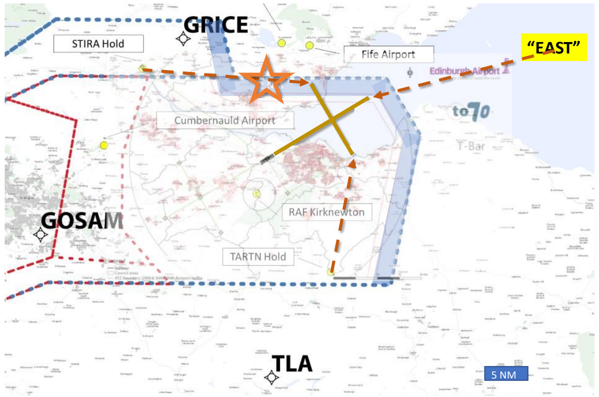
	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

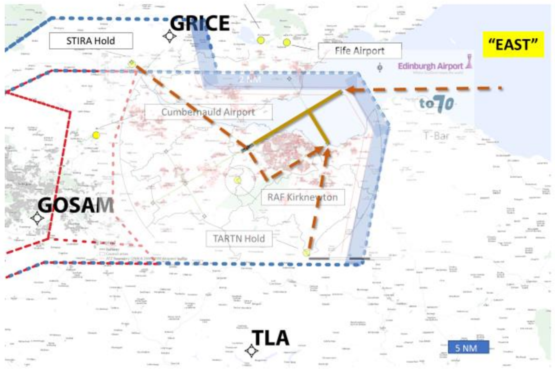
	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 42																
Option RWY24 Baseline and RNAV Approach																
The modernised baseline (do minimum option) is accepted and taken forward to the shortlist of options. The modernised baseline would be RNAV compatible.																

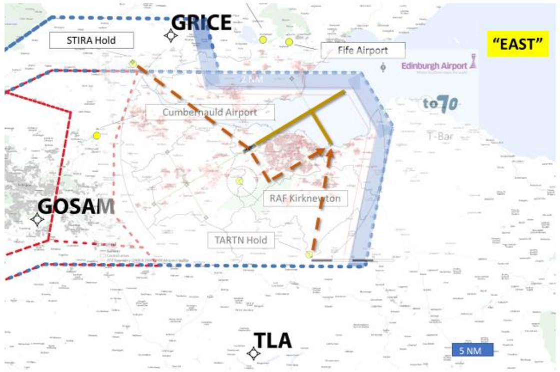
Design Principle Evaluation	Option No: 43
Rwy 24 Vectoring and Approach Transitions (Holds)	**Accept**

Alignment with Design Principles









This option for arrivals involves designing approach transitions from the holds at STIRA and TARTN that would link with the T-Bar for final approach to runway 24. This systemises the way traffic arrives reducing workload both in the cockpit and for the ATCO. If the routing downwind right to the north of the airfield from STIRA is not able to be implemented then STIRA traffic would need to route via the

overhead, or just to the east of the overhead to join the sequence downwind left hand. We would also systemise arrivals inbound from the east which would involve the establishment of a stepped airway in order to contain the arrivals inside controlled airspace. This systemisation would be used during quiet traffic periods and vectoring would still be available to deal with busy traffic periods. Vectoring also offers increased coordination between the tower and approach controllers enabling more arrivals to be sequenced during busy traffic periods.			
Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The holds at STIRA and TARTN are designed to be above the level any SID would climb to. Aircraft are vectored to final approach using approved equipment, licenced ATCO's and aircrew, as well as standardised procedures. Approach transitions would be designed to deconflict from SIDs.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: This option will include holds, approach transitions and RNAV approaches designed with PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes will be designed to be deconflicted and use approved coordination procedures between EDI, GLA and Prestwick ATC.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: Arrivals are vectored from their handover point which could be the hold or a point en-route. This is not predictable and allows for dispersal. However, the approach transitions do provide predictable flight paths.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve this, and this option will provide PBN procedures as part of the CAA's published modernisation strategy.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Descending aircraft will overfly small to large communities and population centres in the Scottish Borders, Midlothian, East Lothian and the City of Edinburgh. From the south / TARTN, aircraft cross the coast between Leith at approximately 3000ft altitude, Musselburgh at approximately 4000ft and Longniddry at approximately 6,000ft. From the north / STIRA, aircraft are routed across Stirling, Clackmannanshire, Fife and the City of Edinburgh, crossing the Fife coast approximately between			

Kinghorn and Kirkcaldy at an altitude of around 3000ft. Aircraft will join the final approach at approximately 8 miles distance from the airport, over the Firth of Forth, and all arrivals will overfly Cramond at an altitude of less than 1000ft; this is unavoidable given the orientation of the 24 runway and aircraft operating rules. While the aircraft will be operating at a lower (and hence quieter) engine power than departing aircraft, the concentration of aircraft on the final approach provides no opportunity to minimise impacts to the affected community in Cramond. Vectoring of aircraft between 3000ft and 8000ft will provide some track dispersion that will reduce impacts to affected communities. In contrast, increased systemisation through the introduction and use of approach transitions to the t-bars will generate greater track concentration when aircraft are not vectored.			
Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: Descending aircraft will overfly small to large communities and population centres in in the Scottish Borders, Midlothian, East Lothian and the City of Edinburgh (from the south / TARTN) and Stirling, Clackmannanshire, Fife and the City of Edinburgh (from the north / STIRA) at altitudes between approximately 3000ft to 8000ft. The aircraft will be operating at a lower (and hence quieter) engine power than departing aircraft, minimising the impact of aviation noise on overflown communities. Vectoring during busy periods will provide a degree of track dispersal above 4000ft that will reduce the frequency of impacts to affected communities. In contrast, increased systemisation through the introduction and use of approach transitions to the t-bars will generate greater track concentration when aircraft are not vectored.			
Design Principle 9: 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.	Not met	Partial	Met
Qualitative Assessment: Descending aircraft will overfly small to large communities and population centres in the Scottish Borders, Midlothian, East Lothian and the City of Edinburgh (from the south / TARTN) and Stirling, Clackmannanshire, Fife and the City of Edinburgh (from the north / STIRA) at altitudes between approximately 3000ft to 8000ft. Vectoring of aircraft during busy periods will provide a degree of track dispersion that will reduce the frequency of impacts to affected communities but may increase the total population overflown. In contrast, increased systemisation through the introduction and use of approach transitions to the t-bars will generate greater track concentration when aircraft are not vectored. It is not possible to further minimise the population overflown at Cramond by aircraft on the final approach as this is fixed based on the orientation of the 24 runway and aircraft operating rules. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Descending aircraft will overfly sensitive locations and noise-sensitive receptors in the Scottish Borders, Midlothian, East Lothian and the City of Edinburgh (from the south / TARTN) and Stirling, Clackmannanshire, Fife and the City of Edinburgh (from the north / STIRA) at altitudes between approximately 3000ft to 8000ft. Vectoring of aircraft during busy periods will provide a degree of track dispersion that will reduce the frequency of impacts to individual affected receptors but may increase the total number of overflown receptors. In contrast, increased systemisation through the introduction and use of approach transitions to the t-bars will generate greater track concentration when aircraft are not vectored. It is not possible to further minimise the overflight of sensitive locations and noise-sensitive receptors at Cramond underneath the final approach as this is fixed based on the orientation of the 24 runway and aircraft operating rules.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met

Qualitative Assessment: During busy periods, vectoring of descending aircraft between approximately 3000ft to 8000ft will provide a degree of track dispersion that will reduce the frequency of impacts to individual affected receptors. In contrast, increased systemisation through the introduction and use of approach transitions to the T-bars will generate greater track concentration when aircraft are not vectored. The final approach will provide track concentration.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: During busy periods, vectoring of descending aircraft between approximately 3000ft to 8000ft will be used to deliver efficient route management that minimises track miles and fuel burn. Increased systemisation through the introduction and use of approach transitions to the T-bars introduction and use of approach transitions to the t-bars will also deliver efficient route management when aircraft are not vectored. In contrast, the use of the STIRA and TARTN holds during busy periods will increase track miles and fuel burn. The final approach is fixed and provides the most efficient flight path to the runway.			
Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to allow for CDA.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume as it is today. Class D rules apply.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that '*Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport*.' The final approach (the last approximately 8 miles and below 3000ft altitude) is fixed because of the runway orientation and aircraft operating rules – further minimisation of impacts from aircraft emissions to Cramond is therefore not possible.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This combination of vectoring and systemisation will bring an increase in capacity and facilitate economic benefits to Scotland including tourism.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 43																
Option RWY24 Vectoring and Approach Transitions (Holds)																
This option is accepted and taken forward to the shortlist of options. This option provides greatest flexibility for capacity and dispersal of tracks. It also allows for track concentration during quieter periods as the approach transition can be designed with a view to minimise population overflown.																

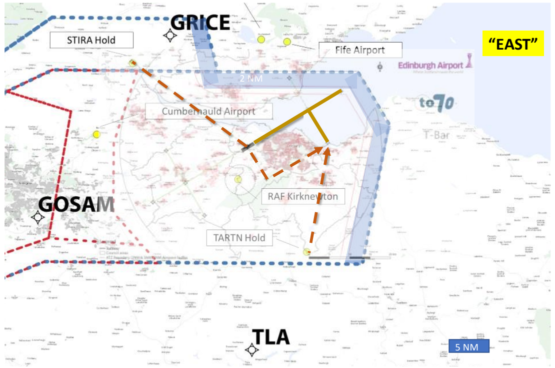
Design Principle Evaluation

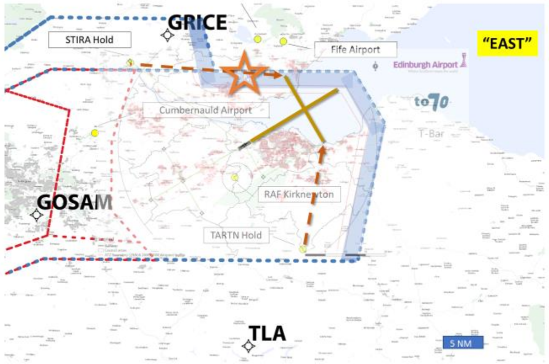
Option No: 44

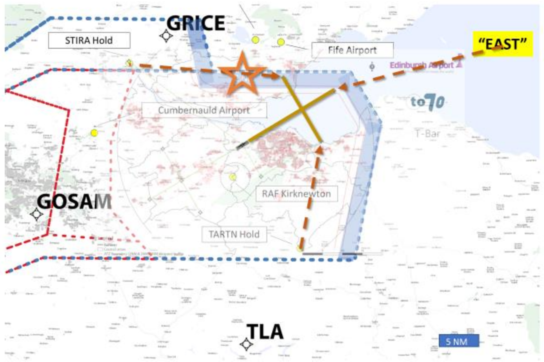
Rwy 24 Holds Approach transitions and Holds

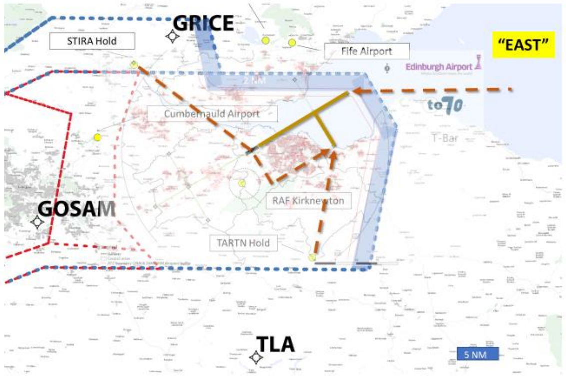
Reject

Alignment with Design Principles









This option for arrivals involves designing approach transitions from the holds at STIRA and TARTN that would link with the T-Bar for final approach to runway 24. This systemises the way traffic arrives reducing workload both in the cockpit and for the ATCO. If the routing downwind right to the north of the airfield from STIRA is not able to be implemented then STIRA traffic would need to route via the overhead, or just to the east of the overhead to join the sequence downwind left hand. We would also systemise arrivals inbound from the east which would involve the establishment of a stepped airway in order to contain the arrivals inside controlled airspace.

Design Principle 1: The airspace design and its operation must be as safe or safer than it is today.	Not met	Partial	Met
Qualitative Assessment: The holds at STIRA and TARTN are designed to be above the level any SID would climb to. Aircraft would follow approach transitions to final approach using approved equipment, licenced ATCO's and aircrew, as well as standardised procedures.			
Design Principle 2: Flight paths must be flyable and technically supported by air traffic control and airport technical management systems.	Not met	Partial	Met
Qualitative Assessment: This is necessary to allow the safe operation of flight and so will be the case.			
Design Principle 3: Flight paths must be designed to allow modern aircraft to use performance-based navigation (PBN) in line with CAA's modernisation strategy.	Not met	Partial	Met
Qualitative Assessment: This option is systemised and uses PBN.			
Design Principle 4: Routes to/from Glasgow and Edinburgh airports must be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Not met	Partial	Met
Qualitative Assessment: These routes would be developed to be procedurally deconflicted with approved procedures between EDI, GAL and Prestwick ATC.			
Design Principle 5: The predictability of flight tracks must be maximised for consistency of operations.	Not met	Partial	Met
Qualitative Assessment: Arrivals would route using approach transitions or holds from their handover point which could be the hold or a point en-route. This is predictable and does not allow for dispersal.			
Design Principle 6: 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.	Not met	Partial	Met
Qualitative Assessment: Work continues with Glasgow and NERL to achieve this. These PBN procedures do comply with the CAA's published modernisation strategy.			
Design Principle 7: Flight paths should be designed to minimise the total adverse effect on health and quality of life created by aircraft noise and emissions.	Not met	Partial	Met
Qualitative Assessment: Descending aircraft will overfly small to large communities and population centres in the Scottish Borders, Midlothian, East Lothian and the City of Edinburgh. From the south / TARTN, aircraft cross the coast between Leith at approximately 3000ft altitude, Musselburgh at approximately 4000ft and Longniddry at approximately 6,000ft. From the north / STIRA, aircraft are routed across Stirling, Clackmannanshire, Fife and the City of Edinburgh, crossing the Fife coast approximately between Kinghorn and Kirkcaldy at an altitude of around 3000ft. Aircraft will join the final approach at approximately 8 miles distance from the airport, over the Firth of Forth, and all arrivals will overfly Cramond at an altitude of less than 1000ft; this is unavoidable given the orientation of the 24 runway and aircraft operating rules. While the aircraft will be operating at a lower (and hence quieter) engine power than departing aircraft, the concentration of aircraft on the final approach provides no opportunity to minimise impacts to the affected community in Cramond. Full systemisation through the introduction and use of approach transitions to the T-bars will generate greater track concentration, while aircraft vectoring, which would generate a degree of track dispersal, will only be used in exceptional circumstances.			

Design Principle 8: 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 CO2 emissions.	Not met	Partial	Met
Qualitative Assessment: Descending aircraft will overfly small to large communities and population centres in the Scottish Borders, Midlothian, East Lothian and the City of Edinburgh (from the south / TARTN) and Stirling, Clackmannanshire, Fife and the City of Edinburgh (from the north / STIRA) at altitudes between approximately 3000ft to 8000ft. The aircraft will be operating at a lower (and hence quieter) engine power than departing aircraft, minimising the impact of aviation noise on overflown communities. Vectoring will only be used in exceptional circumstances and full systemisation through the introduction and use of approach transitions to the t-bars will generate greater track concentration than the baseline.			
Design Principle 9: 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.	Not met	Partial	Met
Qualitative Assessment: Descending aircraft will overfly small to large communities and population centres in the Scottish Borders, Midlothian, East Lothian and the City of Edinburgh (from the south / TARTN) and Stirling, Clackmannanshire, Fife and the City of Edinburgh (from the north / STIRA) at altitudes between approximately 3000ft to 8000ft. Full systemisation through the introduction and use of approach transitions to the t-bars will generate greater track concentration that will minimise the overflown population, and vectoring will only be used in exceptional circumstances. It is not possible to further minimise the population overflown at Cramond by aircraft on the final approach as this is fixed based on the orientation of the 24 runway and aircraft operating rules. People with protected characteristics are considered to typically be distributed throughout population centres, other than where aggregated in facilities such as special schools, care homes, etc.			
Design Principle 10: 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).	Not met	Partial	Met
Qualitative Assessment: Descending aircraft will overfly sensitive locations and noise-sensitive receptors in the Scottish Borders, Midlothian, East Lothian and the City of Edinburgh (from the south / TARTN) and Stirling, Clackmannanshire, Fife and the City of Edinburgh (from the north / STIRA) at altitudes between approximately 3000ft to 8000ft. Full systemisation through the introduction and use of approach transitions to the t-bars will generate greater track concentration that will minimise affected receptors. It is not possible to further minimise the overflight of sensitive locations and noise-sensitive receptors at Cramond underneath the final approach as this is fixed based on the orientation of the 24 runway and aircraft operating rules.			
Design Principle 11: Flight paths should be designed to include track concentration and/or track dispersal options to provide noise respite.	Not met	Partial	Met
Qualitative Assessment: Full systemisation through the introduction and use of approach transitions to the t-bars will maximise track concentration. The final approach will also provide track concentration. The use of vectoring in only exceptional circumstances will minimise track dispersion.			
Design Principle 12: Flight paths should be designed with routes that minimise track miles and fuel burn.	Not met	Partial	Met
Qualitative Assessment: Full systemisation through the introduction and use of approach transitions to the t-bars will deliver efficient route management that minimises track miles and fuel burn. However, potential capacity constraints associated with full systemisation, and the use of vectoring only under exceptional circumstances, may result in more aircraft being held in the STIRA or TARTN holds during busy periods, which will increase track miles and fuel burn. The final approach is fixed and provides the most efficient flight path to the runway.			

Design Principle 13: Flight paths should be designed to ensure efficient and effective route management.	Not met	Partial	Met
Qualitative Assessment: The flight paths are designed to connect with the en-route network and will therefore allow effective and efficient route management. They are also designed to achieve CDA.			
Design Principle 14: Requirements of airspace users should be taken into account when designing flight paths.	Not met	Partial	Met
Qualitative Assessment: CAS remains the same volume as it is today. Class D rules apply.			
Design Principle 15: Flight paths should be designed to minimise adverse local air quality impacts.	Not met	Partial	Met
Qualitative Assessment: CAP1616 states that 'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000 feet (amsl) are unlikely to have a significant impact on local air quality. Therefore, the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport.' The final approach (the last approximately 8 miles and below 3000ft altitude) is fixed because of the runway orientation and aircraft operating rules – further minimisation of impacts from aircraft emissions to Cramond is therefore not possible.			
Design Principle 16: Airspace should be designed to maximise capacity in order to contribute economic benefits to Scotland including tourism.	Not met	Partial	Met
Qualitative Assessment: One of the drivers of the SoN is an increase in capacity. This mode of operation may not bring an increase in capacity.			

	Meets DP
	Partially meets DP
	Does not meet DP
	Not applicable

	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Option 44																
Option RWY24 Holds Approach transitions and Holds																
This option is rejected. This option gives full systemisation which doesn't give flexibility for vectoring during busy periods and is likely to result in greater use of the holds, more track miles, fuel burn and CO2 emissions. This option does not allow for respite and could constrain capacity.																

Summary and Conclusions

The table below provides a summary of the design principle RAG colour coding for each option.

Option		Design Principle															
		DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
Rwy 06 Departures																	
1	Baseline																
2	Baseline M																
3	06 3xt #1																
4	06 3xt #2																
5	06 3xt #3																
6	06 3xt #4																
7	06 3xt #5																
8	06 4xt #1																
9	06 4xt #2																
10	06 4xt #3																
11	06 4xt #4																
12	06 4xt #5																
Rwy 24 Departures																	
13	Baseline																
14	Baseline M																
15	24 3xt #1																
16	24 3xt #2																
17	24 3xt #3																
18	24 3xt #4																
19	24 3xt #5																
20	24 3xt #6																
21	24 3xt #7																
22	24 4xt #1																
23	24 4xt #2																
24	24 4xt #3																

Option		Design Principle															
		DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	DP9	DP10	DP11	DP12	DP13	DP14	DP15	DP16
25	24 4xt #4																
26	24 4xt #5																
27	24 4xt #6																
28	24 4xt #7																
29	24 4xt #8																
30	24 4xt #9																
31	24 4xt #10																
32	24 4xt #11																
33	24 4xt #12																
34	24 4xt #13																
35	24 4xt #14																
36	24 4xt #15																
Rwy 06 Arrivals																	
37	Baseline																
38	Baseline RNAV																
39	Vectoring and transitions																
40	Systemised																
Rwy 24 Arrivals																	
41	Baseline																
42	Baseline RNAV																
43	Vectoring and transitions																
44	Systemised																

The table below identifies which options are rejected and those that are accepted and will be assessed in more detail in Stage 3. Succinct explanatory notes are provided to outline the key reasons behind each reject / accept decision, based on the design principle evaluation for each option.

Option		Accept/Reject	Notes
Rwy 06 Departures			
1	Baseline	Accept	This option is accepted as the do-nothing baseline option for the IOA.
2	Baseline M	Accept	The modernised baseline (do minimum option) is accepted and taken forward to the shortlist of options. The modernised baseline would be RNAV compatible.
3	06 3xt #1	Accept	This option provides benefits over the modernised baseline but is dependent on achieving a 90 second separation to deliver the capacity requirements. This option would be designed to minimise overflying communities.
4	06 3xt #2	Accept	This option is taken forward as it would provide the required capacity should the 90 second departure interval not be achieved (which is required to deliver the increased capacity for Option 3 – 06 3xt #1). This option may overfly new not currently overflown communities.
5	06 3xt #3	Reject	The early left turn for GRICE is unnecessary and is likely to generate a wide swathe over more populated and newly overflown areas. Other options are preferable.
6	06 3xt #4	Reject	While this option could be designed safely, the concentration of traffic in one place increases the complexity of managing the airspace. This option also increases track miles and doesn't meet DP12.
7	06 3xt #5	Reject	While this option could be designed safely, the concentration of traffic in one place increases the complexity of managing the airspace. This option also increases track miles and doesn't meet DP12.
8	06 4xt #1	Accept	This option is the same as Option 3 06 3xt #1 with the addition of the EAST SID which would reduce track miles and the frequency of overflown communities.
9	06 4xt #2	Accept	This option is taken forward as a contingency to provide the required capacity should the 90 second departure interval not be achieved (which is required to deliver the increased capacity for Option 8 – 06 4xt #1). This option may overfly new not currently overflown communities.
10	06 4xt #3	Reject	The early left turn for GRICE is unnecessary and is likely to generate a wide swathe over more populated and newly overflown areas. Other options are preferable.

Option		Accept/Reject	Notes
11	06 4xt #4	Reject	While this option could be designed safely, the concentration of traffic in one place increases the complexity of managing the airspace. This option also increases track miles and doesn't meet DP12.
12	06 4xt #5	Reject	The early left turn for GRICE is unnecessary and is likely to generate a wide swathe over more populated and newly overflown areas; other options are preferable. While this option could be designed safely, the concentration of traffic in one place increases the complexity of managing the airspace. This option also increases track miles and doesn't meet DP12.
Rwy 24 Departures			
13	Baseline	Accept	This option is accepted as the do-nothing baseline option for the IOA.
14	Baseline M	Accept	The modernised baseline (do minimum option) is accepted and taken forward to the shortlist of options. The modernised baseline would be RNAV compatible.
15	24 3xt #1	Accept	This option provides benefits over the modernised baseline but is dependent on achieving a 90 second separation to deliver the capacity requirements. This option would be designed to minimise overflying communities.
16	24 3xt #2	Reject	This option wouldn't increase capacity and would unnecessarily overfly not currently overflown communities.
17	24 3xt #3	Accept	This option is taken forward as it would provide the required capacity should the 90 second departure interval not be achieved (which is required to deliver the increased capacity for Option 15 – 24 3xt #1). This option may overfly new not currently overflown communities. This option has greater complexity as the TALLA SID could only be flown when RAF Kirknewton is not in operation, and an alternative TALLA would be required during those periods. This option would also overfly new not currently overflown communities.
18	24 3xt #4	Reject	While this option increases capacity, the early GRICE turn would overfly new not currently overflown communities and better options are available.
19	24 3xt #5	Reject	This option would entail excessive track miles on TALLA, and the traffic would unnecessarily overfly not currently overflown communities to the north of the airport, while the traffic destination is to the south. This option also doesn't increase capacity.
20	24 3xt #6	Reject	This option would entail excessive track miles on TALLA, and the traffic would unnecessarily overfly not currently overflown communities to the north of the airport, while the traffic destination is to the south.
21	24 3xt #7	Reject	This option would significantly increase the population overflown in new communities while only slightly increasing capacity. The early turn would potentially overfly new and not currently overflown communities below 1000ft.
22	24 4xt #1	Accept	This option is the same as Option 15 24 3xt #1 with the addition of an EAST SID to the north which would reduce track miles and the frequency of overflown communities.

Option		Accept/Reject	Notes
23	24 4xt #2	Reject	Other options provide greater opportunities to reduce overflown populations, with an EAST SID option that avoids newly overlying communities.
24	24 4xt #3	Reject	The three early turns would overfly new communities close to the airfield without a significant improvement in capacity.
25	24 4xt #4	Accept	While the slightly later turns would slightly increase track miles, this option is considered likely to overfly fewer newly overflown communities than the previous options.
26	24 4xt #5	Reject	The early turns may increase the area overflown below 1000ft and significantly increase the population overflown in new communities for little increase in capacity.
27	24 4xt #6	Reject	This option would generate unnecessary overflight of newly overflown populations for little increase in capacity.
28	24 4xt #7	Reject	This option would entail excessive track miles on TALLA, and the traffic would unnecessarily overfly not currently overflown communities to the north of the airport, while the traffic destination is to the south. This option also doesn't significantly increase capacity.
29	24 4xt #8	Reject	This option would entail excessive track miles on TALLA, and the traffic would unnecessarily overfly not currently overflown communities to the north of the airport, while the traffic destination is to the south.
30	24 4xt #9	Reject	This option would have three SIDS with an early turn overflying newly affected communities and excessive track miles for TALLA.
31	24 4xt #10	Reject	This option is the same as Option 15 24 3xt #1 with the addition of an EAST SID to the south, which would increase track miles. It would also overfly large areas of the Pentland Hills that are an area of tranquillity. While this option could be designed safely to avoid conflicts with inbound aircraft, due to the concentration of traffic in one place it would increase the complexity of managing the airspace.
32	24 4xt #11	Reject	This option would have two SIDS with early turns overflying newly affected communities, with the EAST SID overflying the important recreational area of the Pentland Hills. This option has greater complexity as the TALLA and EAST SIDs could only be flown when RAF Kirknewton is not in operation, and alternative SIDS would be required during those periods. While this option could be designed safely to avoid conflicts with inbound aircraft, due to the concentration of traffic in one place it would increase the complexity of managing the airspace.
33	24 4xt #12	Reject	This option has the same limitations as Option 32 24 4xt #11 plus the addition of an extra early turn on GRICE increasing the newly overflown population.
34	24 4xt #13	Reject	This option wouldn't increase capacity and would unnecessarily overfly not currently overflown communities because of the early turn for GRICE. While this option could be designed safely to avoid conflicts with inbound aircraft, due to the concentration of traffic in one place it would increase the complexity of managing the airspace.
35	24 4xt #14	Reject	The two early turns, for GRICE and EAST, would unnecessarily overfly not currently overflown communities without significantly increasing capacity. The two early turns also increase the footprint overflown below 1000ft

Option		Accept/Reject	Notes
			within which there is the potential for local air quality impacts. While this option could be designed safely to avoid conflicts with inbound traffic, due to the concentration of traffic in one place it increases the complexity of managing the airspace.
36	24 4xt #15	Reject	The early turn for EAST would overfly new and not currently overflown communities and would overfly the Pentland Hills with potential effects on tranquillity. While this option could be designed safely to avoid conflicts with inbound traffic, due to the concentration of traffic in one place it increases the complexity of managing the airspace.
Rwy 06 Arrivals			
37	Baseline	Accept	This option is accepted as the do nothing baseline option for the IOA.
38	Baseline RNAV		The modernised baseline (do minimum option) is accepted and taken forward to the shortlist of options. The modernised baseline would be RNAV compatible.
39	Vectoring and approach transitions	Accept	This option provides greatest flexibility for capacity and dispersal. It also allows for track concentration during quieter periods the approach transition can be designed with a view to minimise population overflown.
40	Systemised	Reject	This option provides full systemisation which doesn't give flexibility for vectoring during busy periods and is likely to result in greater use of the holds, more track miles, fuel burn and CO2 emissions, doesn't allow for respite and could constrain capacity.
Rwy 24 Arrivals			
41	Baseline	Accept	This option is accepted as the do nothing baseline option for the IOA.
42	Baseline RNAV	Accept	The modernised baseline (do minimum option) is accepted and taken forward to the shortlist of options. The modernised baseline would be RNAV compatible.
43	Vectoring and approach transitions	Accept	This option provides greatest flexibility for capacity and dispersal. It also allows for track concentration during quieter periods the approach transition can be designed with a view to minimise population overflown.
44	Systemised	Reject	This option provides full systemisation which doesn't give flexibility for vectoring during busy periods and is likely to result in greater use of the holds, more track miles, fuel burn and CO2 emissions, doesn't allow for respite and could constrain capacity.

The Shortlist – Options to analyse in the IOA for Stage 2 and to be taken forward

The shortlist of options to be taken through for the Initial Options Appraisal in Stage 2 are:

Departures Rwy 06

Option 1 Baseline The do-nothing option

Option 2 Modernised Baseline The do minimum option

Option 3 3 exits with no early turn

Option 4 3 exits with one early turn for capacity

Option 8 4 exits with no early turn **The preferred option**

Option 9 4 exits with one early turn for capacity

Options 4 and 9 are taken through to provide an option if our 1.5-minute departure interval is not approved.

Departures Rwy 24

Option 13 Baseline The do-nothing option

Option 14 Modernised Baseline The do minimum option

Option 15 3 exits with no early turn

Option 17 3 exits with one early turn for capacity

Option 22 4 exits with no early turn **The preferred option**

Option 25 4 exits with one early turn for capacity

Options 17 and 25 are taken through to provide an option if our 1.5-minute departure interval is not approved.

Arrivals Rwy 06

Option 37	Baseline The do-nothing option	
Option 38	Modernised Baseline The do minimum option	
Option 39	Vectoring and Systemisation	The preferred option
Arrivals	**Rwy 24**	
Option 41	Baseline The do-nothing option	
Option 42	Modernised Baseline The do minimum option	
Option 43	Vectoring and Systemisation	The preferred option

The Shortlist – Rejected Options

Departures

All departure options including an early turn to GRICE were rejected because of population overflown and also the fact that our capacity would not be increased to required levels as one of drivers of our ACP.

We rejected options with GOSAM routing to the south from Rwy 06 because of the longer track distance compared to a north turn.

We rejected options with TALLA routing via the north from Rwy 24 because of the longer track distance compared to a south turn.

We rejected options from Rwy 24 with an early turn to the EAST because of new populations overflown (north) and reasons of airspace and tranquillity (south)

Arrivals

Full systemisation was rejected in favour of vectoring and some systemisation to offer flexibility and dispersal options. Also, we may not have our requests for additional controlled airspace approved and therefore may not have full systemisation for arrivals to Rwy24 from the north.

Airspace Modernisation Strategy

In Stage 2 we are required to develop options which we think are viable and take them through the design principle evaluation in order to choose the most viable options that comply with our design principles. One caveat to this is that we are working with our neighbouring airport at Glasgow and also our parent Air Traffic Control centre at Prestwick in order to find the best and most efficient design solutions that work for all three parties. For this I refer to our design principle number 6. We therefore reserve the right to revisit some of the design options that are not on our shortlist if we find that these provide better overall solutions and efficiencies when taken as a whole Edinburgh, Glasgow and the ATC Network.