LONDON CITY AIRPORT

Our Future Skies – Airspace Modernisation

Airspace Change Process Documentation

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

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

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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 2A(ii) Design Principle Evaluation

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 indicative design options which were developed through engagement with stakeholders.

1.1.4 The Step 2A(ii) document evaluates the comprehensive list of indicative design options against the design principles established at Stage 1 of the airspace change process. That document explains which of the indicative options progressed through that evaluation and which did not.
See Section 7 on p.84 for a recap of the Design Principles for this proposal.

About this document

1.1.5 This document is titled Step 2B Options Appraisal (Phase 1 Initial) Including Safety Considerations. Its objective is to qualitatively appraise the indicative airspace design options progressed[1] at Step 2A(ii) in relation to an expected set of impacts[2] on listed audience groups, and includes an assessment of the baseline do-nothing option, even though this was discounted at Step 2A(ii).

1.1.6 It also provides brief, plain English safety statements which, as noted in Step 2A(i) and 2A(ii), are early indicative design options that will be further refined and coordinated with adjacent ANSPs in the next stage of the process.

1.1.7 The evidence supplied is qualitative and high level, the assessment criteria based on the opinions of subject matter experts, feedback derived from stakeholders and the evolving design work.

1.1.8 LCY published a traffic forecast in the 2020 Airport Master Plan[3]; this projection is not yet accurate enough to build quantitative airspace change options appraisals. Thus the qualitative initial appraisals for each indicative design option do not consider the traffic forecast. A suitable forecast is required as part of the quantitative analysis at Stage 3 and this will be provided.

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 or system of options. Combining these options into systems has the potential to mitigate overall noise impacts to a greater extent than assessed individually here, by providing respite and/or managed dispersal. These combined systems of individual routes would be developed under Stage 3 in collaboration with

[1] Design options that were discounted at Step 2A(ii) are not appraised here.
[2] CAP1616 Edn 4 Appendix E Table E2 (also see overleaf).
[3] For details see Step 2A(i) Design Options document, page 7 paragraph 2.3

the sponsors of neighbouring airspace changes, their impacts analysed and described as part of the formal consultation.

1.1.11 This assessment compares design options with a 'frozen in time' baseline do-nothing option. The comparison only considers changes related to airspace design differences between the baseline and the option, and not external changes. For example, potential new housing or industrial developments may change community impacts over time for the baseline design and one (or more) of the design options; those potential future impacts are not considered at this stage.

1.1.12 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.

1.1.13 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 Assessment criteria summary

1.2.1 The table below briefly summarises LCY's approach to the key subjects for impact assessment, with one table per design option including the baseline do-nothing option already discounted. It is based on CAP1616 Table E2.

Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
A qualitative assessment of changes to noise impacts compared with the do-nothing baseline. A qualitative assessment of changes to tranquillity impacts, notably for the Kent Downs Area of Outstanding Natural Beauty, compared with the do-nothing baseline		
Communities	Air quality	Qualitative
A qualitative assessment of changes to local air quality compared with the do-nothing baseline.		
Wider society	Greenhouse gas impact	Qualitative
A qualitative assessment of changes to greenhouse gas impacts compared with the do-nothing baseline.		
Wider society	Capacity/ resilience	Qualitative
A qualitative assessment of changes to airspace capacity and resilience compared with the do-nothing baseline.		
General Aviation	Access	Qualitative
A qualitative assessment of changes to GA access to controlled airspace compared with the do-nothing baseline.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
A qualitative assessment of changes to GA and commercial airline economic impacts from increased effective capacity compared with the do-nothing baseline.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
A qualitative assessment of changes to GA and commercial airline fuel burn compared with the do-nothing baseline.		
Commercial airlines	Training costs	Qualitative
A qualitative assessment of changes to commercial airline training costs compared with the do-nothing baseline.		
Commercial airlines	Other costs	Qualitative
A qualitative assessment of changes to other relevant commercial airline costs compared with the do-nothing baseline.		
Airport/ ANSP	Infrastructure costs	Qualitative
A qualitative assessment of changes to ANSP infrastructure costs compared with the do-nothing baseline.		
Airport/ ANSP	Operational costs	Qualitative
A qualitative assessment of changes to ANSP operational costs compared with the do-nothing baseline.		
Airport/ ANSP	Deployment costs	Qualitative
A qualitative assessment of ANSP deployment costs compared with the do-nothing baseline.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
A qualitative assessment of how the design option strikes a balance, considering the AMS objectives of improved capacity, noise, and fuel/CO_2 compared with the do-nothing baseline.		

2 Option 0: Baseline (do nothing)

This option is provided for comparison purposes; it was discounted during Step 2A(ii).

Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
The same set of communities would continue to be overflown. There would be no opportunities to provide respite or to otherwise alter flightpaths. If this baseline system was retained, the noise impact would not change. Some areas of the Kent Downs AONB are overflown in a dispersed manner below 7,000ft, which may have an impact on tranquillity. If this baseline system was retained, this impact on tranquillity would not change.		
Communities	Air quality	Qualitative
The same flightpaths would be flown below 1,000ft[4] . If this baseline system was retained, arrivals would not change flightpath below 1,000ft, departures would not change flightpath below 1,000ft, and local air quality impacts would not change.		
Wider society	Greenhouse gas impact	Qualitative
The same route lengths would be flown and the same typical altitudes would be attained along the track. If this baseline system was retained, track lengths could not be shortened, altitudes could not increase, and greenhouse gas impacts would not change.		
Wider society	Capacity/ resilience	Qualitative
There would be no opportunity to improve airspace capacity or resilience. If this baseline system was retained, all arrivals would continue to flow from the east regardless of origin, departures would continue to always turn north of the airport on take-off, capacity and resilience impacts would not change.		
General Aviation	Access	Qualitative
GA access to LCY airspace would continue in the areas currently observed (generally this is at or below 4,000ft). If this baseline system was retained, GA would continue to access the same areas in a similar manner and access impacts would not change.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
There would be no opportunity to improve airspace capacity. If this baseline system was retained, all arrivals would continue to flow from the east regardless of origin, departures would continue to always turn north of the airport on take-off, capacity impacts would not change, and there would be no change in economic impact for either GA or commercial operators.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
The same route lengths would be flown and the same typical altitudes would be attained along the track. If this baseline system was retained, track lengths could not be shortened, altitudes could not increase, and fuel burn impacts would not change for either GA or commercial operators.		
Commercial airlines	Training costs	Qualitative
Flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. If this baseline system was retained, the same flight procedures would be used and training cost impacts would not change.		
Commercial airlines	Other costs	Qualitative
We are not aware of other commercial airline costs that are appropriate for inclusion in this appraisal. If this baseline system was retained, those other costs would not change.		
Airport/ ANSP	Infrastructure costs	Qualitative
The infrastructure in place is used daily. If this baseline system was retained, the same infrastructure would continue to be used in the same way, with no additional costs beyond typical maintenance.		
Airport/ ANSP	Operational costs	Qualitative
The operation is used daily. If this baseline system was retained, the same operation would continue in the same way, with no additional operational costs.		
Airport/ ANSP	Deployment costs	Qualitative
If this baseline system was retained, there would be no deployment, hence no associated costs.		

[4] Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality, therefore only flightpath changes below 1,000ft may have an impact.

All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
This baseline system would not meet the strategic objectives of the AMS.		

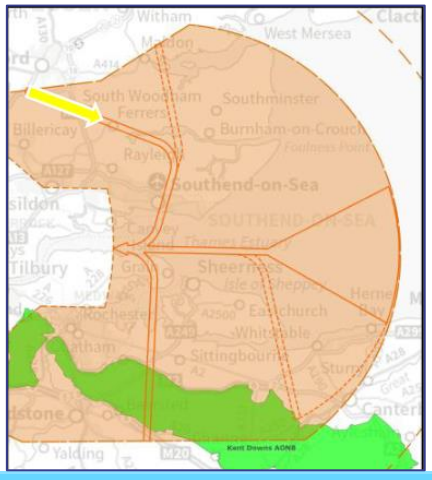
Qualitative safety assessment

A qualitative high-level safety appraisal for the proposed option 0 (do nothing) indicates that if the baseline system was retained, the existing level of safety performance undertaken within the current operation would be at least maintained. However, if there was no change to the current operation the potential increase in traffic as forecast and published in the 2020 master plan p.47 (link) could begin to constrain capacity, which in turn, could increase controller workload and traffic complexity within the LTMA leading to potential safety issues in the future.

3 Arrival Options

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

3.1.1 ARR-Common-Outer-NW-Shortcut



Runway 09 and 27 common arrival, shortcut from the northwest

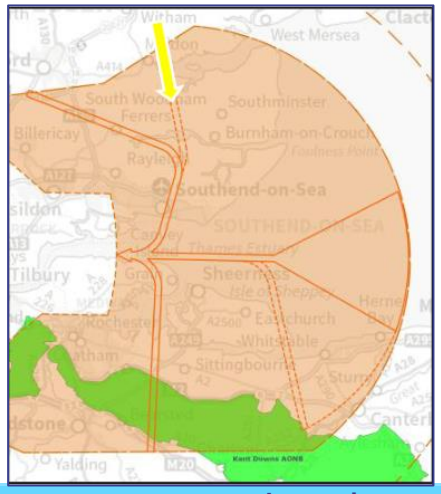
Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly Southend. It would also not reduce the overflight of populated areas elsewhere at these altitudes. Therefore, qualitatively the anticipated noise impact would be greater overall when compared with the baseline do-nothing option. This design option would not overfly an AONB from 7,000ft-4,000ft hence no change in tranquillity impacts.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. No changes in air quality impacts are predicted under this design option (route would be entirely above 1,000ft).		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide a significantly shorter arrival route from the northwest while joining the existing arrival flow over the Estuary. This significantly shorter flightplannable track distance would result in a reduction of greenhouse gas impacts for each flight using this route when compared to the baseline do-nothing option.		
Wider society	Capacity/ resilience	Qualitative
This design option would introduce a new systemised route from the north which has the potential to improve capacity/resilience and associated impacts. However, it would require a delay absorption structure in the upper network. The integration of arrival flows from more than one direction may introduce operational complexities, at this stage it is not clear how much impact this may have on capacity/resilience.		
General Aviation	Access	Qualitative
This design option is anticipated to be contained within existing CAS. Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option. We do not predict a change in GA impacts.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's shorter flightplannable track distance would result in a reduced fuel burn impact on commercial traffic when compared with the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		

Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		
Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (enables capacity improvement, increased overall noise impact, reduced fuel/CO_2).		

Qualitative Safety Assessment

This proposed arrival route is common to runway 09 and 27 via a shortcut from the northwest which overlies Southend Airport. A qualitative safety appraisal indicates that this arrival option would need to deconflict with Southend and potentially Stansted Airport. This option would also require integration with multiple arrivals to 09 and 27 from the Point-Merge system which would require a safety hazard assessment.

3.1.2 ARR-Common-Outer-N-Shortcut



Runway 09 and 27 common arrival, shortcut from the north

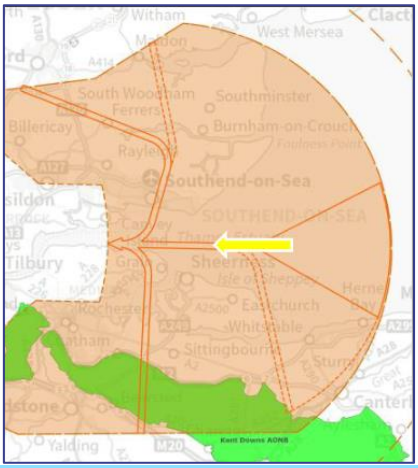
Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly Southend. It would also not reduce the overflight of populated areas elsewhere at these altitudes. Therefore, qualitatively the anticipated noise impact would be greater overall when compared with the baseline do-nothing option. This design option would not overfly an AONB from 7,000ft-4,000ft hence no change in tranquillity impacts.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. No changes in air quality impacts are predicted under this design option (route would be entirely above 1,000ft).		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide a shorter arrival route from the northwest while joining the existing arrival flow over the Estuary. This shorter flightplannable track distance would result in a reduction of greenhouse gas impacts for each flight using this route when compared to the baseline do-nothing option.		
Wider society	Capacity/ resilience	Qualitative
This design option would introduce a new systemised route from the north which has the potential to improve capacity/resilience and associated impacts. However, it would require a delay absorption structure in the upper network. The integration of arrival flows from more than one direction may introduce operational complexities, at this stage it is not clear how much impact this may have on capacity/resilience.		
General Aviation	Access	Qualitative
This design option is anticipated to be contained within existing CAS. Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option. We do not predict a change in GA impacts.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's shorter flightplannable track distance would result in a reduced fuel burn impact on commercial traffic when compared with the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		

Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		
Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (enables capacity improvement, increased overall noise impact, reduced fuel/CO_2).		

Qualitative Safety Assessment

This proposed arrival route common to runway 09 and 27 provides a shorter arrival route from the north. The qualitative safety appraisal indicates that this arrival option would need to deconflict with Southend and potentially Stansted Airport. This option would also require integration with arrivals to 09 and 27 from the Point-Merge system which would require a safety hazard assessment.

3.1.3 ARR-Common-Outer-PM



Runway 09 and 27 common arrival, outer point merge
(This is a structural component of the baseline do-nothing airspace system, which is already optimised, therefore has been retained)

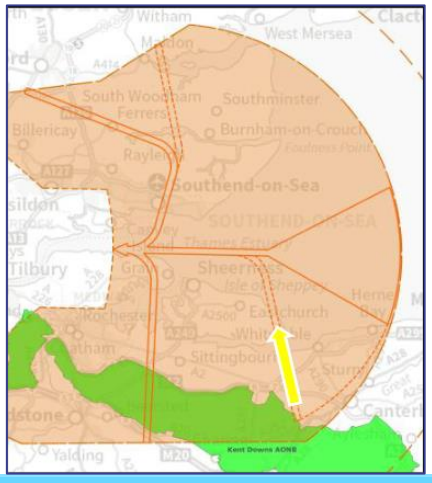
Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option overflies the Estuary from 7,000ft-4,000ft as today. Therefore, qualitatively the anticipated noise impact would be broadly similar when compared with the baseline do-nothing option, which itself is optimised for this element. This design option would not overfly an AONB from 7,000ft-4,000ft hence no change in tranquillity impacts.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. No changes in air quality impacts are predicted under this design option (route would be entirely above 1,000ft).		
Wider society	Greenhouse gas impact	Qualitative
This design option means the same (current) route length would be flown and similar typical altitudes would be attained along the track. Therefore, there would be no change in greenhouse gas contributions for each flight when compared to the baseline do-nothing option, which itself is optimised for this element.		
Wider society	Capacity/ resilience	Qualitative
This design option means the same (current) route element would be flown which, while already optimised, would not enable additional capacity/resilience and associated impacts.		
General Aviation	Access	Qualitative
This design option is the same (current) route element which would be contained within existing CAS. Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option means the same (current) route element would be flown which, while already optimised, would not enable additional capacity hence no improved economic impacts compared with the baseline do-nothing option. We do not predict a change in GA impacts.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option means the same (current) route element would be flown which, while already optimised, would not reduce commercial airline fuel burn impacts compared with the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is the same (current) route element and is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts. The same (current) route element would be flown which would not require systems engineering amendments.		

Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		
Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (no capacity improvement but already optimised, same overall noise impact but already optimised, same fuel/CO_2 impacts but already optimised).		

Qualitative Safety Assessment

This proposed design option for runway 09 and 27 is the same as the baseline Point-Merge system that overflies the Thames Estuary from 7000ft to 4000ft. The qualitative safety assessment for this option indicates similar levels of safety assurance to today's operation.

3.1.4 ARR-Common-Outer-S-PM



Runway 09 and 27 common arrival, outer southern point merge

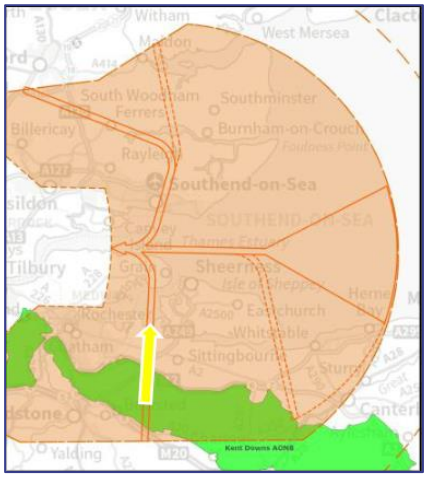
Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly northern Kent. It would also not reduce the overflight of populated areas elsewhere at these altitudes. Therefore, qualitatively the anticipated noise impact would be greater overall when compared with the baseline do-nothing option. Some areas of the Kent Downs AONB may also be overflown at higher altitudes by this route which would have a negative impact on tranquillity.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Arriving aircraft would still descend through 1,000ft on final approach, about 1.7 nautical miles (3.2km) from touchdown at either end of the runway. This is close to landing, in the very final stages of the approach, so the air quality impact would not change when compared with the baseline do-nothing option.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide a shorter arrival route from the south while joining the existing arrival flow over the Estuary. This shorter flightplannable track distance would result in a reduction of greenhouse gas impacts for each flight using this route when compared to the baseline do-nothing option.		
Wider society	Capacity/ resilience	Qualitative
This design option initially routes over a new area and acts as an extension of the existing point-merge structure. While already optimised, this would be unlikely to enable additional capacity/resilience and associated impacts.		
General Aviation	Access	Qualitative
This design option is anticipated to be contained within existing CAS. Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option acts as an extension of the existing point-merge structure. While already optimised, this would be unlikely to enable additional capacity hence no improved economic impacts compared with the baseline do-nothing option. We do not predict a change in GA impacts.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's shorter flightplannable track distance would result in a reduced fuel burn impact on commercial traffic when compared with the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		

Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		
Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (enables capacity improvement, increased overall noise impact, reduced fuel/CO_2).		

Qualitative Safety Assessment

This proposed arrival route is common to runway 09 and 27 via a shorter arrival route from the south and southeast. The safety appraisal indicates that there could be the potential for interaction with Biggin Hill, Gatwick, Heathrow and Southend Airports which would need to be assessed. This option requires integration with arrivals to 09 and 27 from the point merge system which would require a safety hazard assessment.

3.1.5 ARR-Common-Outer-S-Shortcut



Runway 09 and 27 common arrival, outer south shortcut

Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly northern Kent. It would also not reduce the overflight of populated areas elsewhere at these altitudes. Therefore, qualitatively the anticipated noise impact would be greater overall when compared with the baseline do-nothing option. Some areas of the Kent Downs AONB may also be overflown at higher altitudes by this route which would have a negative impact on tranquillity.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. No changes in air quality impacts are predicted under this design option (route would be entirely above 1,000ft).		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide a shorter arrival route from the south and southwest while joining the existing arrival flow over the Estuary. This shorter flightplannable track distance would result in a reduction of greenhouse gas impacts for each flight using this route when compared to the baseline do-nothing option.		
Wider society	Capacity/ resilience	Qualitative
This design option would introduce a new systemised route from the south which has the potential to improve capacity/resilience and associated impacts. However, it would require a delay absorption structure in the upper network. The integration of arrival flows from more than one direction may introduce operational complexities, at this stage it is not clear how much impact this may have on capacity/resilience.		
General Aviation	Access	Qualitative
This design option is anticipated to be contained within existing CAS. Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option. We do not predict a change in GA impacts.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's shorter flightplannable track distance would result in a reduced fuel burn impact on commercial traffic when compared with the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		

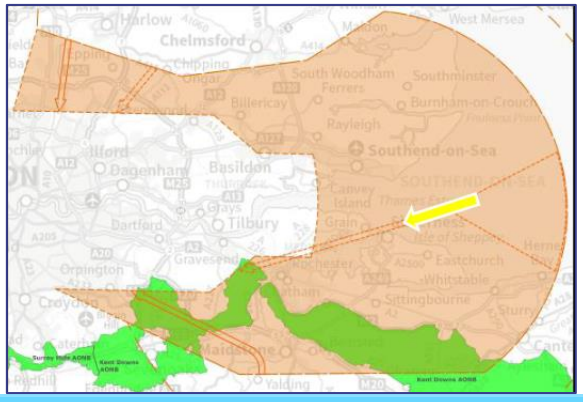
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		
Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (enables capacity improvement, increased overall noise impact, reduced fuel/CO_2).		

Qualitative Safety Assessment

This proposed arrival route is common to runway 09 and 27 via a significantly shorter arrival route from the southwest and south. The safety appraisal indicates that deconfliction would be required with Gatwick air traffic flows, and there could be the potential for interaction with Biggin Hill and Heathrow which would need to be assessed. This option requires integration with LCY arrivals to 09 and 27 from the point merge system which would require a safety hazard assessment.

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

3.2.1 ARR-09-Outer-S-Wide-Alt



Runway 09 arrival, outer south wide alternative

Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly northern Kent. It would also not reduce the overflight of populated areas elsewhere at these altitudes. Therefore, qualitatively the anticipated noise impact would be greater overall when compared with the baseline do-nothing option. Some areas of the Kent Downs AONB may also be overflown at higher altitudes which would have a negative impact on tranquillity.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Arriving aircraft would still descend through 1,000ft on final approach, about 1.7 nautical miles (3.2km) from touchdown at either end of the runway. This is close to landing, in the very final stages of the approach, so the air quality impact would not change when compared with the baseline do-nothing option.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide a shorter arrival route from the northeast, east and southeast. It would use the existing Point-Merge structure but leave in an alternate direction towards Sheerness and Grain, rather than following the Estuary. This shorter flightplannable track distance would result in a reduction of greenhouse gas impacts for each flight using this route when compared to the baseline do-nothing option.		
Wider society	Capacity/ resilience	Qualitative
This design option would introduce a new systemised route from the existing point-merge structure which would have the potential to improve capacity/ resilience and associated impacts. However, it would require a delay absorption structure in the upper network. The integration of arrival flows from more than one direction may introduce operational complexities, at this stage it is not clear how much impact this may have on capacity/resilience.		
General Aviation	Access	Qualitative
This design option is anticipated to be contained within existing CAS. Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's shorter flightplannable track distance would result in a reduced fuel burn impact on commercial traffic when compared with the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		

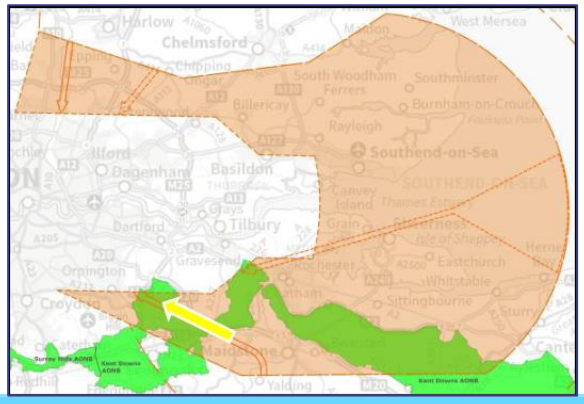
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		
Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (no increase in capacity but is already optimised, increased overall noise impact, reduced fuel/CO_2).		

Qualitative Safety Assessment

This proposed arrival route provides shorter track mileage to runway 09 from the northeast, east and southeast using the existing Point-Merge system. The qualitative safety assessment for this option indicates similar levels of safety assurance to today's operation, however, the integration of an arrival flow from more than one direction may need a safety hazard assessment. There could be some safety benefit in that this option might enable some departures to climb more quickly.

3.2.2 ARR-09-Outer-S-Shortcut-SE

Runway 09 arrival, outer shortcut southeast



Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly northern Kent. It would also not reduce the overflight of populated areas elsewhere at these altitudes. This option would however provide enable a reduction in anticipated noise impact at lower altitudes. Therefore, qualitatively the anticipated noise impact would be greater overall when compared with the baseline do-nothing option. Some areas of the Kent Downs AONB may also be overflown at higher altitudes which may have a negative impact on tranquillity.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Arriving aircraft would still descend through 1,000ft on final approach, about 1.7 nautical miles (3.2km) from touchdown at either end of the runway. This is close to landing, in the very final stages of the approach, so the air quality impact would not change when compared with the baseline do-nothing option.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide a significantly shorter arrival route from the southwest although it would require a new delay absorption structure in the upper network. This shorter flightplannable track distance would result in a large reduction of greenhouse gas impacts for each flight using this route when compared to the baseline do-nothing option.		
Wider society	Capacity/ resilience	Qualitative
This design option would introduce a new systemised route which would have the potential to improve capacity/ resilience and associated impacts. However, it would require a delay absorption structure in the upper network. The integration of arrival flows from more than one direction may introduce operational complexities, at this stage it is not clear how much impact this may have on capacity/resilience.		
General Aviation	Access	Qualitative
This design option is anticipated to be contained within existing CAS. Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's significantly shorter flightplannable track distance would result in a reduced fuel burn impact on commercial traffic when compared with the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		

Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		
Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (enables capacity improvement, increased overall noise impact, reduced fuel/CO_2).		

Qualitative Safety Assessment

This proposed arrival route provides a significantly shorter arrival route to runway 09 from the southwest. The safety assessment for this option indicates that deconfliction would be required against Gatwick, Biggin Hill and Heathrow air traffic flows. This option would also require integration with arrivals from the point merge system which would require a safety hazard assessment.

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

3.3.1 ARR-09-Inner-N-Tight

Runway 09 arrival, inner north tight

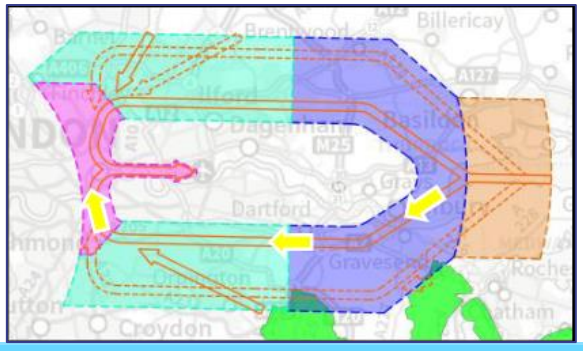
Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly less densely populated areas to the east, towards the start of the procedure, at higher altitudes. However, it would overfly more densely populated areas to the west, towards the end of the procedure, at lower altitudes. Qualitatively, the anticipated noise impact are likely to be broadly similar when compared with the baseline do-nothing option. This design option would not overfly an AONB from 7,000ft-4,000ft hence no change in tranquillity impacts.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Arriving aircraft would still descend through 1,000ft on final approach, about 1.7 nautical miles (3.2km) from touchdown at either end of the runway. This is close to landing, in the very final stages of the approach, so the air quality impact would not change when compared with the baseline do-nothing option.		
Wider society	Greenhouse gas impact	Qualitative
This design option is a northern mirror of option ARR-09-Inner-S-Tight. The same route length would be flown as today, and broadly similar typical altitudes would be attained along the track for this design option (possibly slightly higher than today). Therefore, there would be no change in greenhouse gas contributions for each flight when compared to the baseline do-nothing option, which itself is optimised for this element.		
Wider society	Capacity/ resilience	Qualitative
This design option means the same (current) route element would be flown which, while already optimised, would not enable additional capacity/resilience and associated impacts.		
General Aviation	Access	Qualitative
This design option would have a minor negative impact on low-altitude GA airspace users. There is known activity in the northwest/ north corner of London City's CAS which would be negatively impacted when compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option means the same route length would be flown which, while already optimised, would mean that commercial airline fuel impacts are broadly similar when compared with the baseline do-nothing option (although aircraft may be slightly higher for longer than today). We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		

Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		
Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option's contribution to the AMS would be broadly similar to the baseline (may reduce capacity, similar overall noise impact, similar fuel/CO_2).		

Qualitative Safety Assessment

This proposed arrival route provides a northern mirror option of ARR-09-Inner-S-Tight (see section 3.3.2 below) which is the same track as today's baseline route. The safety assessment for this option indicates that there could be the potential for interaction with London City departures. Furthermore, if the proposed routing route is higher than the equivalent southern baseline that is flown today then deconfliction may be required against Heathrow arrivals and departures, all of which would require safety hazard assessments.

3.3.2 ARR-09-Inner-S-Tight



Runway 09 arrival, inner south tight

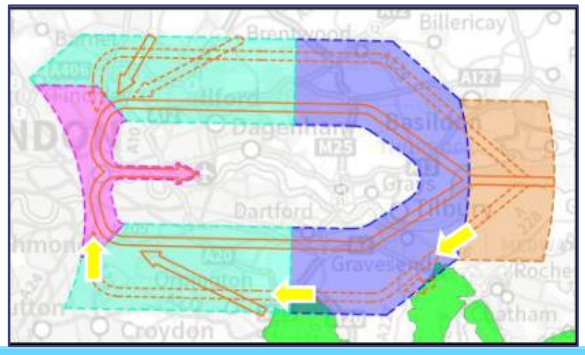
Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option is positioned to match the current track however, it would be slightly higher. Therefore, qualitatively the anticipated noise impact would be less when compared with the baseline do-nothing option. This design option would not overfly an AONB from 7,000ft-4,000ft hence no change in tranquillity impacts.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Arriving aircraft would still descend through 1,000ft on final approach, about 1.7 nautical miles (3.2km) from touchdown at either end of the runway. This is close to landing, in the very final stages of the approach, so the air quality impact would not change when compared with the baseline do-nothing option.		
Wider society	Greenhouse gas impact	Qualitative
The same route length would be flown as today, and similar typical altitudes would be attained along the track for this design option. Therefore, there would be no change in greenhouse gas contributions for each flight when compared to the baseline do-nothing option, which itself is optimised for this element.		
Wider society	Capacity/ resilience	Qualitative
This design option means the same (current) route element would be flown which, while already optimised, would not enable additional capacity/resilience and associated impacts.		
General Aviation	Access	Qualitative
This design option is the same (current) route element which would be contained within existing CAS. Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option means the same (current) route element would be flown which, while already optimised, would not reduce commercial airline fuel burn impacts compared with the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		

Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option's contribution to the AMS would be broadly similar to the baseline (similar capacity, reduced overall noise impact, similar fuel/CO_2).		

Qualitative Safety Assessment

This proposed arrival route is the same track as today's baseline route. The safety assessment for this option indicates that if the proposed routing route is higher than the route flown today then deconfliction may be required against Heathrow arrivals and departures which would require a safety hazard assessment.

3.3.3 ARR-09-Inner-S-Wide



Runway 09 arrival, inner south wide

Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
Despite this design option being longer than the current route, it would overfly less densely populated areas overall. Therefore, qualitatively the anticipated noise impact would be less when compared with the baseline do-nothing option. A small northern section of the Kent Downs AONB may also be overflown at higher altitudes by this route which would have a negative impact on tranquillity.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Arriving aircraft would still descend through 1,000ft on final approach, about 1.7 nautical miles (3.2km) from touchdown at either end of the runway. This is close to landing, in the very final stages of the approach, so the air quality impact would not change when compared with the baseline do-nothing option.		
Wider society	Greenhouse gas impact	Qualitative
This design option would introduce a longer arrival route from the west below 4,000ft. This longer flightplannable track distance would result in an increase of greenhouse gas impacts for each flight using this route when compared to the baseline do-nothing option.		
Wider society	Capacity/ resilience	Qualitative
This design option would route over a new area but initially links from the existing Estuary westbound arrival routes. While already optimised, this would be unlikely to enable additional capacity/resilience and associated impacts.		
General Aviation	Access	Qualitative
This design option would have a minor negative impact on low-altitude GA airspace users. There is known activity in the southwest/ south corner of London City's CAS which would be negatively impacted when compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's longer flightplannable track distance (below 4,000ft) would result in an increased fuel burn impact on commercial traffic when compared with the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		

Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option's contribution to the AMS would be broadly similar to the baseline (may enable increased capacity, similar overall noise impact, potential increase in fuel/CO_2).		

Qualitative Safety Assessment

This proposed arrival route runs parallel and south of ARR-09-Inner-S-Tight (see section 3.3.2) which is similar to today's baseline route. The safety assessment for this option indicates that if the proposed routing route is higher than the parallel route that is flown today then deconfliction may be required against Heathrow arrivals and departures and there could be the potential for interaction with Biggin Hill air traffic flows, all of which would require safety hazard assessments.

3.3.4 ARR-09-Inner-S-Shortcut-SE

Runway 09 arrival, inner south shortcut southeast

Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would be significantly shorter below 4,000ft than the current route. This would result in a reduction in the overflight of populated areas at these altitudes. Therefore, qualitatively the anticipated noise impact would be less when compared with the baseline do-nothing option. A small northern section of the Kent Downs AONB may also be overflown at higher altitudes by this route which would have a negative impact on tranquillity.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Arriving aircraft would still descend through 1,000ft on final approach, about 1.7 nautical miles (3.2km) from touchdown at either end of the runway. This is close to landing, in the very final stages of the approach, so the air quality impact would not change when compared with the baseline do-nothing option.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide a significantly shorter arrival route from the southwest/ south and links from design option ARR-O9-Outer-S-Shortcut-SE. This considerably shorter flightplannable track distance would result in a reduction of greenhouse gas impacts for each flight using this route when compared to the baseline do-nothing option.		
Wider society	Capacity/ resilience	Qualitative
This design option would introduce a new systemised route which would have the potential to improve capacity. Resilience would be broadly similar to today (baseline do-nothing option) although it would introduce a bit more room on the southern side which may reduce the inflexibility of shortcut arrivals from the north.		
General Aviation	Access	Qualitative
This design option would have a minor negative impact on low-altitude GA airspace users. There is known activity in the southwest/ south corner of London City's CAS which would be negatively impacted when compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's significantly shorter flightplannable track distance would result in a reduced fuel burn impact on commercial traffic when compared with the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		

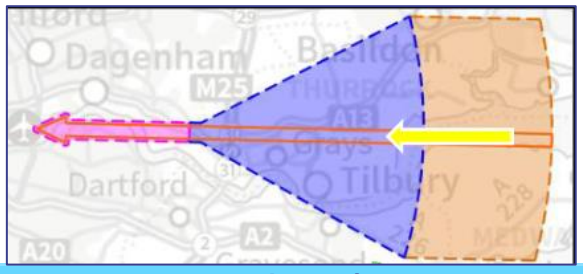
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		
Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (enables capacity improvement, improved overall noise impact, reduced fuel/CO_2).		

Qualitative Safety Assessment

This proposed arrival route is similar to today's baseline route but provides a significantly shorter arrival route from the southwest and south. The safety assessment for this option indicates that if the proposed routing route is higher than the route flown today then deconfliction may be required against Heathrow arrivals and departures, and Gatwick and Biggin Hill air traffic flows, which would require safety hazard assessments.

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

3.4.1 ARR-27-Inner



Runway 27 arrival, inner
(This is a structural component of the baseline do-nothing airspace system, which is already optimised, therefore has been retained)

Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
The same set of communities would continue to be overflown below 7,000ft, resulting in concentration of overflight at low altitudes. However, this route is already optimised with no opportunity for improvement. Therefore, qualitatively the anticipated noise impact would not change when compared with the baseline do-nothing option. This design option would not overfly an AONB from 7,000ft-4,000ft hence no change in tranquillity impacts.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Arriving aircraft would still descend through 1,000ft on final approach, about 1.7 nautical miles (3.2km) from touchdown at either end of the runway. This is close to landing, in the very final stages of the approach, so the air quality impact would not change when compared with the baseline do-nothing option.		
Wider society	Greenhouse gas impact	Qualitative
This design option means the same (current) route length would be flown and typical altitudes would be attained along the track. This design option is the same as the baseline because the route is already as short, direct and efficient as possible. Therefore, there would be no change in greenhouse gas impacts for each flight when compared to the baseline do-nothing option, which itself is optimised for this element.		
Wider society	Capacity/ resilience	Qualitative
There would be no opportunity to improve airspace capacity or resilience impacts because this route is already as short, direct and efficient as possible. Therefore, this design option means the same (current) route element would be flown which, while already optimised, would not enable additional capacity/resilience and associated impacts.		
General Aviation	Access	Qualitative
This design option is the same (current) route element which would be contained within existing CAS. Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option means the same (current) route element would be flown which, while already optimised, would not reduce commercial airline fuel burn impacts compared with the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		

Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		
Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (no increase in capacity but already optimised, no improvement in overall noise impact but already optimised, no change in fuel/CO_2 but already optimised).		

Qualitative Safety Assessment

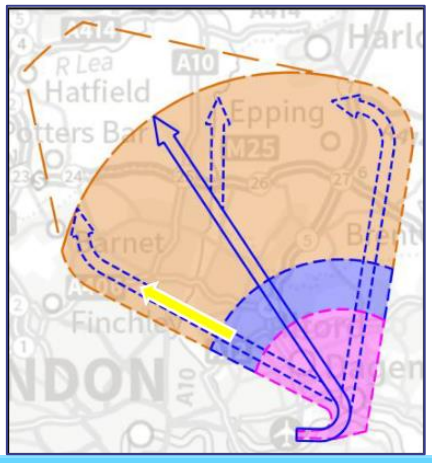
This proposed design option for runway 27 is the same as the baseline route flown today. As the same route lengths would be flown and typical altitudes would be attained then the safety assessment for this option indicates similar levels of safety assurance to today's operation.

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



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

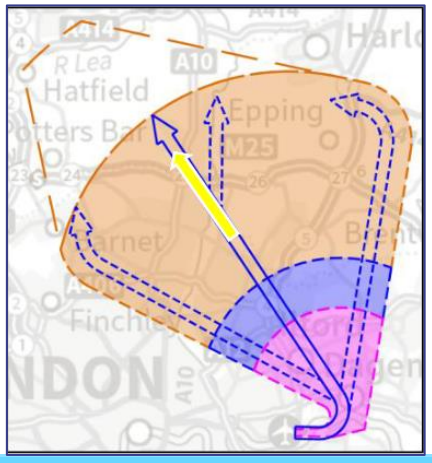
Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly some of the same communities as today and a broadly similar number of people; but would be expected to be higher more quickly when compared to today's route. This design option would not overfly an AONB from 7,000ft-4,000ft hence no change in tranquillity impacts.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft would still climb through 1,000ft on initial departure, about 1.7 nautical miles (3.2km) from either end of the runway.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide a longer departure route to the northwest, turning left towards Heathrow Airport's airspace before turning north. However, it would climb quicker when compared to the baseline do-nothing option and would therefore have the potential to result in a reduction of greenhouse gas impacts for each flight using this route.		
Wider society	Capacity/ resilience	Qualitative
This design option would provide a broadly similar capacity to the baseline do-nothing option because it turns in a similar direction, but it also has the potential to improve resilience over the baseline do-nothing option due to the quicker climb.		
General Aviation	Access	Qualitative
Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's quicker climb has the potential to result in a reduced fuel burn impact on commercial traffic when compared when the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		

Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		
Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (broadly similar capacity to today, improved overall noise impact, reduced fuel/CO_2).		

Qualitative Safety Assessment

This proposed departure option from runway 09 provides a longer departure route to the northwest, with a left turn towards Heathrow airspace before turning north with a higher and quicker climb in comparison to today's operation. The safety assessment for this option indicates that a safety hazard assessment would be required for deconfliction from Heathrow, Luton and Stansted's departures and arrivals, and RAF Northolt departures.

4.1.2 DEP-09-NW-LTO-2



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

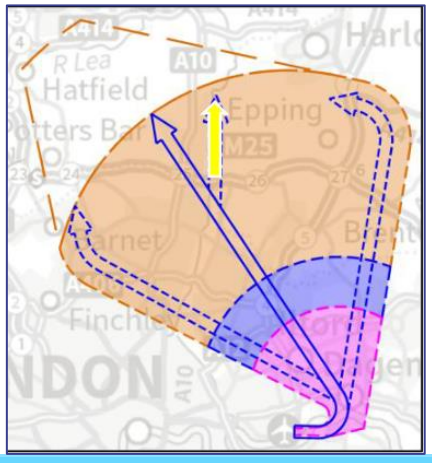
Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly the same initial communities as today after take-off. However, it is expected to be higher more quickly. Therefore, qualitatively the anticipated noise impact would be less when compared with the baseline do-nothing option. This design option would not overfly an AONB from 7,000ft-4,000ft hence no change in tranquillity impacts.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft would still climb through 1,000ft on initial departure, about 1.7 nautical miles (3.2km) from either end of the runway.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide the same departure route to the northwest as today. However, it would climb quicker when compared to the baseline do-nothing option and would therefore have the potential to result in a reduction of greenhouse gas impacts for each flight using this route.		
Wider society	Capacity/ resilience	Qualitative
This design option would provide a broadly similar capacity to the baseline do-nothing option because it turns in a similar direction, but it also has the potential to improve resilience over the baseline do-nothing option due to the quicker climb.		
General Aviation	Access	Qualitative
Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's quicker climb has the potential to result in a reduced fuel burn impact on commercial traffic when compared when the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		

Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (broadly similar capacity to today, improved overall noise impact, reduced fuel/CO_2).		

Qualitative Safety Assessment

This proposed departure option from runway 09 is similar to today's baseline route but aims to provide a higher and more continuous climb. The safety assessment for this option indicates similar levels of safety assurance to today's operation, however a safety hazard assessment would still be required to ensure deconfliction from Heathrow, Luton and Stansted's departures and arrivals, and RAF Northolt departures.

4.1.3 DEP-09-NW-LTO-3



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

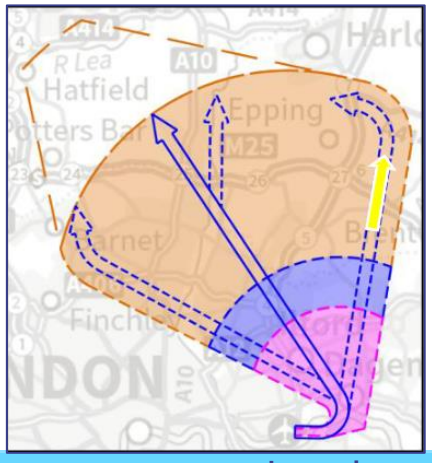
Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly some of the same communities as today after take-off. However, it is expected to be higher more quickly and is positioned to overfly less populated areas as aircraft continue to climb. Therefore, qualitatively the anticipated noise impact would be less when compared with the baseline do-nothing option. This design option would not overfly an AONB from 7,000ft-4,000ft hence no change in tranquillity impacts.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft would still climb through 1,000ft on initial departure, about 1.7 nautical miles (3.2km) from either end of the runway.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide a similar departure route to the northwest as today. However, it would climb quicker when compared to the baseline do-nothing option and would therefore have the potential to result in a reduction of greenhouse gas impacts for each flight using this route.		
Wider society	Capacity/ resilience	Qualitative
This design option would provide a broadly similar capacity to the baseline do-nothing option because it turns in a similar direction, but it also has the potential to improve resilience over the baseline do-nothing option due to the quicker climb.		
General Aviation	Access	Qualitative
Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's quicker climb has the potential to result in a reduced fuel burn impact on commercial traffic when compared when the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		

Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (broadly similar capacity to today, improved overall noise impact, reduced fuel/CO_2).		

Qualitative Safety Assessment

This proposed departure option from runway 09 provides the same initial track as today's baseline route but then turns north to overfly a less densely populated area and is expected to climb higher more quickly. The safety assessment for this option indicates similar levels of safety assurance to today's operation, however a safety hazard assessment would still be required to ensure deconfliction from Heathrow, Luton and Stansted's departures and arrivals, and RAF Northolt departures.

4.1.4 DEP-09-NW-LTO-4



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

Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly some of the same communities as today after take-off. However, it is expected to be higher more quickly and is positioned to overfly less populated areas as aircraft continue to climb. Therefore, qualitatively the anticipated noise impact would be less when compared with the baseline do-nothing option. This design option would not overfly an AONB from 7,000ft-4,000ft hence no change in tranquillity impacts.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft would still climb through 1,000ft on initial departure, about 1.7 nautical miles (3.2km) from either end of the runway.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide a longer departure route to the northwest due to the alternate initial departure direction. However, it would climb quicker when compared to the baseline do-nothing option and would therefore have the potential to result in a reduction of greenhouse gas impacts for each flight using this route.		
Wider society	Capacity/ resilience	Qualitative
This design option would provide a broadly similar capacity to the baseline do-nothing option because it turns in a similar direction, but it also has the potential to improve resilience over the baseline do-nothing option due to the quicker climb.		
General Aviation	Access	Qualitative
Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's quicker climb has the potential to result in a reduced fuel burn impact on commercial traffic when compared when the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		

Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (broadly similar capacity to today, improved overall noise impact, reduced fuel/CO_2).		

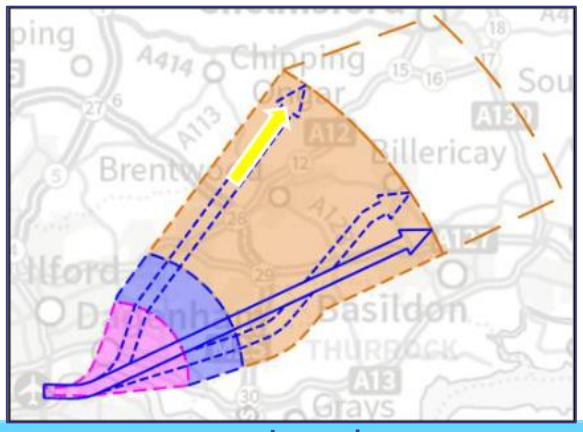
Qualitative Safety Assessment

This proposed departure option from runway 09 provides a longer departure route to the northwest due to the alternate initial departure than today's baseline route but then turns north to overfly a less densely populated area and is expected to climb higher more quickly. The safety assessment for this option indicates similar levels of safety assurance to today's operation, however a safety hazard assessment would still be required to ensure deconfliction from Heathrow, Luton and Stansted's departures and arrivals, and RAF Northolt departures.

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



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

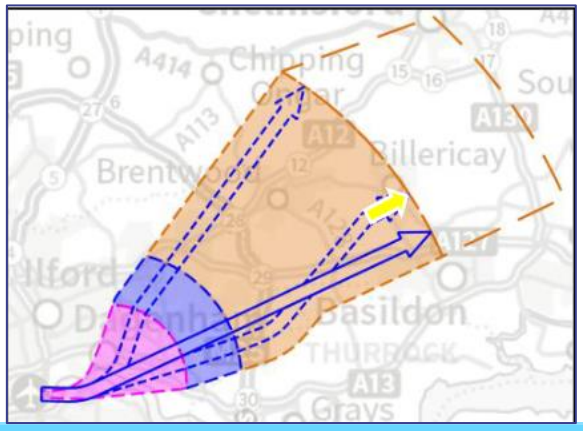
Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly many of the same communities as today after take-off. However, it is expected to be higher more quickly and would overall overfly a broadly similar number of people as today. Therefore, qualitatively the anticipated noise impact would be broadly similar when compared with the baseline do-nothing option. This design option would not overfly an AONB from 7,000ft-4,000ft hence no change in tranquillity impacts.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft would still climb through 1,000ft on initial departure, about 1.7 nautical miles (3.2km) from either end of the runway.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide a similar departure route to the east/ northeast as today but continues further northeast which is similar to the current tactical controlling. However, it would climb quicker when compared to the baseline do-nothing option and would therefore have the potential to result in a reduction of greenhouse gas impacts for each flight using this route.		
Wider society	Capacity/ resilience	Qualitative
This design option would provide a broadly similar capacity to the baseline do-nothing option because it turns in a similar direction, but it also has the potential to improve resilience over the baseline do-nothing option due to the quicker climb.		
General Aviation	Access	Qualitative
Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's quicker climb has the potential to result in a reduced fuel burn impact on commercial traffic when compared when the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		

Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		
Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (broadly similar capacity to today, improved overall noise impact, reduced fuel/CO_2).		

Qualitative Safety Assessment

This proposed departure option from runway 09 follows today's baseline SID but will continue further northeast, which is similar to today's tactical controlling, but is expected to climb higher more quickly. The safety assessment for this option indicates that a safety hazard assessment would be required to ensure deconfliction from Heathrow, Stansted and Southend air traffic flows.

4.2.2 DEP-09-ENE-LTO-2



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

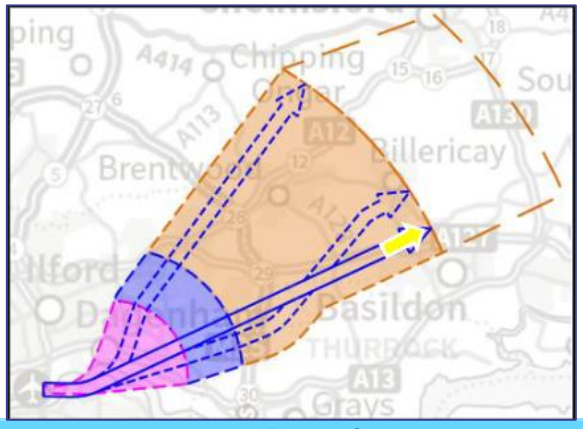
Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly some of the same, but primarily different, communities from today after take-off. However, it is expected to be higher more quickly and would overfly less densely populated areas as aircraft continue to climb. Therefore, qualitatively the anticipated noise impact would be less when compared with the baseline do-nothing option. This design option would not overfly an AONB from 7,000ft-4,000ft hence no change in tranquillity impacts.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft would still climb through 1,000ft on initial departure, about 1.7 nautical miles (3.2km) from either end of the runway.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide a similar departure route to the east/ northeast as today but removes some of the current complex turns in today's route. However, it would climb quicker when compared to the baseline do-nothing option and would therefore have the potential to result in a reduction of greenhouse gas impacts for each flight using this route.		
Wider society	Capacity/ resilience	Qualitative
This design option would provide a broadly similar capacity to the baseline do-nothing option because it turns in a similar direction, but it also has the potential to improve resilience over the baseline do-nothing option due to the quicker climb.		
General Aviation	Access	Qualitative
Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's quicker climb has the potential to result in a reduced fuel burn impact on commercial traffic when compared when the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		

Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (broadly similar capacity to today, improved overall noise impact, reduced fuel/CO_2).		

Qualitative Safety Assessment

This proposed departure option from runway 09 provides a similar departure route to the east/northeast as today, but removes the complex turn from today's baseline SID, and is expected to climb higher more quickly. The safety assessment for this option indicates that a safety hazard assessment would be required to ensure deconfliction from Heathrow, Stansted and Southend air traffic flows.

4.2.3 DEP-09-ENE-LTO-3



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

Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly many of the same communities as today after take-off. However, it is expected to be higher more quickly and would overall overfly a broadly similar number of people as today. Therefore, qualitatively the anticipated noise impact would be broadly similar when compared with the baseline do-nothing option. This design option would not overfly an AONB from 7,000ft-4,000ft hence no change in tranquillity impacts.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft would still climb through 1,000ft on initial departure, about 1.7 nautical miles (3.2km) from either end of the runway.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide a similar departure route to the east/ northeast as today but removes some of the current complex turns in today's route and is as direct as possible. It would also climb quicker when compared to the baseline do-nothing option and would therefore have the potential to result in a reduction of greenhouse gas impacts for each flight using this route.		
Wider society	Capacity/ resilience	Qualitative
This design option would provide a broadly similar capacity to the baseline do-nothing option because it turns in a similar direction, but it also has the potential to improve resilience over the baseline do-nothing option due to the quicker climb.		
General Aviation	Access	Qualitative
Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's quicker climb has the potential to result in a reduced fuel burn impact on commercial traffic when compared when the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		

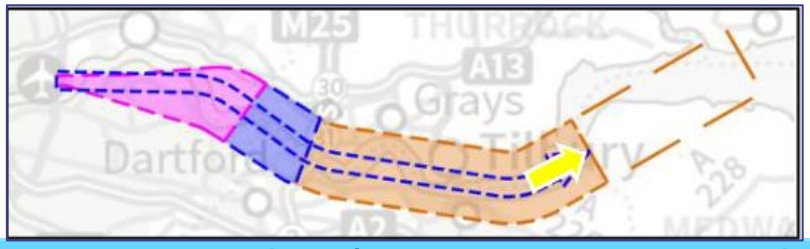
Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (broadly similar capacity to today, improved overall noise impact, reduced fuel/CO_2).		

Qualitative Safety Assessment

This proposed departure option from runway 09 is a similar departure route to the east/northeast as today, but provides a more direct route to the east, removes the complex turn from today's baseline SID, and is expected to climb higher more quickly. The safety assessment for this option indicates that a safety hazard assessment would be required to ensure deconfliction from Heathrow, Stansted and Southend air traffic flows.

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

4.2.4 DEP-09-ENE-RTO-1



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

Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly some of the same, but primarily different, communities from today after take-off. However, it is expected to be higher more quickly and would overfly less densely populated areas as aircraft continue to climb. Therefore, qualitatively the anticipated noise impact would be less when compared with the baseline do-nothing option. This design option would not overfly an AONB from 7,000ft-4,000ft hence no change in tranquillity impacts.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft would still climb through 1,000ft on initial departure, about 1.7 nautical miles (3.2km) from either end of the runway.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide a longer departure route to the east/ northeast as it has been positioned to avoid overflying densely populated areas. However, it would climb quicker when compared to the baseline do-nothing option and would therefore have the potential to result in a reduction of greenhouse gas impacts for each flight using this route.		
Wider society	Capacity/ resilience	Qualitative
This design option would provide a broadly similar capacity to the baseline do-nothing option. It turns in a different initial direction, but quickly turns back onto a similar direction. It also has the potential to improve resilience over the baseline do-nothing option due to the quicker climb.		
General Aviation	Access	Qualitative
Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's quicker climb has the potential to result in a reduced fuel burn impact on commercial traffic when compared when the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		

Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (broadly similar capacity to today, improved overall noise impact, reduced fuel/CO_2).		

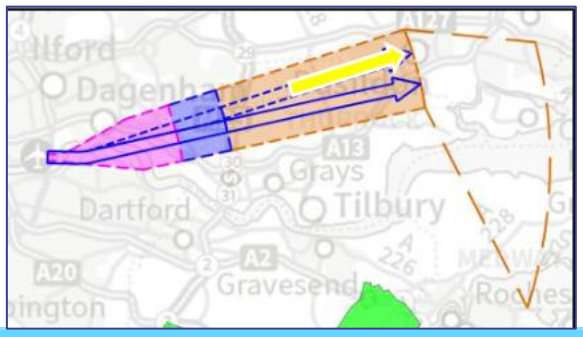
Qualitative Safety Assessment

This departure option from runway 09 is similar to the east/northeast departure as is today but provides a longer departure route to avoid overflying more densely populated areas and is expected to climb higher more quickly. The safety assessment for this option indicates similar levels of safety assurance to today's operation, but a safety hazard assessment would be required to ensure deconfliction against London City 09 arrivals from the south and Southend air traffic flows.

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



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

Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly some of the same, but primarily different, communities from today after take-off. However, it is expected to be higher more quickly and would overfly less densely populated areas as aircraft continue to climb. Therefore, qualitatively the anticipated noise impact would be less when compared with the baseline do-nothing option. This design option would not overfly an AONB from 7,000ft-4,000ft hence no change in tranquillity impacts.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft would still climb through 1,000ft on initial departure, about 1.7 nautical miles (3.2km) from either end of the runway.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide a shorter departure route to the southeast alongside a quicker climb. This shorter flightplannable track distance and increased climb rate would result in a reduction of greenhouse gas impacts for each flight using this route when compared to the baseline do-nothing option.		
Wider society	Capacity/ resilience	Qualitative
This design option would provide a broadly similar capacity to the baseline do-nothing option because it turns in a similar direction, but it also has the potential to improve resilience over the baseline do-nothing option due to the quicker climb.		
General Aviation	Access	Qualitative
Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's shorter flightplannable track distance and quicker climb would result in a reduced fuel burn impact on commercial traffic when compared with the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		

Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (broadly similar capacity to today, improved overall noise impact, reduced fuel/CO_2).		

Qualitative Safety Assessment

This departure option from runway 09 is similar to today's operation but provides a shorter flightplannable route and is expected to climb higher more quickly. The safety assessment for this option indicates similar levels of safety assurance to today's operation, but a safety hazard assessment would be required to ensure deconfliction against London City 09 arrivals and Southend air traffic flows.

4.3.2 DEP-09-SE-LTO-2

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

Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly some of the same, but primarily different, communities from today after take-off. However, it is expected to be higher more quickly and would overfly less densely populated areas as aircraft continue to climb. Therefore, qualitatively the anticipated noise impact would be less when compared with the baseline do-nothing option. This design option would not overfly an AONB from 7,000ft-4,000ft hence no change in tranquillity impacts.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft would still climb through 1,000ft on initial departure, about 1.7 nautical miles (3.2km) from either end of the runway.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide a shorter departure route to the southeast alongside a quicker climb. This shorter flightplannable track distance and increased climb rate would result in a reduction of greenhouse gas impacts for each flight using this route when compared to the baseline do-nothing option.		
Wider society	Capacity/ resilience	Qualitative
This design option would provide a broadly similar capacity to the baseline do-nothing option because it turns in a similar direction, but it also has the potential to improve resilience over the baseline do-nothing option due to the quicker climb.		
General Aviation	Access	Qualitative
Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's shorter flightplannable track distance and quicker climb would result in a reduced fuel burn impact on commercial traffic when compared with the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		

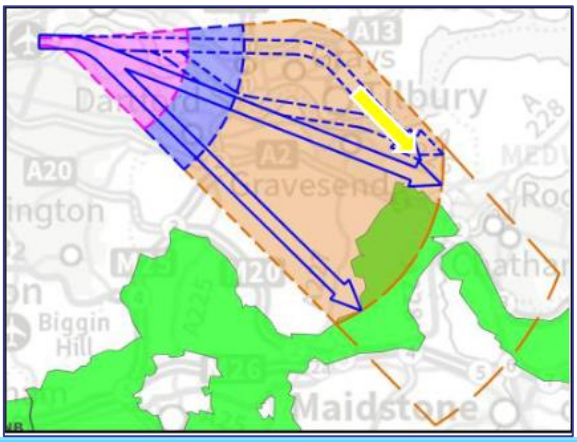
Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (broadly similar capacity to today, improved overall noise impact, reduced fuel/CO_2).		

Qualitative Safety Assessment

This departure option from runway 09 is similar to today's operation but provides a shorter flightplannable route to the southeast and is expected to climb higher more quickly. The safety assessment for this option indicates similar levels of safety assurance to today's operation, but a safety hazard assessment would be required to ensure deconfliction against London City 09 arrivals and Southend air traffic flows.

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

4.3.3 DEP-09-SE-RTO-1



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

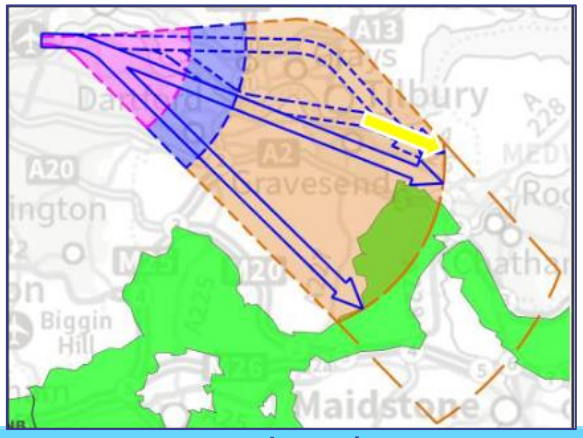
Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly some of the same, but primarily different, communities from today after take-off. However, it is expected to be higher more quickly and would overfly less densely populated areas as aircraft continue to climb. Therefore, qualitatively the anticipated noise impact would be less when compared with the baseline do-nothing option. This design option would not overfly an AONB from 7,000ft-4,000ft hence no change in tranquillity impacts.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft would still climb through 1,000ft on initial departure, about 1.7 nautical miles (3.2km) from either end of the runway.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide a shorter departure route to the southeast alongside a quicker climb. This shorter flightplannable track distance and increased climb rate would result in a reduction of greenhouse gas impacts for each flight using this route when compared to the baseline do-nothing option.		
Wider society	Capacity/ resilience	Qualitative
This design option would provide a capacity improvement over the baseline do-nothing option because its initial direction may allow for reduced departure separation against preceding or succeeding departures. It also has the potential to improve resilience over the baseline do-nothing option due to the quicker climb.		
General Aviation	Access	Qualitative
Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's shorter flightplannable track distance and quicker climb would result in a reduced fuel burn impact on commercial traffic when compared with the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		

Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		
Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (may enable an increase in capacity, improved overall noise impact, reduced fuel/CO_2).		

Qualitative Safety Assessment

This departure option from runway 09 climbs straight ahead then turns to provide a shorter departure route to the southeast along with a quicker climb. The safety assessment for this option indicates similar levels of safety assurance to today's operation, but a safety hazard assessment would be required to ensure deconfliction against London City 09 arrivals and Southend and Biggin Hill air traffic flows.

4.3.4 DEP-09-SE-RTO-2



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

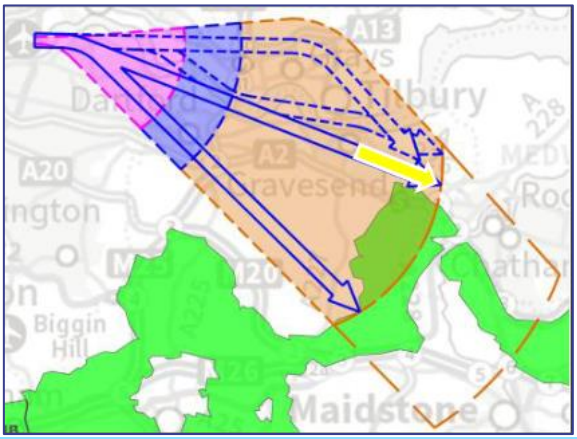
Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly some of the same, but primarily different, communities from today after take-off. However, it is expected to be higher more quickly and would overfly less densely populated areas as aircraft continue to climb. Therefore, qualitatively the anticipated noise impact would be less when compared with the baseline do-nothing option. This design option would not overfly an AONB from 7,000ft-4,000ft hence no change in tranquillity impacts.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft would still climb through 1,000ft on initial departure, about 1.7 nautical miles (3.2km) from either end of the runway.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide a shorter departure route to the southeast alongside a quicker climb. This shorter flightplannable track distance and increased climb rate would result in a reduction of greenhouse gas impacts for each flight using this route when compared to the baseline do-nothing option.		
Wider society	Capacity/ resilience	Qualitative
This design option would provide a capacity improvement over the baseline do-nothing option because its initial direction may allow for reduced departure separation against preceding or succeeding departures. It also has the potential to improve resilience over the baseline do-nothing option due to the quicker climb.		
General Aviation	Access	Qualitative
Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's shorter flightplannable track distance and quicker climb would result in a reduced fuel burn impact on commercial traffic when compared with the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		

Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (may enable an increase in capacity, improved overall noise impact, reduced fuel/CO_2).		

Qualitative Safety Assessment

This departure option from runway 09 provides a shorter departure route to the southeast alongside a quicker climb. The safety assessment for this option indicates similar levels of safety assurance to today's operation, but a safety hazard assessment would be required to ensure deconfliction against London City 09 arrivals and Southend and Biggin Hill air traffic flows.

4.3.5 DEP-09-SE-RTO-3



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

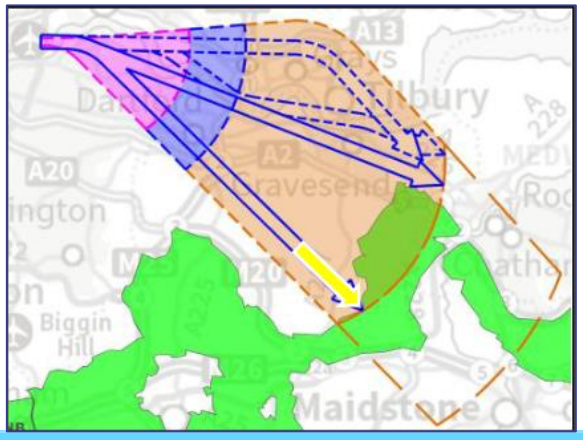
Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly very different communities from today. However, it is expected to be higher more quickly and would overall overfly a broadly similar number of people as today. Therefore, qualitatively the anticipated noise impact would be broadly similar when compared with the baseline do-nothing option. A small northern section of the Kent Downs AONB may also be overflown at higher altitudes by this route which would have a negative impact on tranquillity.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft would still climb through 1,000ft on initial departure, about 1.7 nautical miles (3.2km) from either end of the runway.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide the shortest possible departure route to the applicable southeast exit point (as today) alongside a quicker climb. This shorter flightplannable track distance and increased climb rate would result in a reduction of greenhouse gas impacts for each flight using this route when compared to the baseline do-nothing option.		
Wider society	Capacity/ resilience	Qualitative
This design option would provide a capacity improvement over the baseline do-nothing option because its initial direction may allow for reduced departure separation against preceding or succeeding departures. It also has the potential to improve resilience over the baseline do-nothing option due to the quicker climb.		
General Aviation	Access	Qualitative
This design option, specifically the right turn out, may have a negative impact on GA airspace users between the Isle of Dogs and the Queen Elizabeth II Bridge. Therefore, GA access in this area could be negatively impacted when compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's shorter flightplannable track distance and quicker climb would result in a reduced fuel burn impact on commercial traffic when compared with the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		

Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		
Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (may enable an increase in capacity, broadly similar overall noise impact to today, reduced fuel/CO_2).		

Qualitative Safety Assessment

This departure option from runway 09 provides the shortest possible departure route to the applicable southeast exit point (as is today) alongside a quicker climb. The safety assessment for this option indicates similar levels of safety assurance to today's operation, but a safety hazard assessment would be required to ensure deconfliction against London City 09 arrivals and Gatwick, Southend and Biggin Hill air traffic flows.

4.3.6 DEP-09-SE-RTO-4



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

Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly very different communities from today. However, it is expected to be higher more quickly and would overall overfly a broadly similar number of people as today. Therefore, qualitatively the anticipated noise impact would be broadly similar when compared with the baseline do-nothing option. A small northern section of the Kent Downs AONB may also be overflown at higher altitudes by this route which would have a negative impact on tranquillity.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft would still climb through 1,000ft on initial departure, about 1.7 nautical miles (3.2km) from either end of the runway.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide the shortest possible departure route to the applicable southeast exit point (as today) alongside a quicker climb. This shorter flightplannable track distance and increased climb rate would result in a reduction of greenhouse gas impacts for each flight using this route when compared to the baseline do-nothing option.		
Wider society	Capacity/ resilience	Qualitative
This design option would provide a capacity improvement over the baseline do-nothing option because its initial direction may allow for reduced departure separation against preceding or succeeding departures. It also has the potential to improve resilience over the baseline do-nothing option due to the quicker climb.		
General Aviation	Access	Qualitative
This design option, specifically the right turn out, may have a negative impact on GA airspace users between the Isle of Dogs and the Queen Elizabeth II Bridge. Therefore, GA access in this area could be negatively impacted when compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's shorter flightplannable track distance and quicker climb would result in a reduced fuel burn impact on commercial traffic when compared with the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		

Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		
Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (may enable an increase in capacity, broadly similar overall noise impact to today, reduced fuel/CO_2).		

Qualitative Safety Assessment

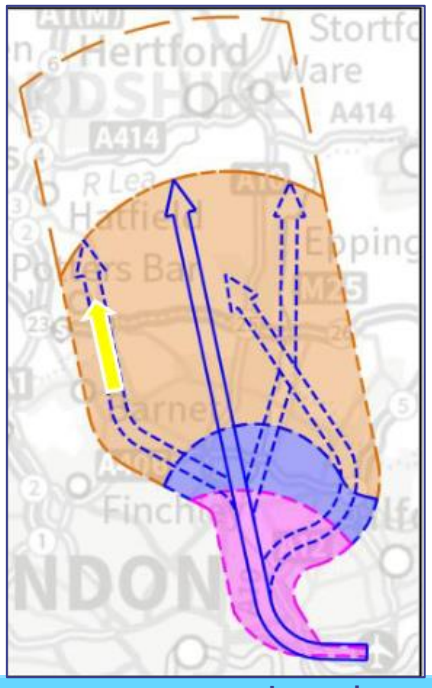
This departure option from runway 09 provides the shortest possible departure route to the applicable southeast exit point (as is today) alongside a quicker climb. The safety assessment for this option indicates similar levels of safety assurance to today's operation, but a safety hazard assessment would be required to ensure deconfliction against London City 09 arrivals and Heathrow, Gatwick, Southend and Biggin Hill air traffic flows.

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



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

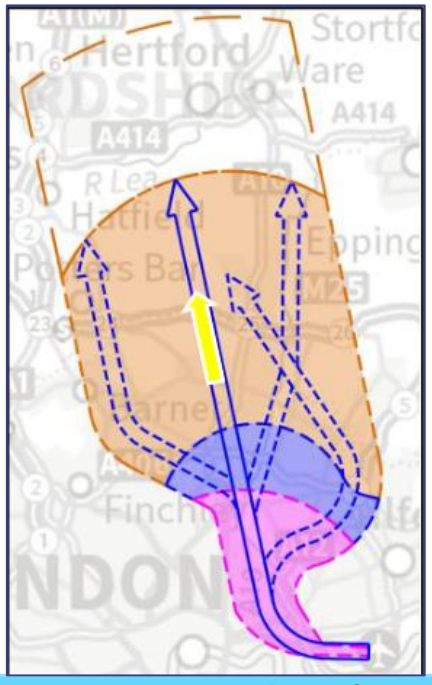
Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly some of the same, but primarily different, communities from today after take-off. However, it is expected to be higher more quickly and would overfly a broadly similar number of people to today overall. Therefore, qualitatively the anticipated noise impact would be broadly similar when compared with the baseline do-nothing option. This design option would not overfly an AONB from 7,000ft-4,000ft hence no change in tranquillity impacts.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft would still climb through 1,000ft on initial departure, about 1.7 nautical miles (3.2km) from either end of the runway.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide a similar departure route length to the northwest as today. It would also climb quicker when compared to the baseline do-nothing option and would therefore have the potential to result in a reduction of greenhouse gas impacts for each flight using this route.		
Wider society	Capacity/ resilience	Qualitative
This design option would provide a broadly similar capacity to the baseline do-nothing option because it turns in a similar direction, but it also has the potential to improve resilience over the baseline do-nothing option due to the quicker climb.		
General Aviation	Access	Qualitative
Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		

General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's quicker climb has the potential to result in a reduced fuel burn impact on commercial traffic when compared when the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		
Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (broadly similar capacity to today, improved overall noise impact, reduced fuel/CO_2).		

Qualitative Safety Assessment

This departure option from runway 27 departs to the northwest and is expected to climb higher more quickly. This design stays away from Heathrow airspace initially, then then turns left to provide an alternate route. The safety assessment for this option indicates a safety hazard assessment would be required to ensure deconfliction against Heathrow, and Northolt arrivals and Luton and Stansted departures.

5.1.2 DEP-27-NW-RTO-2



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

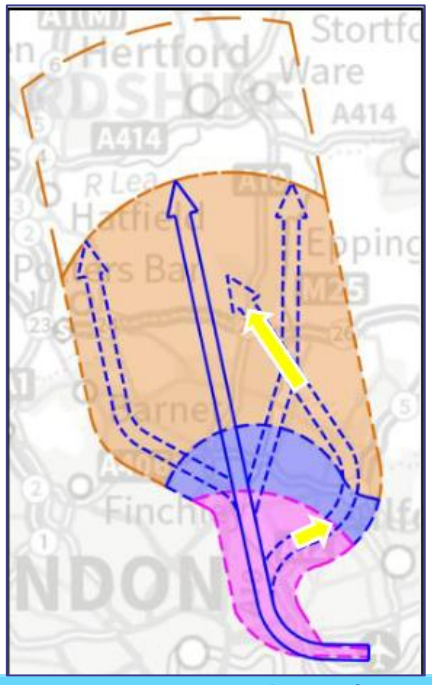
Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly some of the same, but primarily different, communities from today after take-off. However, it is expected to be higher more quickly and would overfly less densely populated areas as aircraft continue to climb. Therefore, qualitatively the anticipated noise impact would be less when compared with the baseline do-nothing option. This design option would not overfly an AONB from 7,000ft-4,000ft hence no change in tranquillity impacts.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft would still climb through 1,000ft on initial departure, about 1.7 nautical miles (3.2km) from either end of the runway.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide a shorter departure route to the northwest alongside a quicker climb. This shorter flightplannable track distance and increased climb rate would result in a reduction of greenhouse gas impacts for each flight using this route when compared to the baseline do-nothing option.		
Wider society	Capacity/ resilience	Qualitative
This design option would provide a broadly similar capacity to the baseline do-nothing option because it turns in a similar direction, but it also has the potential to improve resilience over the baseline do-nothing option due to the quicker climb.		
General Aviation	Access	Qualitative
Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's shorter flightplannable track distance and quicker climb would result in a reduced fuel burn impact on commercial traffic when compared with the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		

Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		
Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (broadly similar capacity to today, improved overall noise impact, reduced fuel/CO_2).		

Qualitative Safety Assessment

This departure option from runway 27 provides a shorter departure route to the northwest and is expected to climb higher more quickly. The safety assessment for this option indicates a safety hazard assessment would be required to ensure deconfliction against Heathrow, and Northolt arrivals and Luton and Stansted departures.

5.1.3 DEP-27-NW-RTO-3



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

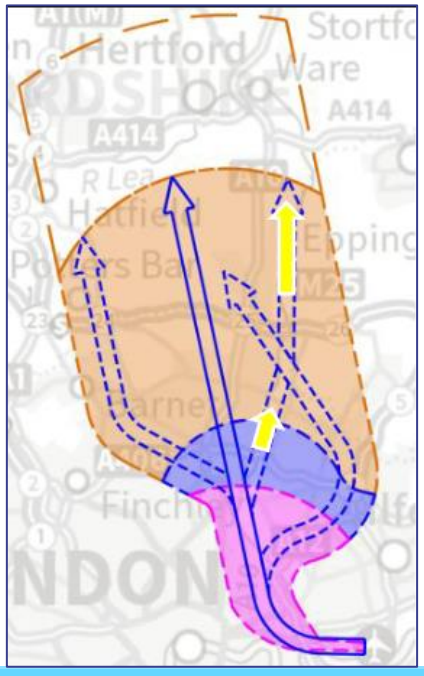
Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly the same communities as today but with a faster climb, thus overflying less densely populated areas at lower levels. Therefore, qualitatively the anticipated noise impact would be less when compared with the baseline do-nothing option. This design option would not overfly an AONB from 7,000ft-4,000ft hence no change in tranquillity impacts.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft would still climb through 1,000ft on initial departure, about 1.7 nautical miles (3.2km) from either end of the runway.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide a similar departure route length to the northwest as today. It would also climb quicker when compared to the baseline do-nothing option and would therefore have the potential to result in a reduction of greenhouse gas impacts for each flight using this route.		
Wider society	Capacity/ resilience	Qualitative
This design option would provide a broadly similar capacity to the baseline do-nothing option because it turns in a similar direction, but it also has the potential to improve resilience over the baseline do-nothing option due to the quicker climb.		
General Aviation	Access	Qualitative
Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's quicker climb has the potential to result in a reduced fuel burn impact on commercial traffic when compared when the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		

Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		
Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (broadly similar capacity to today, improved overall noise impact, reduced fuel/CO_2).		

Qualitative Safety Assessment

This departure option from runway 27 follows today's baseline SID but with a higher quicker climb. The safety assessment for this option indicates a safety hazard assessment would be required to ensure deconfliction against Heathrow, and Northolt arrivals and Luton and Stansted departures.

5.1.4 DEP-27-NW-RTO-4



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

Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly some of the same, but primarily different, communities from today after take-off. However, it is expected to be higher more quickly and would overfly less densely populated areas as aircraft continue to climb. Therefore, qualitatively the anticipated noise impact would be less when compared with the baseline do-nothing option. This design option would not overfly an AONB from 7,000ft-4,000ft hence no change in tranquillity impacts.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft would still climb through 1,000ft on initial departure, about 1.7 nautical miles (3.2km) from either end of the runway.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide the shortest possible departure route to the applicable northwest exit point (as today) alongside a quicker climb. This increased climb rate would result in a reduction of greenhouse gas impacts for each flight using this route when compared to the baseline do-nothing option.		
Wider society	Capacity/ resilience	Qualitative
This design option would provide a broadly similar capacity to the baseline do-nothing option because it turns in a similar direction, but it also has the potential to improve resilience over the baseline do-nothing option due to the quicker climb.		
General Aviation	Access	Qualitative
Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's quicker climb has the potential to result in a reduced fuel burn impact on commercial traffic when compared when the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		

Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		
Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (broadly similar capacity to today, improved overall noise impact, reduced fuel/CO_2).		

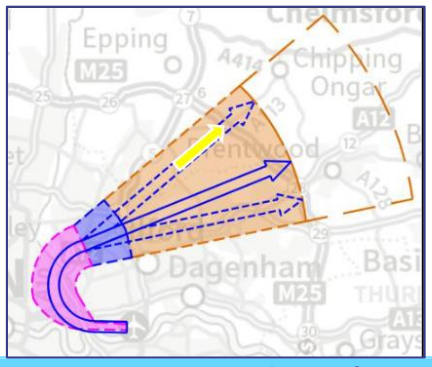
Qualitative Safety Assessment

This departure option from runway 27 provides the shortest possible route to the applicable northwest exit point (as today) along with a quicker climb. The safety assessment for this option indicates a safety hazard assessment would be required to ensure deconfliction against Heathrow, and Northolt arrivals and Luton and Stansted departures.

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



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

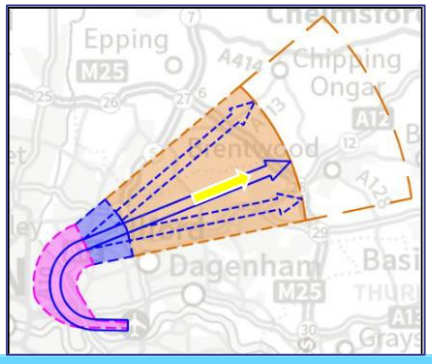
Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly the same communities as today but with a faster climb, thus overflying less densely populated areas at lower levels. Therefore, qualitatively the anticipated noise impact would be less when compared with the baseline do-nothing option. This design option would not overfly an AONB from 7,000ft-4,000ft hence no change in tranquillity impacts.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft would still climb through 1,000ft on initial departure, about 1.7 nautical miles (3.2km) from either end of the runway.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide a similar departure route length to the east/ northeast as today. It would also climb quicker when compared to the baseline do-nothing option and would therefore have the potential to result in a reduction of greenhouse gas impacts for each flight using this route.		
Wider society	Capacity/ resilience	Qualitative
This design option would provide a broadly similar capacity to the baseline do-nothing option because it turns in a similar direction, but it also has the potential to improve resilience over the baseline do-nothing option due to the quicker climb.		
General Aviation	Access	Qualitative
Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's quicker climb has the potential to result in a reduced fuel burn impact on commercial traffic when compared when the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		

Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (broadly similar capacity to today, improved overall noise impact, reduced fuel/CO_2).		

Qualitative Safety Assessment

This departure option from runway 27 provides a similar departure route to today's baseline SID to the northeast but with a faster climb. The safety assessment for this option indicates a safety hazard assessment would be required to ensure deconfliction against Heathrow, Stansted, Luton and Southend air traffic flows.

5.2.2 DEP-27-ENE-RTO-2



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

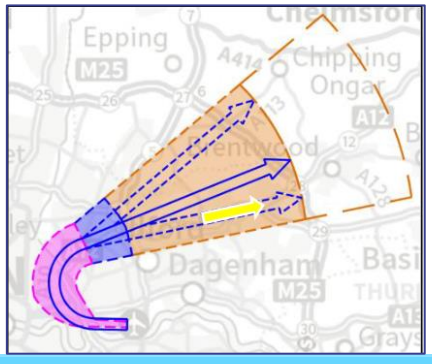
Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly many of the same, and some different, communities from today after take-off. However, it is expected to be higher more quickly and would overfly less densely populated areas as aircraft continue to climb. Therefore, qualitatively the anticipated noise impact would be less when compared with the baseline do-nothing option. This design option would not overfly an AONB from 7,000ft-4,000ft hence no change in tranquillity impacts.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft would still climb through 1,000ft on initial departure, about 1.7 nautical miles (3.2km) from either end of the runway.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide the shortest possible departure route to the applicable east/ northeast exit point (as today) alongside a quicker climb. This increased climb rate would result in a reduction of greenhouse gas impacts for each flight using this route when compared to the baseline do-nothing option.		
Wider society	Capacity/ resilience	Qualitative
This design option would provide a broadly similar capacity to the baseline do-nothing option because it turns in a similar direction, but it also has the potential to improve resilience over the baseline do-nothing option due to the quicker climb.		
General Aviation	Access	Qualitative
Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's quicker climb has the potential to result in a reduced fuel burn impact on commercial traffic when compared when the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		

Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (broadly similar capacity to today, improved overall noise impact, reduced fuel/CO_2).		

Qualitative Safety Assessment

This departure option from runway 27 is a similar departure route to today's baseline SID then provides the shortest possible departure route to the applicable east/northeast exit point (as today) and is expected to climb higher more quickly. The safety assessment for this option indicates a safety hazard assessment would be required to ensure deconfliction against Heathrow, Stansted, Luton and Southend air traffic flows.

5.2.3 DEP-27-ENE-RTO-3



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

Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly many of the same, and some different, communities from today after take-off. However, it is expected to be higher more quickly and would overfly less densely populated areas as aircraft continue to climb. Therefore, qualitatively the anticipated noise impact would be less when compared with the baseline do-nothing option. This design option would not overfly an AONB from 7,000ft-4,000ft hence no change in tranquillity impacts.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft would still climb through 1,000ft on initial departure, about 1.7 nautical miles (3.2km) from either end of the runway.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide the shortest possible departure route to the applicable northwest exit point (as today) alongside a quicker climb. This increased climb rate would result in a reduction of greenhouse gas impacts for each flight using this route when compared to the baseline do-nothing option.		
Wider society	Capacity/ resilience	Qualitative
This design option would provide a broadly similar capacity to the baseline do-nothing option because it turns in a similar direction, but it also has the potential to improve resilience over the baseline do-nothing option due to the quicker climb.		
General Aviation	Access	Qualitative
Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's quicker climb has the potential to result in a reduced fuel burn impact on commercial traffic when compared when the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		

Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (broadly similar capacity to today, improved overall noise impact, reduced fuel/CO_2).		

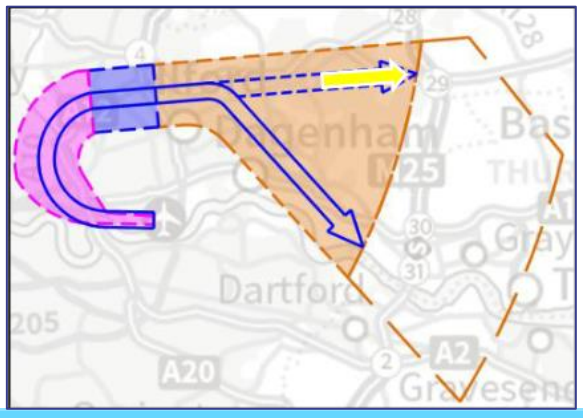
Qualitative Safety Assessment

This departure option from runway 27 is a similar departure route to today's baseline SID as far south as practicable for departures heading east/northeast and is expected to climb higher more quickly. The safety assessment for this option indicates a safety hazard assessment would be required to ensure deconfliction against Heathrow, Stansted, Luton and Southend air traffic flows.

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



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

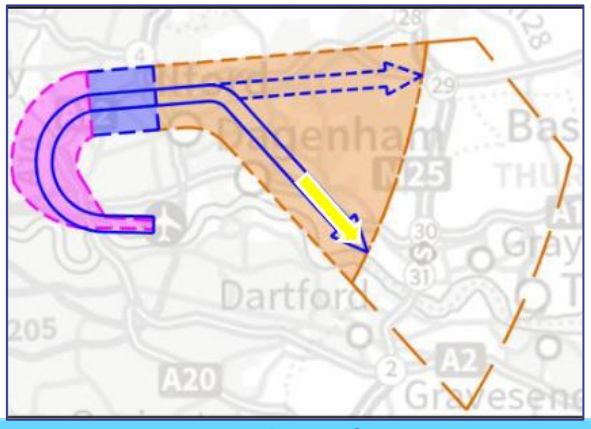
Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly many of the same, and some different, communities from today after take-off. However, it is expected to be higher more quickly and would overfly less densely populated areas as aircraft continue to climb. Therefore, qualitatively the anticipated noise impact would be less when compared with the baseline do-nothing option. This design option would not overfly an AONB from 7,000ft-4,000ft hence no change in tranquillity impacts.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft would still climb through 1,000ft on initial departure, about 1.7 nautical miles (3.2km) from either end of the runway.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide a shorter departure route to the southeast alongside a quicker climb. This shorter flightplannable track distance and increased climb rate would result in a reduction of greenhouse gas impacts for each flight using this route when compared to the baseline do-nothing option.		
Wider society	Capacity/ resilience	Qualitative
This design option would provide a broadly similar capacity to the baseline do-nothing option because it turns in a similar direction, but it also has the potential to improve resilience over the baseline do-nothing option due to the quicker climb.		
General Aviation	Access	Qualitative
Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's shorter flightplannable track distance and quicker climb would result in a reduced fuel burn impact on commercial traffic when compared with the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		

Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		
Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (broadly similar capacity to today, improved overall noise impact, reduced fuel/CO_2).		

Qualitative Safety Assessment

This departure option from runway 27 is a similar departure route to today's baseline SID but is expected to climb higher more quickly and is not tactical as is today. The safety assessment for this option indicates a safety hazard assessment would be required to ensure deconfliction from Southend air traffic flows.

5.3.2 DEP-27-SE-RTO-2



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

Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly many of the same, and some different, communities from today after take-off. However, it is expected to be higher more quickly and would overfly less densely populated areas as aircraft continue to climb. Therefore, qualitatively the anticipated noise impact would be less when compared with the baseline do-nothing option. This design option would not overfly an AONB from 7,000ft-4,000ft hence no change in tranquillity impacts.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft would still climb through 1,000ft on initial departure, about 1.7 nautical miles (3.2km) from either end of the runway.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide the shortest possible departure route to the applicable southeast exit point (as today) alongside a quicker climb. This increased climb rate would result in a reduction of greenhouse gas impacts for each flight using this route when compared to the baseline do-nothing option.		
Wider society	Capacity/ resilience	Qualitative
This design option would provide a broadly similar capacity to the baseline do-nothing option because it turns in a similar direction, but it also has the potential to improve resilience over the baseline do-nothing option due to the quicker climb.		
General Aviation	Access	Qualitative
Qualitatively there would be a similar access impact on GA traffic compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's quicker climb has the potential to result in a reduced fuel burn impact on commercial traffic when compared when the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		

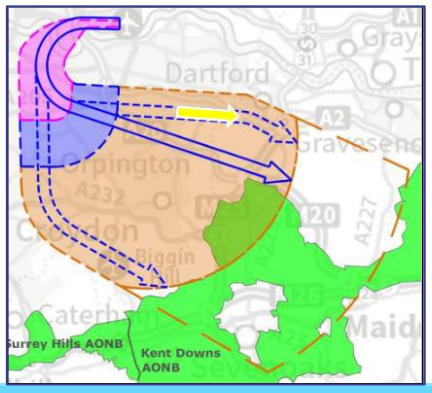
Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (broadly similar capacity to today, improved overall noise impact, reduced fuel/CO_2).		

Qualitative Safety Assessment

This departure option from runway 27 is a similar departure route to today's baseline SID and then turns directly to the applicable southeast exit point (as today) alongside a quicker climb. The safety assessment for this option indicates a safety hazard assessment would be required to ensure deconfliction from London City arrivals and Southend air traffic flows.

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

5.3.3 DEP-27-SE-LTO-1



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

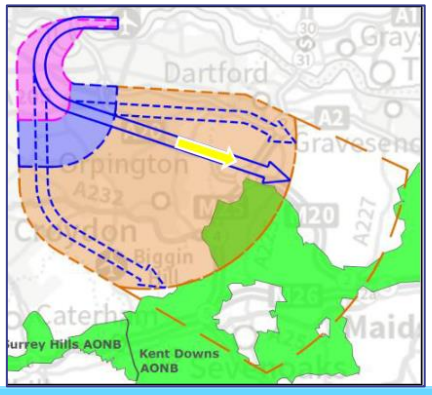
Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly very different communities from today. However, it is expected to be higher more quickly and would overall overfly a broadly similar number of people as today. Therefore, qualitatively the anticipated noise impact would be broadly similar when compared with the baseline do-nothing option. This design option would not overfly an AONB from 7,000ft-4,000ft hence no change in tranquillity impacts.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft would still climb through 1,000ft on initial departure, about 1.7 nautical miles (3.2km) from either end of the runway.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide a shorter departure route to the southeast alongside a quicker climb. This shorter flightplannable track distance and increased climb rate would result in a reduction of greenhouse gas impacts for each flight using this route when compared to the baseline do-nothing option.		
Wider society	Capacity/ resilience	Qualitative
This design option would provide a capacity improvement over the baseline do-nothing option because its initial direction may allow for reduced departure separation against preceding or succeeding departures. It also has the potential to improve resilience over the baseline do-nothing option due to the quicker climb.		
General Aviation	Access	Qualitative
This design option, specifically the left turn out, may have a negative impact on GA airspace users to the southwest and south of London City Airport. Therefore, GA access in this area could be negatively impacted when compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's shorter flightplannable track distance and quicker climb would result in a reduced fuel burn impact on commercial traffic when compared with the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		

Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		
Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (enables capacity improvement, similar noise impact to today, reduced fuel/CO_2).		

Qualitative Safety Assessment

This departure option from runway 27 provides a shorter left turn out departure route to the southeast alongside a quicker climb. The safety assessment for this option indicates a safety hazard assessment would be required to ensure deconfliction from Heathrow departures and Gatwick and Biggin Hill air traffic flows.

5.3.4 DEP-27-SE-LTO-2



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

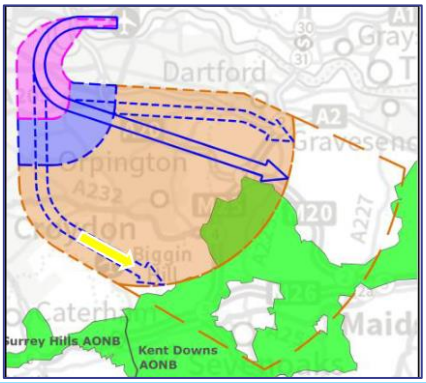
Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly very different communities from today. However, it is expected to be higher more quickly and would overall overfly a broadly similar number of people as today. Therefore, qualitatively the anticipated noise impact would be broadly similar when compared with the baseline do-nothing option. A small northern section of the Kent Downs AONB may also be overflown at higher altitudes by this route which would have a negative impact on tranquillity.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft would still climb through 1,000ft on initial departure, about 1.7 nautical miles (3.2km) from either end of the runway.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide the shortest possible departure route to the applicable southeast exit point (as today) alongside a quicker climb. This increased climb rate would result in a reduction of greenhouse gas impacts for each flight using this route when compared to the baseline do-nothing option.		
Wider society	Capacity/ resilience	Qualitative
This design option would provide a capacity improvement over the baseline do-nothing option because its initial direction may allow for reduced departure separation against preceding or succeeding departures. It also has the potential to improve resilience over the baseline do-nothing option due to the quicker climb.		
General Aviation	Access	Qualitative
This design option, specifically the left turn out, may have a negative impact on GA airspace users to the southwest and south of London City Airport. Therefore, GA access in this area could be negatively impacted when compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's quicker climb has the potential to result in a reduced fuel burn impact on commercial traffic when compared when the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		

Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (enables capacity improvement, similar noise impact to today, reduced fuel/CO_2).		

Qualitative Safety Assessment

This departure option from runway 27 is a left turn out departure route providing the shortest track possible to the applicable southeast exit point (as today) alongside a quicker climb. The safety assessment for this option indicates a safety hazard assessment would be required to ensure deconfliction from Heathrow departures and Gatwick and Biggin Hill air traffic flows.

5.3.5 DEP-27-SE-LTO-3



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

Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life (includes impact on tranquillity due to AONB overflight)	Qualitative
This design option would overfly very different communities from today. However, it is expected to be higher more quickly and would overall overfly a broadly similar number of people as today. Therefore, qualitatively the anticipated noise impact would be broadly similar when compared with the baseline do-nothing option. A small western section of the Kent Downs AONB may also be overflown at higher altitudes by this route which would have a negative impact on tranquillity.		
Communities	Air quality	Qualitative
Government guidance states that aircraft flying higher than 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft would still climb through 1,000ft on initial departure, about 1.7 nautical miles (3.2km) from either end of the runway.		
Wider society	Greenhouse gas impact	Qualitative
This design option would provide a shorter departure route to the southeast alongside a quicker climb. This shorter flightplannable track distance and increased climb rate would result in a reduction of greenhouse gas impacts for each flight using this route when compared to the baseline do-nothing option.		
Wider society	Capacity/ resilience	Qualitative
This design option would provide a capacity improvement over the baseline do-nothing option because its initial direction may allow for reduced departure separation against preceding or succeeding departures. It also has the potential to improve resilience over the baseline do-nothing option due to the quicker climb.		
General Aviation	Access	Qualitative
This design option, specifically the left turn out, may have a negative impact on GA airspace users to the southwest and south of London City Airport. Therefore, GA access in this area could be negatively impacted when compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Economic impact from increased effective capacity	Qualitative
Qualitatively this design option has the potential to contribute to increased effective capacity, which would have a positive economic impact compared with the baseline do-nothing option.		
General Aviation/ commercial airlines	Fuel Burn	Qualitative
Qualitatively this design option's shorter flightplannable track distance and quicker climb would result in a reduced fuel burn impact on commercial traffic when compared with the baseline do-nothing option. We do not predict a change in GA impacts.		
Commercial airlines	Training costs	Qualitative
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This option is not anticipated to impose additional training cost impacts for airlines.		
Commercial airlines	Other costs	Qualitative
No other airline costs are foreseen.		
Airport/ ANSP	Infrastructure costs	Qualitative
This design option is not expected to change Airport or ANSP infrastructure impacts, beyond the initial deployment phase which will require some systems engineering amendments.		
Airport/ ANSP	Operational costs	Qualitative
This design option is not expected to change Airport or ANSP operational cost impacts.		

Airport/ ANSP	Deployment costs	Qualitative
At this stage it is disproportionate to quantify deployment costs per design option as they would be used in arrival, departure and runway permutations not yet detailed. However, a system change for LCY would involve training c.180-200 controllers and 30 assistants via the use of various air traffic simulators (including sim prep, management and staffing), with additional engineering costs TBC.		
All	Performance against the vision and parameters/strategic objectives of the AMS	Qualitative
On balance, this design option has the potential to contribute to the AMS (enables capacity improvement, similar noise impact to today, reduced fuel/CO_2).		

Qualitative Safety Assessment

This departure option from runway 27 is a left turn out immediately south then routes to the southeast alongside a quicker climb. The safety assessment for this option indicates a safety hazard assessment would be required to ensure deconfliction from Gatwick easterly departures and Heathrow and Biggin Hill air traffic flows.

6 Conclusions and Next Steps

6.1.1 The airspace change process started in 2019 at Stage 1 with a Statement of Need, continued with the development of Design Principles (DPs) via stakeholder engagement, and progressed through the CAA's regulatory Stage 1 Gateway Assessment.

6.1.2 In Stage 2 airspace design options were created, described, engaged upon (Step 2Ai) and formally evaluated against the DPs (Step 2Aii). The design options progressing through Step 2Aii were subjected to a qualitative Initial Options Appraisal (Step 2B) including an assessment of safety considerations.

6.1.3 The Initial Options Appraisal (Step 2B) does not discount any of the design options progressed at Step 2Aii Design Principle Evaluation. . However, it also does not consider combinations of design options that may provide respite from overflight when organised into systems; these will be developed during Stage 3 (see paragraph 1.1.10).

6.1.4 Step 2B is the final document of Stage 2 of the airspace change process, published on the airspace change portal in late May 2022 for CAA regulatory process compliance assessment in June.

The UK Airspace Modernisation Strategy (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.

6.1.5 There is not yet enough detailed quantified data for LCY to make a statement on preferred option(s). Appropriate quantitative assessments will be carried out as part of Stage 3, and these will be monetised where possible. These will include:

- Noise modelling analysis to Category B standards[5]; we do not anticipate this category to change throughout the ACP process
- Fuel/CO_2 modelling analysis using the most recent appropriate version of Eurocontrol's Base of Aircraft Data (BADA) as the data source, which will be processed via a fast-time simulation application

The results will be subsequently assessed using the Government's transport analysis tools to provide a monetised output; these are known as WebTAG.

6.1.6 A cost-benefit analysis will be performed, and a preferred option (or combination of options) will be stated. Compromises and trade-offs may be necessary between airports taking part in the FASI-S regional airspace change. These will be guided by the advice and tools provided by the Airspace Change Organising Group ACOG, the independent team tasked with coordinating the redesign of the UK's airspace.

6.1.7 This Step 2B document defines the shortlist of airspace design options. There are 12 arrival design options and 26 departure design options, summarised in Section 6 of Step 2A(ii) Design Principle Evaluation document.

6.1.8 Subject to passing the Stage 2 Gateway Assessment, this proposal will move on to Stage 3 Consult. Stage 3 will involve significant preparation, development, collaboration and coordination with the sponsors of adjacent ACPs, as well as further stakeholder engagement.

[5] Defined in CAP2091 CAA Policy on Minimum Standards for Noise Modelling (link to CAA policy)

6.1.9 As a regional multi-airport airspace change, there are a wide range of stakeholders with conflicting requirements over a large area. There may be intermediate airspace change process phases over a long period, and it is possible that there may be more than one change in the same area as individual airport systems (or partial systems) progress to become a fully integrated regional network of air routes.

6.1.10 A date for the Stage 3 Gateway Assessment has not yet been set. For the latest information on this proposal, please subscribe to email updates on the CAA's airspace change portal (link to the page for this proposal).

7 Annexe: Design Principles

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.

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.

End of document