



Glasgow Airport FASI-N Airspace Change Proposal

Step 2A
Annex A - Design Principle Evaluation

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Option Name	The airspace design and its operation must be as safe or safer than today.	Facilitate the growth in gates, operations and passengers by configuring the airspace to improve efficiency and meet the forecast demand for air transport.	Design the appropriate volume of controlled airspace to support commercial air services, while also offering access for other types of operations and relevant controlled airspace that is not required.	Mitigate any future requirements for further holding or reduced traffic flow on the ground procedure for holding on the ground.	Minimise the total adverse effects of aircraft noise and visual intrusion on physical and mental health and wellbeing.	Offer communities options for both noise concentration and noise dispersion through the use of predictable and transparent multiple route options and other routine methods that are possible within the technical ATC system, en-route network and procedural constraints.	The arrival and departure routes that serve Glasgow Airport below 7000ft should avoid noise sensitive areas and buildings, national parks, areas of outstanding natural beauty, National Science Areas and areas that are not currently affected by aircraft noise.	Mitigate the impacts on local communities that are currently affected by aircraft noise on their approach to the vicinity of the immediate climb-out, where overflight is unavoidable.	Reduce complexity and bottlenecks in controlled and uncontrolled airspace and contribute to a reduction in airspace infringements.	Collaborate with other Scottish airports and NATS to ensure that the airspace design options are compatible with the wider programme of general aviation and network airspace changes being coordinated by the FAS North programme.	Routes from Glasgow and Edinburgh airports should be procedurally deconflicted from the ground to a preferred level in coordination with NATS Provec.	Minimise the growth in aircraft emissions, the further degradation in local air quality and adverse ecological impacts to address growing concerns about the impact of aviation on climate change.	Aircraft operating at Glasgow Airport should climb and descend continuously without a preference for the most environmentally beneficial performance for PBN and provide sufficient resilience and redundancy against Navigational Data System (NDS) failure.	The GLA ECA records with the CAAT published Airspace Modernization Strategy (ICAP3171) and current or future plans associated with it and all other relevant policies and regulatory standards.					
	Option Image																		
RW 23 Arrivals De Nothing		The airspace design is as safe or safer than today with no safety concerns at this time although a PBN arrival to RW 23 may help to reduce ODFMs for some arrivals which are on by triggered by a high use of descent.	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 20% of the number of people overflight below 4000ft (controlling to centrelines).	Option is expected to remain within 25% of the number of people within the ESO/Amec contour (from a typical aircraft overflight).	Option is expected to have no change to the frequency of overflight for those under the extended centrelines within 5km of the runway.	Option doesn't see the use of multiple routes to share noise however routine vectored does dispense the traffic.	Option doesn't see the use of multiple routes to share noise however routine vectored does dispense the traffic.	Option does not affect the noise sensitive areas and buildings, national parks, areas of outstanding natural beauty, National Science Areas overflight below 7000ft.	Option will not see an increase in frequency of overflight for those under the extended centrelines.	Option is likely to maintain existing levels of emissions.	Option is unlikely to affect CO2/CO2e performance.	N/A, there's no PBN arrival with vectored.	See DP1 and DP9	See DP1 and DP9	See DP2, DP4 and DP11	See DP1, DP4, DP5, DP6, DP7, DP8, DP12 and DP13	Option not expected to affect defence and security objectives.
RW 23 Arrivals Option A		Option is not expected from the GLA/EDD buffer but when ED or Enderby operations and GLA or Waterbury operations. The requirement for this buffer will continue to exist in a future design and would not be possible to avoid the buffer with this option. Option discontinued.	Use of a pure PBN arrival system is expected to degrade future operational performance. This is because of the stability of ATC to provide the exact amount of spacing to the runway between pairs which is likely to be more flexible to provide increased spacing between arriving pairs as they catch manage capacity situations with vectors.	Use of a pure PBN arrival system is expected to degrade future operational performance. This is because of the stability of ATC to provide the exact amount of spacing to the runway between pairs which is likely to be more flexible to provide increased spacing between arriving pairs as they catch manage capacity situations with vectors.	Option is expected to reduce the number of people overflight below 4000ft (controlling to centrelines) by more than 25%.	Option is expected to remain within 25% of the number of people within the ESO/Amec contour (from a typical aircraft overflight).	Option is expected to have no change to the frequency of overflight for those under the extended centrelines within 5km of the runway.	Option doesn't see the use of multiple routes to share noise however routine vectored does dispense the traffic.	Option doesn't see the use of multiple routes to share noise however routine vectored does dispense the traffic.	Option reduces the number of noise sensitive areas and buildings, national parks, areas of outstanding natural beauty, National Science Areas overflight 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 for those under the extended centrelines. However, use of a PBN route will result in an increase rate of overflight for those under that route).	Option is likely to contribute to a reduction in infringements because use of pure PBN arrivals to RW 23 will confirm a profile which could raise the base of CTAs which is where 50% of Glasgow's reported infringements occurred.	Option is likely to contribute to a reduction in local air quality.	Option is likely to contribute to a reduction in local air quality.	No feedback to date to suggest option is not, or cannot be, compatible with the wider FAS North programme.	See DP1 and DP9	See DP3 and DP8	See DP2, DP4, DP5, DP6, DP7, DP8, DP12 and DP13	Option not expected to affect defence and security objectives.
RW 23 Arrivals Option B		Option is not expected from the GLA/EDD buffer but when ED or Enderby operations and GLA or Waterbury operations. The requirement for this buffer will continue to exist in a future design and would not be possible to avoid the buffer with this option. Option discontinued.	Use of a pure PBN arrival system is expected to degrade future operational performance. This is because of the stability of ATC to provide the exact amount of spacing to the runway between pairs which is likely to be more flexible to provide increased spacing between arriving pairs as they catch manage capacity situations with vectors.	Use of a pure PBN arrival system is expected to degrade future operational performance. This is because of the stability of ATC to provide the exact amount of spacing to the runway between pairs which is likely to be more flexible to provide increased spacing between arriving pairs as they catch manage capacity situations with vectors.	Option is expected to reduce the number of people overflight below 4000ft (controlling to centrelines) by more than 25%.	Option is expected to remain within 25% of the number of people within the ESO/Amec contour (from a typical aircraft overflight).	Option is expected to have no change to the frequency of overflight for those under the extended centrelines within 5km of the runway.	Option doesn't see the use of multiple routes to share noise however routine vectored does dispense the traffic.	Option doesn't see the use of multiple routes to share noise however routine vectored does dispense the traffic.	Option reduces the number of noise sensitive areas and buildings, national parks, areas of outstanding natural beauty, National Science Areas overflight 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 for those under the extended centrelines. However, use of a PBN route will result in an increase rate of overflight for those under that route).	Option is likely to contribute to a reduction in infringements because use of pure PBN arrivals to RW 23 will confirm a profile which could raise the base of CTAs which is where 50% of Glasgow's reported infringements occurred.	Option is likely to contribute to a reduction in local air quality.	Option is likely to contribute to a reduction in local air quality.	No feedback to date to suggest option is not, or cannot be, compatible with the wider FAS North programme.	See DP1 and DP9	See DP3 and DP8	See DP2, DP4, DP5, DP6, DP7, DP8, DP12 and DP13	Option not expected to affect defence and security objectives.
RW 23 Arrivals Option C		No safety concerns identified as a standalone option unless use of PBN arrival routes are used in relation to provide ingate, in which case the chance of the chance of human error (deconflict) flying the wrong arrival, or ATC thinking the communique is in use will 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 is expected to degrade future operational performance. This is because of the stability of ATC to provide the exact amount of spacing to the runway between pairs which is likely to be more flexible to provide increased spacing between arriving pairs as they catch manage capacity situations with vectors.	Use of a pure PBN arrival system is expected to degrade future operational performance. This is because of the stability of ATC to provide the exact amount of spacing to the runway between pairs which is likely to be more flexible to provide increased spacing between arriving pairs as they catch manage capacity situations with vectors.	Option is expected to reduce the number of people overflight below 4000ft (controlling to centrelines) by more than 25%.	Option is expected to remain within 25% of the number of people within the ESO/Amec contour (from a typical aircraft overflight).	Option is expected to have no change to the frequency of overflight for those under the extended centrelines within 5km of the runway.	Option doesn't see the use of multiple routes to share noise however routine vectored does dispense the traffic.	Option doesn't see the use of multiple routes to share noise however routine vectored does dispense the traffic.	Option reduces the number of noise sensitive areas and buildings, national parks, areas of outstanding natural beauty, National Science Areas overflight 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 for those under the extended centrelines. However, use of a PBN route will result in an increase rate of overflight for those under that route).	Option is likely to contribute to a reduction in infringements because use of pure PBN arrivals to RW 23 will confirm a profile which could raise the base of CTAs which is where 50% of Glasgow's reported infringements occurred.	Option is likely to contribute to a reduction in local air quality.	Option is likely to contribute to a reduction in local air quality.	No feedback to date to suggest option is not, or cannot be, compatible with the wider FAS North programme.	See DP1 and DP9	See DP3 and DP8	See DP2, DP4, DP5, DP6, DP7, DP8, DP12 and DP13	Option not expected to affect defence and security objectives.
RW 23 Arrivals Option D		No safety concerns identified as a standalone option unless use of PBN arrival routes are used in relation to provide ingate, in which case the chance of the chance of human error (deconflict) flying the wrong arrival, or ATC thinking the communique is in use will 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 is expected to degrade future operational performance. This is because of the stability of ATC to provide the exact amount of spacing to the runway between pairs which is likely to be more flexible to provide increased spacing between arriving pairs as they catch manage capacity situations with vectors.	Use of a pure PBN arrival system is expected to degrade future operational performance. This is because of the stability of ATC to provide the exact amount of spacing to the runway between pairs which is likely to be more flexible to provide increased spacing between arriving pairs as they catch manage capacity situations with vectors.	Option is expected to reduce the number of people overflight below 4000ft (controlling to centrelines) by more than 25%.	Option is expected to remain within 25% of the number of people within the ESO/Amec contour (from a typical aircraft overflight).	Option is expected to have no change to the frequency of overflight for those under the extended centrelines within 5km of the runway.	Option doesn't see the use of multiple routes to share noise however routine vectored does dispense the traffic.	Option doesn't see the use of multiple routes to share noise however routine vectored does dispense the traffic.	Option reduces the number of noise sensitive areas and buildings, national parks, areas of outstanding natural beauty, National Science Areas overflight 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 for those under the extended centrelines. However, use of a PBN route will result in an increase rate of overflight for those under that route).	Option is likely to contribute to a reduction in infringements because use of pure PBN arrivals to RW 23 will confirm a profile which could raise the base of CTAs which is where 50% of Glasgow's reported infringements occurred.	Option is likely to contribute to a reduction in local air quality.	Option is likely to contribute to a reduction in local air quality.	No feedback to date to suggest option is not, or cannot be, compatible with the wider FAS North programme.	See DP1 and DP9	See DP3 and DP8	See DP2, DP4, DP5, DP6, DP7, DP8, DP12 and DP13	Option not expected to affect defence and security objectives.
RW 23 Arrivals Option E		No safety concerns identified as a standalone option unless use of PBN arrival routes are used in relation to provide ingate, in which case the chance of the chance of human error (deconflict) flying the wrong arrival, or ATC thinking the communique is in use will 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 is expected to degrade future operational performance. This is because of the stability of ATC to provide the exact amount of spacing to the runway between pairs which is likely to be more flexible to provide increased spacing between arriving pairs as they catch manage capacity situations with vectors.	Use of a pure PBN arrival system is expected to degrade future operational performance. This is because of the stability of ATC to provide the exact amount of spacing to the runway between pairs which is likely to be more flexible to provide increased spacing between arriving pairs as they catch manage capacity situations with vectors.	Option is expected to reduce the number of people overflight below 4000ft (controlling to centrelines) by more than 25%.	Option is expected to remain within 25% of the number of people within the ESO/Amec contour (from a typical aircraft overflight).	Option is expected to have no change to the frequency of overflight for those under the extended centrelines within 5km of the runway.	Option doesn't see the use of multiple routes to share noise however routine vectored does dispense the traffic.	Option doesn't see the use of multiple routes to share noise however routine vectored does dispense the traffic.	Option reduces the number of noise sensitive areas and buildings, national parks, areas of outstanding natural beauty, National Science Areas overflight 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 for those under the extended centrelines. However, use of a PBN route will result in an increase rate of overflight for those under that route).	Option is likely to contribute to a reduction in infringements because use of pure PBN arrivals to RW 23 will confirm a profile which could raise the base of CTAs which is where 50% of Glasgow's reported infringements occurred.	Option is likely to contribute to a reduction in local air quality.	Option is likely to contribute to a reduction in local air quality.	No feedback to date to suggest option is not, or cannot be, compatible with the wider FAS North programme.	See DP1 and DP9	See DP3 and DP8	See DP2, DP4, DP5, DP6, DP7, DP8, DP12 and DP13	Option not expected to affect defence and security objectives.
RW 23 Arrivals Option F		Option is not expected from the GLA/EDD buffer but when ED or Enderby operations and GLA or Waterbury operations. The requirement for this buffer will continue to exist in a future design and would not be possible to avoid the buffer with this option. Option discontinued.	Use of a pure PBN arrival system is expected to degrade future operational performance. This is because of the stability of ATC to provide the exact amount of spacing to the runway between pairs which is likely to be more flexible to provide increased spacing between arriving pairs as they catch manage capacity situations with vectors.	Use of a pure PBN arrival system is expected to degrade future operational performance. This is because of the stability of ATC to provide the exact amount of spacing to the runway between pairs which is likely to be more flexible to provide increased spacing between arriving pairs as they catch manage capacity situations with vectors.	Option is expected to reduce the number of people overflight below 4000ft (controlling to centrelines) by more than 25%.	Option is expected to remain within 25% of the number of people within the ESO/Amec contour (from a typical aircraft overflight).	Option is expected to have no change to the frequency of overflight for those under the extended centrelines within 5km of the runway.	Option doesn't see the use of multiple routes to share noise however routine vectored does dispense the traffic.	Option doesn't see the use of multiple routes to share noise however routine vectored does dispense the traffic.	Option reduces the number of noise sensitive areas and buildings, national parks, areas of outstanding natural beauty, National Science Areas overflight 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 for those under the extended centrelines. However, use of a PBN route will result in an increase rate of overflight for those under that route).	Option is likely to contribute to a reduction in infringements because use of pure PBN arrivals to RW 23 will confirm a profile which could raise the base of CTAs which is where 50% of Glasgow's reported infringements occurred.	Option is likely to contribute to a reduction in local air quality.	Option is likely to contribute to a reduction in local air quality.	No feedback to date to suggest option is not, or cannot be, compatible with the wider FAS North programme.	See DP1 and DP9	See DP3 and DP8	See DP2, DP4, DP5, DP6, DP7, DP8, DP12 and DP13	Option not expected to affect defence and security objectives.
RW 23 Arrivals Vectors only		Option is expected to cater for Glasgow's forecast demand for air transport.	Option is not expected to affect ground or airborne holding.	Option is expected to remain within 20% of the number of people overflight below 4000ft (controlling to centrelines).	Option is expected to remain within 25% of the number of people within the ESO/Amec contour (from a typical aircraft overflight).	Option is expected to have no change to the frequency of overflight for those under the extended centrelines within 5km of the runway.	Option doesn't see the use of multiple routes to share noise however routine vectored does dispense the traffic.	Option doesn't see the use of multiple routes to share noise however routine vectored does dispense the traffic.	Option does not affect the noise sensitive areas and buildings, national parks, areas of outstanding natural beauty, National Science Areas overflight below 7000ft.	Option will not see an increase in frequency of overflight for those under the extended centrelines.	Option is likely to contribute to a reduction in infringements because use of pure PBN arrivals to RW 23 will confirm a profile which could raise the base of CTAs which is where 50% of Glasgow's reported infringements occurred.	Option is likely to contribute to a reduction in local air quality.	Option is likely to contribute to a reduction in local air quality.	The option may not be compatible with NEAT, only if they were to take Forward Point Merge as a concept.	See DP1 and DP9	See DP3 and DP8	See DP2, DP4, DP5, DP6, DP7, DP8, DP12 and DP13	Option not expected to affect defence and security objectives.	
RW 23 Arrivals Vectors and PBN hybrid		No safety concerns identified at this stage.	Option is not expected to affect ground or airborne holding.	Option is expected to remain within 20% of the number of people overflight below 4000ft (controlling to centrelines).	Option is expected to remain within 25% of the number of people within the ESO/Amec contour (from a typical aircraft overflight).	Option is expected to have no change to the frequency of overflight for those under the extended centrelines within 5km of the runway.	Option doesn't see the use of multiple routes to share noise however routine vectored does dispense the traffic.	Option doesn't see the use of multiple routes to share noise however routine vectored does dispense the traffic.	Option does not affect the noise sensitive areas and buildings, national parks, areas of outstanding natural beauty, National Science Areas overflight below 7000ft.	Option will not see an increase in frequency of overflight for those under the extended centrelines.	Option is likely to contribute to a reduction in infringements because use of pure PBN arrivals to RW 23 will confirm a profile which could raise the base of CTAs which is where 50% of Glasgow's reported infringements occurred.	Option is likely to contribute to a reduction in local air quality.	Option is likely to contribute to a reduction in local air quality.	No feedback to date to suggest option is not, or cannot be, compatible with the wider FAS North programme.	See DP1 and DP9	See DP3 and DP8	See DP2, DP4, DP5, DP6, DP7, DP8, DP12 and DP13	Option not expected to affect defence and security objectives.	

