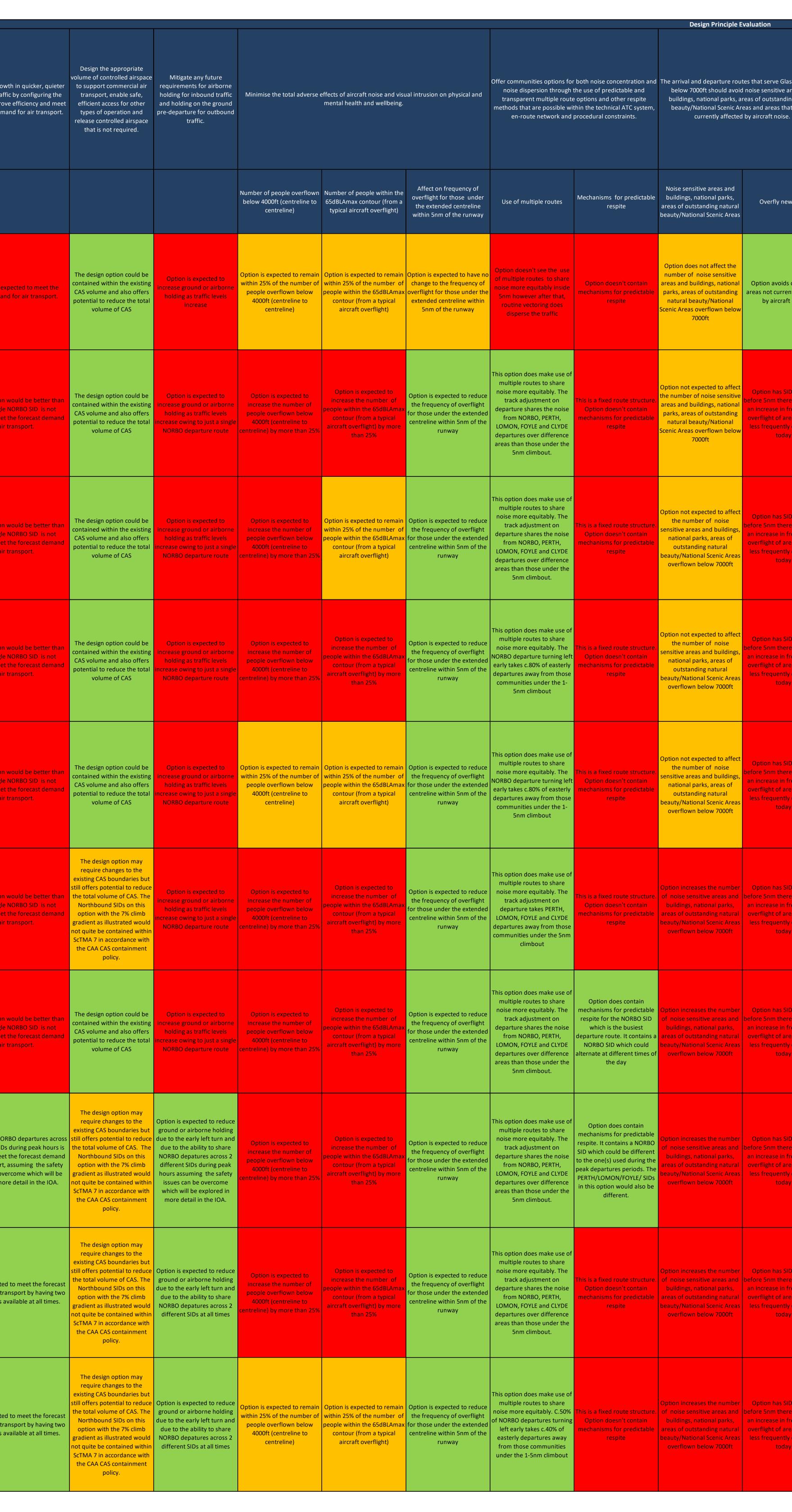


Glasgow Airport FASI-N Airspace Change Proposal

Step 2A Annex A - Design Principle Evaluation

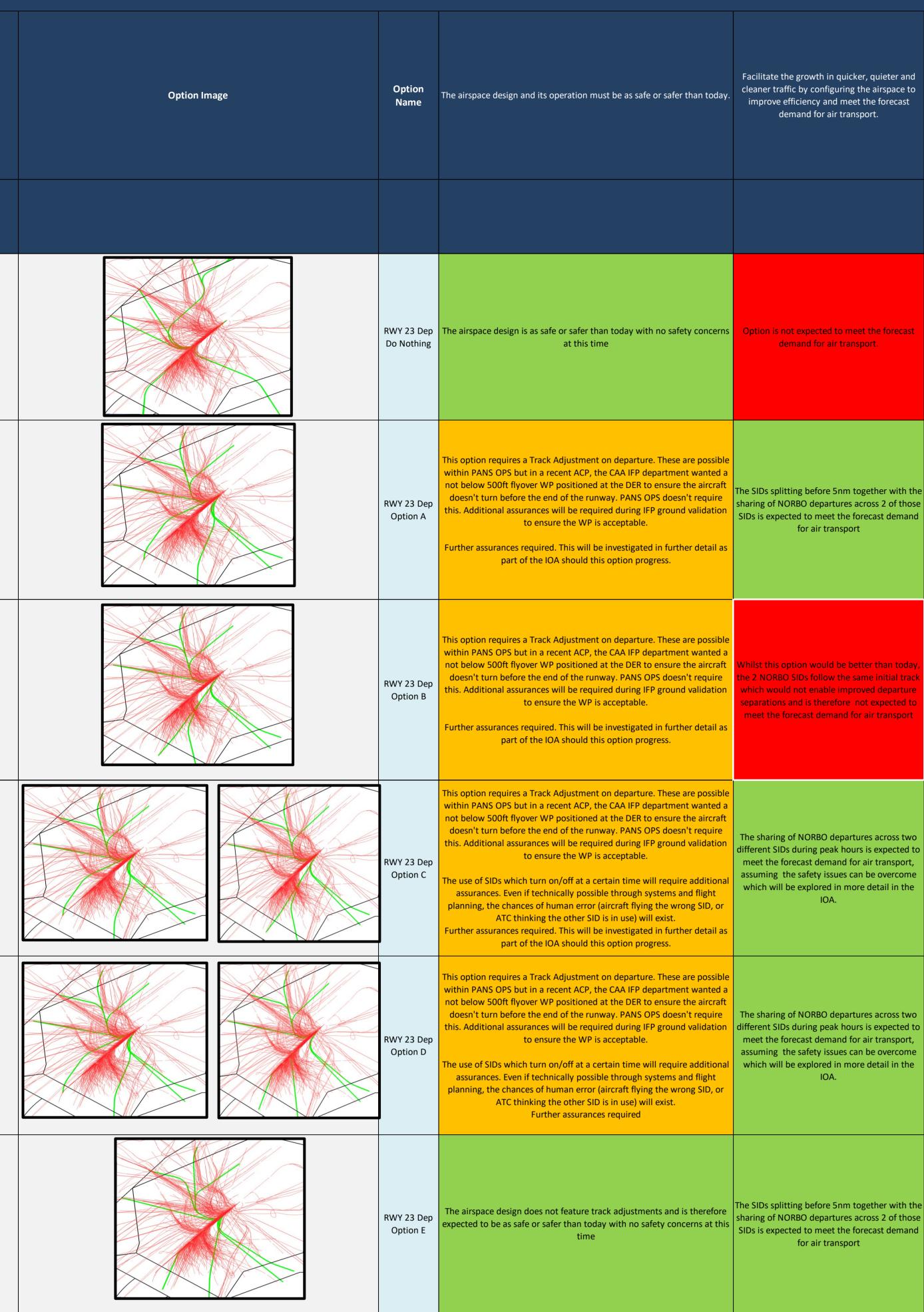
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	V1.1 Submitted to the CAA in July 2022 (Please see the Change Record on CAA Airspace Change Portal for details of updates)
	V1.2 Following CAA request, text changes between V1.0 and V1.1 highlighted.
	V1.3 Updates following clarification meeting with the CAA
	V1.4 Updates following clarification meeting with the CAA (highlighted with white border).

Option Image	Option Name	The airspace design and its operation must be as safe or safer than today.	Facilitate the growt and cleaner traffic airspace to improve the forecast dema
	RWY 05 Dep Do Nothing	The airspace design is as safe or safer than today with no safety concerns at this time	Option is not exp forecast demand
	RWY 05 Dep Option A	This option requires a Track Adjustment on departure. These are possible within PANS OPS but in a recent ACP, the CAA IFP department wanted a 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 early left turn towards high ground also needs more detailed IFP design to ensure it's safe with an acceptable climb gradient. Further assurances required. This will be investigated in further detail as part of the IOA should this option progress.	Whist this ontion w
	RWY 05 Dep Option B	This option requires a Track Adjustment on departure. These are possible within PANS OPS but in a recent ACP, the CAA IFP department wanted a 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 early left turn towards high ground also needs more detailed IFP design to ensure it's safe with an acceptable climb gradient. Further assurances required. This will be investigated in further detail as part of the IOA should this option progress.	Whist this option v today, a single M expected to meet t for air t
	RWY 05 Dep Option C	The early left turn towards high ground needs more detailed IFP design to ensure it's safe with an acceptable climb gradient. Further assurances required. This will be investigated in further detail as part of the IOA should this option progress.	Whlst this option v today, a single N expected to meet t for air t
	RWY 05 Dep Option D	The early left turn towards high ground needs more detailed IFP design to ensure it's safe with an acceptable climb gradient. Further assurances required. This will be investigated in further detail as part of the IOA should this option progress.	Whist this option v today, a single N expected to meet t for air t
	RWY 05 Dep Option E	This option requires a Track Adjustment on departure. These are possible within PANS OPS but in a recent ACP, the CAA IFP department wanted a 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 early left turn towards high ground also needs more detailed IFP design to ensure it's safe with an acceptable climb gradient, especially as this SID would service lower performing aircraft (in terms of climb gradient) Further assurances required. This will be investigated in further detail as part of the IOA should this option progress.	Whist this option v today, a single M expected to meet t for air t
	RWY 05 Dep Option F	This option requires a Track Adjustment on departure. These are possible within PANS OPS but in a recent ACP, the CAA IFP department wanted a 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 early left turn towards high ground also needs more detailed IFP design to ensure it's safe with an acceptable climb gradient. The use of SIDs which turn on/off at a certain time will require additional assurances. Even if technically possible through systems and flight planning, 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 as part of the IOA should this option progress.	Whist this option v today, a single M expected to meet t
	RWY 05 Dep Option G	This option requires a Track Adjustment on departure. These are possible within PANS OPS but in a recent ACP, the CAA IFP department wanted a 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 early left turn towards high ground also needs more detailed IFP design to ensure it's safe with an acceptable climb gradient. The use of SIDs which turn on/off at a certain time will require additional assurances. Even if technically possible through systems and flight planning, 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 as part of the IOA should this option progress.	The sharing of NORI two different SIDs expected to meet t for air transport, a issues can be over explored in more
	RWY 05 Dep Option H	This option requires a Track Adjustment on departure. These are possible within PANS OPS but in a recent ACP, the CAA IFP department wanted a 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 early left turn towards high ground also needs more detailed IFP design to ensure it's safe with an acceptable climb gradient, especially as this SID would service lower performing aircraft (in terms of climb gradient) Further assurances required. This will be investigated in further detail as part of the IOA should this option progress.	Option is expected demand for air trar NORBO routes av
	RWY 05 Dep Option I	The early left turn towards high ground needs more detailed IFP design to ensure it's safe with an acceptable climb gradient. Further assurances required. This will be investigated in further detail as part of the IOA should this option progress.	Option is expected demand for air trar NORBO routes av



Glasgow Airport e areas and Iding natural that are not ise.	Mitigate the impacts on local communities that are currently affected by aircraft noise on final approach or the vicinity of the immediate climb out, where overflight is unavoidable.	Reduce complexity and bottlenecks in or reduction	controlled and uncontrolled air in airspace infringements.	space and contribute to a	Collaborate with other Scottish airports and NATS to ensure that the airspace design options are compatible with the wider programme of lower altitude and network airspace changes being coordinated by the FASI North programme.	Edinburgh airports should be procedurally deconflicted from the ground to a preferred level in coordination with NATS	Minimise the growth in aircra adverse ecological impacts to	
new areas		Complexity in CAS	Bottleneck outside CAS	Infringements			Local Air Quality	Ecological
ids overflying rently affected aft noise	Option does not make use of offset departures	Option is likely to stay the same or contribute to a tolerable increase in complexity for GLA ATC inside CAS.	Option won't affect 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.	Doing nothing will not change flight paths below 1000ft	The airspace expected to r changes to ecol
SIDs turning erefore will see n frequency of areas that are itly overflown day.	Option makes use of offset departures for some SIDs	Option would appear to be beneficial overall in terms of reduced miles and CCO for NORBO departures and deconfliction from the main arrival flow from the South. However this option means that a NORBO behind a slower departure to the NW would require a greater separation that today so could result in continued routine vectoring of some departures for runway efficiency.	Option may 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. Current information from NERL and EDI suggests that continuous climb to FL100 is likely	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 SSSIs, NSAs or I overflown by centrelines belo option does no more of these 2000ft. (There these areas ove route centre option betwee although those already overflo depart
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SIDs turning erefore will see n frequency of areas that are itly overflown day.	Option makes use of offset departures for some SIDs	A NORBO departure which turns right would interact with the main arrival flow from the South and so isn't as low complexity as a SID which turns left. So long as we can ensure the NORBO SID is laterally separated from the arrivals (use of PBN arrival to RWY 05 would be beneficial here so we can gurantee descent profile versus NORBO SIDs) option is still likely to contribute to a reduction in complexity for GLA ATC inside CAS.	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	The LUSIV and TALLA SIDs in this option route much further to the East than today. Even with continuous climb from EDI RWY24 departures, these GLA departures could have to level off underneath them	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 SSSIs, NSAs or I overflown by centrelines belo option does no more of these 2000ft. (There these areas ove route centre option betwee although those already overflo depart
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	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 simultaneously.	Routes should be designed to meet a RNAV1 specification as a minimum in order to gain maximum benefit of the performance capabilities of the modern aircraft fleet operating at Glasgow Airport in line with the guidance provided in CAA CAP1385 on enhanced route spacing for PBN and provide sufficient resilience and redundancy against Global Navigation Satellite System (GNSS) failure.				Modernisation Strate ner relevant policies a	
	Climate Change			Maintain and enhance high aviation safety standards	Secure the efficient use of airspace and enable integration	Avoid flight delays by better managing the airspace network	Improve environmental performance by reducing emissions and by better managing noise	Facilitate defence and security objectives
not ny pacts	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	Doing nothing would maintain Glasgow's reliance on Conventional Navigation for departures	See DP1 and DP9	See DP3 and DP9	See DP2 and DP4	See DP2, DP4, DP5, DP6, DP7, DP8, DP11, DP12 and DP13	Option not expected to affect defence and security objectives
Cs, arks ID This any ow e of nder is 00ft also /Y05	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 CCO and CDO performance	Option can be designed to at least an RNAV1 specification although RNP+RF may deliver benefit for early left turns	See DP1 and DP9	See DP3 and DP9	See DP2 and DP4	See DP2, DP4, DP5, DP6, DP7, DP8, DP11, DP12 and DP13	Option not expected to affect defence and security objectives
Cs, arks ID This any ow of nder is 00ft also /Y05	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 CCO and CDO performance	Option can be designed to at least an RNAV1 specification although RNP+RF may deliver benefit for early left turns	See DP1 and DP9	See DP3 and DP9	See DP2 and DP4	See DP2, DP4, DP5, DP6, DP7, DP8, DP11, DP12 and DP13	Option not expected to affect defence and security objectives
Cs, arks ID This any ow of nder is 00ft also /Y05	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 CCO and CDO performance	Option can be designed to at least an RNAV1 specification although RNP+RF may deliver benefit for early left turns	See DP1 and DP9	See DP3 and DP9	See DP2 and DP4	See DP2, DP4, DP5, DP6, DP7, DP8, DP11, DP12 and DP13	Option not expected to affect defence and security objectives
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Cs, arks ID This any ow of der is 00ft also /Y05	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 CCO and CDO performance	Option can be designed to at least an RNAV1 specification although RNP+RF may deliver benefit for early left turns	See DP1 and DP9	See DP3 and DP9	See DP2 and DP4	See DP2, DP4, DP5, DP6, DP7, DP8, DP11, DP12 and DP13	Option not expected to affect defence and security objectives
Cs, arks ID This any ow e of nder is 00ft also /Y05	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 CCO and CDO performance	Option can be designed to at least an RNAV1 specification although RNP+RF may deliver benefit for early left turns	See DP1 and DP9	See DP3 and DP9	See DP2 and DP4	See DP2, DP4, DP5, DP6, DP7, DP8, DP11, DP12 and DP13	Option not expected to affect defence and security objectives
Cs, arks ID This any ow of nder is 00ft also /Y05	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 CCO and CDO performance	Option can be designed to at least an RNAV1 specification although RNP+RF may deliver benefit for early left turns	See DP1 and DP9	See DP3 and DP9	See DP2 and DP4	See DP2, DP4, DP5, DP6, DP7, DP8, DP11, DP12 and DP13	Option not expected to affect defence and security objectives
Cs, arks ID This any ow e of nder is 00ft also /Y05	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 CCO and CDO performance	Option can be designed to at least an RNAV1 specification although RNP+RF may deliver benefit for early left turns	See DP1 and DP9	See DP3 and DP9	See DP2 and DP4	See DP2, DP4, DP5, DP6, DP7, DP8, DP11, DP12 and DP13	Option not expected to affect defence and security objectives



uieter and irspace to tra forecast		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 of a	aircraft noise and visual intrusion on physical an	nd mental health and wellbeing.	noise dispersion through the use	of predictable and transparent her respite methods that are System, en-route network and		tes that serve Glasgow Airport se sensitive areas and buildings, nding natural beauty/National not currently affected by aircraf	affected by aircraft noise on	/ Reduce complexity and bottl f	enecks in controlled and uncontrolle reduction in airspace infringements	d airspace and contribute to a	that the airspace design option are compatible with the wide programme of lower altitude	Routes to/from Glasgow and Edinburgh airports should be procedurally deconflicted from Minimise the growth in aircraft the ground to a preferred level in coordination with NATS		on in local air quality and adverse	Airport should climb and descend continuously to/from at least 7000ft with a preference for the most environmentally beneficial	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.	The GLA ACP accords wi			sation Strategy (CAP1711), any plicies and regulatory standards
			Number of people overflown below 4000ft (centreline to centreline)	t Number of people within the 65dBLAmax contour (from a typical aircraft overflight)	Affect on frequency of overflight for those under the extended centreline within 5nm of the runway		Mechanisms for predictable respite	Noise sensitive areas and buildings, national parks, areas of outstanding natural beauty/National Scenic Areas	Overfly new areas		Complexity in CAS	Bottleneck outside CAS	Infringements		Local Air Quality	Ecological Impacts	Climate Change			Maintain and enhance high aviation safety standards	Secure the efficient use of airspace and enable integration	void flight delays by better managing the	prove environmental performance by Facilitat ucing emissions and and s y better managing obje noise
e forecast	The design option could be ontained 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 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 more equitably inside 5nm however after that, routine vectoring does disperse the traffic	Option doesn't contain mechanisms for predictable respite	Option does not affect the number of noise sensitive areas and buildings, national parks, areas of outstanding natural beauty/National Scenic Areas overflown below 7000ft	Option avoids overflying areas not currently affected by aircraft noise	S Option does not make use of offset departures	Option is likely to stay the san or contribute to a tolerable increase in complexity for GL ATC inside CAS.	Option won't affect bottlenecks	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 flow below 7000ft at Glasgow but depends on the option taken forward by that sponsor		The airspace design is not expected to result in any changes to ecological impacts	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	Doing nothing would maintain Glasgow's reliance on Conventional Navigation for departures	See DP1 and DP9 See DP1 and DP9	ee DP3 and DP9 S	ee DP2 and DP4 DP7,	2 DP2, DP4, D5, DP6, 7, DP8, DP11, DP12 and DP13 Optioners expected defer security
s 2 of those	The design option could be ontained within the existing CAS volume and also offers potential to reduce the total volume of CAS	The SIDs splitting before 5nm together with the sharing of NORBO departures across 2 of those SIDs is expected to reduce ground delays	Option is expected to increase the number of people overflown below 4000ft (centreline t centreline) by more than 25%	at pooplo within the FEdDL (may contour	frequency of overflight for those	adjustment on departure takes	Option doesn't contain 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	Option has SIDs turning before 5nm therefore will see an increase in frequency of	Untion makes lise of offset	Option is likely to contribute t a reduction in complexity for GLA ATC inside CAS	Option may contribute to a reduction in bottlenecks o 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 sugges option is not, or cannot be, compatible with the wider FA North programme	stFL100, based on existing climb performance observed from EDI, the GLA SIDs in this option should be able to climb continuously to FL90. Currentbelow 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	centrelines below 2000ft. This option does not overfly any 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 CCO and CDO performance	RNAV1 specification although is of	See DP1 and DP9 Si	ee DP3 and DP9	ee DP2 and DP4 DP7,	e DP2, DP4, D5, DP6, 7, DP8, DP11, DP12 and DP13 Contempts Contem
nitial track c departure	The design option could be ontained 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 owing to just a single initial NORBO departure track	Option is expected to increase the Number of people overflown below 4000ft (centrelin to centreline) by more than 25%		under the extended centreline		Option doesn't contain	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	5nm therefore will see an increase in frequency of overflight of areas that are less	Option makes use of offset	Option is likely to contribute t a reduction in complexity for GLA ATC inside CAS	Option may contribute to a reduction in bottlenecks o 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 sugges option is not, or cannot be, compatible with the wider FA North programme	SI EDI, the GLA SIDs in this option should be able to climb continuously to FL90. Current	centrelines below 2000ft. This option does not overfly any more of these areas below 2000ft. (There are some of these areas overflown under	Option will clearly contribute to an overall reduction in aircraft emissions		RNAV1 specification although is of	See DP1 and DP9 See DP1 and DP9	ee DP3 and DP9	ee DP2 and DP4 DP7,	e DP2, DP4, D5, DP6, 7, DP8, DP11, DP12 and DP13 Gefer security
ransport,	ontained within the existing CAS volume and also offers	Option is expected to reduce ground or airborne holding due to the early right turn and due to the ability to share NORBO depatures across 2 different SIDs during peak hours, assuming the safety issues can be overcome which will be explored in more detail in the IOA	people overflown below 4000ft (centreline t	of people within the 65dBl Amax contour	frequency of overflight for those	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	mechanisms for predictable respite for the NORBO SID	Option increases the number of noise sensitive areas and buildings (but not national parks, areas of outstanding natural beauty/National Scenic Areas) overflown below 7000ft	Option has SIDs turning before 5nm therefore will see an increase in frequency of overflight of areas that are less frequently overflown today.	Option makes use of offset departures for all SIDs	Option is likely to contribute t a reduction in complexity bu only if SID swtiching issues ar resolved (see safety assesment	can be contained within	Option unlikely to have an impact on infringements	No feedback to date to sugges option is not, or cannot be, compatible with the wider FA North programme	stFL100, based on existing climb performance observed from EDI, the GLA SIDs in this option should be able to climb continuously to FL90. Currentbelow 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	centrelines below 2000ft. This option does not overfly any 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 CCO and CDO performance		See DP1 and DP9 See DP1 and DP9	ee DP3 and DP9 S	ee DP2 and DP4 DP7,	e DP2, DP4, D5, DP6, 7, DP8, DP11, DP12 and DP13 Option expected defer security
cransport,	The design option could be ontained within the existing CAS volume and also offers	Option is expected to reduce ground or airborne holding due to the early right turn and due to the ability to share NORBO depatures across 2 different SIDs during peak hours, assuming the safety issues can be overcome which will be explored in more detail in the IOA	people overflown below 4000ft (centreline t	of people within the 65dBl Amax contour	frequency of overflight for those	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 increases the number of noise sensitive areas and buildings (but not national parks, areas of outstanding natural beauty/National Scenic Areas) overflown below 7000ft	Option has SIDs turning before 5nm therefore will see an increase in frequency of overflight of areas that are less	e Option makes use of offset departures for some SIDs	Option is likely to contribute t a reduction in complexity bu only if SID swtiching issues ar resolved (see safety assesmen	can be contained within	Option unlikely to have an impact on infringements	No feedback to date to sugges option is not, or cannot be, compatible with the wider FA North programme	stFL100, based on existing climb performance observed from SIbelow 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	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	Option can be designed to at least an RNAV1 specification although is of RNP+RF may deliver benefit	See DP1 and DP9 So	ee DP3 and DP9 S	ee DP2 and DP4 DP7,	2 DP2, DP4, D5, DP6, 7, DP8, DP11, DP12 and DP13 Security
her with the s 2 of those st demand	The design option could be ontained within the existing CAS volume and also offers potential to reduce the total volume of CAS	The SIDs splitting before 5nm together with the sharing of NORBO departures across 2 of those SIDs is expected to reduce ground delays	Option is expected to increase the number c people overflown below 4000ft (centreline t centreline) by more than 25%	of 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	Option has SIDs turning before 5nm therefore will see an increase in frequency of overflight of areas that are less frequently overflown today.	Option does not make use of offset departures	Option is likely to contribute to a reduction in complexity for GLA ATC inside CAS	Option may contribute to a reduction in bottlenecks o 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 sugges option is not, or cannot be, compatible with the wider FA 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. Current information from NERL and EDI suggests that continuous climb to FL100 is likelySince 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.	option does not overfly any more of these areas below 2000ft. (There are some of these areas overflown under route centrelines of this option	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 CCO and 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 DP1 and DP9	ee DP3 and DP9 S	ee DP2 and DP4 See D DP7,	e DP2, DP4, D5, DP6, 7, DP8, DP11, DP12 and DP13 Contraction Cont

Option Image	Option The airspace design and its operation Name must be as safe or safer than today.		e transport, enable safe, et efficient access for other	requirements for airborne holding for inbound traffic and holding on the ground pre-departure for outbound	Minimise the total adverse e	ffects of aircraft noise and visual intrusion on physic mental health and wellbeing.	l and noise dispersion thr transparent multiple methods that are possib	rough the use of predictable and e route options and other respite	and The arrival and departure ro below 7000ft should avo buildings, national parks, em, beauty/National Scenic , currently affecto	id noise sensitive areas and areas of outstanding natural	Mitigate the impacts on loca t communities that are currently affected by aircraft noise on final approach or th	e Reduce complexity and bottl to a	enecks in controlled and uncor a reduction in airspace infringer		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.	Edinburgh airports should be procedurally deconflicted from the ground to a preferred level in coordination with NATS		rcraft emissions, the further deg ts to address growing concerns a climate change.	radation in local air quality and bout the impact of aviation on	Aircraft operating at Glasgow Airport should climb and descend continuously to/from at least 7000ft with a preference for the most environmentally beneficial option to be chose, if both	performance capabilities of the modern aircraft fleet	The GLA ACP accords with the C current or future plans associate	A's published Airspace Modernisation Str with it and all other relevant policies and	rategy (CAP1711), any d regulatory standards
					Number of people overflown below 4000ft (centreline to centreline)	Number of people within the 65dBLAmax contour (from a typical aircraft overflight) 5nm of the run	nder the Use of multiple route within	es Mechanisms for predictal respite	Noise sensitive areas and ble buildings, national parks, areas of outstanding natura beauty/National Scenic Area	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 an enable integratio	delays by better performance by	Facilitate defend y and security s and jing
	RWY 05 Arrv Do Nothing The airspace design is as safe or safer than today with no safety concerns a this time	r demand for air transport however no that changes to vectoring practices would be required	CAS volume and also offers	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 people within the 65dBLAmax contour (from a typical aircraft overflight) 5nm of the run	I does disperse the trat	respite	Option does not affect the number of noise sensitive areas and buildings, nationa parks, areas of outstanding natural beauty/National Scenic Areas overflown below 7000ft	I increase in frequency of overflight of areas that are less frequently overflown	N/A - the mitigation is provided through SIDs with track adjustments		Option won't affect 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	All routes are procedurally deconflicted upto FL90	maintain the same level of	The airspace design is not expected to result in any s changes to ecological impac	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 ar DP9	See DP2, DP4, D5, D See DP2 and DP4 DP7, DP8, DP11, DF and DP13	DP6, P12 Option not expected to affe defence and security objectiv
	RWY 05 Arrival Option A RWY 05 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 AT thinking the otherroute is in use) will exist. At this point, this assessment assume the routes are used as single routes, no as part of an alternating system and is therefore assessed as Met.	 Use of a pure PBN arrival system is expected to degrade future operation 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 inefficiences as well as an increase in ground and airborne holding during peak times. Option is not expected t meet the forecast demand for air 	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 system is expected to increase airborne holding. This is because ATC would lose the flexibility to adjust the spacing once the aircraft have left the stacks. They would also be more likely to provide increased spacing between arriving pairs as they can't manage catch up situations with speed control alone but will routinely require 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 beople within the 65dBLAmax contour (from a typical aircraft overflight) December Contour (from a typical December Contour (from a typical December Contour (from a typical Contour (from a typical) Contour (from a typical) Co	ency of Use of fixed PBN arrival r ider the does not share the no within more equitably.	routes Dise This option does not inclu Dise mechanisms to provide predicatble respite from no	oise areas of outstanding natura	therefore not result in an increase in frequency of overflight of areas that are less frequently overflown	N/A - the mitigation is provided through SIDs with track adjustments. For arrivals, the ability for a Steeper RNP APCH arrival inte Glasgow will be investigated however, the ILS will have to remain at 3.0°	reduce contrioller workload in one regard but also	Option has potential to contribute to an increase in bottlenecks outside CAS	Option unlikely to have an impact on infringements	No feedback to date to suggest option is not, or cannot be, compatible with the wider FASI North programme.	All routes are procedurally deconflicted upto FL90	Since this option has no change to how aircraft fly below 1,000ft compared to today, there are likely to be no changes to local air quali (positive or negative) as a result of this airspace design option.	changes to ecological impac compared to the baseline a	ts s 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 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 ar DP9	See DP2 and DP4 See DP2 and DP4 DP7, DP8, DP11, DF and DP13	DP6, P12 Option not expected to affe defence and security objectiv
	RWY 05 Arrival Option BNo safety concerns identified as a standalone option 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 AT thinking the otherroute is in use) will exist.At this point, this assessment assume the routes are used as single routes, no as part of an alternating system and is therefore assessed as Met.	 Use of a pure PBN arrival system is expected to degrade future operation 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. Option is not expected to meet the forecast demand for air 	al 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 system is expected to increase airborne holding. This is because ATC would lose the flexibility to adjust the spacing once the aircraft have left the stacks. They would also be more likely to provide increased spacing between arriving pairs as they can't manage catch up situations with speed control alone but will routinely require 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 beople within the 65dBLAmax contour (from a typical aircraft overflight) Option is expected to change to the frequ overflight for those u extended centrelin 5nm of the run	ency of Use of fixed PBN arrival r ider the does not share the no	routes Dise This option does not inclu mechanisms to provide predicatble respite from no	oise Option reduces the number of noise sensitive areas and buildings, national parks, areas of outstanding natura beauty/National Scenic Area overflown below 7000ft	therefore not result in an increase in frequency of overflight of areas that are less frequently overflown	N/A - the mitigation is provided through SIDs with track adjustments. For arrivals, the ability for a Steeper RNP APCH arrival inte Glasgow will be investigated however, the ILS will have to remain at 3.0°	Option would require more CAS to the west of the transition (TMA5) or a move to the route to join Final Approach slightly closer. Subject to this, use of PBN transitions alone is likely to reduce contrioller workload in one regard but also increase in another as airborne and ground holding would increase as a result of less accurate final approach	Option has potential to contribute to an increase in bottlenecks outside CAS	Option unlikely to have an impact on infringements	No feedback to date to suggest option is not, or cannot be, compatible with the wider FASI North programme.	All routes are procedurally deconflicted upto FL90	Since this option has no change to how aircraft fly below 1,000ft compared to today, there are likely to be no changes to local air quali (positive or negative) as a result of this airspace design option.	The airspace design is not expected to result in any changes to ecological impac	ts s 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 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 ar DP9	See DP2 and DP4 See DP2, DP4, D5, D DP7, DP8, DP11, DF and DP13	DP6, PP12 Option not expected to affe defence and security objectiv
	RWY 05 Arrival Option CNo safety concerns identified as a standalone option 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 AT thinking the otherroute is in use) will exist.At this point, this assessment assume the routes are used as single routes, no as part of an alternating system and is therefore assessed as Met.	expected to degrade future operation 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 inefficiences as well as an increase in ground and airborne holding during peak times. Option is not expected t meet the forecast demand for air	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.	spacing once the aircraft have left the stacks. They would	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 beople within the 65dBLAmax contour (from a typical aircraft overflight) 5nm of the run	ency of Use of fixed PBN arrival r oder the does not share the no within more equitably.		buildings, national parks, areas of outstanding natura	therefore not result in an increase in frequency of overflight of areas that are less frequently overflown	N/A - the mitigation is provided through SIDs with track adjustments. For arrivals, the ability for a Steeper RNP APCH arrival inte Glasgow will be investigated however, the ILS will have to remain at 3.0°	reduce contrioller workload in one regard but also increase in another as airborne and ground holding would increase as a result of less accurate final approach	Option has potential to contribute to an increase in bottlenecks outside CAS	Option unlikely to have an impact on infringements	No feedback to date to suggest option is not, or cannot be, compatible with the wider FASI North programme.	All routes are procedurally deconflicted upto FL90	Since this option has no change to how aircraft fly below 1,000ft compared to today, there are likely to be no changes to local air quali (positive or negative) as a result of this airspace design option.	expected to result in any changes to ecological impac compared to the baseline a	ts s	PBN arrival routes would facilitate improved 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 DP2 and DP4 See DP2, DP4, D5, D DP7, DP8, DP11, DF and DP13	DP6, PP12 Option not expected to affe defence and security objectiv
	RWY 05 Arrival Option DNo safety concerns identified as a standalone option 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 AT thinking the otherroute is in use) will exist.At this point, this assessment assume the routes are used as single routes, no as part of an alternating system and is therefore assessed as Met.	expected to degrade future operation 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 inefficiences as well as an increase in ground and airborne holding during peak times. Option is not expected t meet the forecast demand for air	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.		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 beople within the 65dBLAmax contour (from a typical aircraft overflight) Option is expected to change to the frequ overflight for those u extended centrelin 5nm of the run	ency of Use of fixed PBN arrival r ider the does not share the no within more equitably.		buildings, national parks,	therefore not result in an increase in frequency of overflight of areas that are less frequently overflown	N/A - the mitigation is provided through SIDs with track adjustments. For arrivals, the ability for a Steeper RNP APCH arrival inte Glasgow will be investigated however, the ILS will have to remain at 3.0°	in one regard but also		Option unlikely to have an impact on infringements	No feedback to date to suggest option is not, or cannot be, compatible with the wider FASI North programme.	All routes are procedurally deconflicted upto FL90	Since this option has no change to how aircraft fly below 1,000ft compared to today, there are likely to be no changes to local air quali (positive or negative) as a result of this airspace design option.	The airspace design is not expected to result in any changes to ecological impac compared to the baseline a no change below 2000ft	ts s	PBN arrival routes would facilitate improved 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 ar DP9	See DP2 and DP4 See DP2, DP4, D5, D DP7, DP8, DP11, DF and DP13	DP6, PP12 Option not expected to affe defence and security objectiv
	RWY 05 Arrival Vectors only No safety concerns identified as this matches the existing concept of operation	S 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 beople within the 65dBLAmax contour (from a typical aircraft overflight) Option is expected to change to the frequ overflight for those u extended centrelin 5nm of the run	have no ency of ider the within ay	use of noise oring ffic	option does not affect the number of noise sensitive areas and buildings, nationa 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 inte Glasgow will be investigated however, the ILS will have to remain at 3.0°	Option is likely to stay the same in terms of level of complexity for GLA ATC inside CAS	Option unlikely to affect 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	All routes are procedurally deconflicted upto FL90	Since this option has no change to how aircraft fly below 1,000ft compared to today, there are likely to be no changes to local air quali (positive or negative) as a result of this airspace design option.	The airspace design is not expected to result in any changes to ecological impac compared to the baseline a no change below 2000ft	ts 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 ar DP9	See DP2, DP4, D5, D See DP2 and DP4 DP7, DP8, DP11, DF and DP13	DP6, P12 Option not expected to affe defence and security objectiv
	RWY 05 Arrival Vectors and PBN hybrid	Option is expected to cater for Glasgow's forecast demand for air transport and is expected to enhance Glasgow's operational performance is the future. This is because ATC can us the PBN arrivals when traffic levels at low and this will also facilitate the use of combined Tower and Approach services (Radar In Tower aswell as reducing workload to manaj arrivals versus departure interaction	e 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	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 people within the 65dBLAmax contour (from a typical aircraft overflight) 5nm of the run	have no ency of ider the within ay Vectoring of arrivals is mechanism which sha noise more equitable However, having PBN ar routes available is likel result in increased concentration compare today.	communiities not under th	late Option does not affect the number of noise sensitive areas and buildings, nationa 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 inte 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 relies on vectors but ATC can also have the benefit from PBN arrivals to reduce their workload when the situation permits. Option D would be the most favourable and ideally slightly further East to keep further from the edge o	Option has potential to contribute to an increase in bottlenecks outside CAS if more CAS required (Note if the PBN path is moved slightly further East, it may be possible to keep contained within existing CAS)	e Option unlikely to have an impact on infringements	No feedback to date to suggest option is not, or cannot be, compatible with the wider FASI North programme.	All routes are procedurally deconflicted upto FL90	Since this option has no change to how aircraft fly below 1,000ft compared to today, there are likely to be no changes to local air quali (positive or negative) as a result of this airspace design option.	The airspace design is not expected to result in any changes to ecological impac compared to the baseline a no change below 2000ft	ts s	PBN arrival routes would facilitate improved CDO 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 ar DP9	See DP2 and DP4 See DP2 and DP4 See DP1, DP3, DP11, DF and DP13	DP6, P12 Option not expected to affe defence and security objectiv

Option Image	Option Name	The airspace design and its operation must be as safe or safer than today.	Facilitate the growth in quicker, quieter and cleaner traffic by configuring the airspace to improve efficiency and meet the forecast demand for air transport.	transport, enable safe, efficient access for other	Mitigate any future requirements		s of aircraft noise and visual intrusior and wellbeing.	n on physical and mental health	noise dispersion through transparent multiple route	the use of predictable and e options and other respite thin the technical ATC system	n, beauty/National Scenic A	outes that serve Glasgow Airpor oid noise sensitive areas and areas of outstanding natural Areas and areas that are not	Mitigate the impacts on local communities that are currently affected by aircraft noise on final approach or the vicinity of the immediate climb out, where overflight is unavoidable.	Reduce complexity and bottleneck redu	ts in controlled and uncontrolled action in airspace infringements.	l airspace and contribute to a	design options are compatible with the wider programme of lower altitude	Routes to/from Glasgow and Edinburgh airports should be procedurally deconflicted from the ground to a preferred level in coordination with NATS Prestwick.	Minimise the growth in aircr adverse ecological impacts t	raft emissions, the further deg to address growing concerns a climate change.	radation in local air quality an bout the impact of aviation o	Airport should climb and descend continuously d to/from at least 7000ft with preference for the most environmentally beneficial option to be chose, if both	Routes should be designed meet a RNAV1 specification as a minimum in order to gain maximum benefit of performance capabilities the modern aircraft flee operating at Glasgow Airp in line with the guidance provided in CAA CAP1385 enhanced route spacing for PBN and provide sufficien resilience and redundant against Global Navigation Satellite System (GNSS) failure.	on b che of t cort current or future pla on or ht cy n		ed Airspace Modernisation Strategy (CAP1711), any all other relevant policies and regulatory standards.
						Number of people overflown belo 4000ft (centreline to centreline)		Affect on frequency of overflight for those under the extended centreline within 5nm of the runway	Use of multiple routes	Mechanisms for predictabl respite	Noise sensitive areas and buildings, national parks, areas of outstanding natural beauty/National Scenic Areas			Complexity in CAS	Bottleneck outside CAS	Infringements			Local Air Quality	Ecological Impacts	Climate Change			Maintain and enhance high aviation safety standards	Secure the efficient use of airspace and enable integration Secure the Avoid delays b manag airspace	I flight by better ging the network I flight Devironmental performance by reducing emissions and by better managing noise
	RWY 23 Arrv	The airspace design is as safe or safer than today with no safety concerns at this time although som aircraft can receive GPWS alerts triggered by a hig rate of descent.	e however note that changes to	contained within the existing CAS volume and also offers	Option is not expected to affect	Option is expected to remain with 25% of the number of people overflown below 4000ft (centrelin to centreline)	in Option is expected to remain withi 25% of the number of people within the 65dBLAmax contour (from a typical aircraft overflight)	in Option is expected to have no change to the frequency of overflight for those under the extended centreline within 5nm of the runway			areas and buildings, national parks, areas of outstanding	overflight of areas that are less frequently overflown	N/A - the mitigation is provided through SIDs with track adjustments	contribute to a tolerable increase in	Option won't affect 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 procedurally deconflicted upto FL90	Option is expected to maintain the same level of local air quality emissions	The airspace design is not expected to result in any changes to ecological impact	Option is likely to maintai existing levels of emission	n Option is unlikely to affect s CCO/CDO performance	N/A, there's no PBN specification with vectori	ng See DP1 and DP9	See DP3 and DP9 See DP2	and DP4 See DP2, DP4, D5, DP6, DP7, DP8, DP11, DP12 and DP13 Option not expected to affect defence and security objectives
	RWY 23 Arrival Option A	when EDI on Easterly operations and GLA on Westerly operations. The requirement for this buffer will continue to exist in a future design and would not be possible to avoid the buffer with th	spacing to the runway between it pairs which is likely to lead to	The design option could be contained within the existing CAS volume and also offers potential to reduce the total volume of CAS	Use of a pure PBN arrival system is expected to increase airborne holding. This is because ATC would lose the flexibility to adjust the spacing once the aircraft have left the stacks. They would also be more likely to provide increased spacing between arriving pairs as they can't manage catch up situations with speed control alone but will routinely require vectors	Option is expected to reduce the number of people overflown belo 4000ft (centreline to centreline) b more than 25%	e Option is expected to remain withi 25% of the number of people within the 65dBLAmax contour (from a typical aircraft overflight)	in 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 noise	e of noise sensitive areas and buildings, national parks,	 outside the existing main arrival swathe and will therefore result in an increase in frequency of overflight of areas that are 	track adjustments. For arrivals, the ability for a Steeper RNP APCH arrival into Glasgow will be investigated	Longer track miles will mean more de and less flexibility. Use of PBN transitions alone is likely to reduce controller workload in one regard bu	 Option may 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 	infringements because use o pure PBN arrivals to RWY23 would confirm a profile which could raise the base o CTA1 which is where 55% of	of No feedback to date to suggest option is not, or cannot be, compatible with the wider FASI North	either GLA or EDI traffic and would	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	The airspace design is not expected to result in any changes to ecological impact compared to the baseline as		n PBN arrival routes would facilitate improved CDO performance	I least an RINAVI specificati	at on ay See DP1 and DP9	See DP3 and DP9 See DP2	and DP4 See DP2, DP4, D5, DP6, DP1, DP12 and DP13 Option not expected to affect defence and security objectives
	RWY 23 Arrival Option B	Option is not separated from the GLA/EDI buffer f when EDI on Easterly operations and GLA on Westerly operations. The requirement for this buffer will continue to exist in a future design and would not be possible to avoid the buffer with th option. Option discontinued	spacing to the runway between it pairs which is likely to lead to	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 reduce the number of people overflown belo 4000ft (centreline to centreline) b	e Option is expected to remain withi 25% of the number of people within the 65dBLAmax contour (from a typical aircraft overflight)	in 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 noise	e of noise sensitive areas and buildings, national parks,	outside the existing main arrival swathe and will therefore result in an	provided through SIDs with track adjustments. For arrivals, the ability for a	and less flexibility. Use of PBN transitions alone is likely to reduce	 Option may 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 	to a reduction in infringements because use o pure PBN arrivals to RWY23	of No feedback to date to suggest option is not, or	either GLA of EDI traffic and would	change to how aircraft fly below 1,000ft compared to today, there are likely to be	The airspace design is not expected to result in any	overall aircraft emissions a	n PBN arrival routes would facilitate improved CDO performance	I least an RINAVI specificati	at on ay See DP1 and DP9	See DP3 and DP9 See DP2	and DP4 See DP2, DP4, D5, DP6, DP1, DP12 DP7, DP8, DP11, DP12 and DP13 Option not expected to affect defence and security objectives
	RWY 23 Arrival Option C	No safety concerns identified as a standalone option 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) w exist. At this point, this assessment assumes the routes are used as single routes, not as part of ar alternating system. (Note: some arrivals experience GPWS alerts while establishing on final approach. It is thought that u of a PBN arrival may help alleviate these alerts an further enhance safety)	 Use of a pure PBN arrival system is expected to degrade future operational performance. This is because of the inability of ATC to provide theexact 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. 	contained within the existing CAS volume and also offers potential to reduce the total volume of CAS	spacing once the aircraft have left the stacks. They would also be	Option is expected to reduce the number of people overflown belo 4000ft (centreline to centreline) b more than 25%	w 25% of the number of people	in 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.		e Option reduces the number of noise sensitive areas and buildings, national parks, areas of outstanding natural beauty/National Scenic Areas overflown below 7000ft	therefore not result in an	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°	approach spacing. This option would	Option may 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	infringements because use o pure PBN arrivals to RWY23 would confirm a profile	of No feedback to date to suggest option is not, or cannot be, compatible with the wider FASI North f programme.	Subject to the route being very slightly 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.Current information from NERL and EDI suggests that continuous climb to FL100 is likely	below 1,000ft compared to today, there are likely to be no changes to local air quality	The airspace design is not expected to result in any changes to ecological impact compared to the baseline as no change below 2000ft	Option has potential to contribute to an increase i overall aircraft emissions a these tracks are longer tha the typical arrival track flow today.	n PBN arrival routes would facilitate improved CDO performance	Option can be designed to least an RNAV1 specificati although is of RNP+RF ma deliver benefit	on See DP1 and DP9	See DP3 and DP9 See DP2	and DP4 See DP2, DP4, D5, DP6, Dption not expected to affect defence and security objectives
		No safety concerns identified as a standalone option 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) w exist. At this point, this assessment assumes the routes are used as single routes, not as part of ar alternating system. (Note: some arrivals experience GPWS alerts while establishing on final approach. It is thought that u of a PBN arrival may help alleviate these alerts an further enhance safety)	 ose 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. Option is not 	The design option could be contained within the existing CAS volume and also offers potential to reduce the total volume of CAS	spacing once the aircraft have left the stacks. They would also be	Option is expected to reduce the number of people overflown belo 4000ft (centreline to centreline) b more than 25%		extended centreline within	routes does not share the noise more equitably.		areas of outstanding natural	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°	require a re-design of the ILS to mov the FAF closer or move the PBN path	Option may 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	to a reduction in infringements because use o pure PBN arrivals to RWY23 would confirm a profile	of No feedback to date to suggest option is not, or cannot be, compatible with	from EDI RWY24 departures. So long as those EDI departures can	today, there are likely to be no changes to local air quality	expected to result in any changes to ecological impact	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 CDO performance	Option can be designed to least an RNAV1 specificati although is of RNP+RF m deliver benefit		See DP3 and DP9 See DP2	and DP4 See DP2, DP4, D5, DP6, Dption not expected to affect defence and security objectives
	RWY 23 Arrival Option E	No safety concerns identified as a standalone option 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) w exist. At this point, this assessment assumes the routes are used as single routes, not as part of ar alternating system. (Note: some arrivals experience GPWS alerts while establishing on final approach. It is thought that u of a PBN arrival may help alleviate these alerts an further enhance safety)	 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. Option is not expected to meet the forecast 	The design option could be contained within the existing CAS volume and also offers potential to reduce the total volume of CAS	spacing once the aircraft have left the stacks. They would also be	number of people overflown belo 4000ft (centreline to centreline) b		overflight for those under the extended centreline within	Use of fixed PBN arrival routes does not share the	mechanisms to provide	areas of outstanding natural	increase in frequency of overflight of areas that are less frequently overflown	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°	approach spacing. This option would require a re-design of the ILS to mov the FAF closer or move the PBN path slightly further east. Need to ascertain	Option may 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	to a reduction in infringements because use o pure PBN arrivals to RWY23 would confirm a profile	of No feedback to date to suggest option is not, or cannot be, compatible with the wider FASI North	Subject to the route being very slightly 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.Current information from NERL and EDI suggests that continuous climb to FL100 is likely	below 1,000ft compared to today, there are likely to be no changes to local air quality (positive or pegative) as a	The airspace design is not expected to result in any changes to ecological impact compared to the baseline as	Option has potential to contribute to an increase i overall aircraft emissions a these tracks are longer tha the typical arrival track flow today.	n PBN arrival routes would facilitate improved CDO performance	Option can be designed to least an RNAV1 specificati although is of RNP+RF ma deliver benefit	on See DP1 and DP9	See DP3 and DP9 See DP2	and DP4 See DP2, DP4, D5, DP6, Dp7, DP8, DP11, DP12 and DP13 Option not expected to affect defence and security objectives
	RWY 23 Arrival Option F	Option is not separated from the GLA/EDI buffer f when EDI on Easterly operations and GLA on Westerly operations. The requirement for this buffer will continue to exist in a future design and would not be possible to avoid the buffer with th option. Option discontinued	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. Option is not expected to meet the 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		number of people overflown belo 4000ft (centreline to centreline) b	e Option is expected to remain withi w 25% of the number of people within the 65dBLAmax contour (from a typical aircraft overflight)	overflight for those under the	Use of fixed PBN arrival routes does not share the	This option does not include mechanisms to provide predicatble respite from noise	e 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 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°	Longer track miles will mean more del 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	 Option may 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 	to a reduction in infringements because use o pure PBN arrivals to RWY23 would confirm a profile which could raise the base o	of No feedback to date to suggest option is not, or cannot be, compatible with the wider FASI North	require vertical decommendit below	change to how aircraft fly below 1,000ft compared to today, there are likely to be no changes to local air quality	The airspace design is not expected to result in any changes to ecological impact	overall aircraft emissions a this track is much longer th	n PBN arrival routes would facilitate improved CDO performance	I least an RNAV1 specificati	at on See DP1 and DP9	See DP3 and DP9 See DP2	and DP4 See DP2, DP4, D5, DP6, Option not DP7, DP8, DP11, DP12 and DP13 Option not expected to affect defence and security objectives
	RWY23 Arrival Vectors only	No safety concerns identified as this matches the existing concept of operation. Whilst vectors are safe, today some aircraft can receive GPWS alert triggered by a high rate of descent; this option would not enhance safety through availability of PBN arrival which may offer opportunities to alleviate these alerts.	5 Option is expected to cater for Glasgow's forecast demand for air	The design option could be contained within the existing CAS volume and also offers potential to reduce the total volume of CAS	Option is not expected to affect ground or airborne holding	Option is expected to remain with 25% of the number of people overflown below 4000ft (centrelin to centreline)	in Option is expected to remain withi 25% of the number of people within the 65dBLAmax contour (from a typical aircraft overflight)	in 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 noise	e 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 tern of level of complexity for GLA ATC insi CAS	Mase of the second seco	Option is likely to contribute to a reduction in infringements because even with continued reliance on vectors, it currently looks	Point Merge as a concept	So long as those EDI departures can climb continuously to at least FL100, this would enable CDA for GLA RWY 23 arrivals from FL90.Current information from NERL and EDI suggests that continuous climb to FL100 is likely	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 impact compared to the baseline as	ts existing levels of emission	n Option is unlikely to affect s CCO/CDO performance	N/A, there's no PBN specification with vectori		See DP3 and DP9 See DP2	and DP4 See DP2, DP4, D5, DP6, Dption not DP7, DP8, DP11, DP12 and DP13 Option not defence and security objectives
	RWY 23 Arrival Vectors and PBN hybrid	No safety concerns identified at this stage. (Note: some arrivals experience GPWS alerts whil establishing on final approach. It is thought that u of a PBN arrival may help alleviate these alerts an further enhance safety)	se performance in the future. This is	cAS volume and also offers potential to reduce the total volume of CAS	Option is not expected to affect ground or airborne holding	Option is expected to remain with 25% of the number of people overflown below 4000ft (centrelin to centreline)	in Option is expected to remain withi 25% of the number of people within the 65dBLAmax contour (from a typical aircraft overflight)	extended centreline within	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 stipulate that PBN arrivals ar mandated during the night which would provide predicatble respite to those communiities not under those routes.	re number of noise sensitive areas and buildings, national parks, areas of outstanding natural beauty/National	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.	track adjustments. For arrivals, the ability for a	benefit from PBN arrivals to reduce their workload when the situation permits. Either PBN route C, D or E	C Option may contribute to a reduction in bottlenecks outside CAS because this option can be contained within existing CAS whilst offering opportunity to reduce the total volume of CAS	Option is likely to contribute to a reduction in infringements because even with continued reliance on vectors, it currently looks feasible to raise the base of	the wider FASI North	Subject to either Option C, D or E being slightly amended above c.5000ft to avoid GLA/EDI buffer this would enable CDA for GLA RWY 23 arrivals from FL90 so long as EDI departures can climb continuously to at least FL100. Current information from NERL and EDI suggests that continuous climb to FL100 is likely	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	y changes to ecological impact compared to the baseline as	ts existing levels of emission	PBN arrival routes would facilitate improved CDO performance	The PBN arrival transition can be designed to at least RNAV1 specification althou is of RNP+RF may delive benefit	an Igh See DP1 and DP9	See DP3 and DP9 See DP2	and DP4 See DP2, DP4, D5, DP6, DP1, DP12 and DP13 Option not expected to affect defence and security objectives