Glasgow Airport Ltd Classification: Public FASI-S Stage 2



Glasgow Airport FASI-N Airspace Change Proposal

Step 2A Annex A - Design Principle Evaluation

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Status: Public

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	operation and release controlled airspace that is	Mitigate any future requirements for airborne holding for inbound traffic and holding on the ground pre-departure for	Minimise the total ad physic	verse effects of aircraft noise a cal and mental health and wel	and visual intrusion on	Offer communities of concentration and noise of of predictable and transpa and other respite method the technical ATC systen procedural	arent multiple route optior	areas and buildings, n	ould avoid noise sensitive ational parks, areas of //National Scenic Areas and	Mitigate the impacts on docal communities that are	f	ottlenecks in controlled and to a reduction in airspace ir	I uncontrolled airspace and Ifringements.	are compatible with the wider programme of lower altitude and network airspace changes being coordinated by the	o/from Glasgow nburgh airports be procedurally licted from the I to a preferred oordination with	Minimise the growth in ai quality and adverse ecolog impac	ircraft emissions, the further de gical impacts to address growin ct of aviation on climate change	e.	Glasgow Airport should climb and descend continuously to/from at least 7000ft with a preference for the most environmentally beneficia 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	e GLA ACP accords with	the CAA's published Airsp and all othe	pace Modernisation Strategy (CAP1711 er relevant policies and regulatory star	.), any current or future plans a: idards.	associated with it
			not required.		Number of people overflown below 4000ft (centreline to centreline)	(from 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 Quality	Ecological Impacts	Climate Change	simultaneously.	provide sufficient resilience and redundancy against Global Navigation	aintain and enhance nigh aviation safety standards		better managing the airspace network perfor emiss	ove environmental mance by reducing Facilita ions and by better secur nanaging noise	
RWY 05 Dep Do Nothing																							See DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See DDP7, D	P2, DP4, D5, DP6, P8, DP12 and DP13	
RWY 05 Dep Option A																							See DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See DDP7, D	P2, DP4, D5, DP6, P8, DP12 and DP13	
RWY 05 Dep Option B																							See DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See D DP7, D	P2, DP4, D5, DP6, P8, DP12 and DP13	
RWY 05 Dep Option C																							See DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See D DP7, D	P2, DP4, D5, DP6, P8, DP12 and DP13	
RWY 05 Dep Option D																							See DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See D DP7, D	P2, DP4, D5, DP6, P8, DP12 and DP13	
RWY 05 Dep Option E																							See DP1 and DP9	See DP3 and DP9		P2, DP4, D5, DP6, P8, DP12 and DP13	
RWY 05 Dep Option F																							See DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See D DP7, D	P2, DP4, D5, DP6, P8, DP12 and DP13	
RWY 05 Dep Option G																							See DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See D DP7, D	P2, DP4, D5, DP6, P8, DP12 and DP13	
RWY 05 Dep Option H																							See DP1 and DP10	See DP3 and DP10	See DP2, DP4 and DP12 DP7, D	P2, DP4, D5, DP6, P8, DP12 and DP14	
RWY 05 Dep Option I																							See DP1 and DP11	See DP3 and DP11	See DP2, DP4 and DP13 See D DP7, D	P2, DP4, D5, DP6, P8, DP12 and DP15	
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RWY 23 Dep Do Nothing																							See DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See DD7, D	P2, DP4, D5, DP6, P8, DP12 and DP13	
RWY 23 Dep Option A																							See DP1 and DP9		DP7, D		
RWY 23 Dep Option B																							See DP1 and DP9		See DP2, DP4 and DP11 See DD7, D		
RWY 23 Dep Option C																							See DP1 and DP9		See DP2, DP4 and DP11 See DDP7, D		
RWY 23 Dep Option D																							See DP1 and DP9		See DP2, DP4 and DP11 See DDP7, D		
RWY 23 Dep Option E																							See DP1 and DP9	See DP3 and DP9	See DP2, DP4 and DP11 See D DP7, D	P2, DP4, D5, DP6, P8, DP12 and DP13	
2000.22																											
RWY 05 Arrv Do Nothing																							See DP1 and DP9		See DP2, DP4 and DP11 See DDP7, D		
RWY 05 Arrival Option	A																						See DP1 and DP9		DP7, D		
RWY 05 Arrival Option	В																						See DP1 and DP9		See DP2, DP4 and DP11 See DDP7, D		
RWY 05 Arrival Option	С																						See DP1 and DP9		See DP2, DP4 and DP11 See DDP7, D		
RWY 05 Arrival Vostors																							See DP1 and DP9		See DP2, DP4 and DP11 See DDP7, D		
RWY 05 Arrival Vectors																							See DP1 and DP9		See DP2, DP4 and DP11 See DDP7, D		
RWY 05 Arrival Vectors and PBN hybrid																							See DP1 and DP10	See DP3 and DP10	See DP2, DP4 and DP12 DP7, D	P8, DP12 and DP14	
RWY 23 Arrv																									See D	P2 DP4 D5 DP6	
Do Nothing																							See DP1 and DP9		DP7, D	P2, DP4, D5, DP6, P8, DP12 and DP13 P2, DP4, D5, DP6,	
RWY 23 Arrival Option																									DP7, D	P2, DP4, D5, DP6, P8, DP12 and DP13 P2, DP4, D5, DP6,	
RWY 23 Arrival Option																							See DP1 and DP9		DP7, D	P8, DP12 and DP13	
RWY 23 Arrival Option																							See DP1 and DP9		See DP2, DP4 and DP11 See DDP7, D		
RWY 23 Arrival Option I																							See DP1 and DP9			P2, DP4, D5, DP6, P8, DP12 and DP13 P2, DP4, D5, DP6,	
RWY 23 Arrival Option																							See DP1 and DP9		See DP2, DP4 and DP11 See DDP7, D		
RWY 23 Arrival Option RWY23 Arrival Vectors																									See DP2, DP4 and DP12 See DDP7, D		
only RWY 23 Arrival Vectors																									See DP2, DP4 and DP12 See DDP7, D	P2, DP4, D5, DP6, P2, DP4, D5, DP6,	
and PBN hybrid																							See DP1 and DP10	See DP3 and DP10		P8, DP12 and DP14	

Option Image	Option Name	The airspace design and its operation must be as safe or safer than toda	and cleaner traffic by configuring the airspace to improve efficiency and mee	Design the appropriate volume of controlled airspace r to support commercial air transport, enable safe, et efficient access for other types of operation and release controlled airspace that is not required. Mitigate are requirements holding for in and holding of pre-departure pre-departure	for airborne bound traffic Minimise the total adv on the ground for outbound	verse effects of aircraft noise an mental health and wellb		noise dispersion throug transparent multiple ro methods that are possible	for both noise concentration and gh the use of predictable and ute options and other respite within the technical ATC system, nd procedural constraints.	below 7000ft should avoid buildings, national parks, and, beauty/National Scenic A	outes that serve Glasgow Airpor oid noise sensitive areas and areas of outstanding natural	currently affected by aircrannoise on final approach or	ft Reduce complexity and bottlenecks reduct	in controlled and uncontrolled a tion in airspace infringements.	airspace and contribute to a		Edinburgh airports should be procedurally deconflicted from the ground to a preferred level in coordination with NATS				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 simultaneously. meet a RN as a minir performan the mode operating a in line wi provided in enhanced PBN and p resilience against Gl Satellite	nce capabilities of ern aircraft fleet at Glasgow Airport The G ith the guidance on CAA CAP1385 on route spacing for	current or future plans associated w	lished Airspace Modernisation Strategy (CAP1711), ith it and all other relevant policies and regulatory standards.
						flown Number of people within ne to 65dBLAmax contour (fro typical aircraft overflig	om a the extended centraline	ose of maniple routes	Mechanisms for predictable respite	Noise sensitive areas and le buildings, national parks, areas of outstanding natural beauty/National Scenic Areas	overny new areas		Complexity in CAS	Bottleneck outside CAS	Infringements			Local Air Quality	Ecological Impacts	Climate Change			Secure the efficient use of airspace and enable integration	Avoid flight elays by better nanaging the space network Improve environmental performance by reducing emissions and by better managing noise Improve environmental performance by and securit objectives
	RWY 05 Dep Do Nothing	The airspace design is as safe or safer than today with no safety concerns a time	this 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	Option is expected to rewithin 25% of the number people overflown belease 4000ft (centreline)	emain Option is expected to reducer of within 25% of the number people within the 65dBLA contour (from a typic aircraft overflight)	main Option is expected to have n er of change to the frequency of Amax overflight for those under th extended centreline within 5nm of the runway	Option doesn't see the use of multiple routes to share noise more equitably insid 5nm however after that, routine vectoring does disperse the traffic	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	areas not currently affected	Option does not make use offset departures	Option is likely to stay the same or contribute to a tolerable increase in complexity for GLA ATC inside CAS. Any untolerable increase would be mitigate by limiting traffic numbers and increasing delays	y Option won't affect d bottlenecks 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	Some routes are not currently procedurally deconflicted up to FL90 andsometimes results in level off below FL90 to step up under 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	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 increased delays as traffic levels rise	Option is unlikely to affect CCO/CDO performance for o	nothing would Glasgow's reliance ntional Navigation departures	DP1 and DP9 See DP3 and See DP9	See DP2, DP4, D5, DP6, DP7, DP8, DP12 and DP13 See DP2, DP4, D5, DP6, DP7, DP8, DP12 and DP13 Option no expected to a defence an security object
	RWY 05 Dep Option A	This option requires a Track Adjustment on departure. These are possible of PANS OPS but in a recent ACP, the CAA IFP department wanted a not below 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 we 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 patches the IOA should this option progress.	the future	The design option could be contained within the existing CAS volume and also offers potential to reduce the total volume of CAS	people overflown bel	Option is expected to increase the number people within the 65dBL/contour (from a typic aircraft overflight) by mother than 25%	Option is expected to reduce the frequency of overflight for those under the extende centreline within 5nm of the runway	from NORBO, PERTH,	This is a fixed route structure e Option doesn't contain mechanisms for predictable respite e	Option not expected to affect the number of noise sensitive areas and buildings, national parks, areas of outstanding natural beauty/National Scenic Areas overflown below 7000ft	Option has SIDs turning before 5nm therefore will se an increase in frequency of overflight of areas that are less frequently overflown today.	e Option makes use of offse departures for some SIDs	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 requal a greater separation that today. ATC would still like to have ability for NORBO 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 Purity with a level greater than 6000ft.	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 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)	Option will clearly contribute to an overall reduction in aircraft emissions	This route structure in combination with deconflicted arrival structures would be expected to improve CDO performance	be designed to at NAV1 specification NP+RF may deliver or early left turns	DP1 and DP9 See DP3 and See	See DP2, DP4, D5, DP6, DP7, DP8, DP12 and DP13 See DP2, DP4, D5, DP6, DP7, DP8, DP12 defence an security object
	RWY 05 Dep Option B	This option requires a Track Adjustment on departure. These are possible of PANS OPS but in a recent ACP, the CAA IFP department wanted a not below 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 we 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 patches the IOA should this option progress.		The design option could be contained within the existing CAS volume and also offers potential to reduce the total volume of CAS			main er of the frequency of overflight Amax for those under the extende centreline within 5nm of the runway	I from NORBO PERTH	This is a fixed route structure e Option doesn't contain mechanisms for predictable respite e	Option not expected to affect the number of noise sensitive areas and buildings, national parks, areas of outstanding natural beauty/National Scenic Areas overflown below 7000ft	less frequently overflown	e Option makes use of offset departures for some SIDs	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 requal a greater separation that today. ATC would still like to have ability for NORBO 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 Powith a level greater than 6000ft.	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	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	location of emissions below	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)	Option will clearly contribute to an overall reduction in aircraft emissions	This route structure in combination with deconflicted arrival structures would be expected to improve CDO performance	be designed to at NAV1 specification NP+RF may deliver or early left turns	DP1 and DP9 See DP3 and DP9 DP9	See DP2, DP4, D5, DP6, DP7, DP8, DP12 and DP13 See DP2, DP4, D5, DP6, DP7, DP8, DP12 and DP13
	RWY 05 Dep Option C	The early left turn towards high ground needs more detailed IFP designensure it's safe with an acceptable climb gradient. Further assurances required. This will be investigated in further detail as of the IOA should this option progress.	Glasgow's operational performance in	The design option could be contained within the existing CAS volume and also offers potential to reduce the total volume of CAS	people overflown bel	increase the number people within the 65dBLA contour (from a typic	Option is expected to reduce the frequency of overflight for those under the extende centreline within 5nm of the runway	noise more equitably. The NORBO departure turning le	e This is a fixed route structure eft Option doesn't contain ly mechanisms for predictable se respite	Option not expected to affect the number of noise sensitive areas and buildings, national parks, areas of outstanding natural beauty/National Scenic Areas overflown below 7000ft	before 5nm therefore will se an increase in frequency of overflight of areas that are less frequently overflown	Option does not make use offset departures	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 requal a greater separation that today. ATC would still like to have ability for NORBO 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 Powith a level greater than 6000ft.	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	cannot be, compatible with	FL100, based on existing	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	more of these areas below 2000ft. (There are some of these areas overflown under route centrelines of this	Option will clearly contribute to an overall reduction in aircraft emissions	This route structure in combination with deconflicted arrival structures would be expected to improve CDO performance	be designed to at NAV1 specification NP+RF may deliver or early left turns	DP1 and DP9 See DP3 and DP9 DP9	See DP2, DP4, D5, DP6, DP7, DP8, DP12 and DP13 See DP2, DP4, D5, DP6, DP7, DP8, DP12 and DP13
	RWY 05 Dep Option D	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 as pathe IOA should this option progress.	Glasgow's operational performance in	The design option could be contained within the existing CAS volume and also offers potential to reduce the total volume of CAS	people overflown bel arly left turn 4000ft (centreline to	o people within the 65dBLA contour (from a typic	main er of the frequency of overflight Amax for those under the extende centreline within 5nm of the runway	early takes c.80% of easterline	This is a fixed route structure eft Option doesn't contain ly mechanisms for predictable se respite	Option not expected to affect the number of noise sensitive areas and buildings, national parks, areas of outstanding natural beauty/National Scenic Areas overflown below 7000ft	an increase in frequency of overflight of areas that are less frequently overflown	e Option does not make use o offset departures	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 requive a greater separation that today. ATC would still like to have ability for NORBO 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 Powith a level greater than 6000ft.	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	impact on infringements	No feedback to date to suggest option is not, or cannot be, compatible with the wider FASI North programme	further to the East than today. Even with continuous climb from EDI RWY24	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	more of these areas below 2000ft. (There are some of	Option will clearly contribute to an overall reduction in aircraft emissions	This route structure in combination with deconflicted arrival structures would be expected to improve CDO performance	be designed to at NAV1 specification NP+RF may deliver or early left turns	DP1 and DP9 See DP3 and See DP9	See DP2, DP4, D5, DP6, DP7, DP8, DP12 and DP13 See DP2, DP4, D5, DP6, DP7, DP8, DP12 defence an security object
	RWY 05 Dep Option E	This option requires a Track Adjustment on departure. These are possible of PANS OPS but in a recent ACP, the CAA IFP department wanted a not below 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 we 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, especially as this SID we service lower performing aircraft (in terms of climb gradient). Further assurances required. This will be investigated in further detail as paths IOA should this option progress.	departures. Many ROBBO/CLYDE/LOMON/FOYLE departures are currently tactically turne left early already so the only enhancement would be for PERTH departures in the first rotation of whic they're aren't many. This option is	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	c expected to nd holding arly left turn is by NORBO nd therefore elp alleviate delays c expected to Option is expected to increase the number people overflown bel 4000ft (centreline to centreline) by more that	Option is expected to increase the number people within the 65dBLA contour (from a typic aircraft overflight) by m than 25%	the frequency of overflight for those under the extende	This option does make use of multiple routes to share noise more equitably. The track adjustment on departure takes PERTH, LOMON, FOYLE and CLYDE departures away from those communities under the 5nd climbout	This is a fixed route structure Option doesn't contain mechanisms for predictable respite	Option increases the number re. of noise sensitive areas and buildings, national parks, e areas of outstanding natural beauty/National Scenic Areas overflown below 7000ft		e Option makes use of offse departures for some SIDs	Would need to ensure the NORBO SID is laterally separated from LANAK hold. Would only want SID to climb to 6000f with ATC to clear through RWY05 arrival. Use of PBN arrival to RWY 05 would be beneficial here so we can gurantee descent profile versus NORBO SIDs. Wou still like flexibility to Vector to the South after first turn (when LANAK not in use). Would need a Standing Agreement to P with a level greater than 6000ft	t dis. 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	No feedback to date to suggest option is not, or cannot be, compatible with the wider FASI North programme	climb from EDI RWY24	emissions in their totality, there will be a change in the location of emissions below		to an overall reduction in	This route structure in combination with deconflicted arrival structures would be expected to improve CDO performance Option can least an RN although RN benefit fo	s be designed to at NAV1 specification NP+RF may deliver or early left turns	DP1 and DP9 See DP3 and See DP9	See DP2, DP4, D5, DP6, DP7, DP8, DP12 and DP13 See DP2, DP4, D5, DP6, DP7, DP8, DP12 and DP13 Option no expected to a defence an security object
	RWY 05 Dep Option F	This option requires a Track Adjustment on departure. These are possible of PANS OPS but in a recent ACP, the CAA IFP department wanted a not below 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 we required during IFP ground validation to ensure the WP is acceptable. The early left turn towards high ground also needs more detailed IFP designent ensure it's safe with an acceptable climb gradient. 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 chances of human error (aircraft flying the wrong SID, or ATC thinking the SID is in use) will exist. Further assurances required. This will be investigated in further detail as paths the IOA should this option progress.	ithin 500ft the II be The early left turn is expected to enhance in Glasgow's operational performance in the the	The design option could be contained within the existing CAS volume and also offers potential to reduce the total volume of CAS	people overflown bel	ow contour (from a typic	Option is expected to reduce the frequency of overflight for those under the extende centreline within 5nm of the runway	noise more equitably. The track adjustment on departure shares the noise from NORBO, PERTH, LOMON, FOYLE and CLYDE	Option does contain mechanisms for predictable respite for the NORBO SID which is the busiest departure route. It contains a NORBO SID which could alternate at different times o	of noise sensitive areas and buildings, national parks, areas of outstanding natural beauty/National Scenic Areas	er Option has SIDs turning before 5nm therefore will se an increase in frequency of overflight of areas that are less frequently overflown today.	e Option makes use of offse departures for some SIDs	Would need to ensure the NORBO SID is laterally separated from LANAK hold. Would only want SID to climb to 6000f with ATC to clear through RWY05 arrival. Use of PBN arrival to RWY 05 would be beneficial here so we can gurantee descent profile versus NORBO SIDs. Wou still like flexibility to Vector to the South after first turn (when LANAK not in use) Would need a Standing Agreement to P with a level greater than 6000ft. SID switching over night would be sensible	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		No feedback to date to suggest option is not, or cannot be, compatible with the wider FASI North programme.	FL100, based on existing climb performance observed from EDL the GLA SIDs in this	emissions in their totality, there will be a change in the location of emissions below 1,000ft which could affect	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)	to an overall reduction in	This route structure in combination with deconflicted arrival structures would be expected to improve CDO performance	be designed to at NAV1 specification NP+RF may deliver or early left turns	DP1 and DP9 See DP3 and See DP9	See DP2, DP4, D5, DP6, DP7, DP8, DP12 and DP13 See DP2, DP4, D5, DP6, DP7, DP8, DP12 defence an security object
	RWY 05 Dep Option G	This option requires a Track Adjustment on departure. These are possible of PANS OPS but in a recent ACP, the CAA IFP department wanted a not below 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 we required during IFP ground validation to ensure the WP is acceptable. The early left turn towards high ground also needs more detailed IFP designensure it's safe with an acceptable climb gradient. 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 chances of human error (aircraft flying the wrong SID, or ATC thinking the SID is in use) will exist. Further assurances required. This will be investigated in further detail as pathered.	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 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 policy.	oorne holding increase the number people overflown bel 4000ft (centreline to	increase the number people within the 65dBLA contour (from a typic aircraft overflight) by m	Option is expected to reduce the frequency of overflight for those under the extende centreline within 5nm of the runway	I from NORBO, PERTH.	mechanisms for predictable respite. It contains a NORBO SID which could be different to the one(s) used during the peak departures periods. The PERTH/LOMON/FOYLE/ SIDs in this option would also be	of noise sensitive areas and buildings, national parks, areas of outstanding natural beauty/National Scenic Areas	er Option has SIDs turning d before 5nm therefore will se an increase in frequency of overflight of areas that are less frequently overflown today.	e Option makes use of offse departures for some SIDs	Option probably has the most benefit do to departure throughput for the peak ar the improved miles for the slow Northbound traffic the rest of that day However the ability to get the L/R NORB departures to the holding point in the correct order will be a challenge and would require new taxiway infrastructur to maximise ability for GMP to deliver th correct order Would like to see a reduction in number of SIDs for in Perio 2, keep the same RTO NORBO option at the morning. Possibly more HF issues to oversome than Option F	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	FL100, based on existing climb performance observed	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	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)	Option will clearly contribute to an overall reduction in aircraft emissions	This route structure in combination with deconflicted arrival structures would be expected to improve CDO performance	be designed to at NAV1 specification NP+RF may deliver or early left turns	DP1 and DP9 See DP3 and See DP9	See DP2, DP4, D5, DP6, DP7, DP8, DP12 and DP13 See DP2, DP4, D5, expected to a defence an security object
	RWY 05 Dep Option H		the Il be NORBO departures across to different SIDs is expected to enhance Glasgow's operational performance in the future	t Northbound SIDs on this due to the earl	oorne holding ly left turn and bility to share tures across 2	aircraft overflight) by m	Option is expected to reduce the frequency of overflight for those under the extende centreline within 5nm of the runway	from NORBO, PERTH,	This is a fixed route structure e Option doesn't contain mechanisms for predictable respite e	re. of noise sensitive areas and buildings, national parks,	· · · · · · · · · · · · · · · · · · ·	e Option makes use of offse departures for some SIDs	Option would appear to be beneficial in terms of reduced miles and CCO for bot NORBO departures and deconfliction from the main LANAK arrivals (subject to being separated from LANAK hold). Would need 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 the time is good as it reduces the number of conflictions with arrivals from the North	om 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		FL100, based on existing climb performance observed from EDI, the GLA SIDs in this	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		aircraft emissions	This route structure in combination with deconflicted arrival structures would be expected to improve CDO performance Option can least an RN although RN benefit fo	be designed to at NAV1 specification NP+RF may deliver or early left turns	DP1 and DP9 See DP3 and See DP9	See DP2, DP4, D5, DP6, DP7, DP8, DP12 and DP13 See DP2, DP4, D5, Expected to a defence an security object
	RWY 05 Dep Option I	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 as pathe 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	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 policy.	Option is expected to rewithin 25% of the number of the second of the number of the second of the se	emain Option is expected to report of within 25% of the number people within the 65dBLA contour (from a typic aircraft overflight)	main er of the frequency of overflight for those under the extende cal centreline within 5nm of the runway	left early takes c.40% of	This is a fixed route structure ng Option doesn't contain mechanisms for predictable respite	buildings, national parks, areas of outstanding natural	er Option has SIDs turning debefore 5nm therefore will see an increase in frequency of overflight of areas that are less frequently overflown today.	e Option makes use of offse departures for some SIDs	Option would appear to be beneficial in terms of reduced miles and CCO for bot NORBO departures and deconfliction from the main LANAK arrivals (subject to being separated from LANAK hold). Would need 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 the 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 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	climb continuously to at least FL100, based on existing	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)	Option will clearly contribute to an overall reduction in aircraft emissions	This route structure in combination with deconflicted arrival structures would be expected to improve CDO performance Option can least an RN although RN benefit fo	be designed to at NAV1 specification NP+RF may deliver or early left turns	DP1 and DP9 See DP3 and See DP9	See DP2, DP4, D5, DP6, DP7, DP8, DP12 and DP13 See DP2, DP4, D5, DP6, DP7, DP8, DP12 defence an security object

										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.	o transport, enable safe, efficient		Minimise the total adverse effects of a	aircraft noise and visual intrusion on physical a	and mental health and wellbeing.	multiple route options and of possible within the technical AT	other respite methods that are	The arrival and departure routes that see below 7000ft should avoid noise sensitiv national parks, areas of outstanding nat Scenic Areas and areas that are not currer noise.	atural beauty/National	urrently ise on Reduce complexity and b cinity of out,	ottlenecks in controlled and uncontro reduction in airspace infringeme		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 level in coordination with NATS Prestwick.	Minimise the growth in aircraft emel ecological impacts to address growth		in local air quality and adverse	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	Routes should be designed to meet a RNAV1 specification as a minimum in order to gain maximum benefit of the erformance capabilities of the modern aircraft fleet operating at Glasgow Airport in line with the guidance rovided in CAA CAP1385 on enhanced route spacing for PBN and provide sufficient resilience and redundancy against Global Navigation Satellite System (GNSS) failure.	The CIA ACD accorde with	the CAA's published Airspace Modernis ociated with it and all other relevant pol	
					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	Overfly new areas	Complexity in CAS	Bottleneck outside CAS	Infringements		Local Air Quality	Ecological Impacts	Climate Change			Maintain and eff enhance high aviation safety standards i	Secure the dicient use of direction are and direction enable airspace network enable airspace network enable airspace network enable enable airspace network enable	rove environmental performance by ucing emissions and better managing noise Facilitate defence and security objectives
	RWY 23 Dep Do Nothing The airspace design is as safe or safer than today with no safety concern at this time	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	Option is expected to increase ground or airborne 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 overflight 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	o avoids overflying areas currently affected by aircraft noise	Option is likely to stay the or contribute to a tolera increase in complexity for ATC inside CAS. Any untole increase would be mitigate limiting traffic numbers increasing delays	ed by	os 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		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 ncreased delays as traffic levels rise	Option is unlikely to affect CCO/CDO performance	Doing nothing would maintain Glasgow's reliance on Conventional Navigation for departures	See DP1 and DP9 See	DP3 and DP9 See DP2, DP4 and DP DP11	DP2, DP4, D5, DP6, P7, DP8, DP12 and DP13 Option not expected to affect defence and security objectives
	This option requires a Track Adjustment on departure. These are possib 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 aircraft 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 detail a 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	ne SIDs splitting before 5nm together with e sharing of NORBO departures across 2 of those SIDs is expected to redcue ground delays	Option is expected to increase the number o beople overflown below 4000ft (centreline to centreline) by more than 25%	of people within the 65dBLAmax contour	Option is expected to reduce the frequency of overflight for those under the extended centreline within 5nm of the runway	all departures away from those	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	o has SIDs turning before in therefore will see an rease in frequency of ght of areas that are less ently overflown today. Option makes use of departures for all	Looks good, especially Prestwick Centre can acce Min departure separation significant issues envisage this point however the ab offset to get the L/R NORBO departures to the holding in the correct order will be challenge and would reque new taxiway infrastructure maximise ability for GMB deliver the correct order	opportunity to reduce the total re to P to	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)	Option will clearly contribute to an overall reduction in aircraft emissions	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 is of RNP+RF may deliver benefit	See DP1 and DP9 See	DP3 and DP9 See DP2, DP4 and DP11 See DP11	DP2, DP4, D5, DP6, P7, DP8, DP12 and DP13 Option not expected to affect defence and security objectives
	This option requires a Track Adjustment on departure. These are possib 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 aircraft 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 detail a part of the IOA should this option progress.	currently tactically turned right early already so the only enhancement would be for PERTH departures in the first rotation of which they'r aren't many. This option is therefore expected	The design option could be contained within the existing CAS volume and also offers potential to reduce the total volume of CAS	Although there is an early right turn, this option sees that turn used only for ROBBO/CLYDE/LOMON/FOYLE/PERTH departures. Many ROBBO/CLYDE/LOMON/FOYLE departures are currently tactically turned right early tready so the only enhancement would be or PERTH departures in the first rotation of nich they're aren't many. All NORBO traffic in one SID is the same as today. Therefore is option is not expected to reduce ground holding	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 numbe 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.	mechanisms for predictable	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	o has SIDs turning before in therefore will see an rease in frequency of ght of areas that are less ently overflown today.	No significant issues envis offset at this point although a IDs NORBO traffic down one r not as optimal as Option	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		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)	Option will clearly contribute to an overall reduction in aircraft emissions	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 is of RNP+RF may deliver benefit	See DP1 and DP9 See	DP3 and DP9 See DP2, DP4 and DP DP11	DP2, DP4, D5, DP6, P7, DP8, DP12 and DP13 Option not expected to affect defence and security objectives
	This option requires a Track Adjustment on departure. These are possib 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 aircraft 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, or ATC thinking the other SID is in use) will exist. Further assurances required. This will be investigated in further detail a part of the IOA should this option progress.	only during the first rotation	gh potential to reduce the total	ne SIDs splitting before 5nm together with e sharing of NORBO departures across 2 of those SIDs is expected to redcue ground lays although only during the first rotation	Option is expected to increase the number o beople overflown below 4000ft (centreline to centreline) by more than 25%	Option is expected to increase the numbe 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	all departures away from these	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	o has SIDs turning before therefore will see an rease in frequency of ght of areas that are less ently overflown today. Option makes use of departures for all	offset Workable but SID swtich generates issues to be reso	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 route centrelines of this option between 2000-4000ft although those areas are also already overflown by RWY05 departures)	Option will clearly contribute to an overall reduction in aircraft emissions	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 is of RNP+RF may deliver benefit	See DP1 and DP9 See	DP3 and DP9 See DP2, DP4 and DP11 See DP11	DP2, DP4, D5, DP6, P7, DP8, DP12 and DP13 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 aircraft 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, or ATC thinking the other SID is in use) will exist. Further assurances required. This will be investigated in further detail a 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 although 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	ne SIDs splitting before 5nm together with e sharing of NORBO departures across 2 of those SIDs is expected to redcue ground lays although only during the first rotation	Option is expected to increase the number o beople overflown below 4000ft (centreline to centreline) by more than 25%	Option is expected to increase the numbe 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	o has SIDs turning before in therefore will see an rease in frequency of ght of areas that are less ently overflown today.	offset Workable but SID swtich SIDs generates issues to be reso	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 route centrelines of this option between 2000-4000ft although those areas are also already overflown by RWY05 departures)	Option will clearly contribute to an overall reduction in aircraft emissions	arrival structures would be	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 DP11	DP2, DP4, D5, DP6, P7, DP8, DP12 and DP13 Option not expected to affect defence and security objectives
	This option requires a Track Adjustment on departure. These are possib 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 aircraft 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 detail a 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	ne SIDs splitting before 5nm together with e sharing of NORBO departures across 2 of those SIDs is expected to redcue ground delays	Option is expected to increase the number o beople 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	n has SIDs turning before in therefore will see an rease in frequency of ght of areas that are less ently overflown today.	No significant issues envis and good if NORBOs can min split between ther	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)	Option will clearly contribute to an overall reduction in aircraft emissions	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 is of RNP+RF may deliver benefit	See DP1 and DP9 See	DP3 and DP9 See DP2, DP4 and DP DP11	DP2, DP4, D5, DP6, P7, DP8, DP12 and DP13 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 for airborne holding for inbound traffic and holding on the ground pre-departure for outbound traffic	Minimise the total adverse effects	s of aircraft noise and visual intrusio and wellbeing.	n on physical and mental health	noise dispersion through t transparent multiple route	the use of predictable and e options and other respite thin the technical ATC system,	, beauty/National Scenic Ai	d noise sensitive areas and ireas of outstanding natural	Mitigate the impacts on local communities that are	Reduce complexity and bottleneck redu	ks in controlled and uncontrolled action in airspace infringements.	d airspace and contribute to a	ensure that the airspace design options are compatible with the wider programme of lower altitude	s 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 Modernisation d with it and all other relevant policies	
					Number of people overflown belov 4000ft (centreline to centreline)	Number of people within the 65dBLAmax contour (from a typic aircraft overflight)	Overflight for those linder the	Use of multiple routes	Mechanisms for predictable respite	Noise sensitive areas and e 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 managing the airspace network n	
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.	val 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		n 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		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 in complexity for GLA ATC inside CAS. A untolerable increase would be mitigat by limiting traffic numbers and increasing delays	ny 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	nd 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 option Option discontinued	fer provide the exact amount of ld spacing to the runway between	volume of CAS	spacing once the aircraft have left the stacks. They would also be more	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		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 increas 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 bottleneck 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	nd 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 Option discontinued	fer provide the exact amount of Id 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 more 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 bottleneck 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 and 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 optic unless 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 i because of the inability of ATC to provide theexact amount of spaci to the runway between pairs whi is likely to lead to inefficiences a well as an increase in ground an airborne holding during peak time		spacing once the aircraft have lef	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		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	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 bottleneck 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 optic unless 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 increasin 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 lef	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 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 arrival 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 bottleneck 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 optic unless 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 i 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 increas in ground and airborne holding during peak times.	potential to reduce the total	spacing once the aircraft have lef	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 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 arrival reference the Campsie Line would remain with a PBN route. This route above c.5000ft will need re-aligning to the control of the part of the pa	Option is likely to contribute to a reduction in bottleneck outside CAS because this option can be contained within existing CAS whilst offering opportunity to reduce the total volume of 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 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 RNAVT specification	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
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 option	Use of a pure PBN arrival system expected to degrade future or operational performance. This i because of the inability of ATC to provide the exact amount of spacing to the runway between n. pairs which is likely to lead to inefficiences as well as an increas in ground and airborne holding during peak times.	VOLUME OF UNS	spacing once the aircraft have lef	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 increas 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 bottleneck 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 which 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 DP11 DP13 See DP2, DP4, D	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)	n 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 bottleneck 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 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 performan in the future. This is because ATc can use the PBN arrivals when traffic levels are low and this wi also facilitate the use of combined Tower and Approact 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)	n 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.	te 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 the 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	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 departure 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

									Desi	gn Principle Evaluation												
Option Image	Option The airspace design and its operation Name must be as safe or safer than today		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 sensiti buildings, national parks, areas of outsta	Mitigate the impa Glasgow Airport communities to we areas and currently affected anding natural noise on final appo that are not vicinity of the in	that are by aircraft roach or the nmediate overflight is	ottlenecks in controlled and unco to a reduction in airspace infringe	ntrolled airspace and contribute ements.	ensure that the airspace design options are compatible with the wider programme of lower altitude	coordination with NATS	inimise the growth in aircraft dverse ecological impacts to a	emissions, the further degrad address growing concerns abo climate change.	dation in local air quality and out 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 cannot be achieved	performance capabilities of the modern aircraft fleet		's published Airspace Modernisation Strategy (CAP1 vith 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.	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 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 runway.	Option doesn't see the under the within 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	ill not see an ifrequency of f areas that are ntly overflown oday. N/A - the mitig provided through track adjusti	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 traffic 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 aintain the same level of scal air quality emissions	The airspace design is not expected to result in any hanges 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 DP13 Operation of the property of the proper
	RWY 05 Arrival Option A Rthis point, this assessment assumthe routes are used as single routes, ras 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	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 acreased 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 centreline of the freque overflight for those unextended centreline of the freque overflight for those unextended centreline overflight fo	ave no ocy of der the vithin y	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 sw therefore r increase ir overflight o less freque today. (Howe PBN route wincreased rates)	BN arrival route existing main athe and will not result in an a frequency of arrivals, the absteeper RNP APCH Glasgow will be invite of overflight ader that route) N/A - the mitigoprovided through track adjustment arrivals, the absteeper RNP APCH Glasgow will be involved through track adjustment arrivals, the absteeper RNP APCH Glasgow will be involved through track adjustment arrivals, the absteeper RNP APCH Glasgow will be involved through track adjustment arrivals, the absteeper RNP APCH Glasgow will be involved through track adjustment arrivals, the absteeper RNP APCH Glasgow will be involved through track adjustment arrivals, the absteeper RNP APCH Glasgow will be involved through track adjustment arrivals, the absteeper RNP APCH Glasgow will be involved through track adjustment arrivals, the absteeper RNP APCH Glasgow will be involved through track adjustment arrivals, the absteeper RNP APCH Glasgow will be involved through track adjustment arrivals, the absteeper RNP APCH Glasgow will be involved through the provided through track adjustment arrivals, the absteeper RNP APCH Glasgow will be involved through the provided through track adjustment arrivals.	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 to deconflicted upto FL90 ()	Since this option has no nange to how aircraft fly slow 1,000ft compared to day, there are likely to be changes to local air quality positive or negative) as a ult of this airspace design option.	The airspace design is not expected to result in any hanges 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 Opi expect defe security
	RWY 05 Arrival Option B RWY 05 Arrival option Explored in rotation to provide respite. In which case the chances of human errival, or A thinking the wrong arrival, or A thinking the otherroute is in use) with exist. At this point, this assessment assume 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		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 sw therefore r increase in overflight or less freque today. (Howe PBN route wincreased rates)	track adjustment are arrivals, the about 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 to deconflicted upto FL90 ()	Since this option has no hange to how aircraft fly slow 1,000ft compared to day, there are likely to be changes to local air quality positive or negative) as a ult of this airspace design option.	The airspace design is not expected to result in any hanges 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 Optobries the property of the property
	RWY 05 Arrival Option C RWY 05 Arrival content of the chances of human error (aircraft flying the wrong arrival, or A thinking the otherroute is in use) with example of the routes are used as single routes, ras 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 form.		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 sw therefore r increase in overflight or less freque today. (Howe PBN route wincreased research)	BN arrival route existing main athe and will not result in an a frequency of a arrivals, the ab Steeper RNP APCH Glasgow will be in however, the ILS will result in an atte of overflight ider that route)	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 to deconflicted upto FL90 no	Since this option has no hange to how aircraft fly slow 1,000ft compared to day, there are likely to be changes to local air quality positive or negative) as a ult of this airspace design option.	hanges 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 Opi expect defe security
	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 assumption 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 people within the 65dBLAmax contour (from a typical aircraft overflight) Option is expected to he change to the freque overflight for those unextended centreline to the freque overflight for those unextended to the freque overflight for those unextended centreline to the frequency overflight for those unextended centreline to the frequency overflight for those unextended centreline to the frequency overflight for the frequency overfli		outes This option does not including 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 sw therefore r increase ir overflight o less freque today. (Howe PBN route wincreased rates)	BN arrival route existing main athe and will not result in an afrequency of arrivals, the abstract sole use of a will result in an after of overflight ader that route) N/A - the mitig provided through track adjustment arrivals, the abstract arrivals arrivals arrivals.	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 to deconflicted upto FL90	Since this option has no hange to how aircraft fly down 1,000ft compared to day, there are likely to be changes to local air quality positive or negative) as a ult of this airspace design option.	hanges 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 Opto expect 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 form.	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 wo increase ir overflight o less freque to	N/A - the mitigory provided through track adjustment are and the steeper RNP APCH Glasgow will be in however, the ILS with the steeper RNP are an at the steeper RNP are at t	cation is In SIDs with cents. For same in terms of level arrival into envestigated will have to	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	c be All routes are procedurally to	Since this option has no hange to how aircraft fly slow 1,000ft compared to day, there are likely to be changes to local air quality positive or negative) as a ult of this airspace design option.	The airspace design is not expected to result in any hanges 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 Opi expect defe security
	RWY 05 Arrival Vectors and PBN hybrid No safety concerns identified at thi 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 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 thos communities not under the	areas and buildings, national parks, areas of outstanding ption will no in frequency see Scenic Areas overflown below areas that are	rd is within the val swathe, this t 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 calbe 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 to deconflicted upto FL90 no ()	Since this option has no hange to how aircraft fly slow 1,000ft compared to day, there are likely to be changes to local air quality positive or negative) as a ult of this airspace design option.	The airspace design is not expected to result in any hanges 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 Opiexpect defersecurity