LONDON CITY AIRPORT

Our Future Skies – Airspace Modernisation

Airspace Change Process Documentation

CAA ref ACP-2018-89 Stage 2 Develop & Assess

Step 2A(ii) Design Principle Evaluation

Document Production Information

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Contents

1 Introduction

1.1.1 London City Airport (LCY) is currently progressing an airspace change which will make changes to the airport's arrival and departure routes alongside associated airspace structures.

1.1.2 This document should be read in conjunction with two complementary documents:

- Step 2A(i) Airspace Design Options
- Step 2B Options Appraisal (Phase 1 Initial) including Safety Assessment

1.1.3 The Step 2A(i) document provides detailed information on the combined programme of airspace modernisation which LCY sits within, and the comprehensive list of design options which were developed through engagement with stakeholders.

About this document

1.1.4 This document is titled 'Step 2A(ii) Design Principle Evaluation

1.1.5 Its purpose is to consider LCY's comprehensive list of airspace design options against its design principles, progressing those which fit best and, if appropriate, discounting those which fit least. The design principles are listed in Table 1 below.

1.1.6 The purpose of the Design Principle Evaluation is to qualitatively assess each individual flightpath design option against each of the Design Principles. The evidence is high level and based on subject matter experts, feedback received from stakeholders (see paragraph 1.1.7 below), and the evolving design work.

1.1.7 During Stage 2 we contacted and re-engaged with the stakeholders' representatives that were engaged during Stage 1. We provided our stakeholders with information, explaining our design concepts and known design constraints such as the position of LCY within the London FASI-S cluster. We targeted our stakeholders for feedback relevant to their interests, which informed the qualitative evidence contained within this document.

1.1.8 The assessment summarised within this document states whether each design principle is met, partially met, or not met, for each indicative design option.

1.1.9 It may be possible to organise arrival design options from each main direction into systems for respite, or that disperse traffic in another way. However at this stage in the process it would be disproportionate to assess every possible permutation of which route works with which other route, while also considering the equivalent permutations of departure options and how they work with arrivals as part of the same system.

1.1.10 Each option is therefore assessed in isolation, unless there is a specific reason to consider its relationship with another option.

1.1.11 Stage 3 is where the routes can be further refined, organised into systems and developed in conjunction with adjacent airports and the upper route network.

1.1.12 A 'do nothing' option has also been included for comparison purposes.

1.1.13 The three primary documents 2A(i), 2A(ii) and 2B, along with supporting material, were submitted to the CAA late May 2022 for their consideration at the CAA Gateway Assessment on Friday 24th June 2022.

1.1.14 All published documents for all stages of the process can be found in the public CAA's Airspace Change portal (link to the page for this proposal).

1.2 Design Principle Evaluation

Design Principles (DPs): Recap

Ref Num	Tier 1 Design Principles	Priority
DP0	**Must maintain (and ideally enhance) current safety standards**	A
DP1	**Must be in compliance with all laws and regulations**	A
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A

Ref Num	Tier 2 Design Principles		Priority
DP4	**Should limit and where possible reduce aircraft noise**		A
	Group (i) noise mitigations	Use noise efficient operational practices	
		Provide predictable respite routes	
		Avoid overflying communities with multiple routes, including from other airports	
	Group (ii) noise mitigations	Minimise the number of people newly overflown	
		Provide managed dispersal	
		Minimise the total population overflown	
		Avoid overflying noise sensitive areas e.g. schools, hospitals, care homes	
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**		B
DP6	**Should minimise air pollution in the local area from aircraft**		B
DP7	**Should improve resilience during abnormal operating conditions**		B
DP8	**Should promote optimal network performance in collaboration with other airspace users**		C

Table 1 Design Principles from Stage 1, encompassing the safety, environmental and operational criteria and the strategic policy objectives we seek to achieve in developing the airspace change proposal.

1.3 What are the Assessment Criteria we used to evaluate the Design Options against the Design Principles?

1.3.1 Table 2 below summarises the assessment criteria used to determine whether each Design Option meets/ partially meets/ does not meet each Design Principle.

1.3.2 This assessment shows how each Design Option aligns with the Design Principles developed at Stage 1. The evidence is qualitative and based on combining input from experienced subject matter experts with feedback from stakeholders (see 1.1.7 above) and the evolving design work.

Ref Num	Tier 1 Design Principles *How would it be evaluated?*	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards** *Qualitative evaluation by experienced subject matter experts SMEs, to consider if safety issues are likely to be present, and if so, their likely scale compared with today's operation*	A	MET: No safety issues identified, or issue that could be overcome with similar levels of safety assurance to today's operation PARTIAL: Issues identified to overcome that would require a significantly more robust safety argument than today's operation NOT MET: Issues identified that would be unlikely to be overcome without prohibitively restrictive safety mitigations
DP1	**Must be in compliance with all laws and regulations** *Qualitative evaluation by experienced SMEs to consider regulatory areas where compliance is mandatory, areas where justifiable exceptions can be made, and if so their likely scale compared with today's operation*	A	MET: Expected to comply fully, or mostly but with reasonable justification for non-compliance in limited technical areas PARTIAL: Expected to comply partially, with significant justification needed for non-compliant areas NOT MET: Significant areas of non-compliance without reasonable justification

Ref Num	Tier 1 Design Principles *How would it be evaluated?*	Priority	Qualitative Criteria for Met, Partial, Not Met
DP2	**Must enhance navigation standards by utilising modern navigation technology** *Qualitative evaluation by SMEs to consider design navigation standards, and their consequences on aircraft fleet equipage requirements*	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades PARTIAL: Designed to high navigation standards likely to require aircraft fleet upgrades NOT MET: Designed to a lower navigation standard than today
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity** *Qualitative evaluation by experienced SMEs to consider the degree of alignment with AMS based on balancing capacity provision, noise impacts and flight efficiency. See subsection 1.4 below.*	A	MET: Generally aligned with the AMS PARTIAL: Partially aligned with the AMS NOT MET: Not aligned with the AMS

Ref Num	Tier 2 Design Principles *How would it be evaluated?*	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise** *(Note that the text of the DP refers to aircraft noise, whereas this evaluation will consider the impacts of aircraft noise on areas overflown).* *Qualitative evaluation by SMEs of the likelihood of the design to reduce overall noise impacts, have broadly similar overall noise impacts, or increased overall noise impacts, described in subsection 1.5 below, and informed by stakeholder feedback.*	A	MET: Has the potential to reduce overall impacts of aircraft noise PARTIAL: Impacts of aircraft noise likely to be broadly similar NOT MET: Has the potential to increase the overall impacts of aircraft noise
DP5	**Should minimise the amount of fuel used, and the CO_2 subsequently emitted** *Qualitative evaluation by SMEs to consider the likelihood of the design to change fuel usage which in turn affects CO_2 emissions, and informed by stakeholder feedback.*	B	MET: Has the potential to reduce fuel burn per flight PARTIAL: May introduce no change (broadly similar to today) NOT MET: Clearly likely to increase fuel burn per flight
DP6	**Should minimise air pollution in the local area from aircraft** *Qualitative evaluation by SMEs to consider the likelihood of the airspace design to change flightpaths below 1,000ft See subsection 1.6 below.*	B	MET: No opportunity for improvement OR No change below 1,000ft PARTIAL: Not clear if there would be a change below 1,000ft NOT MET: A change below 1,000ft that may worsen impacts
DP7	**Should improve resilience during abnormal operating conditions** *Qualitative evaluation by SMEs to consider the likelihood of the airspace design to improve upon the resilience of operations in abnormal scenarios, such as disruption from extreme weather. If so, their likely scale compared with today's operation*	B	MET: Design option has potential to improve resilience PARTIAL: Resilience would be broadly similar under this design option NOT MET: Design option has potential to reduce resilience
DP8	**Should promote optimal network performance in collaboration with other airspace users** *In this context, 'other airspace users' means those not using LCY. These airspace users include adjacent sponsors of FASI-S ACPs, recreational flying by private pilots, military training flights and helicopter taxis for example. Qualitative evaluation by SMEs of the likelihood of the airspace design to change overall impacts on other airspace users.*	C	MET: Minimal change, or positive impact on other airspace users PARTIAL: Minor negative impact on other airspace users NOT MET: Significant negative impact on other airspace users

Table 2: Assessment criteria used to evaluate Design Options against Design Principles

1.4 DP3 Consistency with Airspace Modernisation Strategy AMS

Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity.

1.4.1 This will be a qualitative evaluation by experienced SMEs to consider the degree of alignment with the AMS, based on balancing capacity provision, noise impacts and flight efficiency.

1.4.2 Capacity provision does not have its own DP, therefore we will assess it qualitatively within the context of AMS. As previously stated in paragraphs 1.1.9-1.1.11 above, each indicative design option is considered in isolation, not as part of a system. Therefore the provision of sufficient capacity cannot be assessed at this stage as there is not yet a definition of what 'sufficient' might be, and it would be disproportionate to attempt to provide it. Qualitatively, we will assess the predicted overall impact of each option on capacity using the following criteria, to act as an early indicator against the baseline:

- May cause a reduction – will be assessed as Not Met (red)
- May enable an improvement, or a broadly similar outcome – will be assessed as Partial (amber). (If there is no opportunity for increase due to an element of the baseline design option being considered as already optimised, this will also be assessed as Partial, but may be considered a special case as part of the assessment for DP3 – see Table 3 below)
- Likely to enable an improvement – will be assessed as Met (green)

Stage 3 is where the routes can be further refined, organised into systems and developed in conjunction with adjacent airports and the upper route network. At this point, the capacity requirements for LCY, other FASI-S airports in our regional cluster, and the wider route network will be coordinated.

1.4.3 Our overall assessment will use these guidelines for each indicative design option, balancing three topics within the DP3 assessment.

- Capacity provision (as above)
- Overall assessment of noise impacts (using DP4's assessment)
- Overall assessment of efficiency via fuel/CO_2 impacts (using DP5's assessment)

1.4.4 The 'colour balance' of the three sub-assessments becomes the result of DP3's assessment:

	Based on colour balance of these three sub-assessments		
Result of balanced AMS assessment (DP3)	**Capacity assessment (Tier 1 weight)**	**Noise Impact assessment (Tier 2, DP4)**	**Efficiency assessment via fuel/CO_2 (Tier 2, DP5)**
Met (green)	Met (green)	Met (green)	Met (green)
Met (green)	Partial (amber)	Met (green)	Met (green)
Met (green)	Met (green)	Partial (amber)	Met (green)
Met (green)	Met (green)	Not Met (red)	Met (green)
Partial (amber)	Met (green)	Partial (amber)	Not Met (red)
Partial (amber)	Partial (amber)	Met (green)	Partial (amber)
Partial (amber)	Not Met (red)	Partial (amber)	Partial (amber)
Partial (amber)	Partial (amber)	Not Met (red)	Met (green)
Partial (amber)	Partial (amber)	Partial (amber)	Not Met (red)
Partial (amber)	Not Met (red)	Partial (amber)	Met (green)
Special case Not Met (red)	The overall baseline system 'no change' may be considered as 'Partial', however it means airspace modernisation would not occur and therefore automatically becomes Not Met (red)		
Special case Met (green)	Elements of the baseline system are included as design options, and assessed individually. If their sub-assessments are all Partial due to no change from today but 'today' is already optimised, then the result would be three Partials. However, logically if the baseline-element design option is already optimised then there is little scope for improvement, hence the overall result becomes Met (green). The same logic also applies should an individual 'Partial due to no change (optimised)' occur during the balancing process. Such Partials will also be considered Met (green) for balancing purposes, given that they are already optimised.		

Table 3: DP3 AMS balancing of assessments (NB not every possible permutation of green, amber and red was used)

1.5 DP4 Should limit and where possible reduce aircraft noise

1.5.1 As covered in LCY's Stage 1B Design Principle document, DP4 (which focuses on noise management) includes a subset of noise mitigations recommending how noise management might be achieved. These are prioritised into two groups and describe ways in which the noise impact can be managed and where possible, improved upon when compared to today. These are listed in Table 4 below.

DP4 Should limit and where possible reduce aircraft noise (Priority A)		
Group (i) Noise Mitigations	NM1	Use noise efficient operational practices
	NM2	Provide predictable respite routes
	NM3	Avoid overflying communities with multiple routes, including from other airports
Group (ii) Noise Mitigations	NM4	Minimise the number of people newly overflown
	NM5	Provide managed dispersal
	NM6	Minimise the total population overflown
	NM7	Avoid overflying noise sensitive areas e.g. schools, hospitals, care homes

Table 4: Noise Mitigation elements of DP4

1.5.2 Noise management is a complex and sensitive issue for communities around LCY. This is reflected in the seven noise mitigation elements of DP4 listed above. There are diverging viewpoints, such as finding a balance between providing respite and minimising the overflying of new people. These mitigations demonstrate very specific ways that LCY can consider managing the noise impacts of our flights.

1.5.3 Changes that seem fair for one community may seem less fair to another. Generalising and for example, changing where aircraft fly would bring new communities into the regularly-overflown area (NM4), increasing the total population overflown (NM6 and NM7) while potentially sharing the overall noise impacts such that there could be a reduction on a currently-overflown community (NM2 and NM5). Likewise, if 100 people are currently overflown daily, and that changes to two groups of 100 people overflown every alternate day, that could be considered as 'no overall change', however for the individuals concerned there would clearly be a difference.

- At this point in the process, the design options are **not mature enough** to accurately determine to what extent DP4 could be met, and which combination of noise mitigations might have the greatest effects.

1.5.4 We may progress more than one similar design option to achieve predictable respite (NM2) or managed dispersal (NM5) by, for example, using different routes on different days.

- At this point in the process it would be **disproportionately complex** to attempt to describe every permutation of which option could be used with which other option, and which NM would be appropriate.

1.5.5 We will therefore provide simple, qualitative opinion considering each design option against the overarching DP4 text 'Should limit and where possible reduce aircraft noise' (meaning the impacts of aircraft noise on areas overflown).

- We will not at this time attempt to assess combinations of options.
- The evaluation text for each indicative design option may refer to overflying relative densities of population. This is a simple qualitative assessment, comparing the illustrative routes with the indication of built-up areas on the Ordnance Survey 1:250,000 scale map shown in the images in the Step 2A(i) Design Options document.

1.5.6 Further consideration of the noise mitigations and combinations of options will be provided later in the CAP1616 process as the designs are refined,

detailed analysis work completed, and the plans of adjacent airports can be coordinated.

1.5.7 This proposal also has the potential to change flightpaths over the Kent Downs Area of Outstanding Natural Beauty (AONB) below 7,000ft, which is a process[1] reference to impacts on tranquillity. Where relevant we provide brief qualitative statements on the potential for overflight below 7,000ft. In the next stage of the airspace change process we will be able to provide greater information and detail on those potential impacts.

1.5.8 Overall noise impacts of overflight are considered using these guidelines and the illustrative altitudes for each indicative design option:

- The same or similar areas overflown, with a quicker climb (departures) or staying higher for longer (arrivals) will be assessed as Met (green)
- The same or similar areas overflown for part of the design, but also with new areas overflown elsewhere beneath the design, likely to be fewer people overall, with a quicker climb (departures) or staying higher for longer (arrivals) will be assessed as Met (green)
- The same or similar areas overflown for part of the design, but also with new areas overflown elsewhere beneath the design, likely to be a broadly similar number of people overall, with a quicker climb (departures) or staying higher for longer (arrivals) will be assessed as Met (green)
- Mostly new areas overflown, likely to be fewer people overall e.g. shorter route, with a quicker climb (departures) or staying higher for longer (arrivals) will be assessed as Met (green)
- The same or similar areas overflown, with same climb restrictions (departures) and/or same descent restrictions (arrivals) will be assessed as Partial (amber).
- Mostly new areas overflown but over similar population densities will be assessed as Partial (amber) even if expected to stay higher for longer (arrivals) or climb higher more quickly (departures).
- No change from the baseline but also no opportunity for improvement (i.e. it is already optimised) will be assessed as Partial (amber) but may be considered a special case as part of the assessment for DP3 (see paragraph 1.4 above)
- Mostly new areas overflown and would be an overall greater number (e.g. would not result in a corresponding reduction in overflight elsewhere) will be assessed as Not Met (red)

1.6 DP6 Air Pollution

1.6.1 DP6's text is 'Should minimise air pollution in the local area from aircraft'. The airspace change process CAP1616[2] states that:

'Due to the effects of mixing and dispersion, emissions from aircraft above 1,000ft are unlikely to have a significant impact on local air quality. Therefore the impact of airspace design on local air quality is generally negligible compared with other factors such as changes in the volume of air traffic, and local transport infrastructures feeding the airport. However, sponsors must still show explicit consideration of whether local air quality could be impacted when developing airspace change proposals.'

1.6.2 The assessment of this DP is based on our subject matter experts considering if the design option is likely to result in a flightpath change below 1,000ft.

1 CAP1616 Edn 4 Appendix B paragraphs B76-B78
2 CAP1616 Edn 4 p.171 para B.74

If the design does not provide a clear opportunity to make an improvement, or if there is not likely to be a noticeable change below 1,000ft, then it will be assessed as Met (green).

If it is not clear whether there would be a noticeable change below 1,000ft and only further refinement will reveal the facts, then it will be assessed as Partial (amber).

If there is likely to be a noticeable flightpath change below 1,000ft that may worsen the impacts, then it will be assessed as Not Met (red).

1.6.3 Outer arrival routes are considered from 7,000ft-4,000ft therefore this DP becomes not applicable and the box will be greyed out.

1.6.4 Technical notes:

- Flightpath changes to arrivals to either runway are **not** possible below 1,000ft because they are at the last stages of a steep final approach, having already been aligned with the final approach track from 2,000ft or higher. We would not seek to change this because it would not be safe.
- Flightpath changes to Runway 27 Departures are **not** possible below 1,000ft because current safety requirements (known as obstacle clearance) mandate all departures to fly straight ahead until passing a waypoint known as LCW01 (2.8km west of the runway over the Thames near the Canary Wharf Pier) by which they must reach or exceed 1,102ft. We would not seek to change those safety requirements
- Flightpath changes to Runway 09 Departures **may be** technically possible below 1,000ft. All such departures currently must fly straight ahead until passing a waypoint known as LCE01, by which they must reach or exceed 570ft, for the same safety (obstacle clearance) reason. At LCE01 (1.9km east of the runway at Gallions Reach Park on the opposite riverbank) they turn left (north), but the turn cannot anticipate the waypoint – it must be delayed until they have overflown LCE01. Analysis of radar data[3] shows that, in practice, aircraft do not start their turn until 500-600m after LCE01. Further analysis reveals that over 97% of departures actually reach or exceed 1,000ft by LCE01, with 100% reaching or exceeding 1,000ft when 450-500m past LCE01. Therefore, from a practical point of view, it is unlikely that there would be noticeable flightpath changes below 1,000ft for Runway 09 departures even if the flightpath track was changed after LCE01.

1.7 How will we decide which options to progress to the next stage?

1.7.1 The DPs are split into upper Tier 1 (DP0-DP3) and lower Tier 2 (DP4-DP8).

1.7.2 DP0 encompasses safety and is Priority A within the upper Tier 1 of Design Principles. Therefore, any Design Option which has not met this DP contains safety concerns and will be discounted at this stage.

1.7.3 DP1, DP2 and DP3 are about compliance with relevant laws/ regulations; using the latest navigation technology; and alignment with the Airspace Modernisation Strategy (AMS). They are Priority A within the upper Tier 1 of Design Principles. If any Design Option has not met one of these DPs, it will be discounted at this stage.

[3] LAMP1A London City Airport departures radar data provided publicly for the Post Implementation Review, 2016, re-examined (see Step 2Ai document for details of LAMP1A PIR)

1.7.4 Design Principles DP4 – DP8 encompass objectives surrounding environmental impacts and network performance. They range from Priority A to C and are within the lower Tier 2 of the Design Principles.

- In order to not be overly restrictive, and to enable all suitable options to progress to the next stage, design options will not be rejected if they partially or do not meet these Design Principles. However, this Design Principle evaluation and evidence will be used to inform future design work.

1.7.5 The AMS allows for design options discounted at Stage 2 to be reintroduced at Stage 3 if necessary, during the Masterplan integration process where multiple ACP sponsors are all at the same stage, and it will be possible for a wider holistic overview to be considered.

1.8 Note on Biodiversity impacts

1.8.1 Airspace changes are unlikely to have an impact on biodiversity because they do not normally involve changes to ground based infrastructure[4] (habitat disturbance). None of our DPs mention the subject.

1.8.2 No such ground based infrastructure changes are associated with this proposal, therefore this proposal is not predicted to impact biodiversity.

2 Baseline (do nothing) - Discounted

This assessment considers the do-nothing baseline as a whole system.
It is already designed to a high navigation standard, and some individual elements can be considered already optimised, however if there were no changes then airspace modernisation could not take place in a coordinated manner with other sponsors of airspace changes under the AMS.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Same levels of safety assurance.
DP1	**Must be in compliance with all laws and regulations**	A	MET: Same levels of compliance
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that would not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	NOT MET: Modernisation would not occur
Ref Num	**Tier 2 Design Principles**	**Priority**	**Qualitative Criteria for Met, Partial, Not Met**
DP4	**Should limit and where possible reduce aircraft noise**	A	PARTIAL: Same climb restrictions (departures) and same descent restrictions (arrivals)
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	PARTIAL: Same fuel/emissions efficiency as today
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: No change below 1,000ft
DP7	**Should improve resilience during abnormal operating conditions**	B	PARTIAL: Resilience would be the same
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: No change in impact

4 CAP1616 Edn 4 Appendix B paragraphs B79-B80
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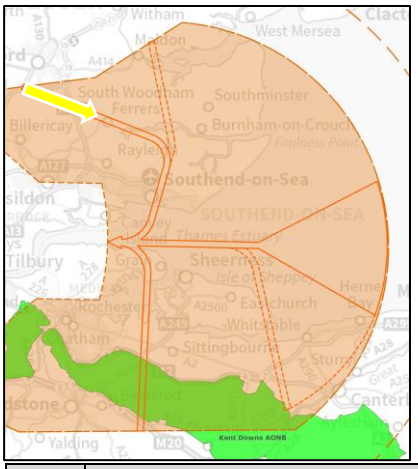
3 Arrival Options

3.1 Outer Routes (from 7,000ft-4,000ft) common to both runways

3.1.1 ARR-Common-Outer-NW-Shortcut - Progressed



Runway 09 and 27 common arrival, shortcut from the northwest

This design option would provide a significantly shorter arrival route from the northwest while joining the existing arrival flow over the Estuary.

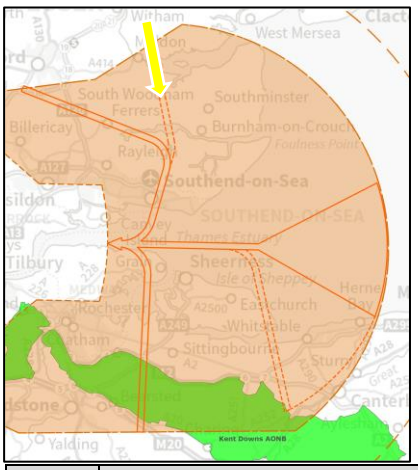
It would need to cross the city of Southend to do so. It stays away from the vicinity of Heathrow, may need to consider Stansted, and would need to deconflict from Southend Airport's air traffic flows.

A delay absorption structure[5] in the upper network would be required. There can be operational complexities to integrate arrival flows from more than one direction.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	PARTIAL: Increased complexity to integrate multiple arrival flows
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Enables capacity improvement (additional route). Increases overall noise impact (DP4). Reduces fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	NOT MET: Overflies Southend, and could not reduce overflight of populated areas elsewhere at these altitudes
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Significantly shorter flightplannable track distance for arrivals from the northwest.
DP6	**Should minimise air pollution in the local area from aircraft**	B	Not applicable to Outer routes
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Design option has potential to improve resilience
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: Minimal change (contained within existing CAS), collaboration with Heathrow, Stansted and Southend will continue in line with FASI programme and masterplan

[5] Any airspace structure used to contain and organise simultaneous arrivals into a manageable sequence to land. This includes traditional racetrack-shaped holding patterns, Point-Merge structures (which LCY uses), and others.

3.1.2 ARR-Common-Outer-N-Shortcut - Progressed



Runway 09 and 27 common arrival, shortcut from the north

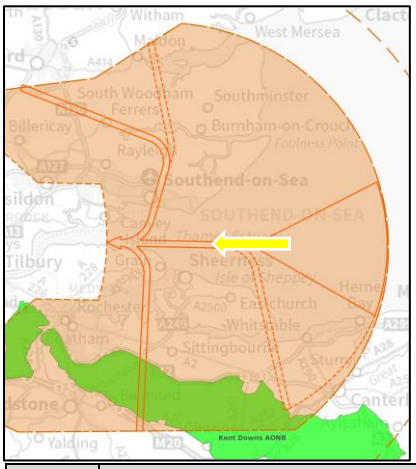
This design option would provide a shorter arrival route from the northwest while joining the existing arrival flow over the Estuary.

It would need to cross the city of Southend to do so. It stays away from the vicinity of Heathrow, may need to consider Stansted, and would need to deconflict from Southend Airport's air traffic flows.

A delay absorption structure in the upper network would be required. There can be operational complexities to integrate arrival flows from more than one direction.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	PARTIAL: Increased complexity to integrate multiple arrival flows
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Enables capacity improvement (additional route). Increases overall noise impact (DP4). Reduces fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	NOT MET: Overflies Southend, and could not reduce overflight of populated areas elsewhere at these altitudes
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Shorter flightplannable track distance for arrivals from the northwest.
DP6	**Should minimise air pollution in the local area from aircraft**	B	Not applicable to Outer routes
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Design option has potential to improve resilience
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: Minimal change (contained within existing CAS), collaboration with Stansted and Southend will continue in line with FASI programme and masterplan

3.1.3 ARR-Common-Outer-PM - Progressed



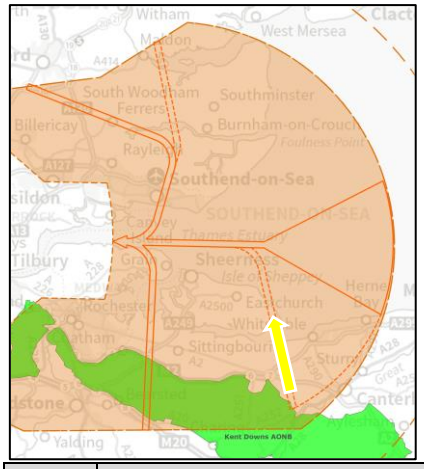
Runway 09 and 27 common arrival, outer point merge

This design option is the same as the baseline Point-Merge structure.

It efficiently links the Point-Merge delay absorption area with a route along the Thames Estuary, not making landfall until Tilbury.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: No increase in capacity, but already optimised. No change to overall noise impact, already optimised (DP4). No change to fuel/CO_2, already optimised (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	PARTIAL: Impacts of aircraft noise likely to be broadly similar (already optimised)
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	PARTIAL: No change (optimised)
DP6	**Should minimise air pollution in the local area from aircraft**	B	Not applicable to Outer routes
DP7	**Should improve resilience during abnormal operating conditions**	B	PARTIAL: Resilience would be broadly similar under this design option
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: Minimal change (contained within existing CAS)

3.1.4 ARR-Common-Outer-S-PM - Progressed



Runway 09 and 27 common arrival, outer southern point merge

This design option would provide a shorter arrival route from the south and southeast.

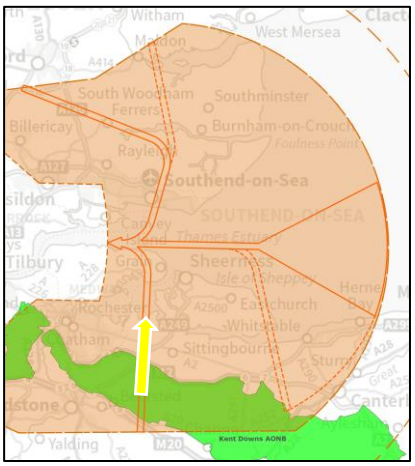
It uses the gap between Faversham & Canterbury to join the existing arrival route along the Thames Estuary. It may cross the edge of the Kent Downs Area of Outstanding Natural Beauty (AONB) at higher altitudes.

It stays away from the vicinity of Heathrow and Gatwick.

It expands the existing higher-level Point-Merge airspace structure clockwise further south, keeping operational flow integration relatively simple.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Enables capacity improvement (additional route). Increases overall noise impact (DP4). Reduces fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	NOT MET: Overflies northern Kent, and could not reduce overflight of populated areas elsewhere at these altitudes
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Shorter flightplannable track distance for arrivals from the southwest.
DP6	**Should minimise air pollution in the local area from aircraft**	B	Not applicable to Outer routes
DP7	**Should improve resilience during abnormal operating conditions**	B	PARTIAL: Resilience would be broadly similar under this design option
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: Minimal change (contained within existing CAS)

3.1.5 ARR-Common-Outer-S-Shortcut - Progressed



Runway 09 and 27 common arrival, outer south shortcut

This design option would provide a significantly shorter arrival route from the southwest and south. I

t uses the gap between Maidstone, Gillingham and Sittingbourne and joins the existing arrival route along the Thames Estuary. It would cross the Kent Downs Area of Outstanding Natural Beauty (AONB) between the M20 and M25.

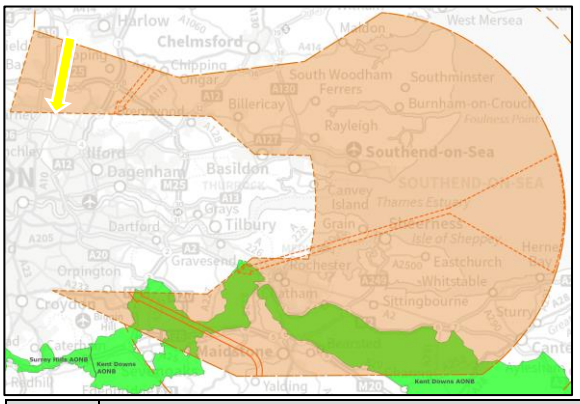
It stays away from the vicinity of Heathrow, and would need to deconflict from Gatwick air traffic flows.

A delay absorption structure in the upper network would be required. There can be operational complexities to integrate arrival flows from more than one direction.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	PARTIAL: Increased complexity to integrate multiple arrival flows
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Enables capacity improvement (additional route). Increases overall noise impact (DP4). Reduces fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	NOT MET: Overflies northern Kent, and could not reduce overflight of populated areas elsewhere at these altitudes
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Shorter flightplannable track distance for arrivals from the southwest.
DP6	**Should minimise air pollution in the local area from aircraft**	B	Not applicable to Outer routes
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Design option has potential to improve resilience
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: Minimal change (contained within existing CAS), collaboration with Gatwick will continue in line with FASI programme and masterplan

3.2 Outer Routes (from 7,000ft-4,000ft) specifically for Runway 09

3.2.1 ARR-09-Outer-N-Shortcut-N - Discounted



Runway 09 arrival, outer north shortcut (northern option)

This design option would provide a significantly shorter arrival route from the northwest.

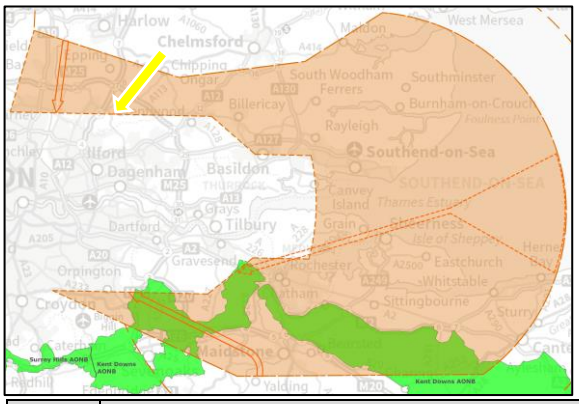
It would follow approximately the Lee Valley between Cheshunt and Waltham Abbey.

It may be complex to deconflict from Heathrow, Luton and Stansted air traffic flows.

A delay absorption structure in the upper network would be required. There can be operational complexities to integrate arrival flows from more than one direction.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	NOT MET: Multiple flows of traffic to/from different airports are likely to require prohibitively restrictive safety mitigations
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Enables capacity improvement (additional route). Increases overall noise impact (DP4). Reduces fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	NOT MET: Overflies Lee Valley area (less densely populated), but could not reduce overflight of populated areas elsewhere at these altitudes. Would result in reduction at lower altitudes (see link to Inner routes in subsection 3.3 below)
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Significantly shorter flightplannable track distance for arrivals from the northwest.
DP6	**Should minimise air pollution in the local area from aircraft**	B	Not applicable to Outer routes
DP7	**Should improve resilience during abnormal operating conditions**	B	NOT MET: Design option has potential to reduce resilience (reduced flexibility in intermediate approach phase)
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: Minimal change (contained within existing CAS), collaboration with Heathrow, Luton and Stansted will continue in line with FASI programme and masterplan

3.2.2 ARR-09-Outer-N-Shortcut-NE - Discounted



Runway 09 arrival, outer north shortcut (northeastern option)

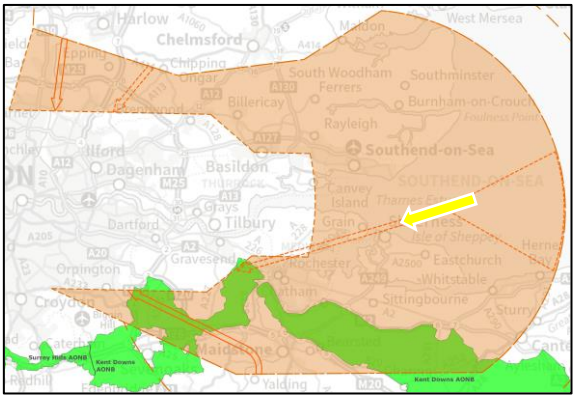
This design option would provide a shorter arrival route from the northwest while staying east of Epping, Theydon Bois and the M11.
It may be complex to deconflict from Heathrow and Stansted air traffic flows.

A delay absorption structure in the upper network would be required. There can be operational complexities to integrate arrival flows from more than one direction.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	NOT MET: Multiple flows of traffic to/from different airports are likely to require prohibitively restrictive safety mitigations
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Enables capacity improvement (additional route). Increases overall noise impact (DP4). Reduces fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	NOT MET: Overflies Tawney Common and Stapleford area (less densely populated), but could not reduce overflight of populated areas elsewhere at these altitudes. Would result in reduction at lower altitudes (see link to Inner routes in subsection 3.3 below)
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Shorter flightplannable track distance for arrivals from the northwest.
DP6	**Should minimise air pollution in the local area from aircraft**	B	Not applicable to Outer routes
DP7	**Should improve resilience during abnormal operating conditions**	B	NOT MET: Design option has potential to reduce resilience (reduced flexibility in intermediate approach phase)
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: Minimal change (contained within existing CAS), collaboration with Heathrow and Stansted will continue in line with FASI programme and masterplan

3.2.3 ARR-09-Outer-S-Wide-Alt - Progressed

Runway 09 arrival, outer south wide alternative

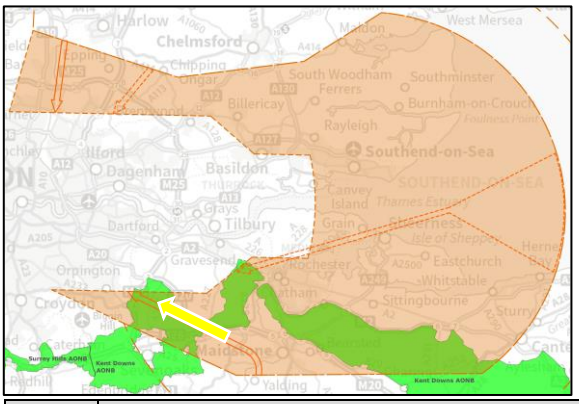


This design option would use the existing Point-Merge structure, but leave in an alternate direction, heading to Sheerness and Grain rather than following the Estuary.
It reaches land sooner than the Estuary flow, hence earlier overflight of populated areas, and under some circumstances would slightly shorten arrivals from the east.

It would cross the northern tip of the Kent Downs AONB near Rochester.
This track could enable some departures to climb more quickly by staying out of their way for longer.
(This indicative design option DP evaluation also includes the short link route at the southeastern corner of the Inner section)

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: No increase in capacity (uses same arrival structure but already optimised) Increases overall noise impact (DP4). Reduces fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	NOT MET: Overflies northern Kent, but could not reduce overflight of populated areas elsewhere at these altitudes.
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Shorter flightplannable track distance for arrivals from the northeast/east/southeast
DP6	**Should minimise air pollution in the local area from aircraft**	B	Not applicable to Outer routes
DP7	**Should improve resilience during abnormal operating conditions**	B	PARTIAL: Resilience would be broadly similar under this design option
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: Minimal change (contained within existing CAS)

3.2.4 ARR-09-Outer-S-Shortcut-SE - Progressed



Runway 09 arrival, outer shortcut southeast

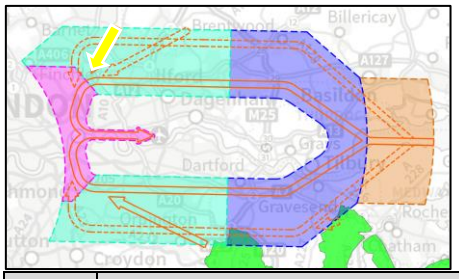
This design option would provide a significantly shorter arrival route from the southwest and south.
It would cross the Kent Downs AONB between the M26 and M25.

It would need to deconflict from Heathrow, Gatwick and Biggin Hill air traffic flows.
A delay absorption structure in the upper network would be required. There can be operational complexities to integrate arrival flows from more than one direction.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	PARTIAL: Increased complexity to integrate multiple arrival flows
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Enables capacity improvement (additional route). Increases overall noise impact (DP4). Reduces fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	NOT MET: Overflies northern Kent, but could not reduce overflight of populated areas elsewhere at these altitudes. Would result in reduction at lower altitudes (see link to Inner routes in subsection 3.3 below)
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Significantly shorter flightplannable track distance for arrivals from the southwest.
DP6	**Should minimise air pollution in the local area from aircraft**	B	Not applicable to Outer routes
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Design option has potential to improve resilience
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: Minimal change (contained within existing CAS), collaboration with Heathrow, Gatwick and Biggin Hill will continue in line with FASI programme and masterplan

3.3 Inner Routes (from 4,000ft to final approach) specifically for Runway 09

3.3.1 ARR-09-Inner-N-Shortcut-N - Discounted

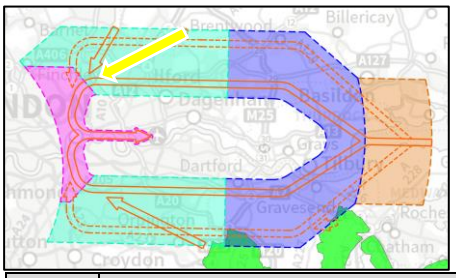


Runway 09 arrival, inner north shortcut from the north

This design option would provide a significantly shorter arrival route from the northwest and links from 3.2.1 above (ARR-09-Outer-N-Shortcut-N).
It would follow approximately the Lee Valley before turning onto final approach.
The northernmost section may be complex to deconflict from Heathrow/Northolt flows.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	NOT MET: Multiple flows of traffic to/from different airports are likely to require prohibitively restrictive safety mitigations
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Enables capacity improvement (additional route). Reduces overall noise impact (DP4). Reduces fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	MET: Significantly shorter route below 4,000ft over less densely populated area
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Significantly shorter flightplannable track distance for arrivals from the northwest.
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: No change below 1,000ft
DP7	**Should improve resilience during abnormal operating conditions**	B	NOT MET: Design option has potential to reduce resilience (reduced flexibility in intermediate approach phase)
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	PARTIAL: Minor negative impact on low-altitude GA airspace users (activity in the NW corner of LCY CAS would be impacted), collaboration with Heathrow/Northolt will continue in line with FASI programme and masterplan

3.3.2 ARR-09-Inner-N-Shortcut-NE - Discounted



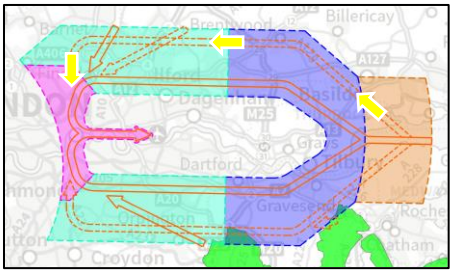
Runway 09 arrival, inner north shortcut from the northeast

This design option is an alternate shortcut option for Runway 09 arrivals from the northwest.
It links from ARR-09-Outer-N-Shortcut-NE.

The northernmost section may be complex to deconflict from Heathrow flows.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	NOT MET: Multiple flows of traffic to/from different airports are likely to require prohibitively restrictive safety mitigations
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Enables capacity improvement (additional route). Reduces overall noise impact (DP4). Reduces fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	MET: Significantly shorter route below 4,000ft over less densely populated area
DP5	**Should minimise the amount of fuel used and the CO2 subsequently emitted**	B	MET: Shorter flightplannable track distance for arrivals from the northwest.
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: No change below 1,000ft
DP7	**Should improve resilience during abnormal operating conditions**	B	NOT MET: Design option has potential to reduce resilience (reduced flexibility in intermediate approach phase)
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	PARTIAL: Minor negative impact on low-altitude GA airspace users (activity in the NW/N corner/edge of LCY CAS would be impacted), collaboration with Heathrow will continue in line with FASI programme and masterplan

3.3.3 ARR-09-Inner-N-Wide - Discounted

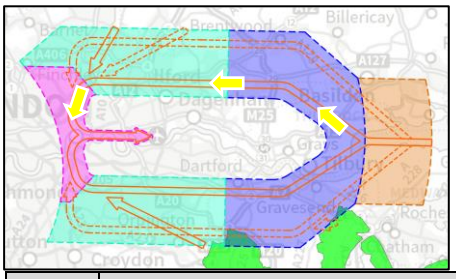


Runway 09 arrival, inner north wide

This design option is a northern mirror of ARR-09-Inner-S-Wide and links from the Estuary westbound arrival routes described previously. It runs parallel and 5.5km north of ARR-09-Inner-N-Tight, and is a longer route. It would overfly different communities, but a broadly similar number of people to the southern mirror route.
The northwestern-most section may be complex to deconflict from Heathrow flows due to the perpendicular base leg as it turns from heading west to south.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	NOT MET: Multiple flows of traffic to/from different airports are likely to require prohibitively restrictive safety mitigations
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	PARTIAL: May enable increase in departure capacity (additional space for departures) Similar overall noise impact (DP4). Longer route may increase fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	PARTIAL: Longer route but overflies similar population densities, likely to be broadly similar
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	NOT MET: Route is longer below 4,000ft
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: No change below 1,000ft
DP7	**Should improve resilience during abnormal operating conditions**	B	PARTIAL: Resilience would be broadly similar under this design option
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	PARTIAL: Minor negative impact on low-altitude GA airspace users (activity in the NW/N corner/edge of LCY CAS would be impacted), collaboration with Heathrow will continue in line with FASI programme and masterplan

3.3.4 ARR-09-Inner-N-Tight - Progressed



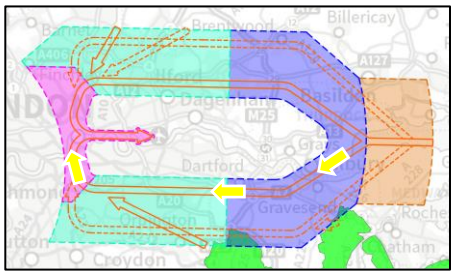
Runway 09 arrival, inner north tight

This design option is a northern mirror of ARR-09-Inner-S-Tight, which is the same track as today's baseline route. It links from the Estuary westbound arrival routes described previously.

It would overfly different communities, but a broadly similar number of people to the southern mirror route (baseline). If this proposed route is higher than the equivalent southern baseline route flown today, then the westbound section may be complex to deconflict from Heathrow flows.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	PARTIAL: Interaction with our own departures would require a significantly more robust safety argument than today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	PARTIAL: May reduce capacity due to departure interactions. Similar overall noise impact (DP4). Same route length means similar fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	PARTIAL: Likely to be broadly similar (less densely populated areas to the east at higher altitudes but more densely populated areas to the west at lower altitudes)
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	PARTIAL: Mirror of today's track, no change to total length, slightly higher
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: No change below 1,000ft
DP7	**Should improve resilience during abnormal operating conditions**	B	PARTIAL: Resilience would be broadly similar under this design option
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	PARTIAL: Minor negative impact on low-altitude GA airspace users (activity in the NW/N corner/edge of LCY CAS would be impacted), collaboration with Heathrow will continue in line with FASI programme and masterplan

3.3.5 ARR-09-Inner-S-Tight - Progressed



Runway 09 arrival, inner south tight

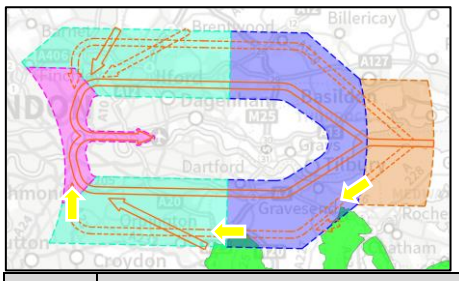
This design option is the same track as today's baseline route.

It links from the Estuary westbound arrival routes described previously. It would overfly the same communities as today.

If this proposed route is higher than flown today, then the westbound section may be complex to deconflict from Heathrow flows.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Same / similar safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	PARTIAL: Broadly similar capacity Slightly reduced overall noise impact (DP4). Similar to day's fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	MET: Same track, slightly higher
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	PARTIAL: Today's track, no change to total length, slightly higher.
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: No change below 1,000ft
DP7	**Should improve resilience during abnormal operating conditions**	B	PARTIAL: Resilience would be broadly similar under this design option
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: No change in impact on other airspace users, collaboration with Heathrow will continue in line with FASI programme and masterplan

3.3.6 ARR-09-Inner-S-Wide - Progressed

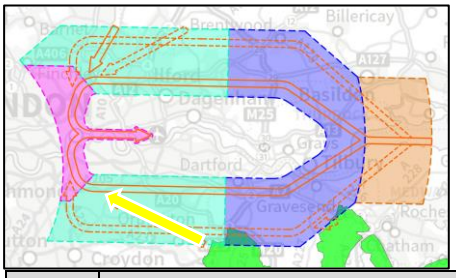


Runway 09 arrival, inner south wide

This design option runs parallel and 5.5km south of ARR-09-Inner-S-Tight. It links from the Estuary westbound arrival routes described previously. It would overfly different communities, likely fewer people, and is a longer route. It partially overflies the Kent Downs AONB between the M20 and M25.
The southwestern-most section may be complex to deconflict from Heathrow flows due to the perpendicular base leg as it turns from heading west to north. Biggin Hill flows would also need deconfliction.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Same / similar safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	PARTIAL: May enable increase in departure capacity Similar overall noise impact (DP4). Longer route may increase fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	MET: Longer route but overflies less densely populated areas overall
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	NOT MET: Route is longer below 4,000ft
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: No change below 1,000ft
DP7	**Should improve resilience during abnormal operating conditions**	B	PARTIAL: Resilience would be broadly similar under this design option
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	PARTIAL: Minor negative impact on low-altitude GA airspace users (activity in the SW/S corner/edge of LCY CAS would be impacted), collaboration with Heathrow and Biggin Hill will continue in line with FASI programme and masterplan

3.3.7 ARR-09-Inner-S-Shortcut-SE - Progressed



Runway 09 arrival, inner south shortcut southeast

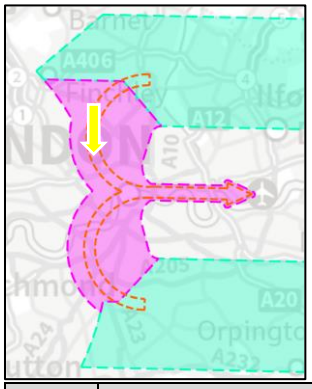
This design option would provide a significantly shorter arrival route from the southwest and south, and links from ARR-09-Outer-S-Shortcut-SE.

It may be complex to integrate with Heathrow, Gatwick and Biggin Hill air traffic flows.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Enables increase in capacity (additional route) Improved overall noise impact (DP4). Shorter route reduces fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	MET: Significantly shorter route below 4,000ft
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Shorter flightplannable track distance for arrivals from the southwest.
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: No change below 1,000ft
DP7	**Should improve resilience during abnormal operating conditions**	B	PARTIAL: Resilience would be broadly similar under this design option (similar concept to ARR-09-Inner-N-Shortcut-NE but more room on S side to reduce inflexibility of shortcut arrivals from N)
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	PARTIAL: Minor negative impact on low-altitude GA airspace users (activity in the SW/S corner/edge of LCY CAS would be impacted), collaboration with Heathrow, Gatwick and Biggin Hill will continue in line with FASI programme and masterplan

Turns to final approach designed with different navigation standard (RNAV1-RF)

3.3.8 ARR-09-Inner-N-RF - Discounted



Runway 09 arrival, inner north, using the navigation standard known as RNAV1-RF.

This design option is the result of increasing the automation of the final base leg turn to final approach.

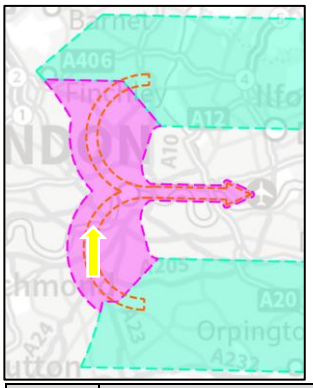
The wider turn means a longer route.

It would overfly different communities, but a broadly similar number of people.

It would be challenging and complex to deconflict from Heathrow flows due to the proximity with Heathrow controlled airspace as it turns southeast.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	NOT MET: Likely to conflict with Heathrow arrivals using their westerly runways' instrument landing systems (ILS). Would require prohibitively restrictive safety mitigations
DP1	**Must be in compliance with all laws and regulations**	A	PARTIAL: Significant justification needed for designing routes conflicting with another airport's ILS flow.
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	PARTIAL: Designed to high navigation standards likely to require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	PARTIAL: May enable improved capacity due to reduced controller workload Similar overall noise impact (DP4). Longer route increases fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	PARTIAL: Likely to be broadly similar (overflies similar population densities, mostly new areas)
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	NOT MET: Route is likely to be longer below 4,000ft
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: No change below 1,000ft
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Would result in improved automation of the last turn onto final approach, reducing reliance on controller input.
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	PARTIAL: Minor negative impact on low-altitude GA airspace users (activity in the NW/N corner/edge of LCY CAS would be impacted), collaboration with Heathrow will continue in line with FASI programme and masterplan

3.3.9 ARR-09-Inner-S-RF - Discounted



Runway 09 arrival, inner south, using the navigation standard known as RNAV1-RF.

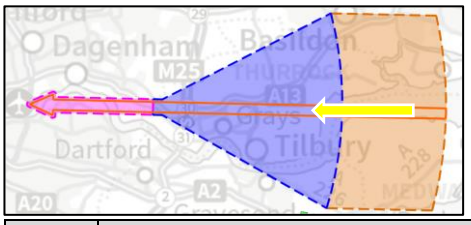
This design option is similar to, but a greater challenge than, the northern version above.

Deconfliction from Heathrow flows is more complex due to the southern route entering and then leaving Heathrow controlled airspace as it turns northeast.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	NOT MET: Likely to conflict with Heathrow arrivals using their westerly runways' instrument landing systems (ILS). Would require prohibitively restrictive safety mitigations
DP1	**Must be in compliance with all laws and regulations**	A	PARTIAL: Significant justification needed for designing routes conflicting with another airport's ILS flow.
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	PARTIAL: Designed to high navigation standards likely to require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	PARTIAL: May enable improved capacity due to reduced controller workload Similar overall noise impact (DP4). Longer route increases fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	PARTIAL: Likely to be broadly similar (overflies similar population densities, mostly new areas)
DP5	**Should minimise the amount of fuel used and the CO2 subsequently emitted**	B	NOT MET: Route is likely to be longer below 4,000ft
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: No change below 1,000ft
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Would result in improved automation of the last turn onto final approach, reducing reliance on controller input.
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	PARTIAL: Minor negative impact on low-altitude GA airspace users (activity in the NW/N corner/edge of LCY CAS would be impacted), collaboration with Heathrow will continue in line with FASI programme and masterplan

3.4 Inner Route (from 4,000ft to final approach) specifically for Runway 27

3.4.1 ARR-27-Inner - Progressed



Runway 27 arrival, inner

This design option is the same as the baseline because the route is already as short, direct and efficient as possible.

It is also as high as possible, and the final approach is already very steep.

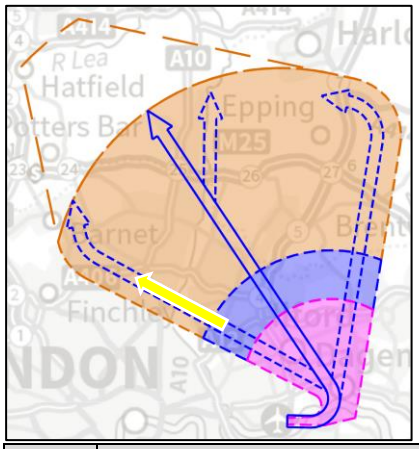
Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: No increase in capacity, but already optimised. No change to overall noise impact, already optimised (DP4). No change to fuel/CO_2, already optimised (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	PARTIAL: No change from the current noise impact (already optimised).
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	PARTIAL: No change in fuel burn per flight (already optimised)
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: No change below 1,000ft
DP7	**Should improve resilience during abnormal operating conditions**	B	PARTIAL: Resilience would be broadly similar under this design option (no change)
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: No change in impact on other airspace users

4 Runway 09 Departure Options

4.1 Runway 09 SIDs to the northwest and west

With a left turn out after take-off (LTO)

4.1.1 DEP-09-NW-LTO-1 - Progressed



Runway 09 departure to the northwest, left turn out (option 1)

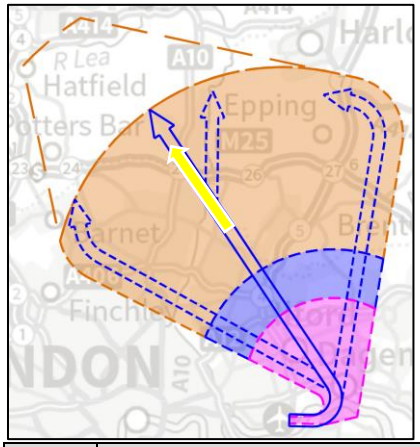
This design option continues the left turn towards Heathrow's airspace, before turning north.

It would overfly different communities, but a broadly similar number of people.

It would need to deconflict from Heathrow, Luton and Stansted air traffic flows.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Broadly similar capacity Improved overall noise impact (DP4). Improved fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	MET: Overflies some of the same communities as today but expected to be higher more quickly, and would overfly a broadly similar number of people
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Has the potential to reduce fuel burn per flight (quicker climb even though route is longer than today)
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: It is not likely that there would be a noticeable change in flightpaths, and associated air pollution, below 1,000ft.
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Quicker climb may improve resilience
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: No change in impact on other airspace users, collaboration with Heathrow, Luton and Stansted will continue in line with FASI programme and masterplan

4.1.2 DEP-09-NW-LTO-2 - Progressed



Runway 09 departure to the northwest, left turn out (option 2)

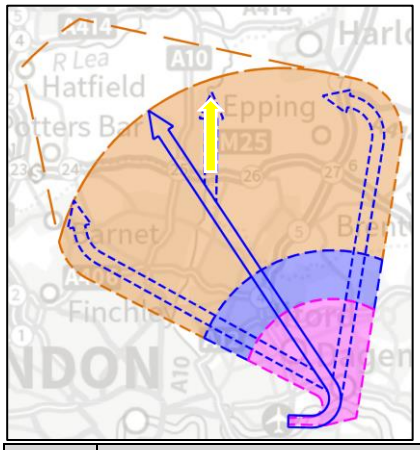
This design option is the same track as today's baseline route.

It would overfly the same communities, but aims to climb higher and more continuously.

It would need to deconflict from Heathrow, Luton and Stansted air traffic flows.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Broadly similar capacity Improved overall noise impact (DP4). Improved fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	MET: Overflies the same communities as today but expected to be higher more quickly.
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Has the potential to reduce fuel burn per flight (quicker climb even though route is same as today)
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: It is not likely that there would be a noticeable change in flightpaths, and associated air pollution, below 1,000ft.
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Quicker climb may improve resilience.
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: No change in impact on other airspace users, collaboration with Heathrow, Luton and Stansted will continue in line with FASI programme and masterplan

4.1.3 DEP-09-NW-LTO-3 - Progressed



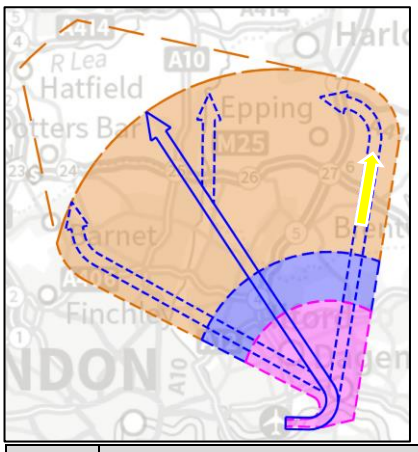
Runway 09 departure to the northwest, left turn out (option 3)

This design option is the same initial track as today's baseline route until reaching the Lee Valley, where it turns to follow the River Lea, which is less densely populated.

It would need to deconflict from Heathrow, Luton and Stansted air traffic flows.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Broadly similar capacity Improved overall noise impact (DP4). Improved fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	MET: Overflies many of the same communities as today but expected to be higher more quickly, and then aims to overfly less densely populated area
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Has the potential to reduce fuel burn per flight (quicker climb, route is similar length to today)
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: It is not likely that there would be a noticeable change in flightpaths, and associated air pollution, below 1,000ft.
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Quicker climb may improve resilience.
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: No change in impact on other airspace users, collaboration with Heathrow, Luton and Stansted will continue in line with FASI programme and masterplan

4.1.4 DEP-09-NW-LTO-4 - Progressed



Runway 09 departure to the northwest, left turn out (option 4)

This route may allow for quicker climbs by routeing initially away from the desired ultimate direction.

It would overfly different communities, and is likely to overfly less densely populated areas.

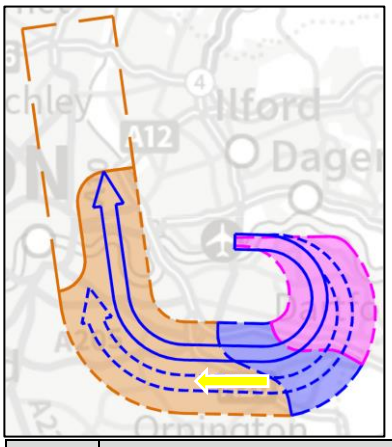
This route would be slightly longer overall due to the alternate initial departure direction.

It would need to deconflict from Heathrow, Luton and Stansted air traffic flows.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Broadly similar capacity Improved overall noise impact (DP4). Improved fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	MET: Overflies some of the same communities as today but expected to be higher more quickly, and then aims to overfly less densely populated area
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Has the potential to reduce fuel burn per flight (quicker climb even though route is longer than today)
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: It is not likely that there would be a noticeable change in flightpaths, and associated air pollution, below 1,000ft.
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Quicker climb may improve resilience.
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: No change in impact on other airspace users, collaboration with Heathrow, Luton and Stansted will continue in line with FASI programme and masterplan

With a right turn out after take-off (RTO)

4.1.5 DEP-09-NW-RTO-1 - Discounted



Runway 09 departure to the northwest, right turn out (option 1)

This design option makes a wide turn to the right, towards Heathrow's airspace, before turning north, crossing final approach at network levels if climb was continuous.

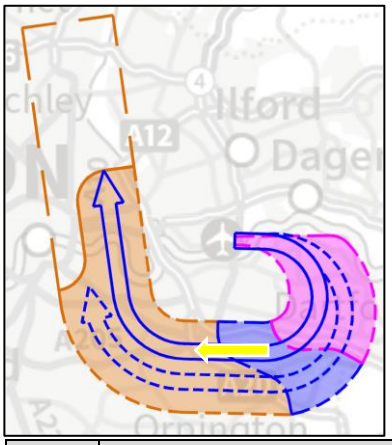
It would overfly different communities, but a broadly similar number of people. It is 1.8km south of, and parallel to, DEP-09-NW-RTO-2.

It would need deconfliction from Biggin Hill, and a challenging & complex deconfliction from Heathrow air traffic flows and our own arrivals.

This may be less efficient from an air traffic departure management point of view.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	NOT MET: Complex interaction with Heathrow and our own arrivals would likely require restrictive safety mitigations
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	PARTIAL: Potential to reduce capacity (may interact with 09 arrivals) Similar overall noise impact (DP4). Improved fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	PARTIAL: Would overfly very different communities from today but a broadly similar number of people, even with a quicker climb than today.
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Has the potential to reduce fuel burn per flight (quicker climb even though route is longer than today)
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: It is not likely that there would be a noticeable change in flightpaths, and associated air pollution, below 1,000ft.
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Quicker climb may improve resilience.
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	PARTIAL: Right turn out may cause negative impact on GA between Isle of Dogs-QEII Bridge, collaboration with Heathrow and Biggin Hill will continue in line with FASI programme and masterplan

4.1.6 DEP-09-NW-RTO-2 - Discounted



Runway 09 departure to the northwest, right turn out (option 2)

This design option makes a tight turn to the right, towards Heathrow's airspace, before turning north and crossing final approach.

It would overfly different communities, but a broadly similar number of people.

It would need deconfliction from Biggin Hill, and a challenging & complex deconfliction from Heathrow air traffic flows and our own arrivals.

This may be less efficient from an air traffic departure management point of view.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	NOT MET: Complex interaction with Heathrow and our own arrivals would likely require restrictive safety mitigations
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	PARTIAL: Potential to reduce capacity (may interact with 09 arrivals) Similar overall noise impact (DP4). Improved fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	PARTIAL: Would overfly very different communities from today but a broadly similar number of people, even with a quicker climb than today.
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Has the potential to reduce fuel burn per flight (quicker climb even though route is longer than today)
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: It is not likely that there would be a noticeable change in flightpaths, and associated air pollution, below 1,000ft.
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Quicker climb may improve resilience.
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	PARTIAL: Right turn out may cause negative impact on GA between Isle of Dogs-QEII Bridge, collaboration with Heathrow and Biggin Hill will continue in line with FASI programme and masterplan

4.2 Runway 09 SIDs to the northeast and east

With a left turn out after take-off (LTO)

4.2.1 DEP-09-ENE-LTO-1 - Progressed

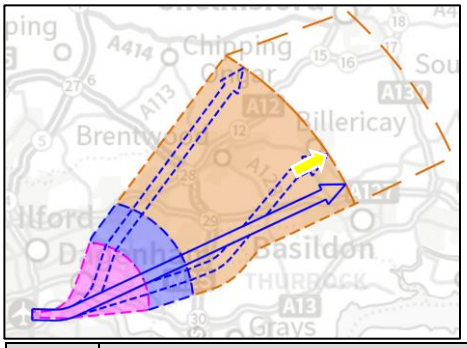
Runway 09 departure to the east-northeast, left turn out (option 1)

This design option follows today's baseline SID but continues further northeast, similar to today's tactical controlling.
This means the departure crosses under Heathrow's arrival flow more quickly, and is then turned east once higher. It would overfly the same communities.

It would need deconfliction from Heathrow, Stansted and Southend air traffic flows.
This may be more efficient from an air traffic departure management point of view.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Broadly similar capacity Improved overall noise impact (DP4). Improved fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	MET: Overflies many of the same communities as today but expected to be higher more quickly, and then would overfly a broadly similar number of people
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Has the potential to reduce fuel burn per flight (quicker climb and route is similar to today)
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: It is not likely that there would be a noticeable change in flightpaths, and associated air pollution, below 1,000ft.
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Quicker climb may improve resilience.
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: No change in impact on other airspace users, collaboration with Heathrow Stansted and Southend will continue in line with FASI programme and masterplan

4.2.2 DEP-09-ENE-LTO-2 - Progressed



Runway 09 departure to the east-northeast, left turn out (option 2)

This design option aims to avoid densely populated areas where possible, and removes the complex turns from today's baseline SID.

It would overfly some of the same communities at lower altitudes, but would also overfly different communities (likely to be fewer people overall).

It would need deconfliction from Heathrow, Stansted and Southend air traffic flows.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Broadly similar capacity Improved overall noise impact (DP4). Improved fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	MET: Overflies some of the same, but mostly different communities, expected to be higher more quickly, and aims to overfly a less densely populated area
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Has the potential to reduce fuel burn per flight (quicker climb and route is similar to today)
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: It is not likely that there would be a noticeable change in flightpaths, and associated air pollution, below 1,000ft.
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Quicker climb may improve resilience.
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: No change in impact on other airspace users, collaboration with Heathrow Stansted and Southend will continue in line with FASI programme and masterplan

4.2.3 DEP-09-ENE-LTO-3 - Progressed

Runway 09 departure to the east-northeast, left turn out (option 3)

This design option is the shortest route to the UK exit point in the east. It removes the complex turns from today's baseline SID.

It would overfly some of the same communities at lower altitudes, but would also overfly different communities (a broadly similar number of people).

It would need deconfliction from Heathrow, Stansted and Southend air traffic flows.

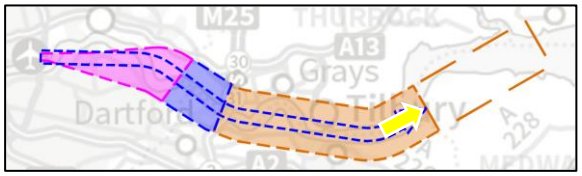
Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Broadly similar capacity Improved overall noise impact (DP4). Improved fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	MET: Overflies some of the same communities as today but expected to be higher more quickly, and would overfly a broadly similar number of people
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Has the potential to reduce fuel burn per flight (quicker climb and route is as short as possible)
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: It is not likely that there would be a noticeable change in flightpaths, and associated air pollution, below 1,000ft.
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Quicker climb may improve resilience.
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: No change in impact on other airspace users, collaboration with Heathrow Stansted and Southend will continue in line with FASI programme and masterplan

With a right turn out after take-off (RTO)

4.2.4 DEP-09-ENE-RTO-1 - Progressed

Runway 09 departure to the east-northeast, right turn out (option 1)

This design option aims to avoid densely populated areas where possible, by climbing straight ahead and then approximately following the River Thames eastwards.
It would overfly some of the same communities at the lowest altitudes, but would also overfly different communities (likely to be fewer people overall).
It would need deconfliction from Southend air traffic flows and our own arrivals, if they were to the south of the airport.



Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Broadly similar capacity Improved overall noise impact (DP4). Improved fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	MET: Overflies some of the same, but mostly different communities, expected to be higher more quickly, and aims to overfly a less densely populated area
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Has the potential to reduce fuel burn per flight (quicker climb even though route is longer than today)
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: It is not likely that there would be a noticeable change in flightpaths, and associated air pollution, below 1,000ft.
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Quicker climb may improve resilience.
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: No change in impact on other airspace users, collaboration with Southend will continue in line with FASI programme and masterplan

4.3 Runway 09 SIDs to the southeast and south

With a left turn out after take-off (LTO)

4.3.1 DEP-09-SE-LTO-1 - Progressed

Runway 09 departure to the southeast, left turn out (option 1)

This design option removes the complex turns from today's baseline SID but continues to route to one of its intermediate waypoints. The departure is then turned southeast once higher, at network levels.

It would overfly some of the same communities more frequently at lower altitudes, and would also overfly different but less densely populated areas (likely to be fewer people overall).

It would need deconfliction from Southend air traffic flows.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Broadly similar capacity Improved overall noise impact (DP4). Improved fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	MET: Overflies some of the same, but mostly different communities, expected to be higher more quickly, and would overfly a less densely populated area
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Has the potential to reduce fuel burn per flight (quicker climb, shorter route than today)
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: It is not likely that there would be a noticeable change in flightpaths, and associated air pollution, below 1,000ft.
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Quicker climb may improve resilience.
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: No change in impact on other airspace users, collaboration with Southend will continue in line with FASI programme and masterplan

4.3.2 DEP-09-SE-LTO-2 - Progressed

Runway 09 departure to the southeast, left turn out (option 2)

This design option removes the complex turns from today's baseline SID and stays as south as possible before needing deconfliction from our own arrivals.

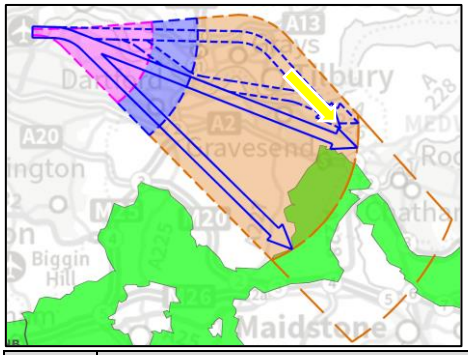
The departure is then turned southeast once higher, at network levels.

It would overfly some of the same communities more frequently at lower altitudes, and would also overfly different but less densely populated areas (likely to be fewer people overall).
It would need deconfliction from Southend air traffic flows.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Broadly similar capacity Improved overall noise impact (DP4). Improved fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	MET: Overflies some of the same, but mostly different communities, expected to be higher more quickly, and would overfly a less densely populated area
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Has the potential to reduce fuel burn per flight (quicker climb, shorter route than today)
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: It is not likely that there would be a noticeable change in flightpaths, and associated air pollution, below 1,000ft.
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Quicker climb may improve resilience.
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: No change in impact on other airspace users, collaboration with Southend will continue in line with FASI programme and masterplan

With a right turn out after take-off (RTO)

4.3.3 DEP-09-SE-RTO-1 - Progressed



Runway 09 departure to the southeast, right turn out (option 1)

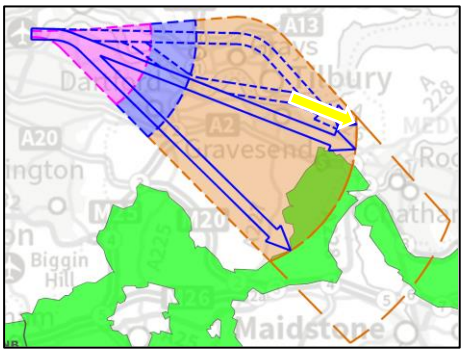
This design option climbs straight ahead and then turns southeast.

It would overfly some of the same communities at the lowest altitudes, but would also overfly different communities (likely to be fewer people overall).

It would need deconfliction from Southend air traffic flows and from our own arrivals.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: May enable increase in capacity (potential reduction in departure separation) Improved overall noise impact (DP4). Improved fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	MET: Overflies some of the same, but mostly different communities, expected to be higher more quickly, and would overfly a less densely populated area
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Has the potential to reduce fuel burn per flight (quicker climb, shorter route than today)
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: It is not likely that there would be a noticeable change in flightpaths, and associated air pollution, below 1,000ft.
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Quicker climb may improve resilience.
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: No change in impact on other airspace users, collaboration with Southend will continue in line with FASI programme and masterplan

4.3.4 DEP-09-SE-RTO-2 - Progressed



Runway 09 departure to the southeast, right turn out (option 2)

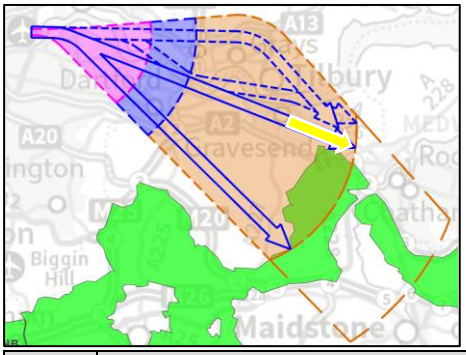
This design option aims to avoid densely populated areas where possible, by climbing straight ahead and then approximately following the River Thames southeastwards.

It would overfly some of the same communities at the lowest altitudes, but would also overfly different communities (likely to be fewer people overall).

It would need deconfliction from Southend air traffic flows and our own arrivals, if they were to the south of the airport.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: May enable increase in capacity (potential reduction in departure separation) Improved overall noise impact (DP4). Improved fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	MET: Overflies some of the same, but mostly different communities, expected to be higher more quickly, and would overfly a less densely populated area
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Has the potential to reduce fuel burn per flight (quicker climb, shorter route than today)
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: It is not likely that there would be a noticeable change in flightpaths, and associated air pollution, below 1,000ft.
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Quicker climb may improve resilience.
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: No change in impact on other airspace users, collaboration with Southend will continue in line with FASI programme and masterplan

4.3.5 DEP-09-SE-RTO-3 - Progressed



Runway 09 departure to the southeast, right turn out (option 3)

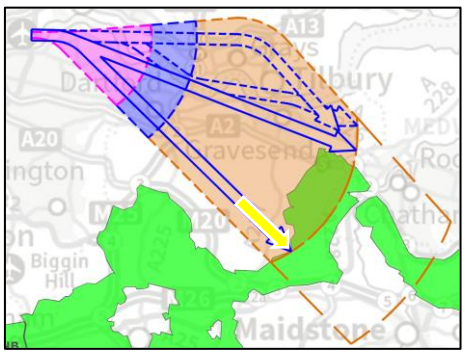
This design option is the shortest route to the UK exit point in the southeast.

It would overfly different communities (a broadly similar number of people).

It would need deconfliction from Gatwick, Biggin Hill and Southend air traffic flows and our own arrivals, if they were to the south of the airport.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: May enable increase in capacity (potential reduction in departure separation) Similar overall noise impact (DP4). Improved fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	PARTIAL: Would overfly very different communities from today but a broadly similar number of people, expected to be higher more quickly.
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Has the potential to reduce fuel burn per flight (quicker climb, shortest route to this exit point)
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: It is not likely that there would be a noticeable change in flightpaths, and associated air pollution, below 1,000ft.
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Quicker climb may improve resilience.
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	PARTIAL: Right turn out may cause negative impact on GA between Isle of Dogs-QEII Bridge, collaboration with Gatwick, Biggin Hill and Southend will continue in line with FASI programme and masterplan

4.3.6 DEP-09-SE-RTO-4 - Progressed



Runway 09 departure to the southeast, right turn out (option 4)

This design option is the shortest route to the UK exit point in the south.

It would overfly different communities (a broadly similar number of people).

It would need deconfliction from Gatwick, Biggin Hill and Southend air traffic flows and our own arrivals, if they were to the south of the airport.

This may be more efficient from an air traffic departure management point of view.

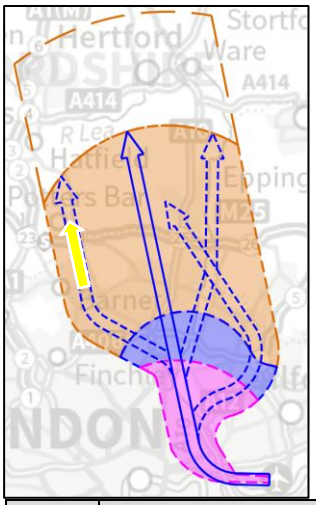
Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: May enable increase in capacity (potential reduction in departure separation) Similar overall noise impact (DP4). Improved fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	PARTIAL: Would overfly very different communities from today but a broadly similar number of people, expected to be higher more quickly.
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Has the potential to reduce fuel burn per flight (quicker climb, shortest route to this exit point)
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: It is not likely that there would be a noticeable change in flightpaths, and associated air pollution, below 1,000ft.
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Quicker climb may improve resilience.
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	PARTIAL: Right turn out may cause negative impact on GA between Isle of Dogs-QEII Bridge, collaboration with Gatwick, Biggin Hill and Southend will continue in line with FASI programme and masterplan

5 Runway 27 Departure Options

5.1 Runway 27 SIDs to the northwest and west

With a right turn out after take-off (RTO)

5.1.1 DEP-27-NW-RTO-1 - Progressed



Runway 27 departure to the northwest, right turn out (option 1)

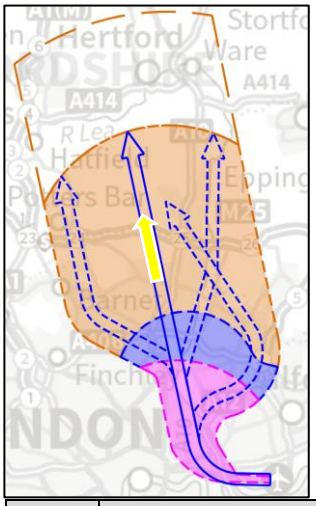
This design option stays away from Heathrow airspace initially but then moves closer to provide an alternate route.

It would overfly some of the same communities, and would also overfly different communities (a broadly similar number of people).

It would need deconfliction from Heathrow, Luton and Stansted air traffic flows.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Broadly similar capacity Improved overall noise impact (DP4). Improved fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	MET: Overflies some of the same, but mostly different communities, and would overfly a broadly similar number of people. Quicker climb expected.
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Has the potential to reduce fuel burn per flight (quicker climb, similar route length to today)
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: It is not likely that there would be a noticeable change in flightpaths, and associated air pollution, below 1,000ft.
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Quicker climb may improve resilience.
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: No change in impact on other airspace users, collaboration with Heathrow, Luton and Stansted will continue in line with FASI programme and masterplan

5.1.2 DEP-27-NW-RTO-2 - Progressed



Runway 27 departure to the northwest, right turn out (option 2)

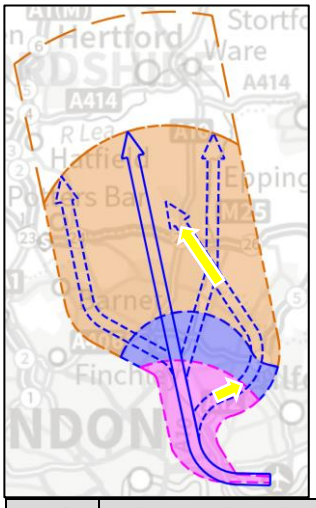
This design option is the shortest route to the northwestern and western route network. It removes the complex turns from today's baseline SID.

It would overfly some of the same communities, and would also overfly different communities (likely to be fewer people overall).

It would need deconfliction from Heathrow, Luton and Stansted air traffic flows.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Broadly similar capacity Improved overall noise impact (DP4). Improved fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	MET: Overflies some of the same, but mostly different communities, and would overfly a less densely populated area. Quicker climb expected.
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Has the potential to reduce fuel burn per flight (quicker climb, shortest route)
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: It is not likely that there would be a noticeable change in flightpaths, and associated air pollution, below 1,000ft.
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Quicker climb may improve resilience.
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: No change in impact on other airspace users, collaboration with Heathrow, Luton and Stansted will continue in line with FASI programme and masterplan s

5.1.3 DEP-27-NW-RTO-3 - Progressed



Runway 27 departure to the northwest, right turn out (option 3)

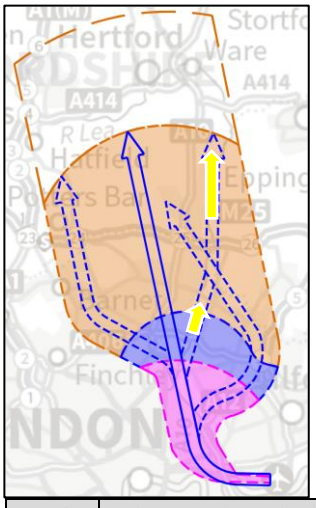
This design option follows today's baseline SID but with a higher climb gradient.

It would overfly the same communities, but likely to be fewer people overall due to faster climb shortening the track length to 7,000ft.

It would need deconfliction from Heathrow, Luton and Stansted air traffic flows.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Broadly similar capacity Improved overall noise impact (DP4). Improved fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	MET: Overflies the same communities, but with quicker climb.
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Has the potential to reduce fuel burn per flight (quicker climb, same track length)
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: It is not likely that there would be a noticeable change in flightpaths, and associated air pollution, below 1,000ft.
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Quicker climb may improve resilience.
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: No change in impact on other airspace users, collaboration with Heathrow, Luton and Stansted will continue in line with FASI programme and masterplan

5.1.4 DEP-27-NW-RTO-4 - Progressed



Runway 27 departure to the northwest, right turn out (option 4)

This design option is the shortest route to the UK exit point in the south.

It would overfly different communities (a broadly similar number of people).

It would need deconfliction from Gatwick, Biggin Hill and Southend air traffic flows and our own arrivals, if they were to the south of the airport.

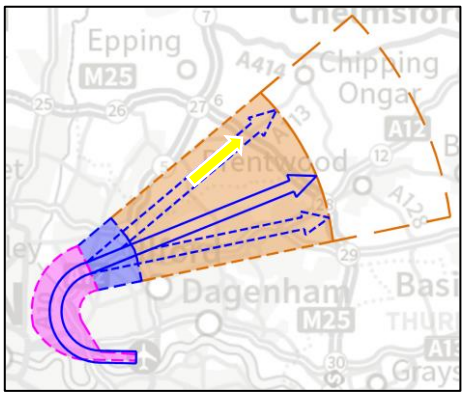
This may be more efficient from an air traffic departure management point of view.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Broadly similar capacity Improved overall noise impact (DP4). Improved fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	MET: Overflies some of the same, but mostly different communities, and aims to overfly a less densely populated area. Quicker climb expected.
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Has the potential to reduce fuel burn per flight (quicker climb, similar track length to today)
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: It is not likely that there would be a noticeable change in flightpaths, and associated air pollution, below 1,000ft.
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Quicker climb may improve resilience.
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: No change in impact on other airspace users, collaboration with Gatwick, Biggin Hill and Southend will continue in line with FASI programme and masterplan

5.2 Runway 27 SIDs to the northeast and east

With a right turn out after take-off (RTO)

5.2.1 DEP-27-ENE-RTO-1 - Progressed



Runway 27 departure to the east-northeast, right turn out (option 1)

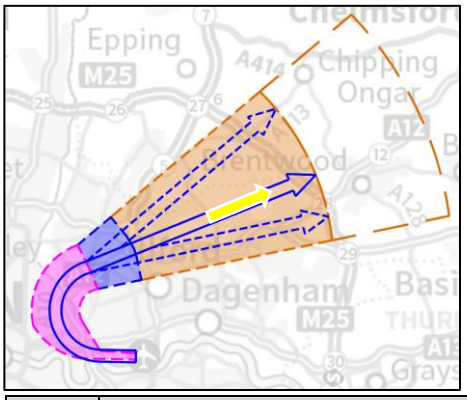
This design option follows today's baseline SID but continues further northeast, similar to today's tactical controlling.

This means the departure crosses under Heathrow's current arrival flow more quickly, and is then turned east once higher. It would overfly the same communities.

It would need deconfliction from Heathrow and Stansted air traffic flows.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Broadly similar capacity Improved overall noise impact (DP4). Improved fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	MET: Overflies the same communities as today but expected to be higher more quickly
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Has the potential to reduce fuel burn per flight (quicker climb and route is similar to today)
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: It is not likely that there would be a noticeable change in flightpaths, and associated air pollution, below 1,000ft.
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Quicker climb may improve resilience.
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: No change in impact on other airspace users, collaboration with Heathrow, and Stansted will continue in line with FASI programme and masterplan

5.2.2 DEP-27-ENE-RTO-2 - Progressed



Runway 27 departure to the east-northeast, right turn out (option 2)

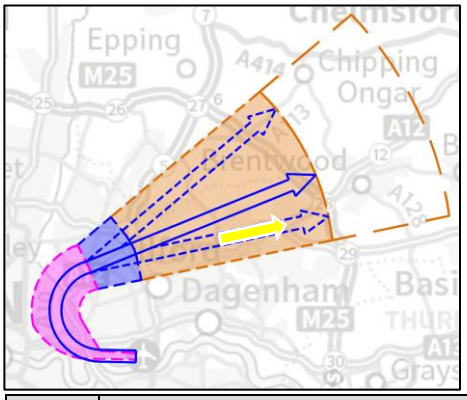
This design option follows today's baseline SID then directly (shortest track) to the UK exit point in the east.

It removes the complex turns from today's baseline SID. It would overfly some of the same communities, and would also overfly different communities (likely to be fewer people overall).

It would need deconfliction from Heathrow, Stansted and Southend air traffic flows.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Broadly similar capacity Improved overall noise impact (DP4). Improved fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	MET: Overflies many of the same communities as today and some new communities, but expected to be higher more quickly
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Has the potential to reduce fuel burn per flight (quicker climb, shortest route)
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: It is not likely that there would be a noticeable change in flightpaths, and associated air pollution, below 1,000ft.
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Quicker climb may improve resilience.
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: No change in impact on other airspace users, collaboration with Heathrow, Stansted and Southend will continue in line with FASI programme and masterplan

5.2.3 DEP-27-ENE-RTO-3 - Progressed



Runway 27 departure to the east-northeast, right turn out (option 3)

This alternate design option follows today's baseline SID and is as far south as reasonably practicable for departures heading northeast and east before needing deconfliction from our own arrivals.

It would mainly overfly the same communities and some new communities, likely to be fewer people overall due to faster climb shortening the track length to 7,000ft.

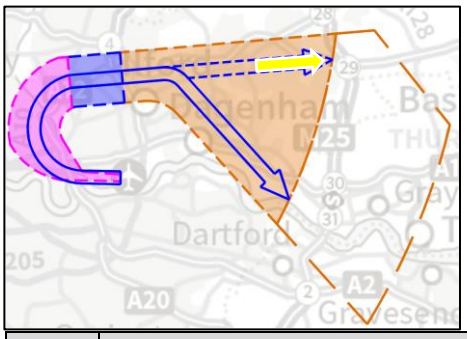
It would need deconfliction from Heathrow, Stansted and Southend air traffic flows.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Broadly similar capacity Improved overall noise impact (DP4). Improved fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	MET: Overflies many of the same communities as today and some new communities, but expected to be higher more quickly
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Has the potential to reduce fuel burn per flight (quicker climb, shortest route)
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: It is not likely that there would be a noticeable change in flightpaths, and associated air pollution, below 1,000ft.
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Quicker climb may improve resilience.
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: No change in impact on other airspace users, collaboration with Heathrow, Stansted and Southend will continue in line with FASI programme and masterplan

5.3 Runway 27 SIDs to the southeast and south

With a right turn out after take-off (RTO)

5.3.1 DEP-27-SE-RTO-1 - Progressed



Runway 27 departure to the southeast, right turn out (option 1)

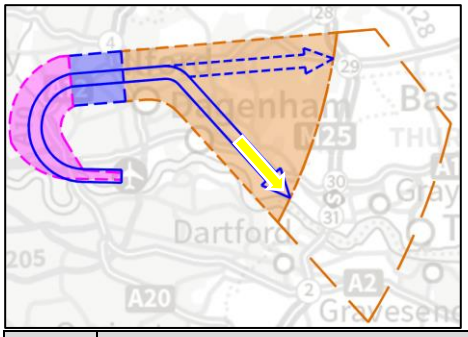
This design option removes the complex turns from today's baseline SID but continues to route to one of its intermediate waypoints.

The departure is then turned southeast once higher, at network levels. It would overfly some of the same communities, and would also overfly different communities (a broadly similar number of people).

It would need deconfliction from Southend air traffic flows.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Broadly similar capacity Improved overall noise impact (DP4). Improved fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	MET: Overflies many of the same communities as today and some new communities, but expected to be higher more quickly
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Has the potential to reduce fuel burn per flight (quicker climb, shorter route)
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: It is not likely that there would be a noticeable change in flightpaths, and associated air pollution, below 1,000ft.
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Quicker climb may improve resilience.
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: No change in impact on other airspace users, collaboration with Southend will continue in line with FASI programme and masterplan

5.3.2 DEP-27-SE-RTO-2 - Progressed



Runway 27 departure to the southeast, right turn out (option 2)

This design option follows today's baseline SID then turns directly (shortest safe track) to a network point for traffic heading southeast and south, overflying our final approach track.
It removes the complex turns from today's baseline SID.

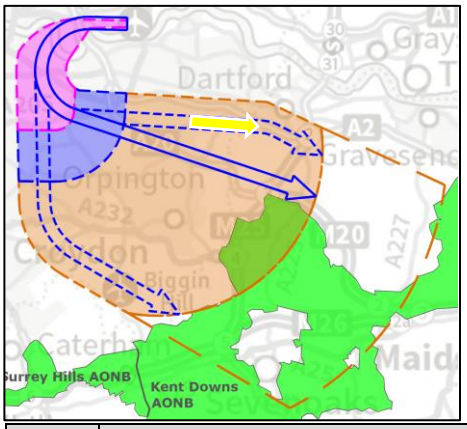
It would overfly some of the same communities, and would also overfly different communities (a broadly similar number of people).

It would need deconfliction from Southend air traffic flows and our own arrivals.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Broadly similar capacity Improved overall noise impact (DP4). Improved fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	MET: Overflies many of the same communities as today and some new communities, but expected to be higher more quickly
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Has the potential to reduce fuel burn per flight (quicker climb, shortest route)
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: It is not likely that there would be a noticeable change in flightpaths, and associated air pollution, below 1,000ft.
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Quicker climb may improve resilience.
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	MET: No change in impact on other airspace users, collaboration with Southend will continue in line with FASI programme and masterplan

With a left turn out after take-off (LTO)

5.3.3 DEP-27-SE-LTO-1 - Progressed



Runway 27 departure to the southeast, left turn out (option 1)

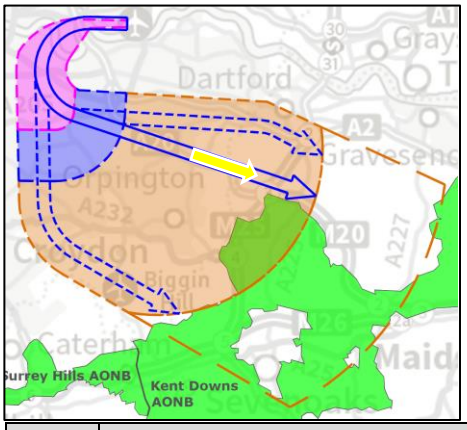
This design option initially mirrors the RTO to the north and is as tight as reasonably practicable.

It would overfly different communities (a broadly similar number of people).

It would need deconfliction from Heathrow, Gatwick and Biggin Hill air traffic flows.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Enables increase in capacity (potential reduction in departure separation) Similar overall noise impact (DP4). Improved fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	PARTIAL: Would overfly very different communities from today but a broadly similar number of people, expected to climb more quickly.
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Has the potential to reduce fuel burn per flight (quicker climb, shorter route)
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: It is not likely that there would be a noticeable change in flightpaths, and associated air pollution, below 1,000ft.
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Quicker climb may improve resilience.
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	PARTIAL: Left turn out may cause negative impact on GA southwest and south of LCY, collaboration with Heathrow, Gatwick and Biggin Hill will continue in line with FASI programme and masterplan

5.3.4 DEP-27-SE-LTO-2 - Progressed



Runway 27 departure to the southeast, left turn out (option 2)

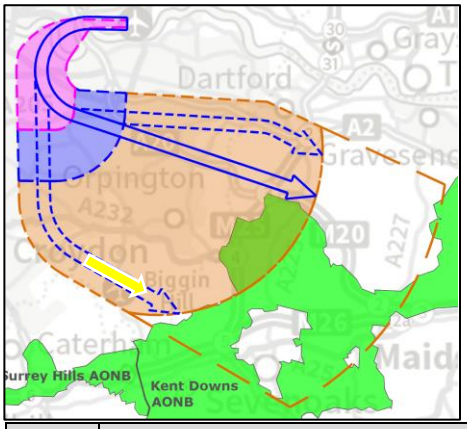
This design option initially mirrors the RTO to the north and then routes directly (shortest track) to a network point for traffic heading southeast and south.

It would overfly different communities (a broadly similar number of people).
It would need deconfliction from Heathrow, Gatwick and Biggin Hill air traffic flows.

This may be more efficient from an air traffic departure management point of view.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Enables increase in capacity (potential reduction in departure separation) Similar overall noise impact (DP4). Improved fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	PARTIAL: Would overfly very different communities from today but a broadly similar number of people, expected to climb more quickly.
DP5	**Should minimise the amount of fuel used and the CO2 subsequently emitted**	B	MET: Has the potential to reduce fuel burn per flight (quicker climb, shortest route)
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: It is not likely that there would be a noticeable change in flightpaths, and associated air pollution, below 1,000ft.
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Quicker climb may improve resilience.
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	PARTIAL: Left turn out may cause negative impact on GA southwest and south of LCY, collaboration with Heathrow, Gatwick and Biggin Hill will continue in line with FASI programme and masterplan

5.3.5 DEP-27-SE-LTO-3 - Progressed



Runway 27 departure to the southeast, left turn out (option 3)

This alternate design option turns immediately south and then turns towards a network point for traffic heading southeast and south.

It would overfly different communities (a broadly similar number of people).

It would need deconfliction from Heathrow, Gatwick and Biggin Hill air traffic flows.

Ref Num	Tier 1 Design Principles	Priority	Qualitative Criteria for Met, Partial, Not Met
DP0	**Must maintain (and ideally enhance) current safety standards**	A	MET: Similar levels of safety assurance to today's operation
DP1	**Must be in compliance with all laws and regulations**	A	MET: Expected to comply fully, as today
DP2	**Must enhance navigation standards by utilising modern navigation technology**	A	MET: Designed to high navigation standards that do not require aircraft fleet upgrades
DP3	**Must be consistent with the CAA's Airspace Modernisation Strategy (CAP1711) and any current or future plans associated with it, including the provision of sufficient airspace capacity**	A	MET: Enables increase in capacity (potential reduction in departure separation) Similar overall noise impact (DP4). Improved fuel/CO_2 (DP5).
Ref Num	**Tier 2 Design Principles**	Priority	Qualitative Criteria for Met, Partial, Not Met
DP4	**Should limit and where possible reduce aircraft noise**	A	PARTIAL: Would overfly very different communities from today but a broadly similar number of people, expected to climb more quickly.
DP5	**Should minimise the amount of fuel used and the CO_2 subsequently emitted**	B	MET: Has the potential to reduce fuel burn per flight (quicker climb, shorter route)
DP6	**Should minimise air pollution in the local area from aircraft**	B	MET: It is not likely that there would be a noticeable change in flightpaths, and associated air pollution, below 1,000ft.
DP7	**Should improve resilience during abnormal operating conditions**	B	MET: Quicker climb may improve resilience.
DP8	**Should promote optimal network performance in collaboration with other airspace users**	C	PARTIAL: Left turn out may cause negative impact on GA southwest and south of LCY, collaboration with Heathrow, Gatwick and Biggin Hill will continue in line with FASI programme and masterplan.

6 Evaluation Summary Matrix

Para ref	Indicative Design Option	Outcome	Tier 1 DPs				Tier 2 DPs					Para ref
			DP0	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8	
2	Baseline do-nothing system	Discounted										2
3.1.1	ARR-Common-Outer-NW-Shortcut	Progressed										3.1.1
3.1.2	ARR-Common-Outer-N-Shortcut	Progressed										3.1.2
3.1.3	ARR-Common-Outer-PM	Progressed										3.1.3
3.1.4	ARR-Common-Outer-S-PM	Progressed										3.1.4
3.1.5	ARR-Common-Outer-S-Shortcut	Progressed										3.1.5
3.2.1	ARR-09-Outer-N-Shortcut-N	Discounted										3.2.1
3.2.2	ARR-09-Outer-N-Shortcut-NE	Discounted										3.2.2
3.2.3	ARR-09-Outer-S-Wide-Alt	Progressed										3.2.3
3.2.4	ARR-09-Outer-S-Shortcut-SE	Progressed										3.2.4
3.3.1	ARR-09-Inner-N-Shortcut-N	Discounted										3.3.1
3.3.2	ARR-09-Inner-N-Shortcut-NE	Discounted										3.3.2
3.3.3	ARR-09-Inner-N-Wide	Discounted										3.3.3
3.3.4	ARR-09-Inner-N-Tight	Progressed										3.3.4
3.3.5	ARR-09-Inner-S-Tight	Progressed										3.3.5
3.3.6	ARR-09-Inner-S-Wide	Progressed										3.3.6
3.3.7	ARR-09-Inner-S-Shortcut-SE	Progressed										3.3.7
3.3.8	ARR-09-Inner-N-RF	Discounted										3.3.8
3.3.9	ARR-09-Inner-S-RF	Discounted										3.3.9
3.4.1	ARR-27-Inner	Progressed										3.4.1
4.1.1	DEP-09-NW-LTO-1	Progressed										4.1.1
4.1.2	DEP-09-NW-LTO-2	Progressed										4.1.2
4.1.3	DEP-09-NW-LTO-3	Progressed										4.1.3
4.1.4	DEP-09-NW-LTO-4	Progressed										4.1.4
4.1.5	DEP-09-NW-RTO-1	Discounted										4.1.5
4.1.6	DEP-09-NW-RTO-2	Discounted										4.1.6
4.2.1	DEP-09-ENE-LTO-1	Progressed										4.2.1
4.2.2	DEP-09-ENE-LTO-2	Progressed										4.2.2
4.2.3	DEP-09-ENE-LTO-3	Progressed										4.2.3
4.2.4	DEP-09-ENE-RTO-1	Progressed										4.2.4
4.3.1	DEP-09-SE-LTO-1	Progressed										4.3.1
4.3.2	DEP-09-SE-LTO-2	Progressed										4.3.2
4.3.3	DEP-09-SE-RTO-1	Progressed										4.3.3
4.3.4	DEP-09-SE-RTO-2	Progressed										4.3.4
4.3.5	DEP-09-SE-RTO-3	Progressed										4.3.5
4.3.6	DEP-09-SE-RTO-4	Progressed										4.3.6
5.1.1	DEP-27-NW-RTO-1	Progressed										5.1.1
5.1.2	DEP-27-NW-RTO-2	Progressed										5.1.2
5.1.3	DEP-27-NW-RTO-3	Progressed										5.1.3
5.1.4	DEP-27-NW-RTO-4	Progressed										5.1.4
5.2.1	DEP-27-ENE-RTO-1	Progressed										5.2.1
5.2.2	DEP-27-ENE-RTO-2	Progressed										5.2.2
5.2.3	DEP-27-ENE-RTO-3	Progressed										5.2.3
5.3.1	DEP-27-SE-RTO-1	Progressed										5.3.1
5.3.2	DEP-27-SE-RTO-2	Progressed										5.3.2
5.3.3	DEP-27-SE-LTO-1	Progressed										5.3.3
5.3.4	DEP-27-SE-LTO-2	Progressed										5.3.4
5.3.5	DEP-27-SE-LTO-3	Progressed										5.3.5

Table 5: Summary matrix of indicative design options, as evaluated against Tier 1 and Tier 2 DPs, with outcome

7 Conclusions and Next Steps

7.1.1 In this document we have:

- Set assessment criteria for each DP
- Explained how we would evaluate each of the indicative design options from the Step 2A(i) Design Options document against each DP
- Set progression criteria and explained how the results of each Tier of DP would progress or discount an indicative design option at this stage
- Evaluated the indicative design options against the DPs in a fair and consistent manner
- Summarised the results into a matrix, including the outcome of each indicative design option

7.1.2 The results are:

- The baseline do-nothing system option was discounted
- Seven indicative arrival options were discounted, twelve were progressed
- Two indicative departure options were discounted, twenty six were progressed

(Note that the AMS allows for design options discounted at Stage 2 to be reintroduced at Stage 3 if necessary, during the Masterplan integration process where multiple ACP sponsors are all at the same stage, and it will be possible for a wider holistic overview to be considered.)

7.1.3 We also state that at this stage we have no reason to believe the indicative design options would not comply with the required technical criteria, once fully refined.

7.1.4 The baseline do-nothing system option, the twelve progressing arrival options and the twenty six progressing departure options will be qualitatively appraised in the complementary document titled Step 2B Options Appraisal (Phase 1 Initial) including Safety Assessment.

8 Annexe: Additional Resources

The CAA Airspace Change Portal (**link**) for Stage 2 of this proposal contains the following material:

8.1.1 **Step 2A(i)** Design Options document

8.1.2 **Step 2A(ii)** Design Principle Evaluation document

8.1.3 **Step 2B** Options Appraisal (Phase 1 Initial) Including Safety Considerations

8.1.4 An **example presentation**, as given to stakeholders either by virtual online meeting, or via email for self-briefing

8.1.5 A document containing **stakeholder feedback** (redacted to de-personalise)

8.1.6 A **technical reference map**, with layers. This map allows for the switching on and off of 'data layers', allowing the user to see illustrations of the current airspace system, the systems LCY designed to engage with stakeholders, and the airspace designs modified following receipt of stakeholder feedback. These can be compared, to illustrate potential areas of change in overflight.

The map is technical in nature but on initial opening it provides an explanation of what the layers mean and how to understand them.

- This layered map is designed to be downloaded to a computer/laptop.
- It will not function correctly if viewed using most tablet/smartphone devices.
- It must be opened using the freely available and commonly-used Adobe Reader software, or other genuine Adobe product.
- It will not function correctly if viewed within a browser such as Chrome or Edge or Internet Explorer, or any non-Adobe PDF viewing application.
- It is relevant to the airspace design development thus far (May 2022). Future development and design evolution will occur.

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