

Glasgow Airport FASI-N Airspace Change Proposal

Step 2A Annex A - Design Principle Evaluation

Date: August 2022

Document Version: Final 1.2

Status: Public

Document History: V1.0 Submitted to the CAA in April 2022

V1.1 Submitted to the CAA in July 2022 (Please see the Change Record on CAA Airspace Change Portal for details of updates)

V1.2 Following CAA request, text changes between V1.0 and V1.1 highlighted. We would recommend reading the change record document which provides context around the clarifications made.

Option Name	The airspace design and its operation must be as case or safer than today.	Facilitate the growth in quicker, quieter and cleaner traffic by configuring the airspace to improve efficiency and meet the forecast demand	Design the appropriate volume of controlled airspace to support commercial air transport, enable safe, efficient access for other types of operation and release controlled airspace that is not required.	Mitigate any future requirements for airborne holding for inbound traffic and holding on the ground pre-departure for	Minimise the total adv	verse effects of aircraft noise cal and mental health and wel	and visual intrusion on	Offer communities o concentration and noise of of predictable and transpa and other respite method the technical ATC systen procedural	arent multiple route optior ds that are possible within m, en-route network and	areas and buildings, n	ould avoid noise sensitive ational parks, areas of //National Scenic Areas and	Mitigate the impacts on local communities that are	f	ottlenecks in controlled and to a reduction in airspace inf		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 being coordinated by the	airports durally om the iferred ion with	growth in aircraft verse ecological in impact of av	emissions, the further degradation in local air npacts to address growing concerns about the viation on climate change.	Glasgow Airport should climb and descend continuously to/from at least 7000ft with a preference for the most environmentally beneficial option to be chose, if both	capabilities of the modern aircraft fleet operating at Glasgow Airport in line with the guidance Il provided in CAA CAP1385	GLA ACP accords with	the CAA's published Airsp and all othe	ace Modernisation Strategy (CAP1711), any r relevant policies and regulatory standards	current or future plans associated with it
			notrequired.		Number of people overflown below 4000ft (centreline to centreline)	(irom a typical aircraft	Affect on frequency of overflight for those under the extended centreline within 5nm of the runway	Use of multiple routes	Mechanisms for predictable respite	Noise sensitive areas and buildings, national parks, areas of outstanding natural beauty/National Scenic Areas	Overfly new areas		Complexity in CAS	Bottleneck outside CAS	Infringements	FASI North programme.	Local Air Qua	nality Ec	cological Impacts Climate Change	simultaneously.	against Global Navigation	intain and enhance gh aviation safety standards		airspace network emissions at	rironmental by reducing Facilitate defence and d by better security objectives g noise
RWY 05 Dep Do Nothing																						ee DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP DP7, DP8, DP	4, D5, DP6, 12 and DP13
RWY 05 Dep Option A																						ee DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP DP7, DP8, DP	4, D5, DP6, 12 and DP13
RWY 05 Dep Option B																						iee DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP7, DP8, DP	4, D5, DP6, 12 and DP13
RWY 05 Dep Option C																						iee DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP7, DP8, DP	4, D5, DP6, 12 and DP13
RWY 05 Dep Option D																					9	ee DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP DP7, DP8, DP	4, D5, DP6, 12 and DP13
RWY 05 Dep Option E																					9	ee DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP DP7, DP8, DP	
RWY 05 Dep Option F																					2	ee DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP DP7, DP8, DP	4, D5, DP6, 12 and DP13
RWY 05 Dep Option G																					5	ee DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP DP7, DP8, DP	4, D5, DP6, 12 and DP13
RWY 05 Dep Option H																					S	ee DP1 and DP10	See DP3 and DP10	See DP2, DP4 and DP12 DP7, DP8, DP	4, D5, DP6, 12 and DP14
RWY 05 Dep Option I																					S	ee DP1 and DP11	See DP3 and DP11	See DP2, DP4 and DP13 See DP2, DP DP7, DP8, DP	4, D5, DP6, 12 and DP15
RWY 23 Dep Do Nothing																						ee DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP7, DP8, DP	4, D5, DP6, 12 and DP13
RWY 23 Dep Option A																					S	ee DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP7, DP8, DP	4, D5, DP6, 12 and DP13
RWY 23 Dep Option B																					2	ee DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP7, DP8, DP	4, D5, DP6, 12 and DP13
RWY 23 Dep Option C																						ee DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP DP7, DP8, DP	4, D5, DP6, 12 and DP13
RWY 23 Dep Option D																						ee DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP DP7, DP8, DP	4, D5, DP6, 12 and DP13
RWY 23 Dep Option E																						ee DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP DP7, DP8, DP	4, D5, DP6, 12 and DP13
														I											
RWY 05 Arrv Do Nothing																						ee DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP DP7, DP8, DP	4, D5, DP6, 12 and DP13
RWY 05 Arrival Option A	,																				9	ee DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP DP7, DP8, DP	4, D5, DP6, 12 and DP13
RWY 05 Arrival Option E																					9	ee DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP DP7, DP8, DP	4, D5, DP6, 12 and DP13
RWY 05 Arrival Option (ee DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP7, DP8, DP	4, D5, DP6, 12 and DP13
RWY 05 Arrival Option [ee DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP DP7, DP8, DP	4, D5, DP6, 12 and DP13
RWY 05 Arrival Vectors only																					s	ee DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP7, DP8, DP	4, D5, DP6, 12 and DP13
RWY 05 Arrival Vectors and PBN hybrid																					S	ee DP1 and DP10	See DP3 and DP10	See DP2, DP4 and DP12 DP7, DP8, DP	4, D5, DP6, 12 and DP14
														I											
RWY 23 Arrv Do Nothing																						ee DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP DP7, DP8, DP	4, D5, DP6, 12 and DP13
RWY 23 Arrival Option A	DISCONTINUE																				2	ee DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP DP7, DP8, DP	4, D5, DP6, 12 and DP13
RWY 23 Arrival Option E	DISCONTINUE																					ee DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP7, DP8, DP	4, D5, DP6, 12 and DP13
RWY 23 Arrival Option (9	ee DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP DP7, DP8, DP	4, D5, DP6, 12 and DP13
RWY 23 Arrival Option [9	ee DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP DP7, DP8, DP	4, D5, DP6, 12 and DP13
RWY 23 Arrival Option E																						ee DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP DP7, DP8, DP	4, D5, DP6, 12 and DP13
RWY 23 Arrival Option F	DISCONTINUE																				S	ee DP1 and DP10	See DP3 and DP10	See DP2, DP4 and DP12 See DP2, DP7, DP8, DP	4, D5, DP6, 12 and DP14
RWY23 Arrival Vectors only																					S	ee DP1 and DP10	See DP3 and DP10	See DP2, DP4 and DP12 See DP2, DP7, DP8, DP	4, D5, DP6, 12 and DP14
RWY 23 Arrival Vectors and PBN hybrid																					S	ee DP1 and DP10	See DP3 and DP10	See DP2, DP4 and DP12 DP7, DP8, DP	

Option Image	Option Name The airspace design and its operation must be as safe or safer than today	Facilitate the growth in quicker, quieter and cleaner traffic by configuring the airspace to improve efficiency and meet the forecast demand for air transport. Design the appropriate volume of controlled airspace to support commercial air transport, enable safe, efficient access for other types of operation and release controlled airspace that is not required. Mitigate any future requirements for airbor to support commercial air transport, enable safe, efficient access for other types of operation and release controlled airspace that is not required.	rne Iffic Minimise the total adverse effects of aircraft noise and visual intrusion on phylund mental health and wellbeing.	Offer communities options for both noise concentration and noise dispersion through the use of predictable and transparent multiple route options and other respite methods that are possible within the technical ATC system, beauty/National Sce	d avoid noise sensitive areas and currently affected by aircraft noise on final approach or reduce complexity and bottlenecks	compatible with the wider programme of lower altitude pand network airspace coordinate to a compatible with the wider programme of lower altitude pand network airspace coordinate to a compatible with the wider programme of lower altitude pand network airspace coordinate to a compatible with the wider programme of lower altitude pand network airspace coordinate to a compatible with the wider programme of lower altitude pand network airspace coordinate to a compatible with the wider programme of lower altitude pand network airspace coordinate to a compatible with the wider programme of lower altitude pand network airspace coordinate to a compatible with the wider programme of lower altitude pand network airspace coordinate to a compatible with the wider programme of lower altitude pand network airspace coordinate to a compatible with the wider programme of lower altitude pand network airspace coordinate to a compatible with the wider programme of lower altitude pand network airspace coordinate to a compatible with the wider programme of lower altitude pand network airspace coordinate to a compatible with the wider programme of lower altitude pand network airspace coordinate to a compatible with the wider programme of lower altitude pand network airspace coordinate to a compatible with the wider programme of lower altitude pand network airspace coordinate to a compatible with the wider programme of lower altitude pand network airspace coordinate to a compatible with the wider programme of lower altitude pand network airspace coordinate to a compatible with the wider programme of lower altitude pand network airspace coordinate to a compatible with the wider programme of lower altitude pand network airspace coordinate to a compatible with the wider pand network airspace coordinate to a compatible with the wider pand network airspace coordinate to a coordinate	rgh airports should be edurally deconflicted Minimise the growth in aircraft emissions, the further degradation in local air quality and adverse ecological impacts to address growing concerns about the impact of aviation on climate change.	Routes should be designed to meet a RNAV1 specification as a minimum in order to gain maximum benefit of the performance capabilities of the modern aircraft fleet operating at Glasgow to/from at least 7000ft with a preference for the most environmentally beneficial option to be chose, if both cannot be achieved simultaneously. Routes should be designed to meet a RNAV1 specification as a minimum in order to gain maximum benefit of the performance capabilities of the modern aircraft fleet operating at Glasgow Airport in line with the guidance provided in CAA CAP1385 on enhanced route spacing for PBN and provide sufficient resilience and redundancy against Global Navigation Satellite System (GNSS) failure.
			Number of people overflown below 4000ft (centreline to centreline) Number of people within the 65dBLAmax contour (from a typical aircraft overflight) Affect on frequency overflight for the within 5nm of the extended contour (from a typical aircraft overflight)	Mechanisms for predictable buildings, national par respite areas of outstanding na	arks, atural Overfly new areas Complexity in CAS	Bottleneck outside CAS Infringements	Local Air Quality Ecological Impacts Climate Change	Maintain and enhance high aviation safety standards Secure the efficient use of airspace and enable integration Secure the efficient use of airspace and enable integration Secure the efficient use of airspace and enable integration Secure the efficient use of airspace and enable integration Secure the efficient use of airspace and enable integration Secure the efficient use of airspace network Improve environmental performance by reducing emissions and by better managing noise
	RWY 05 Dep Do Nothing The airspace design is as safe or safer than today with no safety concerns at time	Option is expected to degrade operational performance in the future operational performance in the future volume of CAS	Option is expected to remain within 25% of the number of people overflown below 4000ft (centreline to centreline) Option is expected to remain within 25% of the number of people within the 65dBLAmax contour (from a typical aircraft overflight) Sometime of people overflown below aircraft overflight) Option is expected to remain within 25% of the number of people within the 65dBLAmax contour (from a typical aircraft overflight)	noise more equitably inside under the 5nm however after that, routine vectoring does mechanisms for predictable parks, areas of outstandard natural beauty/Nation	Option avoids overflying areas not currently affected by aircraft noise Option is likely to stay the same or contribute to a tolerable increase in complexity for GLA ATC inside CAS. An untolerable increase would be mitigated by limiting traffic numbers and increasing the same or contribute to a tolerable increase in complexity for GLA ATC inside CAS. An untolerable increase would be mitigated by limiting traffic numbers and increasing the same or contribute to a tolerable increase in complexity for GLA ATC inside CAS. An untolerable increase would be mitigated by aircraft noise	Option won't affect bottlenecks outside CAS Option unlikely to have an impact on infringements off being detailed bottlenecks outside CAS Option unlikely to have an impact on infringements Option unlikely to have an impact	me routes are not rently procedurally onflicted up to FL90 netimes results in level elow FL90 to step up ander EDI traffic. No modernisation of airspace for departures is expected to increase amount of holding at the runway holding point in the future and therefore has potential to degrade Local Air Quality No modernisation of airspace for departures is expected to increase design is not expected to result in any changes to ecological impacts compared to the baseline levels rise Option has potential to contribute to an increase in aircraft emissions owing to increased delays as traffic levels rise	Option is unlikely to affect CCO/CDO performance on Conventional Navigation for departures See DP1 and DP9 See DP3 and DP9 See DP2, DP4 and DP11 See DP2, DP4 and DP11 See DP2, DP4, D5, DP6, DP7, DP8, DP12 and DP9 and DP13 Security objectives
	This option requires a Track Adjustment on departure. These are possible we pans option a recent ACP, the CAA IFP department wanted a not below so flyover WP positioned at the DER to ensure the aircraft doesn't turn before end of the runway. PANS OPS doesn't require this. Additional assurances wis required during IFP ground validation to ensure the WP is acceptable. The early left turn towards high ground also needs more detailed IFP design ensure it's safe with an acceptable climb gradient. Further assurances required. This will be investigated in further detail as possible we pans of the IOA should this option progress.	the Il be Contained within the existing Glasgow's operational performance in the future The design option could be contained within the existing CAS volume and also offers potential to reduce the total volume of CAS	ding people overflown below people within the 65dBLAmax for those under the	I IOMON FOYLE and CIVIE respite	Option has SIDs turning before 5nm therefore will see an increase in frequency of overflight of areas that are less frequently overflown today. Option makes use of offset departures for some SIDs Option would appear to be beneficial interms of reduced miles and CCO for NORBO departures and deconfliction from the main LANAK arrivals however this option means that a NORBO behind a slower departure to the NW would require a greater separation that today. ATC would still like to have ability for NORB departures to climb straight ahead and turn right (tactically) as this would help deconflict from arrivals from the North Would need a Standing Agreement to Figure 1.	Option is likely to contribute to a reduction in bottlenecks outside CAS because this option can be contained within existing CAS whilst offering opportunity to reduce the total volume of CAS Option unlikely to have an impact on infringements offering opportunity to reduce the total volume of CAS OPC No feedback to date to suggest option is not, or cannot be, compatible with the wider FASI North programme Option unlikely to have an impact on infringements of climb programme Option unlikely to have an impact on infringements of cannot be, compatible with the wider FASI North programme Option is likely to contribute to a reduction in bottlenecks outside CAS because this option can be contained within existing CAS whilst offering opportunity to reduce the total volume of CAS	This option has a change to how aircraft will fly laterally below 1,000ft. Whilst there are likely to be no increase in emissions in their totality, there will be a change in the location of emissions below 1,000ft which could affect continuously to FL90 There are no SPAs, SACs, SSSIs, NSAs or National Parks overflown by today's SID centrelines below 2000ft. This option does not overfly any more of these areas below 2000ft. (There are some of these areas overflown under route centrelines of this option between 2000-4000ft although those areas are also already overflown by RWY05 departures)	This route structure in combination with deconflicted arrival structures would be expected to improve CDO performance Option can be designed to at least an RNAV1 specification although RNP+RF may deliver benefit for early left turns See DP1 and DP9 See DP3 and DP9 See DP2, DP4 and DP11 See DP2, DP4, D5, DP6, DP7, DP8, DP12 and DP911 See DP2 and DP911
	This option requires a Track Adjustment on departure. These are possible we pand of the runway. Pand option B RWY 05 Dep Option B This option requires a Track Adjustment on departure. These are possible we pand of the recent ACP, the CAA IFP department wanted a not below of flyover WP positioned at the DER to ensure the aircraft doesn't turn before end of the runway. Pand OPS doesn't require this. Additional assurances will require during IFP ground validation to ensure the WP is acceptable. The early left turn towards high ground also needs more detailed IFP design ensure it's safe with an acceptable climb gradient. Further assurances required. This will be investigated in further detail as possible we pand of the IOA should this option progress.	the future potential to reduce the total due to the early left turn volume of CAS		nm of the LOMON FOXES and CLYDS	less frequently overflown Areas Would still like to have ability for NORB departures to climb straight ahead and	Option is likely to contribute to a reduction in bottlenecks outside CAS because this option can be contained within existing CAS whilst offering opportunity to reduce the total volume of CAS Option is likely to contribute to a reduction in bottlenecks outside CAS because this option can be contained within existing CAS whilst offering opportunity to reduce the total volume of CAS Option unlikely to have an impact on infringements of cannot be, compatible with the wider FASI North programme Option is likely to contribute to a reduction in bottlenecks outside CAS because this option can be contained within existing CAS whilst offering opportunity to reduce the total volume of CAS	This option has a change to how aircraft will fly laterally below 1,000ft. Whilst there are likely to be no increase in emissions in their totality, there will be a change in the location of emissions below 1,000ft which could affect local air quality There are no SPAs, SACs, SSSIs, NSAs or National Parks overflown by today's SID centrelines below 2000ft. This option does not overfly any more of these areas below 2000ft. (There are some of these areas overflown under route centrelines of this option between 2000-4000ft although those areas are also already overflown by RWY05 departures)	This route structure in combination with deconflicted arrival structures would be expected to improve CDO performance Option can be designed to at least an RNAV1 specification although RNP+RF may deliver benefit for early left turns See DP1 and DP9 See DP3 and DP11 See DP2, DP4 and DP5 DP11 See DP2, DP4 and DP6, DP7, DP8, DP12 and DP9 See DP1 and DP9 See DP2 and DP9 See DP3 and DP13
	RWY 05 Dep Option C The early left turn towards high ground needs more detailed IFP design ensure it's safe with an acceptable climb gradient. Further assurances required. This will be investigated in further detail a part of the IOA should this option progress.	The early left turn is expected to enhance Glasgow's operational performance in the future The design option could be contained within the existing CAS volume and also offers potential to reduce the total volume of CAS The design option could be contained within the existing GAS volume and also offers potential to reduce the total volume of CAS	ding people overflown below people within the 65dBLAmax for those under the	noise more equitably. The NORBO departure turning left extended nm of the opening of the noise more equitably. The NORBO departure turning left early takes c.80% of easterly departures away from those noise more equitably. The Option doesn't contain mechanisms for predictable outstanding natural national parks, areas outstanding natural national parks.	Option would appear to be beneficial in terms of reduced miles and CCO for NORBO departures and deconfliction from the main LANAK arrivals however this option means that a NORBO behind a slower departure to the NW would require a greater separation that today. ATC would still like to have ability for NORB departures to climb straight ahead and	Option is likely to contribute to a reduction in bottlenecks outside CAS because this option can be contained within existing CAS whilst offering opportunity to reduce the total volume of CAS Option unlikely to have an impact on infringements of CAS Option unlikely to have an impact on infringements of CAS Option unlikely to have an impact on infringements of CAS Option unlikely to have an impact on infringements of CAS Option unlikely to have an impact on infringements of CAS Option unlikely to have an impact on infringements of CAS Option unlikely to have an impact on infringements of CAS Option unlikely to have an impact on infringements of CAS Option unlikely to have an impact on infringements of CAS Option unlikely to have an impact on infringements of CAS Option unlikely to have an impact on infringements of CAS Option unlikely to have an impact on infringements of CAS Option unlikely to have an impact on infringements of CAS	There are no SPAs, SACs, SSSIs, NSAs or National Parks overflown by today's SID centrelines below 2000ft. This option does not overfly any more of these areas below 200ft. (There are some of these areas below 2000ft. (There are some of the an overall reduction in the continuous of the second of the continuous of the	This route structure in combination with deconflicted arrival structures would be expected to improve CDO performance Option can be designed to at least an RNAV1 specification although RNP+RF may deliver benefit for early left turns See DP1 and DP9 See DP3 and DP9 See DP2, DP4 and DP11 See DP2, DP4 and DP12 and DP13 Option not expected to affect defence and security objectives
	RWY 05 Dep Option D The early left turn towards high ground needs more detailed IFP design to ensure it's safe with an acceptable climb gradient. Further assurances required. This will be investigated in further detail as possible to the IOA should this option progress.	The early left turn is expected to enhance Glasgow's operational performance in the future The design option could be contained within the existing CAS volume and also offers potential to reduce the total volume of CAS	Option is expected to remain within 25% of the number of people overflown below 4000ft (centreline to centreline) Option is expected to remain within 25% of the number of people within the 65dBLAmax contour (from a typical aircraft overflight) Option is expected to remain within 25% of the number of people within the 65dBLAmax contour (from a typical aircraft overflight)	This option does make use of multiple routes to share noise more equitably. The NORBO departure turning left early takes c.80% of easterly departures away from those communities under the 1-5nm climbout This is a fixed route structure. Option doesn't contain mechanisms for predictable respite Option not expected to a the number of noise sensitive areas and build national parks, areas outstanding natura beauty/National Scenic A overflown below 7000	an increase in frequency of overflight of areas that are less frequently overflown today. Areas Option does not make use of offset departures a greater separation that today. ATC would still like to have ability for NORB departures to climb straight ahead and	Option is likely to contribute to a reduction in bottlenecks outside CAS because this option can be contained within existing CAS whilst offering opportunity to reduce the total volume of CAS Option is likely to contribute to a reduction in bottlenecks outside CAS because this option can be contained within existing CAS whilst offering opportunity to reduce the total volume of CAS Option unlikely to have an impact on infringements of the wider FASI North programme No feedback to date to suggest option is not, or cannot be, compatible with the wider FASI North programme department	Since this option has no change to how aircraft fly below 1,000ft compared to today, there are likely to be no changes to local air quality (positive or negative) as a result of this airspace design option. There are no SPAs, SACs, SSSIs, NSAs or National Parks overflown by today's SID centrelines below 2000ft. This option does not overfly any more of these areas below 2000ft. (There are some of these areas overflown under route centrelines of this option between 2000-4000ft although those areas are also already overflown by RWY05 departures)	This route structure in combination with deconflicted arrival structures would be expected to improve CDO performance Option can be designed to at least an RNAV1 specification although RNP+RF may deliver benefit for early left turns See DP1 and DP9 See DP3 and DP9 See DP2, DP4 and DP10 See DP2, DP4 and DP11 See DP2, DP4 and DP9 Option not expected to affect defence and security objectives
	RWY 05 Dep required during IFP ground validation to ensure the WP is acceptable. Option E The early left turn towards high ground also needs more detailed IFP design	ROBBO/CLYDE/LOMON/FOYLE Il be departures are currently tactically turned left early already so the only enhancement would be for PERTH departures in the first rotation of which they're aren't many. This option is	increase the number of people overflown below 4000ft (centreline to centreline) by more than 25% Increase the number of people within the 65dBLAmax contour (from a typical aircraft overflight) by more than 25% the frequency of people within the 65dBLAmax contour (from a typical aircraft overflight) by more than 25%	to reduce noise more equitably. The track adjustment on departure takes PERTH, LOMON, FOYLE and CLYDE departures away from those	Option has SIDs turning before 5nm therefore will see an increase in frequency of overflight of areas that are less frequently overflown today. Option has SIDs turning before 5nm therefore will see an increase in frequency of overflight of areas that are less frequently overflown today. Option makes use of offset departures for some SIDs Option makes use of offset departures for some SIDs Option makes use of offset departures for some SIDs Size of PBN arrival to RWY 05 would be beneficial here so we can gurantee descent profile versus NORBO SIDs. Would still like flexibility to Vector to the South after first turn (when LANAK not in use Would need a Standing Agreement to Find with a level greater than 6000ft	Option has potential to contribute to an increase in bottlenecks outside CAS if more CAS to the north the wider FASI North programme Option unlikely to have an impact on infringements Option unlikely to have an impact on inf	This option has a change to how aircraft will fly laterally below 1,000ft. Whilst there are likely to be no increase in emissions in their totality, there will be a change in the location of emissions below 1,000ft which could affect off underneath them There are no SPAs, SACs, SSSIs, NSAs or National Parks overflown by today's SID centrelines below 2000ft. This option does not overfly any more of these areas below 2000ft. (There are some of these areas overflown under route centrelines of this option between 2000-4000ft although those areas are also already overflown by RWY05 departures)	This route structure in combination with deconflicted arrival structures would be expected to improve CDO performance Option can be designed to at least an RNAV1 specification although RNP+RF may deliver benefit for early left turns See DP1 and DP9 See DP3 and DP9 See DP2, DP4 and DP11 See DP2, DP4, D5, DP6, DP7, DP8, DP12 and DP911 See DP1 and DP9 See DP2 and DP911
	This option requires a Track Adjustment on departure. These are possible we pand of the runway. Pand OPS doesn't require this. Additional assurances will require during IFP ground validation to ensure the WP is acceptable. The early left turn towards high ground also needs more detailed IFP design ensure it's safe with an acceptable climb gradient. The use of SIDs which turn on/off at a certain time will require additional assurances. Even if technically possible through systems and flight planning, chances of human error (aircraft flying the wrong SID, or ATC thinking the or SID is in use) will exist. Further assurances required. This will be investigated in further detail as possible through progress.	ther volume of CAS	ding people overflown below people within the 65dBLAmax for those under the	track adjustment on departure shares the noise from NORBO, PERTH, LOMON, FOYLE and CLYDE track adjustment on departure for the NORBO SID which is the busiest departure route. It contains a more provided in the could be auty/National Scenic Association and the could be auty-National Association and the could be account	Option has SIDs turning before 5nm therefore will see an increase in frequency of overflight of areas that are less frequently overflown today. Option has SIDs turning before 5nm therefore will see an increase in frequency of overflight of areas that are less frequently overflown today. Option makes use of offset departures for some SIDs Option makes use of offset departures for some SIDs Option makes use of offset departures for some SIDs Still like flexibility to Vector to the South after first turn (when LANAK not in use Would need a Standing Agreement to F with a level greater than 6000ft. SID switching over night would be sensible.	d. Option is likely to contribute to a reduction in bottlenecks outside CAS because this option can be contained within existing CAS whilst offering opportunity to reduce the total volume of CAS Option unlikely to have an impact on infringements of cannot be, compatible with the wider FASI North programme. Option unlikely to have an impact on infringements of climb programme. Option unlikely to have an impact on infringements of climb programme.	This option has a change to how aircraft will fly laterally below 1,000ft. Whilst there are likely to be no increase in emissions in their totality, there will be a change in the location of emissions below 1,000ft which could affect continuously to FL90 There are no SPAs, SACs, SSSIs, NSAs or National Parks overflown by today's SID centrelines below 2000ft. This option does not overfly any more of these areas below 2000ft. (There are some of these areas overflown under route centrelines of this option between 2000-4000ft although those areas are also already overflown by RWY05 departures)	This route structure in combination with deconflicted arrival structures would be expected to improve CDO performance Option can be designed to at least an RNAV1 specification although RNP+RF may deliver benefit for early left turns See DP1 and DP9 See DP3 and DP9 See DP2, DP4 and DP9 DP11 See DP2, DP4 and DP9 Option not expected to affect defence and security objectives
	This option requires a Track Adjustment on departure. These are possible we PANS OPS but in a recent ACP, the CAA IFP department wanted a not below 5 flyover WP positioned at the DER to ensure the aircraft doesn't turn before end of the runway. PANS OPS doesn't require this. Additional assurances will require during IFP ground validation to ensure the WP is acceptable. The early left turn towards high ground also needs more detailed IFP design ensure it's safe with an acceptable climb gradient. The use of SIDs which turn on/off at a certain time will require additional assurances. Even if technically possible through systems and flight planning, chances of human error (aircraft flying the wrong SID, or ATC thinking the or SID is in use) will exist. Further assurances required. This will be investigated in further detail as possible to the IOA should this option progress.	The design option may require changes to the existing CAS boundaries but still offers potential to reduce the total volume of CAS. The Northbound SIDs on this operational performance in the future ther The design option may require changes to the existing CAS boundaries but still offers potential to reduce the total volume of CAS. The Northbound SIDs on this option with the 7% climb gradient as illustrated would not quite be contained within ScTMA 7 in accordance with the CAA CAS containment.	option is expected to increase the number of people overflown below 4000ft (centreline to centreline) by more than 25% Option is expected to increase the number of people within the 65dBLAmax contour (from a typical aircraft overflight) by more runway	track adjustment on departure shares the noise from NORBO, PERTH, LOMON FOXES and CLYDE. Track adjustment on departure shares the noise from NORBO, PERTH, LOMON FOXES and CLYDE. Track adjustment on departure shares the noise from NORBO, PERTH, LOMON FOXES and CLYDE. Track adjustment on departure shares the noise from NORBO, PERTH, LOMON FOXES and CLYDE.	reduction in number of SIDs for in Period 2, keep the same RTO NORBO option a the morning. Possibly more HF issues t	Option has potential to contribute to an increase in bottlenecks outside CAS Option unlikely to have an impact on infringements	This option has a change to how aircraft will fly laterally below 1,000ft. Whilst there are likely to be no increase in emissions in their totality, there will be a change in the location of emissions below 1,000ft which could affect continuously to FL90 There are no SPAs, SACs, SSSIs, NSAs or National Parks overflown by today's SID centrelines below 2000ft. This option does not overfly any more of these areas below 2000ft. (There are some of these areas overflown under route centrelines of this option between 2000-4000ft although those areas are also already overflown by RWY05 departures)	This route structure in combination with deconflicted arrival structures would be expected to improve CDO performance Option can be designed to at least an RNAV1 specification although RNP+RF may deliver benefit for early left turns See DP1 and DP9 See DP3 and DP9 See DP2, DP4 and DP11 See DP2, DP4, D5, DP6, DP7, DP8, DP12 and DP911 See DP2 DP4 and DP911 See DP3 and DP911
	This option requires a Track Adjustment on departure. These are possible we pans open by the part of the runway. Pans open option H RWY 05 Dep Option H RW	existing CAS boundaries but still offers potential to reduce the total volume of CAS. The Northbound SIDs on this option with the 7% climb gradient as illustrated would not quite be contained within existing CAS boundaries but still offers potential to reduce the total volume of CAS. The Northbound SIDs on this quite to the early left turn due to the ability to shape of the total volume of CAS. The Northbound SIDs on this quite to the ability to shape of the total volume of CAS. The Northbound SIDs on this quite to the ability to shape of the total volume of CAS. The Northbound SIDs on this quite to the ability to shape of the total volume of CAS. The Northbound SIDs on this quite to the ability to shape of the total volume of CAS. The Northbound SIDs on this quite to the ability to shape of the total volume of CAS. The Northbound SIDs on this quite to the ability to shape of the total volume of CAS. The Northbound SIDs on this quite to the ability to shape of the total volume of CAS. The Northbound SIDs on this quite to the ability to shape of the total volume of CAS. The Northbound SIDs on this quite to the ability to shape of the total volume of CAS. The Northbound SIDs on this quite to the early left turn of the total volume of CAS. The Northbound SIDs on this quite to the ability to shape of the total volume of CAS. The Northbound SIDs on this quite to the early left turn of the total volume of CAS. The Northbound SIDs on this quite to the ability to shape of the total volume of CAS. The Northbound SIDs on this quite to the ability to shape of the total volume of CAS. The Northbound SIDs on this quite to the ability to shape of the total volume of CAS. The Northbound SIDs on this quite to the ability to shape of the total volume of CAS.	option is expected to increase the number of people overflown below 4000ft (centreline to centreline) by more than 25%	to reduce overflight departure shares the noise from NORBO, PERTH, LOMON, FOYLE and CLYDE This is a fixed route structure. This is a fixed route structure. Option doesn't contain mechanisms for predictable respite of noise sensitive areas buildings, national parameters areas of outstanding national Scenic Associations.	Option has SIDs turning before 5nm therefore will see an increase in frequency of overflight of areas that are less frequently overflown today. Option makes use of offset departures for some SIDs Option makes use of offset departures for some SIDs Option makes use of offset departures for some SIDs Option would appear to be beneficial in terms of reduced miles and CCO for both NORBO departures and deconfliction from the main LANAK arrivals (subject to being separated from LANAK hold). Would not a Standing Agreement to PC with a lever greater than 6000ft as GLA APC would require to work the southbound NORBO Not having all NORBOs going North all time is good as it reduces the number of conflictions with arrivals from the North	Option has potential to contribute to an increase in bottlenecks outside CAS if more CAS to the north required. Option has potential to contribute to an increase in bottlenecks outside CAS if more CAS to the north required. Option unlikely to have an impact on infringements Option unlikely to have an impact on infringements Option unlikely to have an impact on infringements The wider FASI North programme Option bottlenecks outside CAS if more CAS to the north required.	This option has a change to how aircraft will fly laterally below 1,000ft. Whilst there are likely to be no increase in emissions in their totality, there will be a change in the location of emissions below 1,000ft which could affect local air quality There are no SPAs, SACs, SSSIs, NSAs or National Parks overflown by today's SID centrelines below 2000ft. This option does not overfly any more of these areas below 2000ft. (There are some of these areas overflown under route centrelines of this option between 2000-4000ft although those areas are also already overflown by RWY05 departures)	This route structure in combination with deconflicted arrival structures would be expected to improve CDO performance Option can be designed to at least an RNAV1 specification although RNP+RF may deliver benefit for early left turns See DP1 and DP9 See DP3 and DP9 See DP2, DP4 and DP9 DP11 See DP2, DP4, D5, DP6, DP7, DP8, DP12 and DP9 benefit for early left turns
	RWY 05 Dep Option I The early left turn towards high ground needs more detailed IFP design to ensure it's safe with an acceptable climb gradient. Further assurances required. This will be investigated in further detail as possible to of the IOA should this option progress.	The early left turn and the sharing of NORBO departures across to different SIDs is expected to enhance Glasgow's operational performance in the future option with the 7% climb gradient as illustrated would not quite be contained within ScTMA 7 in accordance with the CAA CAS containment policy.	are within 25% of the number of people overflown below people within the 65dBLAmax for those under the contour (from a typical centreline within	noise more equitably. C.50% of NORBO departures turning left early takes c.40% of easterly departures away	Option has SIDs turning before 5nm therefore will see an increase in frequency of overflight of areas that are less frequently overflown today. Option makes use of offset departures for some SIDs Option would appear to be beneficial in terms of reduced miles and CCO for bound NORBO departures and deconfliction from the main LANAK arrivals (subject to being separated from LANAK hold). Would near a Standing Agreement to PC with a lever greater than 6000ft as GLA APC would require to work the southbound NORBO Not having all NORBOs going North all titime is good as it reduces the number of conflictions with arrivals from the North	Option has potential to contribute to an increase in bottlenecks outside CAS if more CAS to the north required. Option has potential to contribute to an increase in bottlenecks outside CAS if more CAS to the north required. Option unlikely to have an impact on infringements	Since this option has no change to how aircraft fly below 1,000ft compared to today, there are likely to be no changes to local air quality (positive or negative) as a result of this airspace design option. There are no SPAs, SACs, SSSIs, NSAs or National Parks overflown by today's SID centrelines below 2000ft. This option does not overfly any more of these areas below 2000ft. (There are some of these areas overflown under route centrelines of this option between 2000-4000ft although those areas are also already overflown by RWY05 departures)	This route structure in combination with deconflicted arrival structures would be expected to improve CDO performance Option can be designed to at least an RNAV1 specification although RNP+RF may deliver benefit for early left turns See DP1 and DP9 See DP3 and DP9 See DP2, DP4 and DP9 See DP2, DP4, D5, DP6, DP7, DP8, DP12 and DP9 although RNP+RF may deliver benefit for early left turns

										Design Principle Evaluation													
Option Image	Option Name The airspace design and its operation must be as safe or safer than toda	Facilitate the growth in quicker, quieter and cleaner traffic by configuring the airspace to improve efficiency and meet the forecast demand for air transport.	transport, enable safe, efficient airbor	orne holding for inbound traffic and	Minimise the total adverse effects of ai	nircraft noise and visual intrusion on physical an		multiple route options and oth	her respite methods that are System, en-route network and	The arrival and departure routes that serve below 7000ft should avoid noise sensitive national parks, areas of outstanding natur Scenic Areas and areas that are not currently noise.	ral beauty/National	tly n Reduce complexity and bottl of	enecks in controlled and uncontrolled reduction in airspace infringements.	ed airspace and contribute to a	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 being coordinated by the FASI North programme. Routes to/from Glasgow and Edinburgh airports should be procedurally deconflicted from the ground to a preferred leve in coordination with NATS Prestwick.	Minimise the growth in aircraft emi ecological impacts to address grow			Aircraft operating at Glasgow Airport should climb and descend continuously to/from at least 7000ft with a preference for the most environmentally beneficial option to be chose, if both cannot be achieved	Airport in line with the guidance ovided in CAA CAP1385 on enhanced		he CAA's published Airspace Modernisa ciated with it and all other relevant polic	
				ı	Number of people overflown below 4000ft (centreline to centreline)	Number of people within the 65dBLAmax contour (from a typical aircraft overflight)			Mechanisms for predictable respite	Noise sensitive areas and buildings, national parks, areas of outstanding natural beauty/National Scenic Areas	erfly new areas	Complexity in CAS	Bottleneck outside CAS	Infringements		Local Air Quality	Ecological Impacts	Climate Change			Maintain and enhance high aviation safety standards ir	Avoid flight delays by better managing the airspace network Impro p reduct by tegration	pove environmental erformance by Facilitate defence and security objectives noise
	RWY 23 Dep Do Nothing The airspace design is as safe or safer than today with no safety concer at this time	ns Option is expected to degrade operational performance in the future	The design option could be contained within the existing CAS volume and also offers potential to reduce the total volume of CAS	on is expected to increase ground or orne holding as traffic levels increase	Option is expected to remain within 25% of the number of people overflown below 4000ft (centreline to centreline)	f Option is expected to remain within 25% of the number of people within the 65dBLAma contour (from a typical aircraft overflight)	Option is expected to have no change to the frequency of verflight for those under the extended centreline within 5nm of the runway	Option doesn't see the use of multiple routes to share noise more equitably inside 5nm however after that, routine vectoring does disperse the traffic	Option doesn't contain mechanisms for predictable respite	areas of outstanding natural	voids overflying areas rrently affected by aircraft noise Option does not make use offset departures	Option is likely to stay the sar or contribute to a tolerable increase in complexity for GL ATC inside CAS. Any untolerable increase would be mitigated be limiting traffic numbers and increasing delays	by Outside CAS	Option unlikely to have an impact on infringements	The option may not be compatible with FASI North programme as revisions to the flows within the ScTMA could require changes to traffic flows below 7000ft at Glasgow but it depends on the option taken forward by that sponsor	• Cr	The airspace design is not expected to result in any changes to ecological impacts compared to the baseline	Option has potential to contribute to an increase in aircraft emissions owing to creased delays as traffic levels rise	Option is unlikely to affect CCO/CDO performance	Doing nothing would maintain ilasgow's reliance on Conventional Navigation for departures	See DP1 and DP9 See I	See DP2, DP4 and DP7 DP11	Option not expected to affect defence and security objectives
	This option requires a Track Adjustment on departure. These are possible within PANS OPS but in a recent ACP, the CAA IFP department wanted not below 500ft flyover WP positioned at the DER to ensure the aircrass doesn't turn before the end of the runway. PANS OPS doesn't require this. Additional assurances will be required during IFP ground validation to ensure the WP is acceptable. Further assurances required. This will be investigated in further details part of the IOA should this option progress.	The SIDs splitting before 5nm together with the sharing of NORBO departures across 2 of those SIDs is expected to enhance Glasgow's operational performance in the future	The design option could be contained within the existing CAS volume and also offers potential to reduce the total volume of CAS	Ds splitting before 5nm together with aring of NORBO departures across 2 of e SIDs is expected to redcue ground delays	Option is expected to increase the number of eople overflown below 4000ft (centreline to centreline) by more than 25%	Option is expected to increase the number of people within the 65dBLAmax contour (from a typical aircraft overflight) by more than 25%	Option is expected to reduce the frequency of overflight for those under the extended centreline within 5nm of the runway	This option does make use of multiple routes to share noise more equitably. The track adjustment on departure takes all departures away from those communities under the 5nm climbout. In addition the NORBO traffic is shared across 2 different departure routes	This is a fixed route structure. Option doesn't contain mechanisms for predictable respite	Option increases the number of noise sensitive areas and buildings (but not national parks, areas of outstanding natural beauty/National Scenic Areas) overflown below 7000ft	Option makes use of offse departures for all SIDs ty overflown today.	Looks good, especially if Prestwick Centre can accept Min departure separations. N significant issues envisaged a this point however the ability to get the L/R NORBO departures to the holding poi in the correct order will be a challenge and would require new taxiway infrastructure to maximise ability for GMP to deliver the correct order.	opportunity to reduce the total volume of CAS	Option unlikely to have an impact on infringements	No feedback to date to suggest option is not, or cannot be, compatible with the wider FASI North programme Subject to EDI being able to enable their departures to climb continuously to at least FL100, based on existing climb performance observed from EDI, the GLA SIDs in this option should be able to climb continuously to FL90	This option has a change to how aircraft will fly laterally below 1,000ft. Whilst there are likely to be no increase in emissions in their totality, there will be a change in the location of emissions below 1,000ft which could affect local air	There are no SPAs, SACs, SSSIs, NSAs or National Parks overflown by today's SID centrelines below 2000ft. This option does not overfly any more of these areas below 2000ft. (There are some of these areas overflown under route centrelines of this option between 2000-4000ft although those areas are also already overflown by RWY05 departures)	otion will clearly contribute to n overall reduction in aircraft emissions	This route structure in combination with deconflicted arrival structures would be expected to improve CDO performance	ption can be designed to at least an RNAV1 specification although is of RNP+RF may deliver benefit	See DP1 and DP9 See I	See DP2, DP4 and DP7	Option not expected to affect defence and security objectives
	This option requires a Track Adjustment on departure. These are possible within PANS OPS but in a recent ACP, the CAA IFP department wanted not below 500ft flyover WP positioned at the DER to ensure the aircra doesn't turn before the end of the runway. PANS OPS doesn't require this. Additional assurances will be required during IFP ground validation to ensure the WP is acceptable. Further assurances required. This will be investigated in further details part of the IOA should this option progress.	the only enhancement would be for PERTH departures in the first rotation of which they'r aren't many. This option is therefore expected	contained within the existing CAS volume and also offers potential to reduce the total volume of CAS CAS volume and also offers already for PERI which the	bough there is an early right turn, this ption sees that turn used only for BBO/CLYDE/LOMON/FOYLE/PERTH departures. Many BO/CLYDE/LOMON/FOYLE departures currently tactically turned right early by so the only enhancement would be RTH departures in the first rotation of they're aren't many. All NORBO traffic e SID is the same as today. Therefore ption is not expected to reduce ground holding	Option is expected to increase the Number f people overflown below 4000ft (centreline to centreline) by more than 25%	Option is expected to increase the number of people within the 65dBLAmax contour (from a typical aircraft overflight) by more than 25%	Option is expected to reduce the frequency of overflight for those under the extended centreline within 5nm of the runway	This option does make use of multiple routes to share noise more equitably. The track adjustment on departure takes all departures away from those communities under the 5nm climbout.	This is a fixed route structure. Option doesn't contain mechanisms for predictable respite	Option increases the number of noise sensitive areas and buildings (but not national parks, areas of outstanding natural beauty/National Scenic Areas) overflown below 7000ft	ULATEAS IIIALATE IESS I	No significant issues envisage at this point although all NORBO traffic down one rout not as optimal as Option A.	Option is likely to contribute to a reduction in bottlenecks outside CAS because this option can be contained within existing CAS whilst offering opportunity to reduce the total volume of CAS	Option unlikely to have an impact on infringements	No feedback to date to suggest option is not, or cannot be, compatible with the wider FASI North programme Subject to EDI being able to enable their departures to climb continuously to at least FL100, based on existing climb performance observed from EDI, the GLA SIDs in this option should be able to climb continuously to FL90	This option has a change to how aircraft will fly laterally below 1,000ft. Whilst there are likely to be no increase in emissions in their totality, there will be a change in the location of emissions below 1,000ft which could affect local air	these areas overflown under oute centrelines of this option	otion will clearly contribute to n overall reduction in aircraft emissions	This route structure in combination with deconflicted arrival structures would be expected to improve CDO performance	ption can be designed to at least an RNAV1 specification although is of RNP+RF may deliver benefit	See DP1 and DP9 See I	See DP2, DP4 and DP7	Option not expected to affect defence and security objectives
	This option requires a Track Adjustment on departure. These are possible within PANS OPS but in a recent ACP, the CAA IFP department wanted not below 500ft flyover WP positioned at the DER to ensure the aircrast doesn't turn before the end of the runway. PANS OPS doesn't require this. Additional assurances will be required during IFP ground validation to ensure the WP is acceptable. The use of SIDs which turn on/off at a certain time will require addition assurances. Even if technically possible through systems and flight planning, the chances of human error (aircraft flying the wrong SID, of ATC thinking the other SID is in use) will exist. Further assurances required. This will be investigated in further detailed part of the IOA should this option progress.	The SIDs splitting before 5nm together with the sharing of NORBO departures across 2 of those SIDs is expected to enhance Glasgow's operational performance in the future althoug only during the first rotation	The design option could be contained within the existing CAS volume and also offers potential to reduce the total volume of CAS	Ds splitting before 5nm together with aring of NORBO departures across 2 of personal e SIDs is expected to redcue ground although only during the first rotation	Option is expected to increase the number of eople overflown below 4000ft (centreline to centreline) by more than 25%	Option is expected to increase the number of people within the 65dBLAmax contour (from a typical aircraft overflight) by more than 25%	Option is expected to reduce the frequency of overflight for those under the extended centreline within 5nm of the runway	This option does make use of multiple routes to share noise more equitably. The track adjustment on departure takes all departures away from those communities under the 5nm climbout. In addition the NORBO traffic is shared across 4 different departure routes	Option does contain mechanisms for predictable respite for the NORBO SID which is the busiest departure route.	Option increases the number of noise sensitive areas and buildings (but not national parks, areas of outstanding natural beauty/National Scenic Areas) overflown below 7000ft	Option makes use of offse departures for all SIDs ty overflown today.	Workable but SID swtiching generates issues to be resolve	Option is likely to contribute to a reduction in bottlenecks outside CAS because this option can be contained within existing CAS whilst offering opportunity to reduce the total volume of CAS	Option unlikely to have an impact on infringements	No feedback to date to suggest option is not, or cannot be, compatible with the wider FASI North programme Subject to EDI being able to enable their departures to climb continuously to at least FL100, based on existing climb performance observed from EDI, the GLA SIDs in this option should be able to climb continuously to FL90	This option has a change to how aircraft will fly laterally below 1,000ft. Whilst there are likely to be no increase in emissions in their totality, there will be a change in the location of emissions below 1,000ft which could affect local air	There are no SPAs, SACs, SSSIs, NSAs or National Parks overflown by today's SID centrelines below 2000ft. This option does not overfly any more of these areas below 2000ft. (There are some of these areas overflown under oute centrelines of this option between 2000-4000ft although those areas are also already overflown by RWY05 departures)	otion will clearly contribute to n overall reduction in aircraft emissions	This route structure in combination with deconflicted arrival structures would be expected to improve CDO performance	otion can be designed to at least an RNAV1 specification although is of RNP+RF may deliver benefit	See DP1 and DP9 See I	See DP2, DP4 and DP7 DP11	Option not expected to affect defence and security objectives
	This option requires a Track Adjustment on departure. These are possible within PANS OPS but in a recent ACP, the CAA IFP department wanted not below 500ft flyover WP positioned at the DER to ensure the aircrated doesn't turn before the end of the runway. PANS OPS doesn't require this. Additional assurances will be required during IFP ground validation to ensure the WP is acceptable. The use of SIDs which turn on/off at a certain time will require addition assurances. Even if technically possible through systems and flight planning, the chances of human error (aircraft flying the wrong SID, of ATC thinking the other SID is in use) will exist. Further assurances required. This will be investigated in further detail part of the IOA should this option progress.	The SIDs splitting before 5nm together with the sharing of NORBO departures across 2 of those SIDs is expected to enhance Glasgow's operational performance in the future althouge only during the first rotation	The design option could be contained within the existing CAS volume and also offers potential to reduce the total volume of CAS The SIDS the sharing the sharing those delays al	Ds splitting before 5nm together with aring of NORBO departures across 2 of e SIDs is expected to redcue ground although only during the first rotation	Option is expected to increase the number of eople overflown below 4000ft (centreline to centreline) by more than 25%	Option is expected to increase the number of people within the 65dBLAmax contour (from a typical aircraft overflight) by more than 25%	Option is expected to reduce the frequency of overflight for those under the extended centreline within 5nm of the runway	This option does make use of multiple routes to share noise more equitably. The track adjustment on departure takes all departures away from those communities under the 5nm climbout. In addition the NORBO traffic is shared across 4 different departure routes	Option does contain mechanisms for predictable respite for the NORBO SID which is the busiest departure route.	Option increases the number of noise sensitive areas and buildings (but not national parks, areas of outstanding natural beauty/National Scenic Areas) overflown below 7000ft	Option makes use of offse departures for some SIDs tly overflown today.	Workable but SID swtiching generates issues to be resolve	Option is likely to contribute to a reduction in bottlenecks outside CAS because this option can be contained within existing CAS whilst offering opportunity to reduce the total volume of CAS	Option unlikely to have an impact on infringements	No feedback to date to suggest option is not, or cannot be, compatible with the wider FASI North programme Subject to EDI being able to enable their departures to climb continuously to at least FL100, based on existing climb performance observed from EDI, the GLA SIDs in this option should be able to climb continuously to FL90	This option has a change to how aircraft will fly laterally below 1,000ft. Whilst there are likely to be no increase in emissions in their totality, there will be a change in the location of emissions below 1,000ft which could affect local air	option does not overfly any more of these areas below 2000ft. (There are some of these areas overflown under oute centrelines of this option	otion will clearly contribute to n overall reduction in aircraft emissions	arrival structures would be R	ption can be designed to at least an RNAV1 specification although is of RNP+RF may deliver benefit	See DP1 and DP9 See I	See DP2, DP4 and DP7 DP11 See DP2	Option not expected to affect defence and security objectives
	RWY 23 Dep Option E RWY 23 Dep Option E This option requires a Track Adjustment on departure. These are possible within PANS OPS but in a recent ACP, the CAA IFP department wanted not below 500ft flyover WP positioned at the DER to ensure the aircradoesn't turn before the end of the runway. PANS OPS doesn't require this. Additional assurances will be required during IFP ground validation to ensure the WP is acceptable. Further assurances required. This will be investigated in further detail apart of the IOA should this option progress.	The SIDs splitting before 5nm together with the sharing of NORBO departures across 2 of those SIDs is expected to enhance Glasgow's operational performance in the future	The design option could be contained within the existing CAS volume and also offers potential to reduce the total volume of CAS	Os splitting before 5nm together with aring of NORBO departures across 2 of e SIDs is expected to redcue ground delays	Option is expected to increase the number of eople overflown below 4000ft (centreline to centreline) by more than 25%	Option is expected to remain within 25% of the number of people within the 65dBLAmax contour (from a typical aircraft overflight)	Option is expected to reduce the frequency of overflight for those under the extended centreline within 5nm of the runway	This option does make use of multiple routes to share noise more equitably. The NORBO traffic is shared across 2 different departure routes	This is a fixed route structure. Option doesn't contain mechanisms for predictable respite	Option increases the number of noise sensitive areas and buildings (but not national parks, areas of outstanding natural beauty/National Scenic Areas) overflown below 7000ft	os SIDs turning before derefore will see an se in frequency of of areas that are less thy overflown today. Option does not make use offset departures	No significant issues envisage and good if NORBOs can get min split between them	Option is likely to contribute to a reduction in bottlenecks outside CAS because this option can be contained within existing CAS whilst offering opportunity to reduce the total volume of CAS	Option unlikely to have an impact on infringements	No feedback to date to suggest option is not, or cannot be, compatible with the wider FASI North programme Subject to EDI being able to enable their departures to climb continuously to at least FL100, based on existing climb performance observed from EDI, the GLA SIDs in this option should be able to climb continuously to FL90	Since this option has no change to how aircraft fly below 1,000ft compared to today, there are likely to be no changes to local air quality	There are no SPAs, SACs, SSSIs, NSAs or National Parks overflown by today's SID centrelines below 2000ft. This option does not overfly any more of these areas below 2000ft. (There are some of these areas overflown under route centrelines of this option between 2000-4000ft although those areas are also already overflown by RWY05 departures)	otion will clearly contribute to n overall reduction in aircraft emissions	This route structure in combination with deconflicted arrival structures would be expected to improve CDO performance	otion can be designed to at least an RNAV1 specification although is of RNP+RF may deliver benefit	See DP1 and DP9 See I	See DP2, DP4 and DP7 DP11	Option not expected to affect defence and security objectives

Option Image Option Name	The airspace design and its operation must be as sa or safer than today.	Facilitate the growth in quicker quieter and cleaner traffic by configuring the airspace to impro efficiency and meet the forecas demand for air transport.	transport, enable safe, efficient access for other	Mitigate any future requirements	Minimise the total adverse effects	of aircraft noise and visual intrusion and wellbeing.	n on physical and mental health	noise dispersion through t	the use of predictable and e options and other respite thin the technical ATC system.	, beauty/National Scenic Ar	d noise sensitive areas and reas of outstanding natural	Mitigate the impacts on local communities that are	Reduce complexity and bottleneck redu	ss in controlled and uncontrolled ction in airspace infringements.	d airspace and contribute to a	ensure that the airspace	coordination with NATS		aft emissions, the further degra to address growing concerns ab climate change.	adation in local air quality and rout the impact of aviation on	Airport should climb and descend continuously to/fro at least 7000ft with a preference for the most environmentally beneficia option to be chose, if both	Routes should be designed to meet a RNAV1 specification as a minimum in order to gain maximum benefit of the performance capabilities of the modern aircraft fleet operating at Glasgow Airport in line with the guidance provided in CAA CAP1385 on enhanced route spacing for PBN and provide sufficient resilience and redundancy against Global Navigation Satellite System (GNSS) failure.		CAA's published Airspace Modernisationed with it and all other relevant policies	
					Number of people overflown below 4000ft (centreline to centreline)	Number of people within the 65dBLAmax contour (from a typic aircraft overflight)	Affect on frequency of overflight for those under the extended centreline within 5nm of the runway	Use of multiple routes	Mechanisms for predictable respite	Noise sensitive areas and buildings, national parks, areas of outstanding natural beauty/National Scenic Areas	Overfly new areas		Complexity in CAS	Bottleneck outside CAS	Infringements			Local Air Quality	Ecological Impacts	Climate Change			Maintain and enhance high aviation safety standards Secure th efficient use airspace as enable integratio	e Avoid flight environment end delays by better performance reducing emission airspace network noise	
RWY 23 Arry Do Nothing	The airspace design is as safe or safer than today w no safety concerns at this time although a PBN arriv to RWY 23 may help to reduce GPWAs for some arrivals which are can be triggered by a high rate of descent.	Option is expected to maintain Glasgow's operational performan	The design option could be contained within the existing CAS volume and also offers potential to reduce the total volume of CAS	Option is not expected to affect ground or airborne holding		Option is expected to remain with 25% of the number of people within the 65dBLAmax contour (from a typical aircraft overflight	I change to the frequency of	Option doesn't see the use of multiple routes to share noise however routine vectoring does disperse the traffic	Option doesn't contain mechanisms for predictable respite	Option does not affect the number of noise sensitive areas and buildings, national parks, areas of outstanding natural beauty/National Scenic Areas overflown below 7000ft	increase in frequency of overflight of areas that are less frequently overflown	provided through SIDs with	Option is likely to stay the same or contribute to a tolerable increase ir complexity for GLA ATC inside CAS. As untolerable increase would be mitigat by limiting traffic numbers and increasing delays	Option won't affect	Option unlikely to have an impact on infringements	The option may not be compatible with FASI North programme as revisions to the flows within the ScTMA could require changes to traffic flows below 7000ft at Glasgow but it depends on the option taken forward by that sponsor		Option is expected to maintain the same level of local air quality emissions	The airspace design is not expected to result in any changes to ecological impacts compared to the baseline	Option is likely to maintain existing levels of emissions	n Option is unlikely to affect ccO/CDO performance	N/A, there's no PBN specification with vectoring	See DP1 and DP9 DP9	See DP2, DP4 and DP7, DP8, DP1 DP13	Option not expected to affect defence and security objectives
RWY 23 Arrival Option A	Option is not separated from the GLA/EDI buffer for when EDI on Easterly operations and GLA on Westerly operations. The requirement for this buff will continue to exist in a future design and it wou not be possible to avoid the buffer with this optio Option discontinued	ffer provide the exact amount of spacing to the runway between	se Volume of CAS	spacing once the aircraft have left the stacks. They would also be mor	Option is expected to reduce the number of people overflown below 4000ft (centreline to centreline) by more than 25%	25% of the number of people	Option is expected to have no change to the frequency of overflight for those under the extended centreline within 5nm of the runway	Use of fixed PBN arrival routes does not share the noise more equitably.	This option does not include mechanisms to provide	Option reduces the number of noise sensitive areas and buildings, national parks, areas of outstanding natural beauty/National Scenic Areas overflown below 7000ft	arrival swathe and will therefore result in an increase in frequency of overflight of	N/A - the mitigation is provided through SIDs with track adjustments. For arrivals, the ability for a Steeper RNP APCH arrival into Glasgow will be investigated however, the ILS will have to remain at 3.0°	and less flexibility. Use of PBN transitions alone is likely to reduce controller workload in one regard bu also increase in another as airborne a	to a reduction in bottlenecks outside CAS because this option can be contained within existing CAS whilst offering opportunity to reduce the total volume of	infringements because use of pure PBN arrivals to RWY23 would confirm a profile which could raise the base of CTA1		sub-optimal profile for either GLA or EDI traffic and would	Since this option has no change to how aircraft fly below 1,000ft compared to today, there are likely to be no changes to local air quality (positive or negative) as a result of this airspace design option.	changes to ecological impacts compared to the baseline as	overall aircraft emissions a this track is much longer tha	PBN arrival routes would facilitate improved CDA	I least an KNAVI specification	See DP1 and DP9 DP9	See DP2, DP4 and DP7, DP8, DP1 DP13	Option not expected to affect defence and security objectives
RWY 23 Arrival Option B	Option is not separated from the GLA/EDI buffer for when EDI on Easterly operations and GLA on Westerly operations. The requirement for this buff will continue to exist in a future design and it wou not be possible to avoid the buffer with this option of the possible to avoid the buffer with this option discontinued	ffer provide the exact amount of uld spacing to the runway between	CAS volume and also offers	lose the flexibiliy to adjust the spacing once the aircraft have left the stacks. They would also be mor likely to provide increased spacing	Option has potential to contribute to an increase in bottlenecks outside CAS although if the PBN path can be moved slightly further East, it may be possible to keep contained within existing CAS	within the 65dBLAmax contour (from a typical aircraft overflight	extended controline within	Use of fixed PBN arrival routes does not share the noise more equitably.	This option does not include mechanisms to provide	Option reduces the number of noise sensitive areas and buildings, national parks, areas of outstanding natural beauty/National Scenic Areas overflown below 7000ft	outside the existing main arrival swathe and will therefore result in an increas	N/A - the mitigation is provided through SIDs with track adjustments. For arrivals, the ability for a Steeper RNP APCH arrival into Glasgow will be investigated however, the ILS will have to remain at 3.0°	and less flexibility. Use of PBN transitions alone is likely to reduce controller workload in one regard bu also increase in another as airborne a	to a reduction in bottlenecks outside CAS because this option can be contained within existing CAS whilst offering opportunity to reduce the total volume of	infringements because use of pure PBN arrivals to RWY23 would confirm a profile which could raise the base of CTA1	f No feedback to date to suggest option is not, or cannot be, compatible with	buffer, this would result in a sub-optimal profile for either GLA or EDI traffic and would	Since this option has no change to how aircraft fly below 1,000ft compared to today, there are likely to be no changes to local air quality (positive or negative) as a result of this airspace design option.	The airspace design is not expected to result in any changes to ecological impacts	overall aircraft emissions a	PBN arrival routes would facilitate improved CDA	I least an KNAV1 specification	See DP1 and DP9 See DP3 ar DP9	See DP2, DP4 and DP7, DP8, DP1 DP13	Option not expected to affect defence and security objectives
RWY 23 Arrival Option C	No safety concerns identified as a standalone opticunless use of PBN arrival routes are used in rotation to provide respite. In which case the chances of the chances of human error (aircraft flying the wrong arrival, or ATC thinking the otherroute is in use) wexist. At this point, this assessment assumes the routes are used as single routes, not as part of an alternating system. Some arrivals experience GPWS alerts whilst establishing on final approach. It is thought that use of a PBN arrival may help alleviate these alerts.	Use of a pure PBN arrival system expected to degrade future operational performance. This is because of the inability of ATC to provide theexact amount of space to the runway between pairs which is likely to lead to inefficiences a well as an increase in ground an airborne holding during peak time		spacing once the aircraft have left	Option is expected to reduce the number of people overflown below 4000ft (centreline to centreline) by more than 25%	25% of the number of people	Option is expected to have no change to the frequency of overflight for those under the extended centreline within 5nm of the runway	Use of fixed PBN arrival routes does not share the noise more equitably.	This option does not include mechanisms to provide predicatble respite from nois	beauty/National Scenic Areas	increase in frequency of overflight of areas that are	N/A - the mitigation is provided through SIDs with track adjustments. For arrivals, the ability for a Steeper RNP APCH arrival into Glasgow will be investigated however, the ILS will have to remain at 3.0°	slightly further east. Need to ascertain	Option is likely to contribute to a reduction in bottlenecks outside CAS because this option can be contained within existing CAS whilst offering opportunity to reduce the total volume of CAS	Option is likely to contribute to a reduction in infringements because use of pure PBN arrivals to RWY23 would confirm a profile which could raise the base of CTA1 which is where 55% of Glasgow's reported infringments occurred.		would also ensure it remains laterally and vertically deconflicted from EDI RWY24 departures. So long as those EDI departures can climb	Since this option has no change to how aircraft fly below 1,000ft compared to today, there are likely to be no changes to local air quality (positive or negative) as a result of this airspace design option.	T compared to the paseline as	Option has potential to contribute to an increase in overall aircraft emissions a these tracks are longer that the typical arrival track flow today.	PBN arrival routes would facilitate improved CDA	I least an KINAV L specification	See DP1 and DP9 See DP3 ar DP9	See DP2, DP4 and DP7, DP8, DP1 DP13	Option not expected to affect defence and security objectives
RWY 23 Arrival Option D	No safety concerns identified as a standalone opticunless use of PBN arrival routes are used in rotation to provide respite. In which case the chances of the chances of human error (aircraft flying the wrong arrival, or ATC thinking the otherroute is in use) we exist. At this point, this assessment assumes the routes are used as single routes, not as part of an alternating system. Some arrivals experience GPWS alerts whilst establishing on final approach. It is thought that use of a PBN arrival may help alleviate these alerts.	use of a pure PBN arrival system expected to degrade future operational performance. This is because of the inability of ATC to provide the exact amount of spacing to the runway between pairs which is likely to lead to inefficiences as well as an increa in ground and airborne holding during peak times.	The design option could be contained within the existing CAS volume and also offers	spacing once the aircraft have left	Option is expected to reduce the number of people overflown below 4000ft (centreline to centreline) by more than 25%	25% of the number of people	Option is expected to have no change to the frequency of overflight for those under the extended centreline within 5nm of the runway	Use of fixed PBN arrival routes does not share the noise more equitably.	This option does not include mechanisms to provide predicatble respite from nois	Option reduces the number of noise sensitive areas and buildings, national parks, areas of outstanding natural beauty/National Scenic Areas overflown below 7000ft	Option has PBN arrival route within the existing main arrival swathe and will therefore not result in an increase in frequency of overflight of areas that are less frequently overflown today. (However, sole use of PBN route will result in an increased rate of overflight for those under that route)	N/A - the mitigation is provided through SIDs with track adjustments. For arrivals, the ability for a Steeper RNP APCH arrival into Glasgow will be investigated however, the ILS will have to remain at 3.0°	Use of PBN transitions alone is likely reduce controller workload in one regard but also increase in another a airborne and ground holding would increase as a result of less accurate fir approach spacing. This option would require a re-design of the ILS to mov the FAF closer or move the PBN path slightly further east. Need to ascertain the existing requirement that GLA AT have to apply to vectoring of arrivals reference the Campsie Line would remain with a PBN route. This route above c.5000ft will need re-aligning to	Option is likely to contribute to a reduction in bottlenecks outside CAS because this option can be contained within existing CAS whilst offering opportunity to reduce the total volume of CAS	Option is likely to contribute to a reduction in infringements because use of pure PBN arrivals to RWY23 would confirm a profile which could raise the base of CTA1 which is where 55% of Glasgow's reported infringments occurred.	f No feedback to date to suggest option is not, or cannot be, compatible with the wider FASI North programme.	Once this route is amended above c.5000ft to remain clear of EDI/GLA buffer this would also ensure it remains laterally and vertically deconflicted from EDI RWY24 departures. So long as those EDI departures can climb continuously to at least FL100, this would enable CDA for GLA RWY 23 arrivals from FL90.	Since this option has no change to how aircraft fly below 1,000ft compared to today, there are likely to be no changes to local air quality (positive or negative) as a result of this airspace design option.	The airspace design is not expected to result in any changes to ecological impacts compared to the baseline as no change below 2000ft	Option has potential to maintain or reduce aircraf emissions as this option mo closley replicates where th majority of Runway 05 arrivals are vectored today	PBN arrival routes would facilitate improved CDA performance	Option can be designed to at least an RNAV1 specification although is of RNP+RF may deliver benefit	See DP1 and DP9 See DP3 ar DP9	See DP2, DP4 and DP7, DP8, DP1 DP13	Option not expected to affect defence and security objectives
RWY 23 Arrival Option E	No safety concerns identified as a standalone opticunless use of PBN arrival routes are used in rotation to provide respite. In which case the chances of the chances of human error (aircraft flying the wrong arrival, or ATC thinking the otherroute is in use) we exist. At this point, this assessment assumes the routes are used as single routes, not as part of an alternating system. Some arrivals experience GPWS alerts whilst establishing on final approach. It is thought that use of a PBN arrival may help alleviate these alerts.	use of a pure PBN arrival system expected to degrade future operational performance. This is because of the inability of ATC to provide the exact amount of spacing to the runway between pairs which is likely to lead to inefficiences as well as an increa in ground and airborne holding during peak times.	volume of CAS	spacing once the aircraft have left the stacks. They would also be mor	Option is expected to reduce the number of people overflown below 4000ft (centreline to centreline) by more than 25%	Option is expected to remain with 25% of the number of people within the 65dBLAmax contour (from a typical aircraft overflight	Option is expected to have no change to the frequency of overflight for those under the extended centreline within 5nm of the runway	Use of fixed PBN arrival routes does not share the noise more equitably.	This option does not include mechanisms to provide predicatble respite from nois	Option reduces the number of noise sensitive areas and buildings, national parks, areas of outstanding natural beauty/National Scenic Areas overflown below 7000ft		N/A - the mitigation is provided through SIDs with track adjustments. For arrivals, the ability for a Steeper RNP APCH arrival into Glasgow will be investigated however, the ILS will have to remain at 3.0°	avoid the EDI/GLA buffer Use of PBN transitions alone is likely to reduce controller workload in one regard but also increase in another a airborne and ground holding would increase as a result of less accurate fir approach spacing. This option would require a re-design of the ILS to move the FAF closer or move the PBN path slightly further east. Need to ascertain the existing requirement that GLA AT have to apply to vectoring of arrivals reference the Campsie Line would remain with a PBN route. This route above c.5000ft will need re-aligning to	CAS		f No feedback to date to suggest option is not, or cannot be, compatible with the wider FASI North programme.	Once this route is amended above c.5000ft to remain clear of EDI/GLA buffer this would also ensure it remains laterally and vertically deconflicted from EDI RWY24 departures. So long as those EDI departures can climb continuously to at least FL100, this would enable CDA for GLA RWY 23 arrivals from FL90.	Since this option has no change to how aircraft fly below 1,000ft compared to today, there are likely to be no changes to local air quality (positive or negative) as a result of this airspace design option.	The airspace design is not expected to result in any changes to ecological impacts compared to the baseline as no change below 2000ft	Option has potential to contribute to an increase is overall aircraft emissions a these tracks are longer tha the typical arrival track flow today.	PBN arrival routes would facilitate improved CDA	I least an RNAV1 specification	See DP1 and DP9 See DP3 ar DP9	See DP2, DP4 and DP7, DP8, DP1 DP13	Option not expected to affect defence and security objectives
RWY 23 Arrival Option F	Westerly operations. The requirement for this buff will continue to exist in a future design and it wou not be possible to avoid the buffer with this optio	Use of a pure PBN arrival system expected to degrade future operational performance. This is because of the inability of ATC to provide the exact amount of spacing to the runway between pairs which is likely to lead to inefficiences as well as an increa in ground and airborne holding during peak times.	VOLUME OF UNS	spacing once the aircraft have left the stacks. They would also be mor	Option is expected to reduce the number of people overflown below 4000ft (centreline to centreline) by more than 25%		Option is expected to have no change to the frequency of overflight for those under the extended centreline within 5nm of the runway	Use of fixed PBN arrival routes does not share the noise more equitably.	This option does not include mechanisms to provide predicatble respite from nois	Option reduces the number of noise sensitive areas and buildings, national parks, areas of outstanding natural beauty/National Scenic Areas overflown below 7000ft	arrival swathe and will therefore result in an increasing frequency of overflight of	N/A - the mitigation is provided through SIDs with track adjustments. For arrivals, the ability for a Steeper RNP APCH arrival into Glasgow will be investigated however, the ILS will have to remain at 3.0°	and less flexibility. Use of PBN transitions alone is likely to reduce controller workload in one regard bu also increase in another as airborne a	outside CAS because this option can be contained within existing CAS whilst offering opportunity to	infringements because use of pure PBN arrivals to RWY23 would confirm a profile whice could raise the base of CTA1	f No feedback to date to suggest option is not, or cannot be, compatible with the wider FASI North	sub-optimal profile for either GLA or EDI traffic and would require vertical deconfliction	Since this option has no change to how aircraft fly below 1,000ft compared to today, there are likely to be no changes to local air quality (positive or negative) as a result of this airspace design option.	changes to ecological impacts	Option has potential to contribute to an increase is overall aircraft emissions a this track is much longer that the typical arrival track flow today.	PBN arrival routes would facilitate improved CDA	Option can be designed to at least an RNAV1 specification although is of RNP+RF may deliver benefit	See DP1 and DP9 See DP3 are DP9	See DP2, DP4 and DP7, DP8, DP1 DP13	Option not expected to affect defence and security objectives
RWY23 Arrival Vectors only	No safety concerns identified as this matches the existing concept of operation	Option is expected to cater for Glasgow's forecast demand for a transport	The design option could be contained within the existing CAS volume and also offers potential to reduce the total volume of CAS	Option is not expected to affect ground or airborne holding	Option is expected to remain within 25% of the number of people overflown below 4000ft (centreline to centreline)	Option is expected to remain with 25% of the number of people within the 65dBLAmax contour (from a typical aircraft overflight	Option is expected to have no change to the frequency of overflight for those under the extended centreline within 5nm of the runway	Option doesn't see the use of multiple routes to share noise however routine vectoring does disperse the traffic	This option does not include mechanisms to provide predicatble respite from nois	Option does not affect the number of noise sensitive areas and buildings, national parks, areas of outstanding natural beauty/National Scenic Areas overflown below 7000ft	Option will not see an increase in frequency of overflight of areas that are less frequently overflown today.	N/A - the mitigation is provided through SIDs with track adjustments. For arrivals, the ability for a Steeper RNP APCH arrival into Glasgow will be investigated however, the ILS will have to remain at 3.0°	Option is likely to stay the same in ter of level of complexity for GLA ATC insi CAS	Option is likely to contribute to a reduction in bottlenecks outside CAS because this option can be contained within existing CAS whilst offering opportunity to reduce the total volume of CAS	e Option is likely to contribute to a reduction in infringements because ever with continued reliance on vectors, it currently looks feasible to raise the base of CTA1 in some areas.	The option may not be compatible with NERL only if they were to take forward Point Merge as a concept	So long as GLA remains clear of EDI/GLA buffer, vectors to RWY23 does generally enable CDO from 7000ft today. So long as those EDI departures can climb continuously to at least FL100, this would enable CDA for GLA RWY 23 arrivals from FL90.	Since this option has no change to how aircraft fly below 1,000ft compared to today, there are likely to be no changes to local air quality (positive or negative) as a result of this airspace design option.	The airspace design is not expected to result in any changes to ecological impacts compared to the baseline as no change below 2000ft	Option is likely to maintain existing levels of emissions	n Option is unlikely to affect as CCO/CDO performance	N/A, there's no PBN specification with vectoring	See DP1 and DP9 DP9	See DP2, DP4 and DP7, DP8, DP1 DP13	Option not expected to affect defence and security objectives
RWY 23 Arrival Vectors and PBN hybrid	No safety concerns identified at this stage	Option is expected to enhance Glasgow's operational performar in the future. This is because AT can use the PBN arrivals when traffic levels are low and this w also facilitate the use of combined Tower and Approace services (Radar In Tower)	The design option could be contained within the existing CAS volume and also offers potential to reduce the total volume of CAS	Option is not expected to affect ground or airborne holding	Option is expected to remain within 25% of the number of people overflown below 4000ft (centreline to centreline)	Option is expected to remain with 25% of the number of people within the 65dBLAmax contour (from a typical aircraft overflight	Option is expected to have no change to the frequency of overflight for those under the extended centreline within 5nm of the runway	Vectoring of arrivals is a mechanism which shares noise more equitably. However, having PBN arrival routes available is likely to result in increased concentration compared to today.	It may be possible to stipulat that PBN arrivals are mandated during the night which would provide predicatble respite to those communiities not under thos routes.	Option does not affect the number of noise sensitive areas and buildings, national parks, areas of outstanding natural beauty/National Scenic Areas overflown below 7000ft	Assuming that the PBN path taken forward is within the existing arrival swathe, this ption will not see an increase in frequency of overflight of areas that are less frequently overflown today.	N/A - the mitigation is provided through SIDs with track adjustments. For arrivals, the ability for a Steeper RNP APCH arrival into Glasgow will be investigated however, the ILS will have to remain at 3.0°	Option is likely to contribute to a reduction in complexity for GLA ATC inside CAS because this option still rel on vectors but ATC can also have the benefit from PBN arrivals to reduce th workload when the situation permit. Either PBN route C, D or E would preferred subject to FAF distances, Campsie Line investigation and realignment of routes above c.5000ft to avoid EDI/GLA buffer	outside CAS because this option can be contained within existing CAS whilst offering opportunity to reduce the total volume of	Option is likely to contribute to a reduction in infringements because ever with continued reliance on vectors, it currently looks feasible to raise the base of CTA1 in some areas.	No feedback to date to suggest option is not, or cannot be, compatible with the wider FASI North programme.	Subject to either Option C, D or E being amended above c.5000ft to avoid GLA/EDI buffer this would enable CDA for GLA RWY 23 arrivals from FL90 so long as EDI departures can climb continuously to at least FL100	Since this option has no change to how aircraft fly below 1,000ft compared to today, there are likely to be no changes to local air quality (positive or negative) as a result of this airspace design option.	The airspace design is not expected to result in any changes to ecological impacts compared to the baseline as no change below 2000ft	Option is likely to maintain existing levels of emissions	Availability of PBN arrival routes would facilitate improved CDA performance	The PBN arrival transitions can be designed to at least an RNAV1 specification although is of RNP+RF may deliver benefit	See DP1 and DP9 DP9	See DP2, DP4 and DP7, DP8, DP1 DP13	Option not expected to affect defence and security objectives

									Desig	gn Principle Evaluation												
Option Image	Option The airspace design and its operation Name must be as safe or safer than today	Facilitate the growth in quicker, quiete on and cleaner traffic by configuring the	transport, enable safe, ho t efficient access for other ar	equirements for airborne olding for inbound traffic nd holding on the ground		ffects of aircraft noise and visual intrusion on physica mental health and wellbeing.	and noise dispersion thro transparent multiple methods that are possib	ough the use of predictable and	nd The arrival and departure routes that serve (below 7000ft should avoid noise sensitiv buildings, national parks, areas of outstan	Mitigate the impactory communities to currently affected noise on final appropriate that are not vicinity of the imits.	d currently affected by aircraft noise on final approach or the		ensure that the airspace design options are compatible with the wider programme of lower altitude		Routes to/from Glasgow and Edinburgh airports should be procedurally deconflicted from the ground to a preferred level in coordination with NATS	Minimise the growth in aircraf adverse ecological impacts to	ft emissions, the further degra address growing concerns ab climate change.	adation in local air quality and bout the impact of aviation on	Aircraft operating at Glasgow Airport should climb and descend continuously to/from at least 7000ft with a preference for the most environmentally beneficial option to be chose, if both	Routes should be designed to meet a RNAV1 specification as a minimum in order to gain maximum benefit of the performance capabilities of the modern aircraft fleet operating at Glasgow Airport in line with the guidance provided in CAA CAP1385 on enhanced route spacing for PBN and provide sufficient resilience and redundancy against Global Navigation Satellite System (GNSS) failure.		's published Airspace Modernisation Strategy (CAP17) ith it and all other relevant policies and regulatory s
					below 4000ft (centreline to	Number of people within the 65dBLAmax contour (from a typical aircraft overflight) Affect on frequence overflight for those unextended centrelines 5nm of the runwall for the sunwall for the	der the Vithin Use of multiple route	Mechanisms for predictab respite	Noise sensitive areas and buildings, national parks, areas of outstanding natural beauty/National Scenic Areas	new areas	Complexity in CAS	Bottleneck outside CAS	Infringements			Local Air Quality	Ecological Impacts	Climate Change			Maintain and enhance high aviation safety standards Secure the efficient use of airspace and enable integration	Avoid flight environmental delays by better managing the airspace network large moise large larg
	RWY 05 Arrv Do Nothing The airspace design is as safe or safe than today with no safety concerns this time		The design option could be contained within the existing CAS volume and also offers potential to reduce the total volume of CAS	Option is not expected to vaffect ground or airborne holding	Option is expected to remain within 25% of the number of people overflown below 4000ft (centreline to centreline)	Option is expected to remain within 25% of the number of people within the 65dBLAmax contour (from a typical aircraft overflight) Option is expected to he change to the freque overflight for those un extended centreline from the runwal strength of the runwal strength.	Option doesn't see the under the vithin does disperse the traff		Option does not affect the number of noise sensitive areas and buildings, national parks, areas of outstanding natural beauty/National Scenic Areas overflown below 7000ft	Il not see an frequency of areas that are ntly overflown day. Il not see an N/A - the mitig provided through track adjustn	Option is likely to stay to same or contribute to tolerable increase in complexity for GLA ATC in CAS. Any untolerable increased by limiting traffic numbers increasing delays	one asside Option won't affect bease bottlenecks outside CAS and	Option unlikely to have an impact on infringements	The option may not be compatible with FASI North programme as revisions to the flows within the ScTMA could require changes to traffice flows below 7000ft at Glasgow but it depends on the option taken forward by that sponsor	All routes are procedurally deconflicted upto FL90	Option is expected to maintain the same level of local air quality emissions	The airspace design is not expected to result in any changes to ecological impacts compared to the baseline	Option is likely to maintain existing levels of emissions	Option is unlikely to affect CCO/CDO performance	N/A, there's no PBN specification with vectoring	See DP1 and DP9 See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP4, D5, DP6, DP7, DP8, DP12 and defe security
	RWY 05 Arrival Option A RWY 05 Arrival option	Use of a pure PBN arrival system is expected to degrade future operational performance. This is because of the inability of ATC to provide the exact amount of spacing to the runway between pairs which is likely to lead to inefficiences as well as an increase in ground and airborne holding during	The design option may require changes to the existing CAS boundaries but still offers potential to reduce the total volume of CAS. The arrival routes as illustrated would not quite be contained within ScTMA 5 in accordance with the CAA CAS containment policy.	Use of a pure PBN arrival tem is expected to increase airborne holding. This is ecause ATC would lose the kibiliy to adjust the spacing ce the aircraft have left the tacks. They would also be more likely to provide creased spacing between rriving paris as they can't anage catch up situations with vectors	Option is expected to reduce the number of people overflown below 4000ft (centreline to centreline) by more than 25%	Option is expected to remain within 25% of the number of people within the 65dBLAmax contour (from a typical aircraft overflight) Option is expected to he change to the freque overflight for those unextended centreline of the runward of the runward option is expected to he change to the freque overflight for those unextended centreline of the runward option is expected to he change to the freque overflight for those unextended centreline of the freque overflight for those unextended to the frequency of the frequency overflight for those unextended to the frequency overflight for the freque	ave no ncy of der the does not share the noi within more equitably.	outes This option does not including the mechanisms to provide predicatble respite from no	Option reduces the number of noise sensitive areas and buildings, national parks, areas of outstanding natural beauty/National Scenic Areas overflown below 7000ft within the arrival swatch therefore no increase in overflight of less frequent today. (However, PBN route was a route of the swatch the arrival swatch the arrival swatch therefore no increase in overflight of less frequent today.	ot result in an frequency of areas that are ntly overflown ver, sole use of a vill result in an te of overflight from the of overflight provided through track adjustme arrivals, the abi Steeper RNP APCH Glasgow will be in however, the ILS versult in an remain at 3	arrival into reduce contrioller workl in one regard but also will have to increase in another a	Option has potential to contribute to an increase in bottlenecks outside CAS	Option unlikely to have an impact on infringements	No feedback to date to suggest option is not, or cannot be, compatible with the wider FASI North programme.	All routes are procedurally deconflicted upto FL90 r	Since this option has no change to how aircraft fly below 1,000ft compared to today, there are likely to be o changes to local air quality (positive or negative) as a result of this airspace design option.	The airspace design is not expected to result in any changes to ecological impacts compared to the baseline as no change below 2000ft	Option has potential to contribute to an increase in overall aircraft emissions as this track is longer than the typical arrival track flown today.	PBN arrival routes would facilitate improved CDA performance	Option can be designed to at least an RNAV1 specification although is of RNP+RF may deliver benefit	See DP1 and DP9 See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP4, D5, DP6, DP7, DP8, DP12 and DP13 Opt expected defe security
	RWY 05 Arrival Option B RWY 05 Arrival option Character of the chances of human error option which case the chances of human error options are used in rotation to provide respite. In which case the chances of human error options are used in rotation to provide respite. In which case the chances of human error options are used in rotation to provide respite. In which case the chances of human error options are used in rotation to provide respite. In which case the chances of human error options are used in rotation to provide respite. In which case the chances of human error options are used in rotation to provide respite which case the chances of human error options are used in rotation to provide respite which case the chances of human error options are used in rotation to provide respite which case the chances of human error options are used in rotation to provide respite which case the chances of human error options are used in rotation to provide respite which case the chances of human error options are used in rotation to provide respite which case the chances of human error options are used in rotation to provide respite which case the chances of human error options are used in ro	Use of a pure PBN arrival system is expected to degrade future operational performance. This is because of the inability of ATC to provide the exact amount of spacing to the runway between pairs which is likely to lead to inefficiences as well as an increase in ground and airborne holding during neak times		Use of a pure PBN arrival tem is expected to increase airborne holding. This is ecause ATC would lose the kibiliy to adjust the spacing ce the aircraft have left the tacks. They would also be more likely to provide creased spacing between rriving paris as they can't anage catch up situations with vectors	Option is expected to reduce the number of people overflown below 4000ft (centreline to centreline) by more than 25%	Option is expected to remain within 25% of the number of people within the 65dBLAmax contour (from a typical aircraft overflight) Option is expected to he change to the freque overflight for those unextended centreline of the runward strength of	vithin more equitably.	outes This option does not including the mechanisms to provide predicatble respite from no	Option reduces the number of noise sensitive areas and buildings, national parks, areas of outstanding natural beauty/National Scenic Areas overflown below 7000ft within the arrival swatcherefore no increase in overflight of less frequent today. (However, PBN route we increased rates)	ot result in an frequency of areas that are atly overflown	Option would require management of the transition (TMA5) or a management to the route to join Find Approach slightly close Subject to this, use of Parameters and arrival into investigated will have to 3.0° Option would require management and store and ground find transition and ground hold would increase as a resuless accurate final approach.	Option has potential to contribute to an increase in bottlenecks outside CAS	Option unlikely to have an impact on infringements	No feedback to date to suggest option is not, or cannot be, compatible with the wider FASI North programme.	All routes are procedurally deconflicted upto FL90 r	Since this option has no change to how aircraft fly below 1,000ft compared to today, there are likely to be o changes to local air quality (positive or negative) as a result of this airspace design option.	compared to the paseline as	Option has potential to contribute to an increase in overall aircraft emissions as this track is longer than the typical arrival track flown today.	PBN arrival routes would facilitate improved CDA performance	Option can be designed to at least an RNAV1 specification although is of RNP+RF may deliver benefit	See DP1 and DP9 See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP4, D5, DP6, Expected defends a DP13 See DP2, DP4, D5, DP6, DP7, DP8, DP12 and DP13
	RWY 05 Arrival Option C RWY 05 Arrival content of the chances of the chances of human error (aircraft flying the wrong arrival, or A thinking the otherroute is in use) with the routes are used as single routes, reas part of an alternating system and therefore assessed as Met.	Use of a pure PBN arrival system is expected to degrade future operational performance. This is because of the inability of ATC to provide the exact amount of spacing to the runway between pairs which is likely to lead to inefficiences as well as an increase in ground and airborne holding during peak times.	The design option may require changes to the existing CAS boundaries but still offers potential to reduce the total volume of CAS. The arrival routes as illustrated would not quite be contained within ScTMA 5 in accordance with the CAA CAS	Use of a pure PBN arrival tem is expected to increase airborne holding. This is ecause ATC would lose the kibiliy to adjust the spacing ce the aircraft have left the tacks. They would also be more likely to provide creased spacing between rriving paris as they can't anage catch up situations with vectors	Option is expected to reduce the number of people overflown below 4000ft (centreline to centreline) by more than 25%	Option is expected to remain within 25% of the number of change to the freque overflight for those un extended centreline aircraft overflight) Option is expected to he change to the freque overflight for those un extended centreline of the runward forms.		outes This option does not including the mechanisms to provide predicatble respite from no	overflown below 7000ft Beauty/National Scenic Areas today. (However PBN route we increased rate)	existing main athe and will ot result in an frequency of areas that are otly overflown ver, sole use of a vill result in an	Approach slightly close Subject to this, use of Particular transitions alone is likely reduce contrioller workly in one regard but also increase in another a airborne and ground hold would increase as a resuless accurate final approach.	Option has potential to contribute to an increase in bottlenecks outside CAS	Option unlikely to have an impact on infringements	No feedback to date to suggest option is not, or cannot be, compatible with the wider FASI North programme.	All routes are procedurally deconflicted upto FL90	Since this option has no change to how aircraft fly below 1,000ft compared to today, there are likely to be o changes to local air quality (positive or negative) as a result of this airspace design option.	changes to ecological impacts	Option has potential to contribute to an increase in overall aircraft emissions as this track is longer than the typical arrival track flown today.	PBN arrival routes would facilitate improved CDA performance	Option can be designed to at least an RNAV1 specification although is of RNP+RF may deliver benefit	See DP1 and DP9 See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP4, D5, DP6, DP7, DP8, DP12 and DP13 Opt expects defersecurity
	RWY 05 Arrival Option D RWY 05 Arrival option option unless use of PBI arrival routes are used in rotation to provide respite. In which case the chances of human errival, or A thinking the otherroute is in use) with exist. At this point, this assessment assum the routes are used as single routes, reasonable of an alternating system and therefore assessed as Met.	Use of a pure PBN arrival system is expected to degrade future operational performance. This is because of the inability of ATC to provide the exact amount of spacing to the runway between pairs which is likely to lead to inefficiences as well as an increase in ground and airborne holding during neak times.	The design option may require changes to the existing CAS boundaries but still offers potential to reduce the total volume of CAS. The arrival routes as illustrated would not quite be contained within ScTMA 5 in accordance with the CAA CAS	Use of a pure PBN arrival tem is expected to increase airborne holding. This is ecause ATC would lose the kibiliy to adjust the spacing ce the aircraft have left the tacks. They would also be more likely to provide creased spacing between rriving paris as they can't anage catch up situations with vectors	Option is expected to reduce the number of people overflown below 4000ft (centreline to centreline) by more than 25%	Option is expected to remain within 25% of the number of people within the 65dBLAmax contour (from a typical aircraft overflight) Option is expected to he change to the freque overflight for those unextended centreline of the runward state.		outes This option does not including the mechanisms to provide predicatble respite from no	PBN route wincreased rate	existing main of the and will ot result in an frequency of areas that are of the area of t	Approach slightly close ents. For slitty for a arrival into nvestigated Approach slightly close Subject to this, use of P transitions alone is likely reduce contrioller workl in one regard but also	Option has potential to contribute to an increase in bottlenecks outside CAS	Option unlikely to have an impact on infringements	No feedback to date to suggest option is not, or cannot be, compatible with the wider FASI North programme.	All routes are procedurally deconflicted upto FL90	Since this option has no change to how aircraft fly below 1,000ft compared to today, there are likely to be o changes to local air quality (positive or negative) as a result of this airspace design option.	changes to ecological impacts	Option has potential to contribute to an increase in overall aircraft emissions as this track is longer than the typical arrival track flown today.	PBN arrival routes would facilitate improved CDA performance	Option can be designed to at least an RNAV1 specification although is of RNP+RF may deliver benefit	See DP1 and DP9 See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP4, D5, DP6, DP7, DP8, DP12 and DP13 Opt expects defe security
	RWY 05 Arrival Vectors only No safety concerns identified as thi matches the existing concept of operation	Option is expected to cater for Glasgow's forecast demand for air transport	The design option could be contained within the existing CAS volume and also offers potential to reduce the total volume of CAS	Option is not expected to affect ground or airborne holding	Option is expected to remain within 25% of the number of people overflown below 4000ft (centreline to centreline)	Option is expected to remain within 25% of the number of change to the freque overflight for those un extended centreline aircraft overflight) Option is expected to he change to the freque overflight for those un extended centreline of the runward forms.	Option doesn't see the under the vithin does disperse the traff	Inredicatble resulte from no	Option does not affect the number of noise sensitive areas and buildings, national parks, areas of outstanding natural beauty/National Scenic Areas overflown below 7000ft Option wi increase in overflight of less frequent to	Il not see an frequency of areas that are atly overflown day. N/A - the mitig provided through track adjustme arrivals, the abi Steeper RNP APCH Glasgow will be in however, the ILS we remain at 3	cation is In SIDs with cents. For same in terms of level complexity for GLA ATC in CAS In SIDs with Option is likely to stay to same in terms of level complexity for GLA ATC in CAS	ne of Option unlikely to affect side bottlenecks outside CAS	Option unlikely to have an impact on infringements	The option may not be compatible with NERL only if they were to take forward Point Merge as a concept	f All routes are procedurally to deconflicted upto FL90	Since this option has no change to how aircraft fly below 1,000ft compared to today, there are likely to be o changes to local air quality (positive or negative) as a result of this airspace design option.	The airspace design is not expected to result in any changes to ecological impacts compared to the baseline as no change below 2000ft	Option is likely to maintain existing levels of emissions	Option is unlikely to affect CCO/CDO performance	N/A, there's no PBN specification with vectoring	See DP1 and DP9 See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP4, D5, DP6, DP7, DP8, DP12 and DP13 Opt expects defe security
	RWY 05 Arrival Vectors and PBN hybrid No safety concerns identified at this stage	Option is expected to enhance Glasgow's operational performance in the future. This is because ATC can use the PBN arrivals when traffic levels are low and this will also facilitate the use of combined Tower and Approach services (Radar In Tower)	arrival routes as illustrated would not quite be contained within ScTMA 5 in accordance	Option is not expected to waste affect ground or airborne holding	Option is expected to remain within 25% of the number of people overflown below 4000ft (centreline to centreline)	Option is expected to remain within 25% of the number of change to the freque overflight for those un extended centreline aircraft overflight) Option is expected to he change to the freque overflight for those un extended centreline of the runward forms of the runward forms.	Vectoring of arrivals is mechanism which shar noise more equitably However, having PBN arroutes available is likely result in increased concentration compared today.	which would provide predicatble respite to those	areas and buildings, national parks, areas of outstanding natural beauty/National see Scenic Areas overflown below existing arrive ption will not in frequency areas that are	provided through track adjustme arrivals, the abi see an increase of overflight of	arrival into expressing a trival section of the arrival section of the arrival section of the most favourable arrivals to reduce the workload when the situation of the most favourable arrivals to reduce the workload when the situation of the most favourable arrivals to reduce the workload when the situation of the most favourable arrivals to reduce the workload when the situation of the situati	Option has potential to contribute to an increase in bottlenecks outside CAS although if the PBN path ca be moved slightly further East, it may be possible to keep contained within existing CAS	n Option unlikely to have an impact on infringements	No feedback to date to suggest option is not, or cannot be, compatible with the wider FASI North programme.	All routes are procedurally deconflicted upto FL90 r	Since this option has no change to how aircraft fly below 1,000ft compared to today, there are likely to be o changes to local air quality (positive or negative) as a result of this airspace design option.	The airspace design is not expected to result in any changes to ecological impacts compared to the baseline as no change below 2000ft	Option is likely to maintain existing levels of emissions	Availability of PBN arrival routes would facilitate improved CDA performance	The PBN arrival transitions can be designed to at least an RNAV1 specification although is of RNP+RF may deliver benefit	See DP1 and DP9 See DP3 and DP9	See DP2, DP4 and DP11 See DP2, DP4, D5, DP6, DP7, DP8, DP12 and DP13 Opt expects defersecurity