# Design Principle Evaluation (DPE)

Stage 2 Develop and Assess

MAG East Midlands Airport

# Document Details

| Reference | Description |
|---|---|
| Document Title | Design Principle Evaluation (DPE) |
| Issue | Version 1 |
| Date | 27 October 2023 |
| Note | |

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# 1 Introduction

## 1.1 Background

The East Midlands Airport (EMA) Airspace Change Proposal (ACP) is currently at Stage 2 – Develop and Assess - of the CAA's CAP1616 Airspace Design process. Step 2A requires the sponsor to develop a comprehensive list of design options that address the Statement of Need (SoN) and align with the design principles that were developed at Stage 1.

This **Design Principle Evaluation (DPE)** sets out EMA's response to that requirement, by presenting the assessment of the design options identified in the Design Options Report (DOR) against the design principles. This DPE forms part of the suite of documents submitted to the Civil Aviation Authority (CAA) at Gateway 2 of the CAP1616 process and is intended to be read alongside these documents.

The full suite of Stage 2 submission documents is:

- Stage 2 Summary Document, which draws together the key points from the Stage 2 submission and provides an overview of the Government's national programme of airspace change, the CAP1616 process and the progress to date of the East Midlands Airport future airspace project. This information is not repeated in this report.
- Design Options Evolution (DOE), Appendix A to the Stage 2 Summary Document, shows the evolution of the design options through Steps 2A and 2B of the CAP1616 process. The resulting shortlist of design options will be considered in the Full Options Appraisal (FOA) at Stage 3.
- The Design Options Report (DOR), which sets out the change sponsor's approach to the design process and the output of that process in the form of design options for both departures and arrivals at the airport. It presents the design options identified and describes how those options were refined to provide a comprehensive list of design options to be progressed to the Design Principle Evaluation.
- This report, the Design Principle Evaluation (DPE), which assesses how the design options have responded to the design principles, which were established at Stage 1 of the CAP1616 process and identifies those that warrant further analysis at the next stage.
- The Initial Options Appraisal (IOA), building on the results of the DPE, the IOA is the first iteration of three option appraisals, required as part of the CAP1616 process. The purpose of the IOA is to provide, at a minimum, a qualitative assessment of each design option providing stakeholders and the CAA with the relative differences between impacts, both positive and negative.
- The Stakeholder Engagement Report (SER), which explains how engagement has been used in the processes described in the other Stage 2 documents and records its outputs.

The full suite of reports, together with their supporting appendices, will be published on the CAA Airspace Change Portal www.airspacechange.caa.co.uk.

## 1.2 Step 2A

At Step 2A, a list of design options was developed which included options that challenged how we currently operate and sought to explore how we might improve our operations at EMA, taking into account the feedback received during the engagement with stakeholders when establishing our design principles at Stage 1. As part of this process, the options were tested with stakeholders, as detailed in the SER. As part of the options development process, the initial list of design options was assessed to identify options which did not perform well against the 'must have' design principles of Safety, Programme and Continuity.

This initial assessment is described in the DOR as the 'viability filter' and resulted in a Comprehensive List of viable options, which have been analysed further within this DPE. In addition, this DPE also re-iterates the analysis of the 'viable but poor fit' design options against the three 'must have' design principles that was conducted during the

DOR phase. However, as described in section 5 of the DOR, these design options were not progressed to the full DPE. It should be noted that the criteria that inform the colour coding associated with the 'viable but poor fit' options within the DOR are different to the criteria for the analysis of the options within the DPE. The criteria for 'viable but poor fit' have been described within section 5.13 of the DOR.

Sections 5 to 22 of this DPE describe how each of the design options have been individually assessed against the design principles and how the design options have responded to each of those design principles. During the stakeholder engagement undertaken as part of Stage 2, stakeholders provided feedback on the application of the design principles. In doing so, they emphasised the importance of considering certain features or areas, including areas of planned property developments. These have been taken into account in the criteria used to assess the design options against the design principles in this DPE. For full details on Stage 2 engagement please refer to the SER and accompanying appendices or sections 5 to 21 of the Stage 2 Summary Document.

In assessing the design options, we have borne in mind that the options that are eventually chosen must also be compliant with the relevant technical criteria, as detailed in Appendix F to CAP1616. Sections 5 to 22 of this DPE also present an initial evaluation of how each design option responds to the technical criteria, identifying where plans will need to be established to resolve any compliance issues that may otherwise arise during Stage 4.

## 1.3 Purpose of the Design Principle Evaluation Process

The purpose of the DPE is to assess how the design options have responded to the design principles and identify those design options that warrant further analysis at the next step: the IOA at Step 2B. The DPE process also identifies design options that should be rejected at this stage due to a lack of alignment with the design principles; the process of evaluating the design principles, is detailed in section 3. The evaluation assessment criteria and accept/reject criteria are detailed in section 4.

## 1.4 List of Design Principles

The work undertaken during Stage 1 established a set of design principles. These design principles provide a framework against which design options have been evaluated. The list of design principles is shown in Table 1 below, while the Design Principles Report submitted to the CAA at the 'Define' Gateway can be found here Design Principles Report.

| Design Principle Designation | Design Principle Description |
|---|---|
| S | **Safety**<br>**'Keeping the Skies Safe'**<br>Safety must take precedence over all other factors. Flight paths must be safe for airspace users, the airport and communities on the ground. |
| P | **Programme**<br>**'A joined-up Approach'**<br>Any changes must align with the broader national airspace modernisation strategy, comply with national, international and industry regulations and legislation, and align with current and future Airspace Change Programmes in the north and south of the UK in the Future Airspace Strategy Implementation groups. |
| C | **Continuity**<br>**'Meeting Demand'**<br>New flight paths must ensure the continuation of services offered today and meet any future demand, in keeping with local and national planning policy, and the Government's policy on 'making best use' of existing runway capacity. |
| E | **Emissions**<br>**'Limiting our Footprint'**<br>Flight paths that limit and, where possible, reduce emissions should be implemented. |
| N1 | **Noise 1**<br>**'Sharing the Load'**<br>Flight paths should, where practical, be spread out to avoid concentration of aircraft activity to share any noise impacts. |
| N2 | **Noise 2**<br>**'Responsive Flight Paths'**<br>Where flight paths have to overfly communities, we will consider existing noise in the local area, and will select flight paths to mitigate effects on areas with relatively low levels of ambient noise. |

| | |
|---|---|
| N3 | Noise 3<br>'Limiting Disturbance'<br>Flight paths should seek to limit and, where possible, reduce noise disturbances to communities – especially at night. |
| N4 | Noise 4<br>'Noise Sensitive Locations'<br>Flight paths should, where practical, avoid locations that are especially sensitive to noise. |
| A1 | Airspace users 1<br>'Fit for the Future'<br>Flight paths should be designed to futureproof our airspace and cannot be constrained by existing arrangements. |
| A2 | Airspace users 2<br>'Airspace for All'<br>Our controlled airspace should be open to all authorised users; however, priority will be given to airport traffic over other airspace users, except for emergency aircraft. |
| T | Technology<br>'Embracing Technology'<br>Flight paths should be designed using the latest, widely available navigational technology and flying techniques. |

Table 1 - EMA Design Principles

## 1.5 East Midlands Airport Current Operations

In order to follow both how the design options have been developed and evaluated it is necessary to have an understanding of the current operational arrangements at EMA. This section gives an overview of these arrangements.

Aircraft take off and land into wind, and because of the UK's dominant wind direction, westerly operations are predominant. Over the last 20 years the split is approximately 75% westerly using runway 27 and 25% easterly using runway 09.

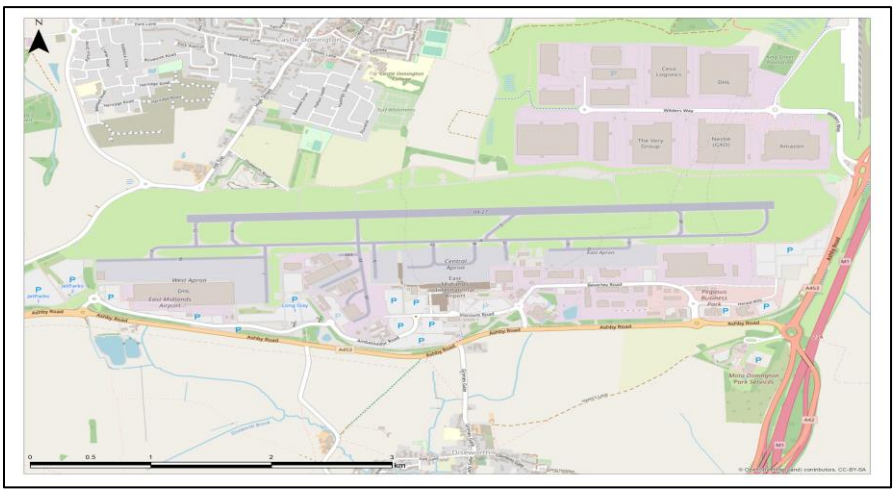

Figure 1: EMA

EMA serves just under five million passengers a year. In addition to this important role as a regional passenger airport, EMA is the UK's largest dedicated air-cargo airport, processing and transporting over 400,000 tonnes of cargo a year. These cargo operations play a significant part in the way that the airport operates, with a high proportion of annual movements taking place between 20:00 and 04:00.

Currently, arrival and departure routes at EMA do not fully utilise the capability of modern aircraft navigation technology and techniques due to their reliance on ground based navigation aids. This was reflected in the SoN and led to the development of the design principles highlighted in section 4.

The number of aircraft arrivals and departures in 2020 and 2021 was significantly affected by the pandemic with a reduced number of passenger aircraft movements and an increased number of cargo movements as shown in Figure 2. Whilst 2022 showed a return towards pre-pandemic trends, instability in the industry continued to impact operations in both passenger and cargo movements. During 2023, passenger operations have showed a steady recovery towards pre pandemic levels. The number of cargo movements has reduced compared to 2020 and 2021 levels. As EMA operations continue to stabilise, we expect this trend to continue albeit with some cargo growth retained, and for 2023 to be a more representative year. However, in the meantime, the calendar year of 2019

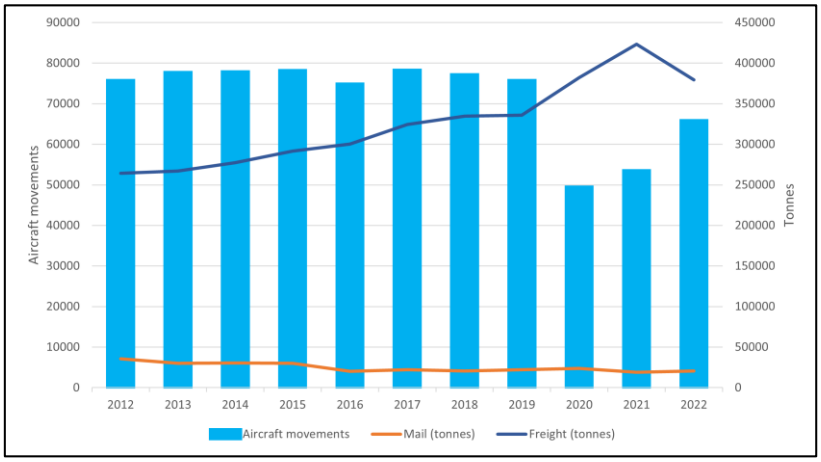


Figure 2: Annual traffic statistics

represents the last full year of (pre-pandemic) normal operations and has therefore been used as the baseline for analysis in the DPE and IOA, as it most closely reflects 'normal' operations.

For departures there are currently four Standard Instrument Departure (SIDs) for runway 09 and two for runway 27. These link each runway direction to the NATS en route airspace network at the SID termination altitude of 6,000ft to the north and FL90 to the south. Departing aircraft follow the SIDs until they have reached a minimum altitude of at least 3,000ft. Above this, ATC vectoring may be used to provide a route to connect to the NATS upper airspace network which results in a dispersed overflight distribution. Departures are typically transferred to the NATS en-route sectors after passing 3,000ft. Due to the Airport's location, EMA interacts with both NATS en-route centres, with traffic to/from the north being managed by the Scottish Centre and traffic to/from the south being managed by the London Centre.

The airport is used by a number of airlines to conduct training flights. However, these do not fly a Standard Instrument Departure (SID) and are practising the initial stages of departure and the final stages of landing with a short circuit in-between. The circuits they fly are flown at a lower altitude under the supervision of ATC. As a result, the changes being made under the airspace change programme do not apply to training flights and will have no impact on their operation.

Arriving aircraft approach UK airspace from several entry points before routing towards one of the two holds at ROKUP and PIGOT. ATC vectoring is then used to establish aircraft on final approach to the runway, which again results in a dispersed overflight distribution. EMA regularly achieves over 90% CDA's for arrivals.

## Departures

Figure 3 and Figure 4, below show the distribution of departing aircraft from runway 09 and runway 27 over a typical summer's day.

This distribution is influenced by:

- The design of the Standard Instrument Departures (SIDs) including the location of ground based navigation aids, specifically the DVORs.
- The need to connect to the NATS upper airspace network, and to be deconflicted from the flights to and from other airports including Birmingham.
- The dimensions of the Noise Preferential Routes (NPRs) which encompass the SIDs.
- The rules and regulations regarding ATC vectoring. Once aircraft reach a certain altitude, which varies between 3,000ft and 6,000ft, ATC are permitted to turn the aircraft off the SID, either to create a more direct route, or to ensure separation from other air traffic.

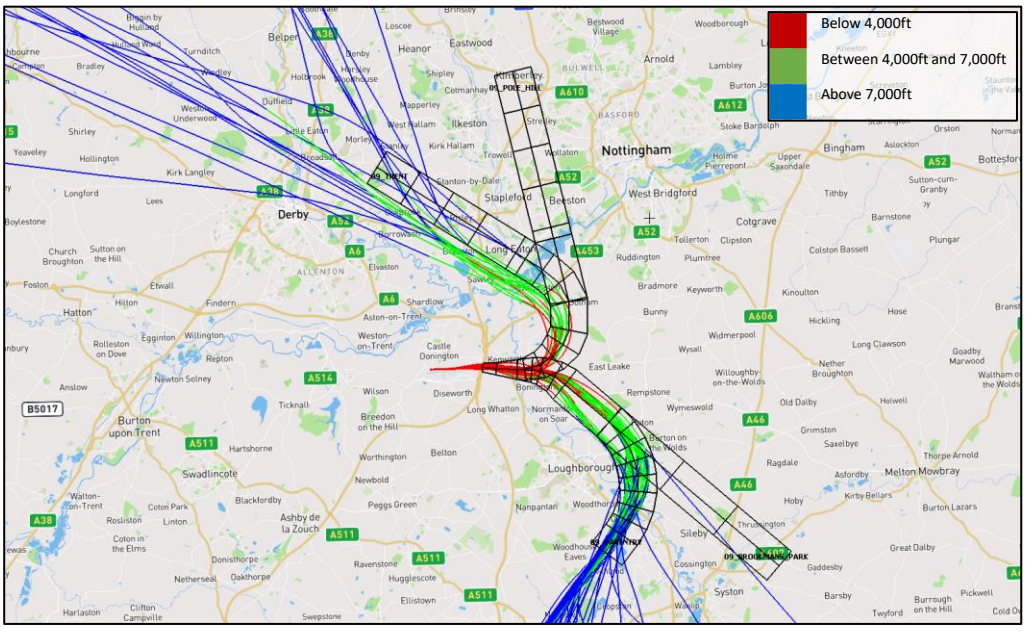


Figure 3: Runway 09 departures

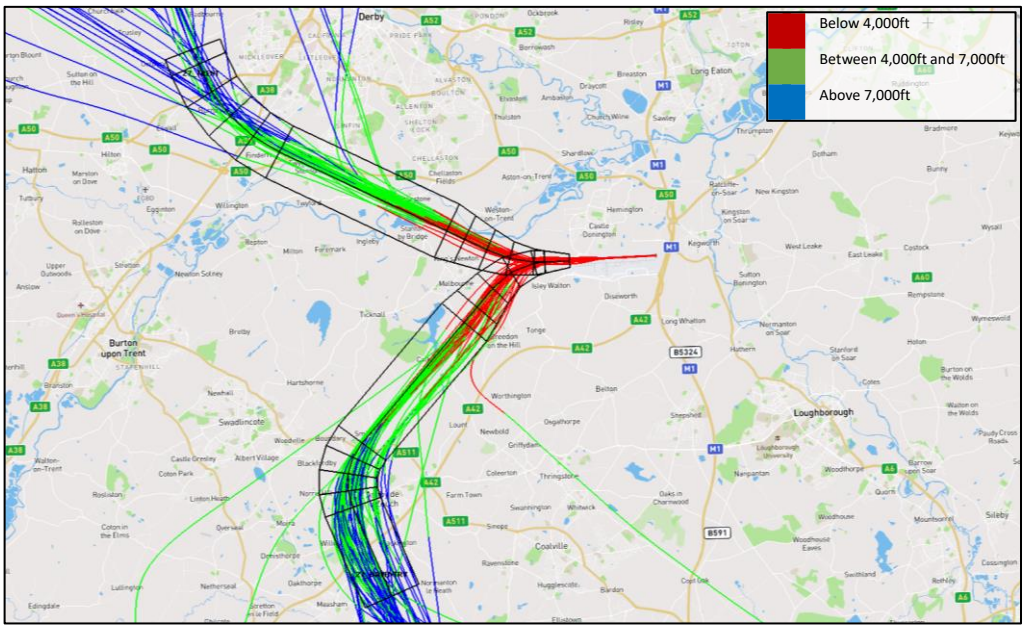

Figure 4: Runway 27 departures

There are currently four SIDs for runway 09 and two for runway 27 which are shown at Table 2: Departure directions and associated SIDs. These SIDs link each runway direction to the NATS en route airspace network.

| Departure direction | Runway 09 SID | Runway 27 SID |
|---|---|---|
| North and West | Trent<br>Pole Hill (07:00-22:00 only) | Trent |
| South and East | Daventry<br>Brookmans Park (00:01-06:00 only) | Daventry |

Table 2: Departure directions and associated SIDs

The SIDs from runway 27 are deconflicted from arrival routes, meaning that there are typically no restrictions on departures from runway 27. However, on runway 09 operations, the departures are typically subject to a restriction that requires EMA radar control to approve the release due to interactions with the arrival routes. This leads to some departures, from runway 09, having their climb stopped at an intermediate level (typically 5,000ft) until they are clear of the arrival at which point, they are climbed either to the SID level or to another level that has been coordinated with the relevant NATS en route sector.

A buffer zone exists between EMA and Birmingham ATC for runway 09 operations. This is of particular relevance for EMA RWY09 operations but can also be of relevance for runway 27 departures that require to climb straight ahead and not follow the SID track for weather avoidance. In this case, the departure is required to be stopped off at 5000ft until co-ordination is effected with Prestwick Centre.

### Arrivals

Arriving aircraft approach UK airspace via several entry points before routing towards one of the two EMA holding stacks at ROKUP and PIGOT. During busy periods arriving aircraft may be held in one of these, before being vectored for their final approach.

Wherever possible aircraft will be offered a Continuous Descent Approach (CDA) by ATC which means aircraft descend on a smooth, continuous path from the two holding patterns to the runway. CDAs have an environmental benefit by reducing fuel burn and noise and EMA regularly achieves over 90% compliance for CDA's from 5,000ft.

Figure 5 and Figure 6, below show the distribution of arriving aircraft for runways 09 and 27 over a typical summer's day. In normal operating conditions, there are no pre-defined flightpaths for arriving aircraft below 7,000ft until they

are established on 'final approach' at an altitude of at least 2,000ft or approximately six miles from the runway. However, there are defined arrival routes for scenarios when there is a total radar failure at EMA.

Arriving aircraft are vectored and sequenced by ATC to ensure they remain safely separated from other air traffic and to maximise capacity. This involves controlling the speed, direction, and height of the aircraft prior to them being turned on to final approach and following the Instrument Landing System (ILS). This vectoring results in the dispersed arrival patterns shown in the figures below.

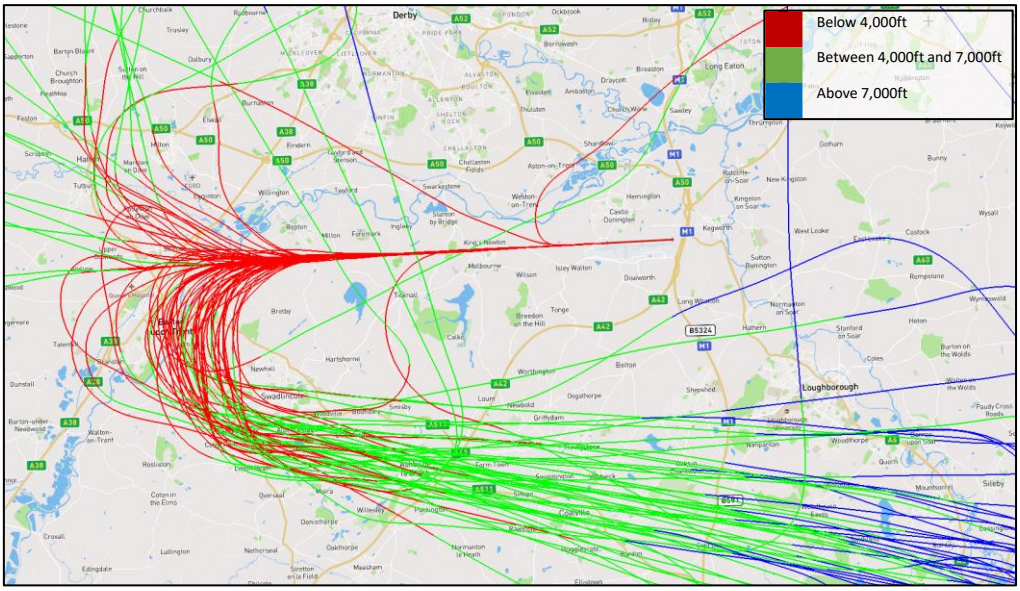


Figure 5: Runway 09 arrivals

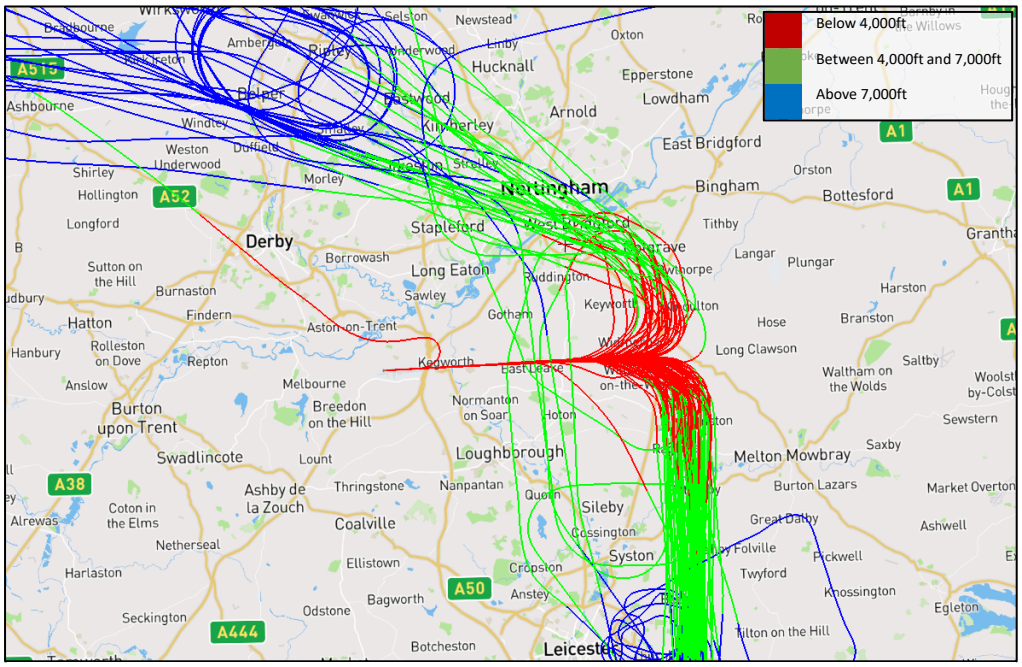


Figure 6: Runway 27 arrivals

# 2 Comprehensive List of Viable Options

## 2.1 Procedure Options

In accordance with the SoN, EMA is seeking to modernise its airspace arrangements for aircraft operating to and from the Airport at altitudes of 7,000ft and below. The SoN can be found here Statement of Need.

EMA is considering new departure and arrival routes as part of a coordinated plan for airspace modernisation along with other airports in the north and south of England. This coordinated plan will ensure that the airport can make use of new technologies so that the operational efficiency and environmental benefits that modern aircraft offer can be realised. In doing so, the airport seeks to introduce optimised procedures that will integrate fully with other airports and the wider airspace system.

Currently, the airport relies on conventional ground-based Doppler Very High Frequency Omni Range Radio Beacons (DVOR) navigational aids that are reaching the end of their operational life. In accordance with international obligations to transfer to Performance Based Navigation (PBN), there is a UK wide plan for these aging navigational aids to be withdrawn and this plan is reflected in CAP1711 the UK Government Airspace Modernisation Strategy (AMS).

The current departure procedures use a system of navigational beacons or points, each with a unique name, such as TRENT, DAVENTRY or Pole Hill (POL). If new routes are introduced, some new navigational points will have to be established, and each will have a new name assigned, and these will not be associated with beacons.

Table below contains a summary of the existing procedures in use at EMA, together with the list of options under assessment within this DPE.

NOTE: In some instances, the term "replication" is used. This refers to a route design that has been developed to match an existing route, which is already in use, as far as is practicable. This provides a 'do minimum' option, as described in further detail in section 4.4 in the DOR. Most of the current route tracks can vary due to a number of factors including aircraft type, speed that the procedure is being flown, weather conditions and the type of Flight Management System (FMS) on board a given aircraft. Routes designed using satellite navigation are designed to a different set of criteria and are normally flown more consistently. As a result, it is impossible to exactly replicate a conventional procedure and its effects using a satellite-based procedure.

## 2.2 Design Options Development

Step 2A requires the sponsor to develop a comprehensive list of options that address the SoN and that align with the design principles that were developed at Stage 1. This comprehensive list is detailed in the DOR which also outlines the design process at EMA together with the design options for both departures and arrivals.

As the sponsor of the ACP, EMA tested these options with the stakeholders that contributed to the development of the design principles. The engagement carried out during Step 2A is detailed in the SER, and the feedback received is reflected in the comprehensive list of options detailed within the DOR.

A summary of the design options described in the DOR and assessed in this DPE is provided in Table 3, below. This sets out the number of options assessed for each of the design envelopes, along with a basic description of those options. The options presented below are those which were assessed as 'viable and good fit' or 'viable but poor fit' in the DOR.

Each design option is created and described in the DOR as a singular option with a termination point at 7,000ft.

For the purpose of the assessment of the designs within this DPE and the IOA, each design option has been assessed in isolation using the individual routes for each runway.

| Procedure | Number of Options | Basic Description |
|---|---|---|
| SID Runway 09 East | 5 | These design options have been created for traffic routing to the east from runway 09, without initially routing to the south which is a requirement of current operations. |
| SID Runway 09 North | 7 | These design options have been created for traffic routing to the north from runway 09. The options are based around the existing POL 2P SID and after departure, route options turn to the left to head north in the direction of Pole Hill. |
| SID Runway 09 North West | 11 | These design options have been created for traffic routing to the north west from runway 09. The options are based around the existing TNT 3P SID towards the Trent (TNT) DVOR, and after departure, route options turn to the left to head north west. |
| SID Runway 09 South | 18 | These design options have been created for traffic routing to the south west, south and south east from runway 09. The options are based around the existing BPK 2P and DTY 4P SIDs, which route towards the Brookmans Park and Daventry DVORs, with new options also being created towards potential upper airspace joining points around the TOBID reporting points within the NATS upper airspace network, enabling a shorter route for traffic to the south and south west. |
| SID Runway 09 West | 7 | These design options have been created to provide traffic with the potential to route directly to the west, thereby avoiding additional track miles by routing north west or south west before turning west. Because this is a new envelope, there is no 'do minimum' option within the envelope. |
| SID Runway 27 East | 6 | These design options have been created for traffic routing to the east from runway 27, without initially routing to the south via the DTY SID which is a requirement of current operations. |
| SID Runway 27 North | 8 | These design options have been created for traffic routing to the north from runway 27. At present, all north bound departures from EMA use the TNT 2N SID towards the north west initially and are then vectored to the north by |

| | | |
|---|---|---|
| | | ATC, once they are within the NATS upper airspace network. |
| SID Runway 27 North West | 10 | These design options have been created for traffic routing to the north west from runway 27 and are based around the existing TNT 2N SID. |
| SID Runway 27 South | 12 | These design options have been created for traffic routing to the south from runway 27. They are based around the existing DTY 3N SID which routes towards the Daventry DVOR, with new options being created towards potential upper airspace joining points with the NATS Upper Airspace Network to the south. |
| SID Runway 27 South West | 8 | These design options have been created for traffic routing to the south west from runway 27. At present, all south west departures use the DTY SID initially and are then vectored once within the NATS upper airspace network. These options have been created to offer potential for a more direct and flight plannable route to the south west and to provide a greater spread of routes in line with Design Principle Noise N1. |
| SID Runway 27 South East | 14 | These design options have been created for traffic routing to the south east and east from runway 27. At present, all south east departures from this runway use the DTY SID initially and are then vectored to the east and south east by ATC once within the NATS upper airspace network. These options create the opportunity for a more direct and flight plannable route to the east and south east. |
| SID Runway 27 West | 6 | These design options have been created to provide traffic with the potential to route directly to the west, thereby avoiding additional track miles by routing north west on the current TNT SID, or south on the current DTY SID, before turning west. These options are aimed at decreasing the track mileage and fuel burnt in reaching the network. |
| Transition Runway 09 North | 36 | These options have been created for traffic from the north, which will make a PBN approach and landing for runway 09. In current operations from the north, ATC radar vector aircraft from the ROKUP hold which is located to the west of Belper.<br>Arrivals options have been created that start from this and 6 other IAF points and route to the north and west of EMA to a base leg to the north of |

| | | |
|---|---|---|
| | | Burton upon Trent, and then onto final approach. These options comprise 20 direct and 16 indirect routes. |
| Transition Runway 09 South | 22 | These options have been created for traffic from the south, which will make a PBN approach and landing for runway 09. In current operations from the south, ATC radar vector aircraft from the from the PIGOT hold which is located south east of Leicester.<br>Arrivals options have been created that start from 4 IAF points and route to the south of EMA to a base leg over Burton upon Trent and then onto final approach. These options comprise 12 direct routes and 10 indirect routes. |
| Transition Runway 27 North | 30 | These options have been created for traffic from the north, which will make a PBN approach and landing for runway 27. In current operations, from the north, ATC radar vector aircraft from the ROKUP hold which is located to the west of Belper.<br>Arrivals options have been created that start from this and 6 other IAF points and route to the north of EMA to a base leg to the south and east of Nottingham, and then onto final approach. These options comprise 16 direct and 14 indirect routes. |
| Transition Runway 27 South | 22 | These options have been created for traffic from the south, which will then make a PBN approach and landing for runway 27. In current operations from the south, ATC radar vector aircraft from the from the PIGOT hold which is located south east of Leicester.<br>Arrivals options have been created that start from 4 IAF points and route to the south and east of EMA to a base leg to the north east of Loughborough and then onto final approach. These options comprise 10 direct routes and 12 indirect routes |

Table 3 – Summary of Existing Procedures and Numbers of Options Being Considered

# 3 Design Principle Evaluation

## 3.1 Evaluation of the Options against the Design Principles

Each design option has been assessed against the list of design principles shown in Table 1 in section 1.4 above.

The design principles have been examined to identify a process of evaluating each design option against a set of criteria which assesses the option's alignment with the design principles. The resulting evaluation matrices are shown below, together with a full description of how the routes have been measured against the design principle. Where it has not been possible to fully evaluate each option at this stage, it has been made clear within the assessment. As described in further detail in section 23 Next Steps, of this DPE, further analysis will be undertaken if required. This approach serves to ensure that design options are not discounted prematurely.

Sections 4.4 to 4.14 below give an overview of the evaluation carried out for each design principle. Each table relates to a single design principle and shows a summary of the analysis conducted for each option against that design principle, together with a high-level assessment of whether the design principle is either not met, partially met, or fully met, as follows:

- A green box indicates that the design principle has been **met** by the specified option.
- An orange box means that the design principle has been **partially met** by the specified option.
- A red box indicates that the design principle has **not been met** by the specified option.
- Further detail on the criteria for the evaluation of each option is also shown within sections 4.4 to 4.14. What constitutes 'not met', 'partially met' and 'fully met' for each design principle is explained in turn in relation to that principle. Sections 5 to 22 then provide an analysis of each option against those criteria.

## 3.2 Description of 'Do Nothing' and 'Do Minimum'

The CAP1616 process requires a 'do nothing' scenario to be considered and, as is the case for EMA, where 'do nothing' is not a feasible option a 'do minimum' scenario too.

- The 'do nothing' scenario is used as the baseline for comparison in the Options Appraisals, including the IOA.
- The 'do minimum' option(s) describe the minimum changes required to address the issues with the 'do nothing' scenario and the issues identified in the SoN and are listed as design options for assessment in this DPE.

A description of and rationale for the 'do nothing' scenario and the 'do minimum' options for both arrivals and departures is provided in section 4.4 of the DOR.

As the 'do nothing' scenario fails to comply with the requirements of the AMS and does not align with the 'must have' design principles, it does not form part of the comprehensive list of options in the DOR and is not assessed as an option in this DPE. However, the nature of the design principles Emissions, Noise 3 and Noise 4 means that a baseline is required to provide a comparative evaluation. Therefore, for the evaluation of design options against these design principles, 'do nothing' has been used for comparative purposes. The way in which the 'do nothing' has been considered as part of the evaluation against each of these design principles is detailed in sections 4.7, 4.10 and 4.11.

Overflight Assessment

When considering the number of people 'overflown', the definition of overflight provided in the CAA's definition of overflight (CAP1498) has been used. CAP1498 recognises that an aircraft does not have to pass directly overhead, to be considered an overflight. Instead, overflight should be defined to include aircraft that pass over and to the side of an observer (see section 4.9).

The geometry of this definition dictates that, the higher the aircraft, the broader the overflight footprint. It therefore follows that a shallower climb gradient will result in a longer, thinner footprint than a steeper climb gradient. A consequence of this can be that, despite there being little difference between the lateral tracks of design options, the population etc. Overflown may, in some instances, differ markedly.

To estimate the size of the population affected by noise from current aircraft operations, a modal average path[1] (a single line that delineates those locations on the ground that have experienced the greatest number of overflights) has been created for each of the existing departure and arrival patterns.

It has been assessed against the above overflight definition both to

- a height of 4,000ft, reflecting the point at which an aircraft flying the route is likely to result in noise exposure above the LOAELs, and
- a height of 7,000ft, the height up to which EMA are responsible for the route design.

As explained in section 1.5, both departing and arriving aircraft are tactically vectored by ATC, either to ensure safe separation between aircraft or to provide a more direct route. To ensure this vectoring process and the dispersed tracks it creates have been captured, the actual spread of tracks (to a height of 7,000ft) has been mapped, and this has been used to estimate the area and affected population beneath those tracks. This is known as the 'do nothing' scenario, for comparisons in this DPE and the Initial Options Appraisal (IOA).

This provides a means to quantify the number of people, dwellings and sensitive areas overflown and has been used to present the possible effect of proposals on local communities that are exposed to noise from aircraft up to 7,000 feet. However, the limitations of overflight assessment are described in CAP1498, which recognises that it does not set out to directly assess noise impacts. These noise impacts will be fully quantified in Stage 3.

[1] Traffic data for the 92-day summer period (16/06/2019 to 15/09/2019.

# 4 Acceptance/Rejection Criteria

## 4.1 Introduction

To ensure consistent application of each design principle, a set of criteria were developed. These are explained in this chapter and the criteria for each design principle are set out in sections 4.4– 4.14 below. In applying these criteria to the departure design options, the acceptance and rejection criteria set out in section 4.2 were considered. The acceptance and rejection criteria for the arrival design options are set out in section 4.3.

## 4.2 Acceptance/Rejection Criteria for Departures Options

The eleven design principle RAG (red, amber, green) statuses for each design option were totalled. In order to qualify for further consideration, i.e., to be accepted, departure design options were taken forward if they were the 'best-performing' option or equal to the 'best-performing' option within each design envelope. To determine this, the following process was followed:

1. As a minimum, accepted options must partially meet the 'must have' design principles of Safety, Programme and Continuity.
2. Each design envelope has been considered as a peer group[2]. The option with the greatest combined number of 'greens' and 'ambers' was deemed to be 'best-performing' and was accepted. In the summary tables, this is denoted as 'Best'. To illustrate, of the options below, options 'X' and 'Y' would be 'best-performing'.

| | Green | Amber | Red |
|---|---|---|---|
| Option X | 9 | 2 | 0 |
| Option Y | 6 | 4 | 1 |
| Option Z | 9 | 0 | 2 |

3. Any other options evaluated as equal to the 'best-performing' option were also accepted. In the summary tables this is denoted as 'Best'.
4. All 'do minimum' (Replication) departure options were accepted, to enable their continued consideration. In the summary tables, this is denoted as 'Do Minimum (Replication)'.
5. Consistent with the Government's Altitude-based priorities, design options not identified as 'best performing', equal to the 'best performing' or 'do minimum' were reconsidered to establish whether the population overflown up to 4,000ft was less than that of an option already accepted. Any identified options were subsequently accepted. In the summary tables, this is denoted as '4,000ft beneficial'.
6. Any option which does not accord with any of the criteria above was rejected. In the summary tables, this is denoted as 'Rejected'.
7. Where options were accepted, these progressed to the IOA at Step 2B. The assessment of rejected options was not progressed. A hypothetical example is shown in the table below.

| | Accept / Reject under steps 1,2,3 and 4. | Approximate total population overflown up to 4,000ft | Additional options accepted under step 5 |
|---|---|---|---|
| Option 1 | 'do minimum' | 19,300 | |

[2] All envelopes consist of a single peer group, with the exception of R27 SE, which is separated into two peer groups, one which serves departures to the east and one which serves departures to the south east.

| | Accept / Reject under steps 1,2,3 and 4. | Approximate total population overflown up to 4,000ft | Additional options accepted under step 5 |
|---|---|---|---|
| Option 2 | Equal best-performing | 21,100 | |
| Option 3 | Best-performing | 17,500 | |
| Option 4 | 4,000ft beneficial | 20,900 | Yes as 20,900 is less than the 21,100 population over flown by Option 2 |
| Option 5 | Rejected | 28,200 | No as 28,200 is greater than 21,100 population over flown by Option 2. |
| Option 6 | Equal best-performing | 19,200 | |

This process provides sufficient flexible and variable design options within each design envelope to undertake the IOA. This is because the options allow appropriate balance across the design principles to allow comparison between the design options.

CAP1616 provides guidance on the appropriate baseline for the options appraisal process, which has been closely followed by EMA at Step 2B as reported in the IOA. However, the DPE is not part of the options appraisal process. Rather, it forms part of Step 2A. As such, CAP1616 does not specify the appropriate baseline to inform the DPE where one is required. This is logical, given the extent to which a baseline is required for comparative purposes during the DPE will depend on the nature of the design principles selected by a particular sponsor.

By way of an example at EMA, Design Principle Safety represents an absolute, such that it does not require comparison. In contrast, the design principles Noise N3, Noise N4 and Emissions all require a comparator in order to provide a meaningful evaluation of design options against the design principles. This allows design principles that reflect a degree of change to be understood. As the DPE is required to evaluate how the identified design options have responded to a sponsor's particular design principles, the choice of the baseline for the DPE is necessarily guided by those design principles.

The 'do nothing' baselines used in evaluating departure design options, against design principles Noise N3, Noise N4 and Emissions are set out in the table below:

| Design Envelopes Assessed | Height(ft) | Emissions (Track Length) | Noise 3 (Total Population) | Noise 4 (Total Noise Sensitive Buildings) | Baseline |
|---|---|---|---|---|---|
| South | 7,000 | 42km (23nm) | 22,000 | 65 | R09 Daventry |
| South | 4,000 | | 3,400 | 10 | R09 Daventry |
| East, North | 7,000 | 40km (22nm) | 115,400 | 300 | R09 Pole Hill |
| East, North | 4,000 | | 2,900 | 15 | R09 Pole Hill |
| West, North West | 7,000 | 37km (20nm) | 85,600 | 205 | R09 Trent |

| | | | | | |
|---|---|---|---|---|---|
| West, North West | 4,000 | | 19,300 | 55 | R09 Trent |
| South, South West, South East | 7,000 | 35km (19nm) | 23,300 | 65 | R27 Daventry |
| South, South West, South East | 4,000 | | 5,000 | 15 | R27 Daventry |
| West, North West, North, East | 7,000 | 38km (21nm) | 85,600 | 225 | R27 Trent |
| West, North west, North, East | 4,000 | | 7,900 | 15 | R27 Trent |

The 'do nothing' scenarios are set out in section 3.3 of the Initial Options Appraisal.

### Interaction with the airspace masterplan

The NERL network is developing separate ACPs for both the Manchester TMA (MTMA) and the London TMA (LTMA). Whilst the deployment of the EMA ACP will take place as part of the MTMA, the route structures from EMA to the south, south west and south east will need to align with the future network flows of the LTMA. This is because of the location of EMA in relation to the airspace sectors in the NERL network.

Whilst NERL route development and simulation activities are progressing within the MTMA, in the LTMA, NERL are yet to develop a comprehensive list of design options or a future operating network. As a result, we do not have full visibility of the entire NERL network design with which we are required to align. This creates uncertainty in relation to:

- Route design option connectivity for departures to the south that route within the LTMA. These may change as a result of the design work within NERL and at other airports.
- The viability of airspace to the north east and east for EMA departure design options. NERL are in conversations with stakeholders including the military and the General Aviation (GA) community to understand where opportunities may lie to create additional Controlled Airspace (CAS). If created, these areas of additional CAS would be expected to create fuel savings for flights from both EMA and other airports, and if approved, may result in EMA flights needing to join or leave the NERL network in a different place to current operational assumptions. However, until these discussions are complete, and an airspace change has been submitted by NATS and approved by CAA, there is a need to retain flexibility in route designs from EMA.
- The exact position of the arrival structures envisaged for EMA operations above 7,000ft.

In order to address this, the change sponsor has collaborated closely with colleagues in NERL to help create a comprehensive list of options that provide flexibility and have the ability to integrate with a new MTMA and LTMA network. Discussions with NERL took account of:

- the current network traffic flows and emerging design options for the MTMA including routes to and from MAN and LPL.
- the options and orientation of the northerly hold for EMA above 7,000ft.
- the potential to create additional CAS to the east of EMA to facilitate more direct routes. This included the potential horizontal and vertical dimensions of this airspace and the times of operation.
- assumed interface points for EMA flights to and from the south in the absence of a fully developed set of network design options.
- the current routes to and from BHX.

- the requirement to safely deconflict EMA departures and arrivals from each other.

The output from these sessions has been captured in an Airspace Design Workshop Record (ADWR) for EMA for the MTMA. This is a NERL document which details the design assumptions used by both parties and contains a long list of potential network concepts which the group considered and discussed. The ADWR document tells the story of how concepts, options and designs have been developed by NERL, and is the formal NERL record of the output from the meetings and will be used to support ACP submissions for NERL for the airspace above 7,000ft. A similar document to cover the EMA route development rationale for the LTMA will be produced, on commencement of detailed FASI-S network design.

We have also tested our designs with NERL and other change sponsors during the stakeholder engagement process.

As the NERL designs progress, it is possible that some of our design options will either be misaligned or conflict with their designs (or those of other airports). This may mean that some design options will not be progressed and that some design options will need to be further refined or modified in response to the progress of this work.

We will continue to engage in discussions with regards to both the MTMA and the LTMA in partnership with NERL and other airports to respond to any such interactions in line with the developing national airspace masterplan. Any such changes will be clearly explained to and tested with stakeholders at Stage 3.

Our proposed approach to address any such further information becoming available is described as part of the Next Steps in section 23.

## 4.3 Acceptance/Rejection Criteria for Arrivals Options

Arrivals options have been grouped into Initial Approach Fix (IAF) peer groups, to ease the evaluation as the final design can only have arrival routes from a single IAF to the north and a single IAF to the south of the airport for safety reasons. Each IAF peer group includes design options that have been grouped by;

- Runway direction.
- Direction of approach (North/South).
- Route type (direct/indirect - as set out at section 19.7 of the DOR).
- Intermediate fix.

The eleven design principle RAG statuses for each design option were totalled. In order to qualify for further consideration, i.e., to be accepted, arrivals design options were taken forward if they were the 'best-performing' option or equal to the 'best-performing' option within each peer group. To determine this, the following professional judgement was applied.

1. As a minimum, accepted options must partially meet the 'must have' design principles of Safety, Programme, and Continuity.
2. Within each IAF peer group, the option with the greatest combined number of 'greens' and 'ambers' was deemed to be 'best-performing' and was accepted. In the summary tables, this is denoted as 'Best'. To illustrate, of the options below, options 'X' and 'y' would be 'best performing'.

| | Green | Amber | Red |
|---|---|---|---|
| Option X | 9 | 2 | 0 |
| Option Y | 6 | 4 | 1 |
| Option Z | 9 | 0 | 2 |

3. Any other options evaluated as equal to the 'best-performing' option were also accepted. In the summary tables, this is denoted as 'Best'.
4. Design options not identified as 'best performing' or equal to the 'best performing' were reconsidered to establish whether the population overflown up to 4,000ft was less than that of an option already accepted.

Any identified options were subsequently accepted. In the summary tables, this is denoted as '4,000ft beneficial'.

5. Any option that does not accord with the criteria above was rejected. In the summary tables, this is denoted as 'Rejected'.
6. Where options were accepted, these progressed to the IOA at Step 2B. The assessment of rejected options was not progressed. A hypothetical example is shown in the table below.

| | Accept / Reject under steps 1,2,3 and 4. | Approximate total population overflown up to 4,000ft | Additional options accepted under step 5 |
|---|---|---|---|
| Option 1 | 'do minimum' | 19,300 | |
| Option 2 | Equal best-performing | 21,100 | |
| Option 3 | Best-performing | 17,500 | |
| Option 4 | 4,000ft beneficial | 20,900 | Yes as 20,900 is less than the 21,100 population over flown by Option 2 |
| Option 5 | Rejected | 28,200 | No as 28,200 is greater than 21,100 population over flown by Option 2. |
| Option 6 | Equal best-performing | 19,200 | |

This process provides the change sponsor with the flexibility to analyse IAF peer groups in the IOA, with a view to providing respite (route type) and relief (intermediate fix).

CAP1616 provides guidance on the appropriate baseline for the options appraisal process, which has been closely followed by EMA at Step 2B as reported in the IOA. However, the DPE is not part of the options appraisal process. Rather, it forms part of Step 2A. As such, CAP1616 does not specify the appropriate baseline to inform the DPE where one is required. This is logical, given the extent to which a baseline is required for comparative purposes during the DPE will depend on the nature of the design principles selected by a particular sponsor.

By way of an example at EMA, Design Principle Safety represents an absolute, such that it does not require comparison – a proposal will either be safe or not. In contrast, the design principles Noise N3, Noise N4 and Emissions all require a comparator in order to provide a meaningful evaluation of design options against the design principles. This allows design principles that reflect a degree of change to be understood. As the DPE is required to evaluate how the identified design options have responded to a sponsor's particular design principles, the choice of the baseline for the DPE is necessarily guided by those design principles.

The 'do nothing' baselines used in evaluating arrival design options, against design principles Noise N3, Noise N4 and Emissions are set out in the table below:

| Design Envelopes Assessed | Height(ft) | Emissions (Track Length) | Noise 3 (Total Population) | Noise 4 (Total Noise Sensitive Buildings) | Baseline |
|---|---|---|---|---|---|
| North | 7,000 | 51km (28nm) | 176,600 | 675 | R09 North Arrivals (ROKUP) |
| North | 4,000 | | 31,300 | 110 | R09 North Arrivals (ROKUP) |

| | | | | | |
|---|---|---|---|---|---|
| South | 7,000 | 57km (31nm) | 265,200 | 820 | R09 South Arrivals (PIGOT) |
| South | 4,000 | | 82,000 | 310 | R09 South Arrivals (PIGOT) |
| North | 7,000 | 55km (30nm) | 436,600 | 2,130 | R27 North Arrivals (ROKUP) |
| North | 4,000 | | 122,600 | 675 | R27 North Arrivals (ROKUP) |
| South | 7,000 | 53km (29nm) | 355,300 | 1,235 | R27 South Arrivals (PIGOT) |
| South | 4,000 | | 6,200 | 45 | R27 South Arrivals (PIGOT) |

The 'do nothing' scenarios are set out in section 3.3 of the Initial Options Appraisal. The full DOE can be found in Appendix A of the Stage 2 Summary Document.

## 4.4 Design Principle Criteria – Safety

<table>
<tr><td rowspan="2">Design Principle<br><br>S</td><td colspan="3">Safety – keeping the skies safe<br><br>Safety must take precedence over all other factors. Flight paths must be safe for airspace users, the airport and communities on the ground.</td></tr>
<tr><td>Not met<br><br>When assessed in isolation, this option does not meet the requirement of being considered safe for airspace users, the airport, and communities on the ground and no mitigations can be implemented.</td><td>Partial<br><br>When assessed in isolation, this option may be considered as safe for airspace users, the airport, and communities on the ground; however, additional safety mitigations or processes would be required, which may include the creation additional controlled airspace.</td><td>Met<br><br>When assessed in isolation, this option is considered safe for airspace users, the airport and communities on the ground with no additional safety mitigations or procedures expected to be required at this stage.</td></tr>
<tr><td>Evaluation assessment summary</td><td colspan="3">In order to deliver a high level of safety, all of the design options have been developed by UK CAA approved Instrument Flight Procedure designers. All our new or amended options have been designed as stand-alone routes to ICAO PANS-OPS 8168 criteria and are therefore considered to be safe in terms of aircraft performance for operations from/to EMA.<br><br>To be considered safe for airspace users, the airport and communities on the ground within this DPE a route must:<br><br>- Comply with the minimum requirements of PANS-OPS 8168.<br>- Not have the potential to generate hazardous interactions with other routes either at EMA or other adjacent airports.<br>- Remain wholly within CAS. If it does enter Class G uncontrolled airspace, in order to be carried forward, the option is contingent on the application for and creation of additional CAS using the CAP1616 process in order to be considered ‘Safe’. Any option that requires additional CAS would only be classified as Partial.<br>- Align with CAS containment requirements.<br><br>As the process moves forward and further safety analysis is carried out (at Stage 3), options will inevitably present a better or poorer fit against this design principle. Some options may then require additional safety mitigations or procedures to be implemented to ensure alignment with this design principle, these may include (but not be limited to): a requirement for additional CAS, or for the use of routes to be limited to certain hours.<br><br>For the purposes of this DPE, each option has been assessed in isolation. As part of Stage 3, Consult, the CAP1616 process requires route design options to be grouped together - for example, a suite of arrivals with a suite of departures. This may identify other hazards not considered at this stage and may lead to options being rejected, or other mitigations being introduced. Our proposal to consider any such scenario is set out in section 23, Next Steps, of this DPE.<br><br>The primary means to provide safety assurance evidence, to support the introduction of the new procedures is a Safety Case. The Safety Case will be developed in accordance with the</td></tr>
</table>

| | |
|---|---|
| | guidance provided in the CAA's Guidance on the Conduct of Hazard Identification, Risk Assessment and the Production of Safety Cases (CAP760) as mandated in the East Midlands Airport Safety Management Process and aligned to the CAP1616 process and the requirements within the Airspace Masterplan.<br><br>The first step in the development of the Safety Case was a Hazard Identification (HazID) held with relevant aviation stakeholders, including local and enroute ATC and airlines. This identified the safety requirements at an early stage of the design process, and it has been used to support early qualitative analysis of the design options. As the process moves forwards, a more quantitative methodology will be adopted using the Safety Case approach. This will initially evaluate routes in isolation but ultimately will evaluate combinations (families) of routes as a system. |
| Evaluation assessment criteria | Does the option:<br>- Comply with the minimum requirements of PANS-OPS 8168?<br>- Have the potential to generate hazardous interactions with other routes either at EMA or other adjacent airports?<br>- Remain wholly within, or require additional CAS?<br>- Align with CAS containment requirements? |
| Summary | Each option has been assessed to ensure that, in isolation, it satisfies the Design Principle Safety. There will be further assessments conducted at a later stage of the ACP, see section 23, Next Steps, when we will consider whether combinations of routes still satisfy this design principle. |

## 4.5 Design Principle Criteria - Programme

<table>
<tr><td rowspan="2">Design Principle<br><br>P</td><td colspan="3">Programme - a joined-up approach<br>Any changes must align with the broader national airspace modernisation strategy, comply with national, international and industry regulations and legislation, and align with current and future Airspace Change Programmes in the north and south of the UK through involvement in the Future Airspace Strategy Implementation groups.</td></tr>
<tr><td>Not met<br>When assessed in isolation, this option:<br><br>- does not align with the AMS; or<br>- does not align with national, international and industry regulations and legislation; or<br>- does not align with current and planned Airspace Change Programmes in the north and south of the UK.</td><td>Partial<br>When assessed in isolation, this option is considered likely to be consistent with most aspects of the AMS and complies with most national, international and industry regulations and legislation and the current FASI programmes. However, further work with other sponsors and airspace users may be necessary to ensure that it represents a practicable solution.</td><td>Met<br>When assessed in isolation, this option aligns with the AMS and complies with national, international and industry regulations and legislation. It also aligns with current and future Airspace Change Programmes in the north and south of the UK.</td></tr>
<tr><td>Evaluation assessment summary</td><td colspan="3">The CAA's AMS (CAP1711) sets out the 'Ends' that airspace modernisation must deliver to achieve the Government's objectives in relation to airspace modernisation. These ends cover four broad headings, of which EMA notes the following.<br><br>• Safety: Maintaining and, where possible, improving the UK's high levels of aviation safety has priority over all other 'ends' to be achieved by airspace modernisation.<br><br>This highlights the priority that safety has in airspace change. However, in addition to the consideration of the Safety end within this design principle, EMA also have a stand-alone design principle for safety. Rather than considering safety twice, the approach that has been taken is to consider Safety in its own right as one of the 'must have' design principles. This ensured there was a clear focus on safety as the highest priority and that the risk of a "double evaluation", which may have caused confusion for stakeholders, was removed.<br><br>This approach was initially applied within the DOR Viability filter and to ensure consistency, was also applied throughout the analysis within this DPE. As a result, Safety was not considered within the Design Principle Programme assessment, but as part of the Design Principle Safety assessment.<br><br>• Simplification – reducing complexity and improving efficiency: Consistent with the safe operation of aircraft, airspace modernisation should wherever possible secure the most efficient use of airspace and the expeditious flow of traffic, accommodating new demand and improving system resilience to the benefit of airspace users, thus improving choice and value for money for consumers.</td></tr>
</table>

- Integration of diverse users: Airspace modernisation should wherever possible satisfy the requirements of operators and owners of all classes of aircraft, including the accommodation of existing users (such as commercial air transport, General Aviation operations, military, taking into account interests of national security) and new or rapidly developing users (such as remotely piloted aircraft systems, advanced air mobility (aerial taxis), spacecraft, high-altitude platform systems).

The AMS calls for a transition towards greater integration of air traffic including GA and the military. It should facilitate the greatest possible access to all users and seek to minimise the amount of controlled airspace to maintain a high standard of air safety.

- Environmental sustainability: Environmental sustainability will be an overarching principle applied through all airspace modernisation activities. Airspace modernisation should deliver the Government's key environmental objectives with respect to air navigation as set out in the Government's Air Navigation Guidance and, in doing so, will take account of the interests of all stakeholders affected by the use of airspace.

This covers the creation of options that offer shorter, more fuel efficient flightpaths, and options that seek to reduce noise impact in line with the Altitude Based Priorities within the ANG. Reducing noise impact was evaluated through the use of overflight analysis to identify the total population overflown in line with the criteria within the 'Altitude based priorities' in the ANG. Reducing carbon emissions was evaluated by identifying routes that had the shortest track length in relation to their anticipated joining or leaving point with the upper airspace network, resulting in lower fuel burn and emissions.

The evaluation against the AMS therefore focusses on the ends, Simplicity, Integration and Environmental Sustainability, including the altitude based priorities on noise within the Air Navigation Guidance. Safety is considered in its own right as part of the 'must have' design principles.

The provision of runway throughput to make best use of the capacity of the runway at EMA is captured within the "must have" Design Principle Continuity. Therefore, the consideration of the Simplification end within this DPE focused on the potential for design options to:

- Align with the routes to and from adjacent airports or
- Align with the traffic flows within the wider NATS network and the airspace being developed within the FASI-N and FASI-S programmes.

The evaluation against the Integration end builds upon work previously carried out, as part of the Viability Filter in the DOR (section 5.11), where the vertical and horizontal profile of options and whether they had the potential to reduce airspace access for GA users or may require additional CAS, was considered. There is no existing dedicated military airspace with which any of our options may conflict on current climb ratios up to 7,000ft.

The UK AMS includes a provision to consider equitable access for all airspace users and highlights the need for an appropriate balance between the requirements of various types of users, and the need to improve environmental performance. Whilst requiring additional CAS does not align with the AMS simplification end, if by adding additional CAS there are benefits in terms of the AMS Ends of safety, integration or environment then an appraisal of the benefits and costs needs to be undertaken. Therefore, for the purposes of the DPE an option with a potential requirement for additional CAS is assessed as Partial.

In considering Environmental Sustainability, it is acknowledged that there is potential for the most direct and fuel efficient route to overfly more people. Equally the route overflying the least number of people may take a less fuel efficient route. The AMS recognises this potential trade-off between noise and fuel burn which creates a clear differentiator between

| | |
|---|---|
| | the benefits of design options within this evaluation. A quantitative analysis has therefore been undertaken to ascertain the potential noise impact and track length of each design option in section 4.7and 4.10 respectively.<br><br>- For the purpose of the DPE, an option will not meet the Environmental Sustainability end of the AMS if it is expected to increase the population affected by noise both between 0ft and 4,000ft and 0ft and 7,000ft, as well as having a longer track length (and therefore assumed greater emissions) than the relevant 'do nothing' scenario. Increase is defined as being greater than 110% of the 'do nothing' value for the respective metric.<br><br>The design principle also requires options to be aligned with the Future Airspace Strategy Implementation programmes for the North (FASI-N) and for the South (FASI-S) which are the initiatives to deliver the requirements of the AMS through the re-design of airspace in the north and south of the UK. These requirements will be considered within the further detailed evaluation of the Simplification 'End' once networks of routes are created in Stage 3A.<br><br>FASI-N and FASI-S require coordination between various airspace change sponsors. This coordination will be delivered through the masterplan of airspace changes prepared and delivered by the Airspace Change Organising Group (ACOG).<br><br>Other airspace users/considerations will be covered through regular bilateral (or if required, trilateral) meetings with airports and NATS. These meetings may also be attended by ACOG to align the airport work with the airspace masterplan, and within these meetings, discussion points will include:<br><br>- The operating concepts being applied, such as climb gradients, PBN standard and the use of systemisation.<br>- An analysis of the design options that have been developed, and where conflicts may occur. These conflicts may be related to any of the design principles, but resolution will be primarily driven by the Design Principle Safety.<br>- Agreement on options to resolve conflicts. These conflict resolution discussions and decisions will be formally recorded by both the airports and ACOG and will be used to support final submissions to CAA to demonstrate where concessions have been made. Where a conflict cannot be resolved, the ACOG resolution process will be triggered.<br>- The potential for cumulative impact issues to arise from the routes, and how these should be addressed, resolved and described in stakeholder communications.<br><br>In addition, ACOG have created the Technical Coordination Group which meets to discuss and resolve policy and technical issues affecting airspace design across all airports. |
| Evaluation assessment criteria | Does the option<br>- Fail to align with at least one of the Simplicity, Integration or Environmental Sustainability ends of the AMS?<br>- Comply with national, international and industry regulations and legislation?<br>- Align with current and future Airspace Change Programmes in the north and south of the UK? |
| Summary | Each design option has been assessed against the Design Principle Programme to ensure that it satisfies our requirement for all new or existing PBN design options to meet the requirements of the AMS and to align with current and future Airspace Change Programmes in the north and south of the UK in the Future Airspace Strategy Implementation groups.<br>It is not possible to assess all CAS demands based upon individual design options at this present time. Therefore, further CAS assessment will be conducted at Stage 3 of the |

| | |
|---|---|
| | CAP1616 process, when further consideration will be given to what extent combinations of routes as part of a system satisfy this design principle. See section 23 for Next Steps. |

## 4.6 Design Principle Criteria – Continuity

<table>
<tr><td rowspan="2">Design Principle<br>C</td><td colspan="3">Continuity – meeting demand<br><br>New flight paths must ensure the continuation of services offered today and meet any future demand, in keeping with local and national planning policy and the Government's policy on 'making best use' of existing runway capacity.</td></tr>
<tr><td>Not met<br><br>When assessed in isolation, this design option does not ensure the continuation of services offered today and will not meet any future demand, in keeping with local and national planning policy. Used operationally, this option does not enable EMA to make the best use of the capacity of existing runway capacity.</td><td>Partial<br><br>When assessed in isolation, this design option ensures the continuation of services offered today; however, further work and engagement may be required during Stage 3 and onwards to meet any future demand, to keep within local and national planning policies and make the best use of existing runway capacity.</td><td>Met<br><br>Assessed in isolation, this design option ensures the continuation of services offered today and meets any future demand, in keeping with local and national planning policy. This option could be used operationally to enable EMA to make the best use of existing runway capacity.</td></tr>
<tr><td>Evaluation assessment summary</td><td colspan="3">Air traffic at EMA was affected by the global pandemic, with passenger numbers falling sharply although air cargo volumes grew. Passenger traffic is expected to return to pre-pandemic levels over the next two to three years, and the continued growth in cargo activity is also anticipated.<br><br>Current and future passenger demand and cargo demand drives the number of aircraft using the airport. In turn, the ability of the airport to meet demand is constrained by runway availability, capacity of the passenger terminal, capacity of cargo handling facilities, airfield taxiway infrastructure and the airspace surrounding EMA. For the future, EMA has the capability to develop its capacity to levels identified in its Sustainable Development Plan that is also supported in the North West Leicestershire Local Plan. This will enable EMA to make 'best use of runway capacity'. Any further terrestrial planning considerations (if relevant) will be identified during Stage 3 when the routes are systemised.<br><br>From an airspace perspective, enabling EMA to make 'best use of runway capacity' will require departure and arrival routes that operate effectively as a system and in conjunction with other routes in directional peer groups. However, because at this stage this design principle is looking at individual routes (rather than the system), the analysis in the DPE looks at the potential ability of the route to be implemented independently to support optimal departure splits, or to avoid the imposition of arrivals holding.<br><br>If a route is not able to operate in accordance with any of the assessment criteria below, restrictions (typically in the form of departure flow rates or airborne holding) may be imposed by ATC, resulting in a reduced hourly runway capacity and in the worst case, a failure to make 'best use of runway capacity'. As a result, such a route would not meet the Design Principle Continuity.</td></tr>
</table>

| | |
|---|---|
| Evaluation assessment criteria | Could the option operate:<br>- In the case of departures, independently from the arrival structure or arrival design options for EMA.<br>- In the case of arrivals independently from the departure structure or departure design options for EMA?<br>- To support optimal departure splits or minimum arrivals separations?<br>- In compliance with current ATC published operating procedures and/or safety restrictions to ensure that runway utilisation is maximised?<br>- In alignment with Government, national and local policies in developing capacity levels? |
| Summary | Each option has been assessed against the above criteria to ensure that it satisfies the change sponsor's requirement to ensure the continuation of services offered today and meet any future demand, in keeping with local and national planning policy and the Government's policy on 'making best use' of existing runway capacity.<br><br>There will be further assessments conducted at Stage 3 of the ACP process that will consider if combinations of routes still satisfy this design principle. See section 23 for Next Steps. |

## 4.7 Design Principle Criteria - Emissions

<table>
<tr><td rowspan="2">Design Principle<br>E</td><td colspan="3">Emissions – limiting our footprint<br>Flight paths that limit and, where possible, reduce emissions should be implemented.</td></tr>
<tr><td>Not met<br>When assessed in isolation, this option performs worse than the ‘do nothing’ baseline scenario with respect to track distance flown.</td><td>Partial<br>When assessed in isolation, this option performs similar to the ‘do nothing’ baseline scenario with respect to track distance flown.</td><td>Met<br>When assessed in isolation, this option performs better than the ‘do nothing’ baseline scenario with respect to track distance flown.</td></tr>
<tr><td>Evaluation assessment summary</td><td colspan="3">Each design option has been evaluated in terms of track distance flown, as a proxy for fuel burn/emissions generated. From the quantitative analysis made in the assessment of track distance flown, the track length has been rounded to the nearest 1,000m.<br><br>Existing procedures do not support optimal aircraft performance and therefore are predicted to have a greater environmental impact compared to proposed options. Within Stage 2 of the CAP1616 process, there is no requirement for a change sponsor to conduct quantitative fuel burn or emissions analysis; this will be conducted in Stage 3. In order to make a comparison, track mileage is used as a proxy on the basis that the shorter the track mileage, the less greenhouse gases are emitted.</td></tr>
<tr><td>Evaluation assessment criteria</td><td colspan="3">How does the track distance flown for this option compare to that of the ‘do nothing’ scenario? Is it:<br><br>- Worse - worse is defined as being greater than 110% of the ‘do nothing’ value for the respective metric.<br>- Similar – similar is defined as being within +/- 10% of the ‘do nothing’ value for the respective metric.<br>- Better - better is defined as being less than 90% of the ‘do nothing’ value for the respective metric.</td></tr>
<tr><td>Summary</td><td colspan="3">Each design option has been assessed against the above criteria, to ensure that it satisfies the Design Principle Emissions.<br><br>Further assessments will be conducted at a later stage of the ACP process that will consider if combining routes still satisfies this design principle. See section 23, Next Steps.</td></tr>
</table>

## 4.8 Design Principle Criteria - Noise N1

<table>
<tr><td rowspan="2">Design Principle<br>N1</td><td colspan="3">Noise 1 – sharing the load<br>Flight paths should, where practical, be spread out to avoid concentration of aircraft activity to share any noise impacts.</td></tr>
<tr><td>Not met<br>N/A</td><td>Partial<br>N/A</td><td>Met<br>At this stage, when considering individual design options in isolation, it is not possible to evaluate against this design principle. It has therefore been assumed that all options could be used as part of a network. Performance against this design principle will be assessed further at Stage 3. See section 23, Next Steps.</td></tr>
<tr><td>Evaluation assessment summary</td><td colspan="3">The CAA's AMS (CAP 1711) sets out detailed initiatives that the aviation industry must deliver to achieve the Government's objectives in relation to airspace modernisation. CAP1711 details the outcomes that airspace modernisation must bring, under four broad headings:<br><br>• Safety<br>• Integration<br>• Simplification<br>• Environmental sustainability<br><br>In relation to environmental sustainability, CAP1711 states that the interests of all stakeholders affected by the use of airspace, should be taken into account when it is modernised. In line with guidance provided by the Government on environmental objectives, the Air Navigation Guidance 2017, sets out how carbon emissions, air quality and noise should be considered. This includes the consideration of more efficient, shorter and cost-effective flightpaths, enabling CCO and CDA, the re-design of arrival and departure routes allowing for noise impacts to be redistributed away from more noise sensitive areas and the introduction of respite (routes).<br><br>CAP1616 defines respite as 'Planned and notified periods where overflight or noise impact are reduced or halted to allow communities undisturbed time.' CAP1616 expands upon the topic stating that - if multiple routes are considered in order to provide respite, then it is vital that the views of local communities and stakeholders are taken into consideration when deciding what might constitute a sufficient period of respite. As described at section 3.5.8 of the SER, EMA have engaged with local communities and other stakeholders to understand how respite and relief could be used to best effect.<br><br>At this (Step 2A) point in the airspace change process, when considering individual design options, it is not possible to assess an ability to deliver 'respite' or 'relief' - this will only become possible when the design options have been grouped into dependent networks. Therefore, no route will be excluded at this stage, on the basis of respite or relief – all will pass, and the issue will be considered more fully at Stage 3, when the design options are</td></tr>
</table>

| | |
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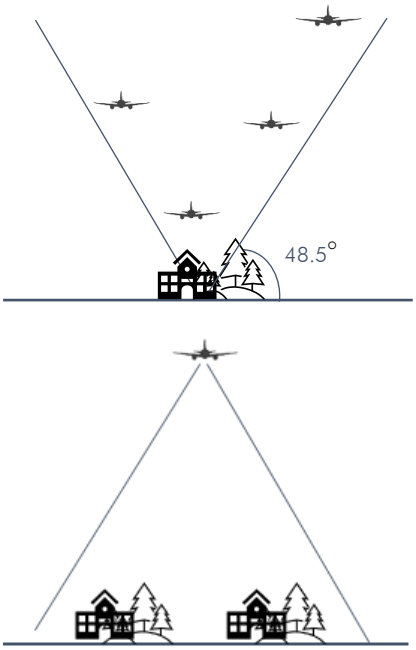
| | grouped into dependent networks. When considering relief during the Stage 3 systemisation, we will seek to allow breaks from or reduction in aircraft noise by spreading the noise across different routings. This means that the reduction in impact would be likely to be less predictable (unscheduled) and more tactical or short term in nature. |
| Evaluation assessment criteria | N/A |
| Summary | There will be further assessments conducted at Stage 3 of the ACP, see section 23, Next Steps, when we will consider whether combinations of routes still satisfy this design principle. |

## 4.9 Design Principle Criteria - Noise N2

| Design Principle N2 | Noise 2 – responsive flight paths<br><br>Where flight paths have to overfly communities, we will consider existing noise in the local area, and will select flight paths to mitigate effects on areas with relatively low levels of ambient noise. | | |
|---|---|---|---|
| | **Not met**<br><br>Lower third. The design option largely avoids flying over areas of high ambient noise, such as major roads and railways. | **Partial**<br><br>Mid third. A relatively small proportion of the design option flies over areas of high ambient noise, such as major roads and railways. | **Met**<br><br>Upper third. A relatively large proportion of the design option flies over areas of high ambient noise, such as major roads and railways. |
| **Evaluation assessment summary** | The AMS states that airspace modernisation must take account of the interests of 'all stakeholders affected by the use of airspace, in line with government policy and guidance on environmental objectives setting out how greenhouse-gas emissions, air quality and noise should be considered.'<br><br>In specifically considering the potential noise impact of airspace modernisation, the AMS reflects the Government's key environmental objective of 'limiting and, where possible, reducing the number of people in the UK significantly affected by adverse impacts from aircraft noise.' In addressing this requirement, one of the primary considerations during the development of design options has been to avoid, as far as is possible, overflying concentrations of population, as this would likely increase the adverse effects associated with aircraft noise.<br><br>However, it is commonly acknowledged that attitudes to aircraft noise can be influenced by contextual, including non-acoustic, factors. At Stage 1 of the CAP 1616 process, stakeholders asked that we consider background or 'ambient noise' levels as one such factor. Ambient noise refers to all noise present in a given environment. In effect, in areas with lower background noise levels, aircraft noise may be experienced as being more disturbing, leading to an increased risk of annoyance. On the other hand, in areas experiencing high levels of background noise, aircraft noise may be partially screened, thus reducing the possibility of annoyance. In responding to this design principle, the extent of areas with 'higher' levels of background noise has also been an important design consideration.<br><br>The CAA's CAP1767 'An investigation into the influence of background ambient noise levels on attitudes to aircraft noise' observes that 'for areas in the vicinity of airports, non-aircraft background ambient noise levels are dominated by road traffic and railway noise.' Levels of both road traffic and railway noise are estimated every five years under the Environmental Noise (England) Regulations 2006 (as amended)[1]. The results of the most recent (2017) round of 'strategic noise mapping' are published by the Department for Environment, Food and Rural Affairs (DEFRA) here Strategic Noise Mapping (2017). | | |

For the purposes of evaluation against this design principle, the same overflight tool described in the Design Principle Noise N3, has been used to create an overflight corridor, for each individual design option.




CAP 1616 recommends the use of 48.5° as an elevation angle. This is because for an aircraft to give a noise level approximately 3dB lower than if it had flown directly overhead, it would need to be at an elevation angle of 48.5°. 3dB is widely accepted as the smallest difference between two noise levels that the average person can perceive.

Alternatively, by looking at this from an aircraft's perspective, all buildings and locations within the cone are 'overflown'.

Each overflight corridor has then been overlayed upon the 55dB $L_{den}$ noise contour[2] (produced as part of the 'strategic noise mapping') for major roads and major railways. Where the two zones coincide, the design option in question has been considered to be overflying an area with relatively high levels of background noise. Conversely, in locations where the two zones do not coincide the design option has been considered to be overflying an area with relatively low levels of background noise. The proportion of the overflight corridor contained within the noise contours (as a percentage) has then been used to evaluate alignment of the design option with the design principle – the higher the percentage, the greater the alignment.

[1]The Environmental Noise (England) Regulations 2006 (as amended) turn EU directive 2002/49 Environmental Noise Directive (END) into UK law. Under the END the following sources are considered:

- Agglomerations (large urban areas);
- Major Airports;
- Major Railways; and
- Major Roads.

[2] High outdoor noise levels are defined in the (EU) 7th Environment Action Programme (EAP) as being above 55dB $L_{den}$.

| | |
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| **Evaluation assessment criteria** | - When compared to others in the peer group, to what extent does this design option overfly areas of high background (ambient) noise? |

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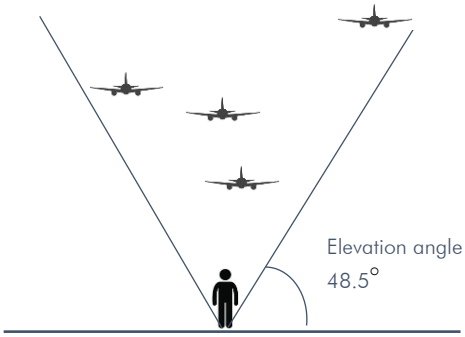
| | All design options within a design envelope are divided into peer groups. The RAG categories have been assigned in accordance with the design option's ranking against its peers. Lower third – not met, mid third – partial, upper third met.<br>Where the number of options within a peer group is not divisible by three, a conservative approach has been taken to categorisation of the options as illustrated in the examples below. |
| Summary | Each design option has been assessed against the above criteria, to assess the extent to which it satisfies the Design Principle Noise 2 – responsive flight paths, which requires that ambient noise levels have been considered during the design process. |

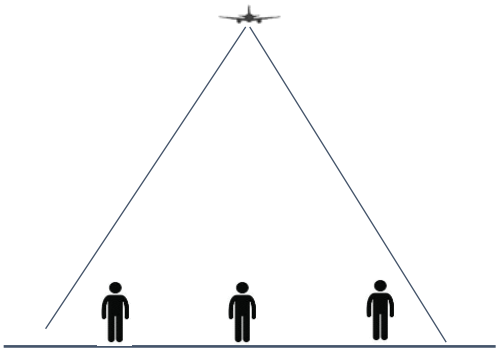
| 1 option peer group | | 2 option peer group | | 5 option peer group | |
|---|---|---|---|---|---|
| Not Met | 0 | Not Met | 0 | Not Met | 1 |
| Partial | 0 | Partial | 1 | Partial | 2 |
| Met | 1 | Met | 1 | Met | 2 |

## 4.10 Design Principle Criteria - Noise N3

<table>
<tr><td rowspan="2">Design Principle<br>N3</td><td colspan="3">Noise 3 – limiting disturbance<br><br>Flight paths should seek to limit and, where possible, reduce noise disturbance to communities – especially at night.</td></tr>
<tr><td>Not met<br><br>The estimated total future population overflown up to both 4,000ft and 7,000ft is increased when compared to the to the baseline ‘do nothing’ scenario.</td><td>Partial<br><br>The estimated total future population overflown up to either 4,000ft or 7,000ft is reduced or similar (i.e. Limited) when compared to the baseline ‘do nothing’ scenario.</td><td>Met<br><br>The estimated total future population overflown up to both 4,000ft and 7,000ft is reduced when compared to the baseline ‘do nothing’ scenario.</td></tr>
<tr><td>Evaluation assessment summary</td><td colspan="3">The CAA’s Airspace Change guidance (CAP1616) requires sponsors to assess the potential noise impact of any proposal being put forward, using a range of indicators. The level of assessment expected varies according to the scale of the change options being proposed and the stage of the change process that has been reached.<br><br>At this stage (Stage 2) in the ACP - the number of options to be assessed is significant and the level of refinement immature. CAP1616 therefore does not require the change sponsor to go into a full level of detail for every option on the ‘comprehensive list’. Instead, the scale of assessment should be proportionate, and the appraisal must as a minimum, contain qualitative assessments of the different options.<br><br>It is recognised however, that in assessing the comprehensive list, such a qualitative approach may not always adequately reflect the extent to which an option reflects the design principles. Therefore, the following quantitative assessment has been carried out on all the design options and these have been compared against that of a ‘do nothing’ scenario.<br><br>For stakeholder engagement purposes, $L_{Aeq}$ contours remain the ‘primary’ indicator. The contours show a set of closed lines on a map – each contour shows places where people get the same amount of noise from aircraft, measured as an energy average ($L_{Aeq}$). However, there is a recognition that local communities situated outside these ‘standard’ contours, may still be disturbed or adversely affected by passing aircraft. To represent people and communities affected in this way, a metric to quantify ‘overflight’ both inside and outside standard noise contours – up to a height of 7,000ft – has been produced by the CAA – Definition of overflight (CAP1498).<br><br>CAP1498 recognises that an aircraft does not have to pass directly overhead, to be considered an overflight. Instead, overflight should be defined to include aircraft that pass over and to the side of an observer. The distance that an aircraft can be to the side and still considered an overflight is set using an elevation angle. An aircraft flying directly overhead would be at an elevation angle of 90°. An aircraft on the ground would be at an elevation angle of 0°.</td></tr>
</table>




CAP1616 recommends the use of 48.5° as an elevation angle. This is because for an aircraft to give a noise level approximately 3dB lower than if it had flown directly overhead, it would need to be at an elevation angle of 48.5°. 3dB is widely accepted as the smallest difference between two noise levels that the average person can perceive.



Alternatively, by looking at this from an aircraft's perspective, all locations within the cone are 'overflown'

In this stage of evaluation, the overflight analysis provides an estimate for the total number of people overflown by taking into consideration:

- The number of households currently overflown. *
- The population currently overflown.**
- Known planned property developments at the time of undertaking the evaluation.***
- The number of proposed dwellings associated with the above developments.

* Provided by OS AddressBase
** Population figures based on CACI database using 2021 census.
*** Data was collated by CBRE on five-year housing plans. See "Planned Property Developments" in the glossary for information.

At this relatively early stage, it is not practicable to make the distinction between noise disturbance during the day and at night. This will occur in Stage 3, as part of the full options appraisal, once systemisation has taken place and traffic forecasts and noise contours are produced.
Glossary for more information.
In order to estimate the future potential population:

- Divide the current population identified by the number of existing households; this gives an average population per household for each design option.
- Multiply the number of proposed dwellings by the average population per household for each design option.
- The sum of the existing population and the future potential population to get an estimate for the total number of people overflown.

From the quantitative analysis, the population count has been rounded to the nearest 100, households and planned property developments to the nearest 50.

Departures baseline - 'do nothing'

The baseline 'do nothing' scenario reflects the present-day situation at EMA. Currently, departing aircraft are required to follow their planned SID until reaching a published 5,000ft release height, at which point they may be vectored away from the SID by ATC. A consequence of such tactical vectoring by ATC, is that - since those aircraft are no longer flying a prescribed path – the tracks over the ground are less concentrated and far more widely spread.

To estimate the size of the population affected by noise from departures, a modal average path* has been created for each of the existing SIDs and this has been assessed against the above overflight definition both to a height of 4,000ft, reflecting the point at which an aircraft flying the route is unlikely to result in noise exposure above the Lowest Observed Adverse Effect Level (LOAELs) and to 7,000ft, the height up to which EMA are responsible for the route design. Further, to ensure that the impact of aircraft that have been vectored away from the SID has also been captured, the actual spread of tracks (to a height 7,000ft) has been mapped. This was used to estimate the area and affected population beneath those tracks.

* A single line that delineates those locations on the ground that have experienced the greatest number of overflights for each of the current SIDs, during a given period (summer 2019). The modal average paths depict the line over the ground, most commonly followed by aircraft flying a particular route.

Departures Design Options

The centreline of each individual design option, (from our comprehensive list) has been taken and assessed against the above overflight definition. This has been done both to a height of 4,000ft, reflecting the point at which an aircraft flying the route is unlikely to result in noise exposure above the LOAELs, and to 7,000ft, the height up to which EMA is responsible for the route design.

Arrivals baseline - 'do nothing'

Currently arriving aircraft are tactically vectored by ATC from the airborne holding stacks in a sequence. This sequencing enables the most efficient spacing between arrivals on final approach.

To estimate the size of the population affected by noise from arrivals, modal average paths have been created that reflect the typical concentrations of aircraft over the ground. Recognising, however, that this approach may not always fully capture the current picture – aircraft may be vectored over a much wider area, where there is little or no evidence of a common path. To take account of this, the actual spread of tracks (from a height of 7,000ft) has been mapped. This was used to estimate the area and affected population beneath those tracks.

Arrivals Design Options

The centreline of each individual design option, (from our comprehensive list) has been taken and assessed against the above overflight definition. This has been done both from a height of 4,000ft, reflecting the point at which an aircraft flying the route is unlikely to result in noise exposure above the LOAELs, and from 7,000ft, the height from which EMA is responsible for the route design.

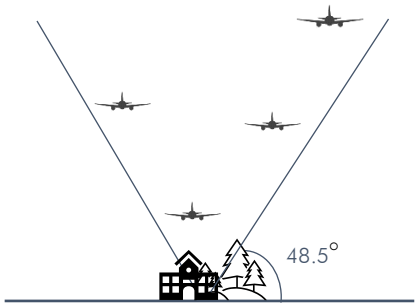
| | |
|---|---|
| | It is important to remember that, at this stage, the 'overflight' assessment is simply a mechanism to set out how each design option has responded to the design principles, in terms of populations overflown – it does not illustrate noise impacts. |
| Evaluation assessment criteria | How does the estimated future population overflown by this option (up to 4,000ft and 7,000ft), compare to that of the 'do nothing' scenario? Is it:<br>- Increased - increased is defined as being greater than 110% of the baseline 'do nothing' value for the respective metric.<br>- Similar – similar is defined as being within +/- 10% of the baseline 'do nothing' scenario.<br>- Reduced - reduced is defined as being less than 90% of the baseline 'do nothing' value for the respective metric. |
| Summary | Each design option has been assessed against the Design Principle Noise N3 to ensure that it satisfies the requirement for all new design options to seek to limit and, where possible, reduce noise disturbances to communities – especially at night.<br><br>There will be further assessments conducted at Stage 3 of the ACP process that will consider if combinations of routes still satisfy this design principle. See section 23 for Next Steps. |

## 4.11 Design Principle Criteria - Noise N4

| Design Principle N4 | Noise 4 – noise sensitive locations<br>Flight paths should, where practical, avoid locations that are especially sensitive to noise. | | |
|---|---|---|---|
| | **Not met**<br>The estimated number of noise sensitive locations overflown up to both 4,000ft **and** 7,000ft is increased when compared to the to the baseline 'do nothing' scenario. | **Partial**<br>The estimated number of noise sensitive locations overflown up to either 4,000ft **or** 7,000ft is less than or similar to the baseline 'do nothing' scenario. | **Met**<br>The estimated number of noise sensitive locations overflown up to both 4,000ft **and** 7,000ft is reduced when compared to the to the baseline 'do nothing' scenario. |

**Evaluation assessment summary**

We have applied the same overflight tool used in the Design Principle Noise N3, to estimate the impact upon noise sensitive locations. It has been concluded, for the purpose of this evaluation, that a reduction in the estimated number of noise sensitive locations overflown (compared to the baseline 'do nothing' scenario), indicates alignment with this design principle i.e., the fewer noise sensitive locations overflown, the more locations have been avoided.




CAP 1616 recommends the use of 48.5° as an elevation angle. This is because for an aircraft to give a noise level approximately 3dB lower than if it had flown directly overhead, it would need to be at an elevation angle of 48.5°. 3dB is widely accepted as the smallest difference between two noise levels that the average person can perceive.

Alternatively, by looking at this from an aircraft's perspective, all buildings and locations within the cone are 'overflown'.

In this stage of evaluation, the overflight analysis will provide an estimate for the total number of noise sensitive areas overflown by taking into consideration:

- Educational facilities*
- Medical facilities*
- Places of Worship*

*Provided by OS AddressBase

| | |
|---|---|
| | Following the stakeholder engagement phases, no additional areas (such as cultural or historic assets, tranquil or rural areas) were accounted for in this evaluation. In the IOA, Tranquillity will be analysed and is detailed in section 2.5.5 of the Initial Options Appraisal.<br><br>Departures baseline - 'do nothing'<br><br>The baseline 'do nothing' scenario reflects the present-day situation at EMA. Currently, departing aircraft are required to follow their planned SID until reaching a published release height (5,000ft), at which point they may be vectored away from the SID by ATC. A consequence of such tactical vectoring by ATC, is that - since those aircraft are no longer flying a prescribed path – the tracks over the ground are less concentrated and far more widely spread.<br><br>To estimate the number of noise sensitive locations affected by noise from departures, a modal average path* has been created for each of the existing SIDs and this has been assessed against the above overflight definition both to a height of 4,000ft, reflecting the point at which an aircraft flying the route is unlikely to result in noise exposure above the Lowest Observed Adverse Effect Level (LOAELs) and to 7,000ft, the height up to which EMA are responsible for the route design. Further, to ensure that the impact of aircraft that have been vectored away from the SID has also been captured, the actual spread of tracks (to a height 7,000ft) has been mapped. This was used to estimate the area and affected population beneath those tracks.<br><br>* A single line that delineates those locations on the ground that have experienced the greatest number of overflights for each of the current SIDs, during a given period (summer 2019). The modal average paths depict the line over the ground, most commonly followed by aircraft flying a particular route.<br><br>Departures Design Options<br><br>The centreline of each individual design option, (from our comprehensive list) has been taken and assessed against the above overflight definition. This has been done both to a height of 4,000ft, reflecting the point at which an aircraft flying the route is unlikely to result in noise exposure above the LOAELs, and to 7,000ft, the height up to which EMA is responsible for the route design.<br><br>Arrivals baseline - 'do nothing'<br><br>Currently arriving aircraft are tactically vectored by ATC from the airborne holding stacks in a sequence. This sequencing enables the most efficient spacing between arrivals on final approach.<br><br>To estimate the number of noise sensitive locations affected by noise from arrivals, modal average paths have been created that reflect the typical concentrations of aircraft over the ground. Recognising, however, that this approach may not always fully capture the current picture – aircraft may be vectored over a much wider area, where there is little or no evidence of a common path. To take account of this, the actual spread of tracks (from a height of 7,000ft) has been mapped. This was used to estimate the area and affected population beneath those tracks.<br><br>Arrivals Design Options<br><br>The centreline of each individual design option, (from our comprehensive list) has been taken and assessed against the above overflight definition. This has been done both from a height of 4,000ft, reflecting the point at which an aircraft flying the route is unlikely to result |

| | |
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| | in noise exposure above the LOAELs, and from 7,000ft, the height from which EMA is responsible for the route design.<br><br>It is important to remember that, at this stage, the 'overflight' assessment is simply a mechanism to set out how each design option has responded to the design principles, in terms of noise sensitive locations overflown – it does not illustrate noise impacts. |
| Evaluation assessment criteria | How does the estimated number of noise sensitive locations overflown by this option (up to 4,000ft and 7,000ft), compare to that of the 'do nothing' scenario? Is it:<br><br>- Increased - increased is defined as being greater than 110% of the baseline 'do nothing' value for the respective metric.<br>- Similar – similar is defined as being within +/- 10% of the baseline 'do nothing' scenario.<br>- Reduced - reduced is defined as being less than 90% of the baseline 'do nothing' value for the respective metric. |
| Summary | Each design option has been assessed against the Design Principle Noise N4 to ensure that it satisfies the requirement for all new design options to, where practical, avoid locations that are especially sensitive to noise.<br><br>There will be further assessments conducted at Stage 3 of the ACP process that will consider if combinations of routes still satisfy this design principle. See section 23 for Next Steps. |

## 4.12 Design Principle Criteria – Airspace Users 1

<table>
<tr><td rowspan="2">Design Principle<br><br>A1</td><td colspan="3">Airspace Users 1 - fit for the future<br><br>Flight paths should be designed to futureproof our airspace and should not be constrained by existing arrangements.</td></tr>
<tr><td>Not met<br><br>Assessed in isolation, this option is deemed not to be designed to futureproof airspace in the vicinity of EMA by designing to (PANS-OPS 8168) PBN requirements or is constrained by existing arrangements.</td><td>Partial<br><br>Assessed in isolation, this option is deemed to be designed to futureproof airspace in the vicinity of EMA by designing to (PANS-OPS 8168) PBN requirements but will require additional engagement and investigation during Stage 3 to ensure that it is not constrained by existing arrangements.</td><td>Met<br><br>Assessed in isolation, this option is deemed to be designed to futureproof airspace in the vicinity of EMA by designing to (PANS-OPS 8168) PBN requirements and is not constrained by existing arrangements.</td></tr>
<tr><td>Evaluation assessment summary</td><td colspan="3">UK airspace is among the most complex in the world, yet its underpinning design dates back to the 1950s. Aircraft performance and navigation capabilities have changed significantly since then. To fully utilise the performance capabilities of modern aircraft, aviation needs an efficient and effective airspace structure that is futureproof and not constrained on existing arrangements.<br><br>Outdated arrival and departure routes are again based on obsolete ground navigation beacons and restrict the potential improvements in environmental performance. By not utilising the modern technologies available, current flightpaths constrain aircraft climb performance, increasing the time taken to reach optimum cruising altitude. This creates inefficiencies and results in more emissions and greater fuel burn. Technology deployments will, where possible, utilise standards developed through international cooperation to ensure consistent and interoperable deployment.<br><br>A significant redesign utilising current and developing procedures will aid EMA in developing routes that are futureproof in line with the AMS and will enable the most efficient use of available airspace. A wide range of routes have been designed for each envelope that include replications of current procedures and all have been designed to the latest standards to meet with PBN regulations and meet with the aims of the FASI-N programme. Once the routes have been systemised as part of the Stage 3 activity, these routes will be consulted upon and should existing arrangements require to be changed or re-negotiated, EMA will ensure that appropriate procedures are followed.</td></tr>
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| | |
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| Evaluation assessment criteria | - Has the option been designed by an IFP designer in compliance with PBN requirements (PANS-OPS 8168)?<br>- Is the route constrained by existing arrangements such as CAS dimensions or procedures between adjacent ANSPs?<br>- Is the option considered to be future proof? |
| Summary | Each option has been assessed against the above criteria to ensure that it satisfies the Design Principle Airspace A1 - 'Fit for the Future' that design option flight paths should be designed to futureproof our airspace and cannot be constrained by existing arrangements.<br><br>Assessments will be conducted at Stage 3 of the ACP process that will consider to what extent design options satisfy this design principle. See section 23, Next Steps. |

## 4.13 Design Principle Criteria – Airspace Users 2

<table>
<tr><td rowspan="2">Design Principle<br>A2</td><td colspan="3">Airspace Users 2 - airspace for all<br><br>Our controlled airspace should be open to all authorised users; however, priority will be given to airport traffic over other airspace users, except for emergency aircraft.</td></tr>
<tr><td>Not met<br><br>When assessed in isolation, access to the airspace required to contain the procedure would be denied to non-airport traffic and emergency aircraft.</td><td>Partial<br><br>When assessed in isolation this option enables access to all authorised users, but at certain times there may be a need to reduce, or delay access to non-airport traffic to provide protection to EMA arrivals and departures.</td><td>Met<br><br>When assessed in isolation, the airspace required to contain this option continues to enable access to all authorised users and does not restrict access to emergency aircraft in the airspace surrounding EMA.</td></tr>
<tr><td>Evaluation assessment summary</td><td colspan="3">The CAA Controlled Airspace Containment Policy Statement (January 2014 and updated in August 2022) sets out the minimum criteria applicable to containment of instrument flight procedures for airports already within CAS. Each option has been assessed against this policy statement to ensure that the minimum volume of airspace is used to contain the route within CAS. An assessment will also be made, during Stage 3 of the ACP process, as to whether it might be possible to reduce the current volume of CAS whilst still complying with the containment criteria.<br><br>In line with advice from the Secretary of State, the CAA has the power to review airspace classification. The classification of the airspace determines the flight rules that apply and the procedures that must be followed. The size and classification of the airspace around an airport is determined by the types of aircraft and the complexity of the route structure. Ultimately the establishment of controlled airspace is to provide a safe environment for passenger-carrying commercial aircraft; however, EMA is also cognisant that there are a multitude of airspace users in the vicinity of the airport and procedures currently exist to enable the safe integration of air traffic for all authorised users.<br><br>In the vicinity of EMA, most airspace is classified as Class D (up to 3,500ft) and Class A above (forming part of the Manchester Terminal Manoeuvring Area [MTMA]), allowing operations for all authorised users to take place in a controlled environment but placing some restrictions on general aviation (or recreational flying).<br><br>As EMA look to the future and look at changing arrival and departure routes, whilst some options may require additional CAS to assure safety, there is the possibility that some of the airspace may no longer be required to contain commercial aircraft operations and this airspace could be considered for re-classification as uncontrolled Class G airspace which would allow greater access to all stakeholders.<br><br>Where controlled airspace remains, procedures for access into the controlled airspace will continue for transiting traffic and access to our airspace for the emergency services will always be given the highest priority. It is accepted that there may be disruptions to normal airport traffic operations in order to accommodate access for emergency aircraft as the preservation of life is paramount.</td></tr>
</table>

| | |
|---|---|
| Evaluation assessment criteria | - Does this option afford priority to EMA traffic?<br>- Is the airspace required for the procedure accessible to all authorised users?<br>- Are emergency aircraft permitted to operate within the airspace that is required for the option? |
| Summary | As the options are initially being assessed in isolation, it is not possible to understand the second and third order effects with regards to access for airspace users as they are not being analysed as part of a system. However, access for emergency aircraft will remain a priority in line with current operations. A full containment assessment will be undertaken at a later stage in the ACP process, at that point therefore this initial evaluation may need to be updated. |

## 4.14 Design Principle Criteria – Technology

<table>
<tr><td rowspan="2">Design Principle<br><br>T</td><td colspan="3">Technology - embracing technology<br><br>Flight paths should be designed using the latest, widely available navigational technology and flying techniques.</td></tr>
<tr><td>Not met<br><br>When assessed in isolation, this design option does not utilise the latest widely available aircraft technology and is not PBN compliant.</td><td>Partial<br><br>When assessed in isolation, this design option utilises the latest widely available aircraft technology.<br><br>Further work may be required to confirm that the route is flyable and/or it meets with route design rules.</td><td>Met<br><br>When assessed in isolation, this design option utilises the latest widely available aircraft technology and meets current PBN standards and regulations.</td></tr>
<tr><td>Evaluation assessment summary</td><td colspan="3">Aircraft taking off from or landing at EMA currently do so flying ‘conventional’ departure and arrival routes. Conventional routes use a network of ground based DVOR navigation aids to provide guidance to aircraft on departure and arrival. However, this technology is becoming obsolete, and these DVORs are gradually being withdrawn from service. As a result, in the future, all guidance will be provided via satellites to on-board aircraft systems. This is known as Performance Based Navigation (PBN).<br><br>In its AMS (CAP1711), the CAA sets out detailed initiatives that the aviation industry must deliver to achieve the Government’s objectives in relation to airspace modernisation. The strategy describes the outcomes that airspace modernisation must bring, under four broad headings: Safety; Integration; Simplification and Environmental sustainability. Of these groups, ‘Simplification’ talks, in particular about the need to upgrade airports’ standard arrival and departure routes using PBN, to provide more efficient routes and ‘…introduce the flexibility that, in collaboration with impacted communities, can allow industry to better manage noise and fuel/$CO_2$ impacts. This includes the use of continuous climb departures and continuous descent approaches which have both fuel and noise benefits.<br><br>PBN technology enables aircraft to fly along pre-determined flightpaths (including departure and arrival routes) more accurately and results in less dispersed tracks than those based on ground based systems. However, to provide flexibility across aviation there are a range of PBN specifications that can be used, some of which result in greater accuracy of track keeping than others.<br><br>To understand which of those PBN specifications the aircraft operating into EMA are able to use, an airline fleet equipage survey was conducted, as detailed further in section 5.5.1 of the DOR. This survey confirmed that 100% of commercial flights can operate to a specification known as RNAV1, with 82% capable of using the more advanced RNP1 specification. Our design options have therefore been primarily designed to RNAV-1 specification, unless otherwise stated, where they have been designed as RNP- to meet the PBN requirement.</td></tr>
</table>

| | |
|---|---|
| Evaluation assessment criteria | - Has the option been designed in compliance with PBN requirements (PANS-OPS 8168)?<br>- Is further work required to confirm that the route is flyable and/or it meets with route design rules?<br>- Does the option facilitate the delivery of CDA/CCO? |
| Summary | Each option has been assessed against the above criteria to ensure that it satisfies the Design Principle Technology - embracing technology, that design options should be designed to make use of the latest widely available aircraft navigation technology.<br><br>Assessments will be conducted at Stage 3 of the ACP process that will consider to what extent design options satisfy this design principle. See section 23, Next Steps. |

# 5 Standard Instrument Departures - Evaluation

# 6 Runway 09 East

## 6.1 Runway 09 East Option 1

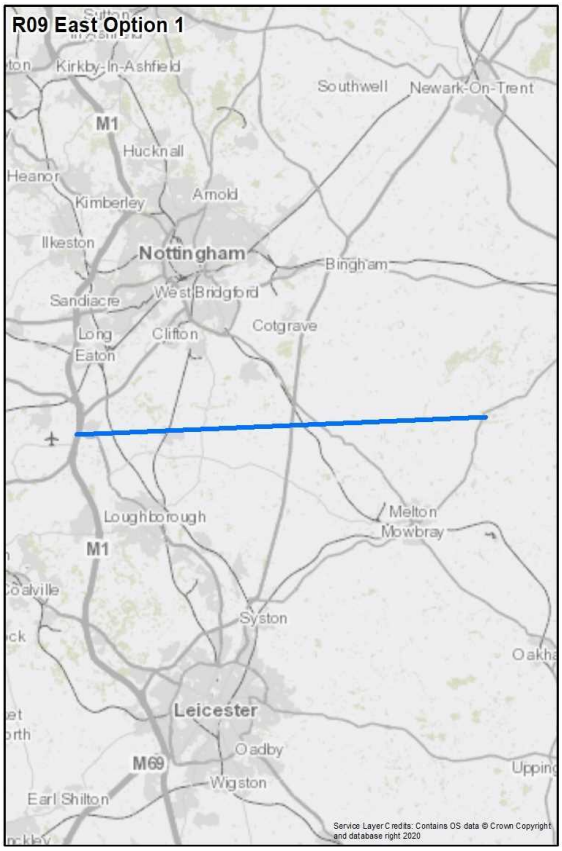
| Design Principle Evaluation | Option No. 1 |
|---|---|
| Option Name: SID RW 09 East Option 1 | REJECT |

**Option Description:**

This option provides a direct route to the east and proceeds straight ahead without making any turns. This route has the least track mileage within this envelope as the route flies directly on runway heading to the east.

After departure it passes over West Leake and East Leake and terminates north east of Melton Mowbray and north of Stonesby.

There would be no speed restrictions applied to the procedure; therefore, the maximum speed of 250kts would apply. This will permit many aircraft to fly this route in a clean configuration (without the use of flaps) which has potential benefits in terms of noise.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being similar and reduced, respectively, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 1 is 39km (21nm). When compared to the 'do nothing' baseline (42km (23nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

8.3% of the area of the Option 1 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1 is estimated to overfly approximately 1,750 households with an approximate population of 3,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 3,500.

Up to 7,000ft, Option 1 is estimated to overfly approximately 2,700 households with an approximate population of 5,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 5,300.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a similar population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1 is estimated to overfly, 30 noise sensitive areas.

Up to 7,000ft, Option 1 is estimated to overfly 45 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | MET |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA. | |

## 6.2 Runway 09 East Option 2

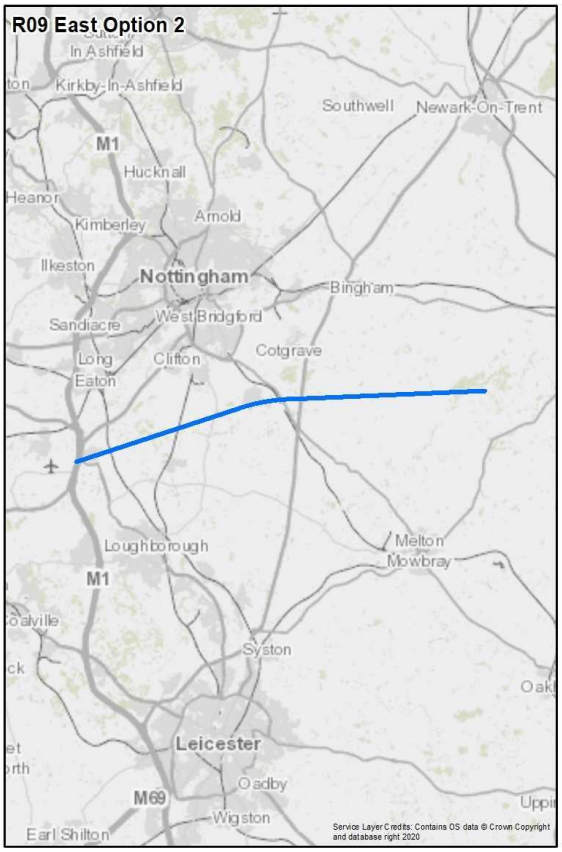
| Design Principle Evaluation | Option No. 2 |
|---|---|
| Option Name: SID RW 09 East Option 2 | REJECT |

**Option Description:**

This option commences with a 15° northerly offset from the runway heading immediately after take-off.

The initial 15° offset to the north results in the route, passing south of Kegworth and it maintains this heading for approximately 8nm to Keyworth where it turns east following the northernmost edge of the design envelope terminating north east of Melton Mowbray, south east of Grantham and north of Eaton.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 2 is 39km (21nm). When compared to the 'do nothing' baseline (42km (23nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

7.0% of the area of the Option 2 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 2 is estimated to overfly approximately 3,100 households with an approximate population of 6,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 6,900.

Up to 7,000ft, Option 2 is estimated to overfly approximately 4,250 households with an approximate population of 8,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 8,800.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 2 is estimated to overfly, 25 noise sensitive areas.

Up to 7,000ft, Option 2 is estimated to overfly 30 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 6.3 Runway 09 East Option 3

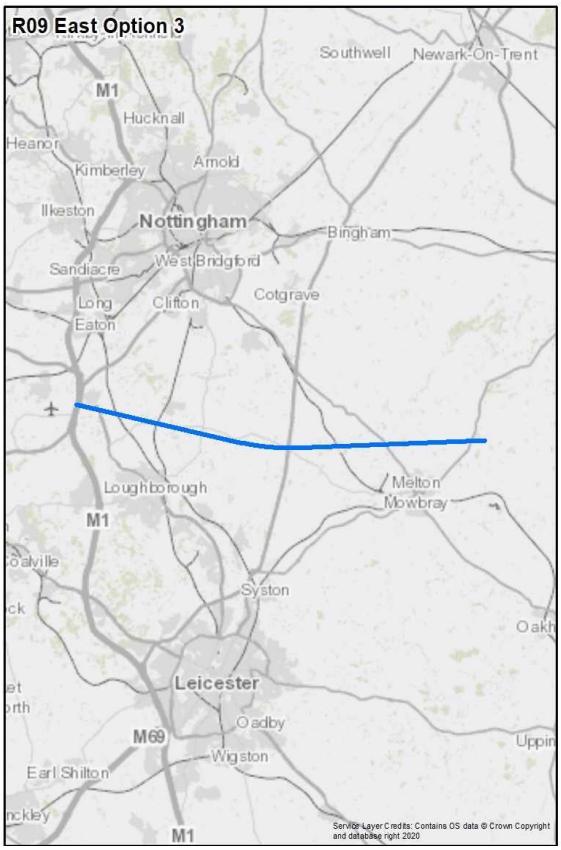
| Design Principle Evaluation | Option No. 3 |
|---|---|
| Option Name: SID RW 09 East Option 3 | ACCEPT |

**Option Description:**

This option commences with a 15° southerly offset from the runway heading immediately after take-off.

The initial 15° offset to the south results in the route, passing south of Kegworth and maintains this heading for approximately 8nm to a point beyond Wymeswold where it turns east following the southernmost edge of the design envelope terminating north east of Melton Mowbray and south of Waltham on the Wolds.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 3 is 39km (21nm). When compared to the 'do nothing' baseline (42km (23nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

9.9% of the area of the Option 3 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 3 is estimated to overfly approximately 750 households with an approximate population of 1,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 2,200.

Up to 7,000ft, Option 3 is estimated to overfly approximately 1,800 households with an approximate population of 3,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 3,700.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 3 is estimated to overfly, 10 noise sensitive areas.

Up to 7,000ft, Option 3 is estimated to overfly 25 noise sensitive areas.

This is a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 6.4 Runway 09 East Option 4

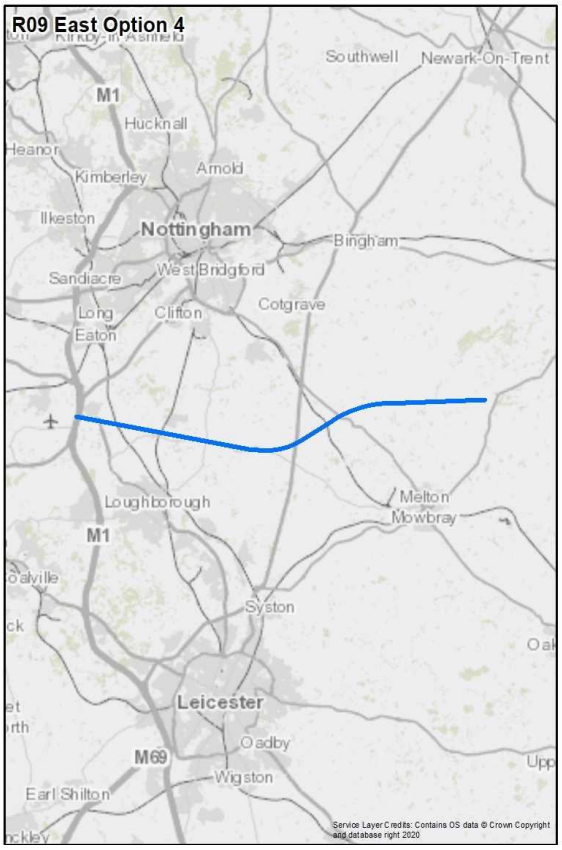
| Design Principle Evaluation | Option No. 4 |
|---|---|
| Option Name: SID RW 09 East Option 4 | ACCEPT |

**Option Description:**

After take-off this option diverges by 12.5° to the south of the extended runway centreline.

The initial 12.5° offset to the south results in the route, passing south of Kegworth and it maintains this heading for approximately 8nm at which point it turns to a north easterly heading before reverting to an easterly track to intercept the extended runway centreline at Long Clawson. The route maintains the easterly heading until it terminates north east of Melton Mowbray and north of Waltham on the Wolds.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 4 is 40km (22nm). When compared to the 'do nothing' baseline (42km (23nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

11.2% of the area of the Option 4 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 4 is estimated to overfly approximately 800 households with an approximate population of 1,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 1,800.

Up to 7,000ft, Option 4 is estimated to overfly approximately 1,850 households with an approximate population of 3,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 3,700.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 4 is estimated to overfly, 10 noise sensitive areas.

Up to 7,000ft, Option 4 is estimated to overfly 20 noise sensitive areas.

This is a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 6.5 Runway 09 East Option 5

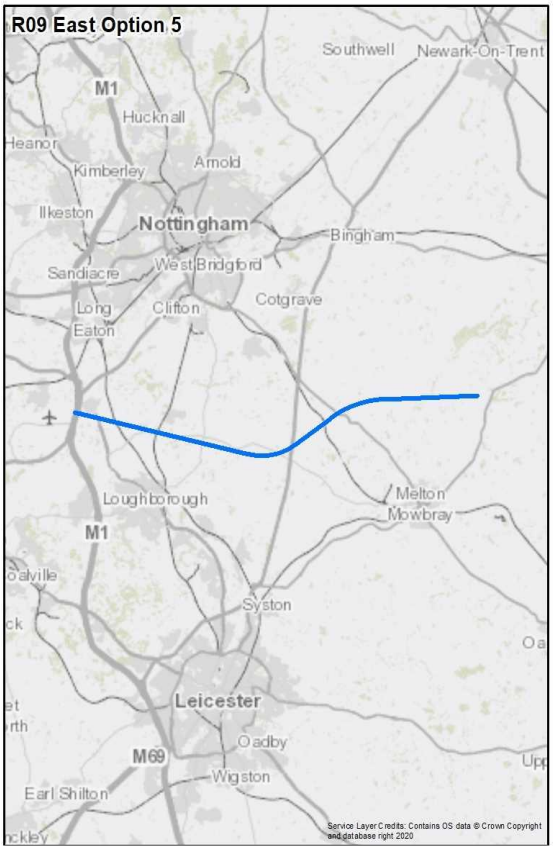
| Design Principle Evaluation | Option No. 5 |
|---|---|
| Option Name: SID RW 09 East Option 5 | ACCEPT |

**Option Description:**

This option is similar to Option 4 but with an increased 15° offset to the south of the extended runway centreline rather than 12.5°.

The offset to the south results in the route, passing south of Kegworth and it maintains this heading for approximately 8nm to a point beyond Wymeswold. It then turns to a north easterly heading before reverting to an easterly track to intercept the extended runway centreline at Long Clawson. The route maintains the easterly heading until it terminates north east of Melton Mowbray and north of Waltham on the Wolds.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 5 is 40km (22nm). When compared to the 'do nothing' baseline (42km (23nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

12.3% of the area of the Option 5 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 5 is estimated to overfly approximately 750 households with an approximate population of 1,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 1,600.

Up to 7,000ft, Option 5 is estimated to overfly approximately 1,850 households with an approximate population of 3,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 3,600.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 5 is estimated to overfly, 10 noise sensitive areas.

Up to 7,000ft, Option 5 is estimated to overfly 20 noise sensitive areas.

This is a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 6.6 Runway 09 East Summary

| | Option 1 | Option 2 | Option 3 | Option 4 | Option 5 |
|---|---|---|---|---|---|
| **S - Safety** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **P - Programme** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **C - Continuity** | MET | MET | MET | MET | MET |
| **E - Emissions** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **N1 - Noise** | MET | MET | MET | MET | MET |
| **N2 - Noise** | PARTIAL | NOT MET | PARTIAL | MET | MET |
| **N3 - Noise** | MET | PARTIAL | MET | MET | MET |
| **N4 - Noise** | PARTIAL | PARTIAL | MET | MET | MET |
| **A1 - Airspace** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **A2 - Airspace** | MET | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET | MET |
| | Best | Rejected | Best | Best | Best |

## 6.7 Runway 09 East Viable but Poor Fit Options

| Option | Safety | Programme | Continuity |
|---|---|---|---|
| A6 | S | P | C |

Description: This option departs runway 09 in a north easterly direction, before initiating a gradual right turn continuing south easterly towards Knipton.

Safety: This option is not fully aligned with this design principle as it exceeds the limits of controlled airspace, however there is a reasonable expectation that controlled airspace could be extended in this area. This option has therefore been rated as amber.

Programme: This option fails to align with the environmental end of the AMS and is not fully aligned with the integration end.

> *Integration*: This option is not fully aligned with this AMS end, as additional controlled airspace would be required to maintain safety. However, the impact could be minimal if the controlled airspace is limited to night only.
>
> *Environment*: This option would involve greater track mileage than is necessary by taking traffic north east before turning it east leading to increased fuel burn and emissions. The number of people impacted by noise for this option in comparison to other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

| | | | |
|---|---|---|---|
| B7 | S | P | C |

Description: This option departs runway 09 and proceeds in a south easterly direction, then initiates a gradual left turn after overflying Melton Mowbray, continuing north easterly towards the SID aiming point.

Safety: This option is not fully aligned with this design principle as it exceeds the limits of controlled airspace, however there is a reasonable expectation that controlled airspace could be extended in this area. This option has therefore been rated as amber.

Programme: This option fails to align with the environmental end of the AMS and is not fully aligned with the integration end.

> *Integration*: This option is not fully aligned with this AMS end, as additional controlled airspace would be required to maintain safety. However, the impact could be minimal if the controlled airspace is limited to night only.
>
> *Environment*: This option would involve greater track mileage than is necessary by taking traffic south east before turning it east leading to increased fuel burn and emissions. The number of people impacted by noise for this option in comparison to other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

| | | | |
|---|---|---|---|
| C8 | S | P | C |

Description: This option departs runway 09 and initiates a 90-degree left turn towards west Nottingham, then turning right over northern Nottingham to head east towards Sleaford.

Safety: This option is not fully aligned with this design principle as it exceeds the limits of controlled airspace, however there is a reasonable expectation that controlled airspace could be extended in this area. This option has therefore been rated as amber.

Programme: This option fails to align with the environmental end of the AMS and is not fully aligned with the integration end.

> *Integration*: This option is not fully aligned with this AMS end, as additional controlled airspace would be required to maintain safety. However, the impact could be minimal if the controlled airspace is limited to night only.
>
> *Environment*: This option would involve greater track mileage than is necessary by taking traffic north before turning it east leading to increased fuel burn and emissions. The number of people impacted by noise for this option in comparison to other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

Continuity: This option fails to align with this design principle, because it would have a prolonged interaction with the departure envelopes north and north west which would limit the ability to achieve one minute departure splits and not enable best use of runway capacity. In addition, it is likely to interact with arrivals to runway 09 from the north.

| D9 | S | P | C |
|---|---|---|---|

Description: This option departs runway 09 and initiates a 90-degree right turn heading south, east of Shepshed, before turning left near Loughborough in an easterly direction, south of Melton Mowbray, heading towards the SID aiming point.

Safety: This option is not fully aligned with this design principle as it exceeds the limits of controlled airspace, however there is a reasonable expectation that controlled airspace could be extended in this area. This option has therefore been rated as amber.

Programme: This option fails to align with the environmental end of the AMS and is not fully aligned with the integration end.

> *Integration*: This option is not fully aligned with this AMS end, as additional controlled airspace would be required to maintain safety. However, the impact could be minimal if the controlled airspace is limited to night only.
>
> *Environment*: This option would involve greater track mileage than is necessary by taking traffic north before turning it east leading to increased fuel burn and emissions. The number of people impacted by noise for this option in comparison to other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

Continuity: This option fails to align with this design principle, because it would have a prolonged interaction with the south departure envelope which would limit the ability to achieve one minute departure splits and not enable best use of runway capacity. In addition, it is likely to interact with arrivals to runway 09 from the south.

| E10 | S | P | C |
|---|---|---|---|

Description: After departing Runway 09 this option initiates a left-hand wrap-around, to the north west before proceeding in an easterly direction and routes over the southern elements of Nottingham, Derby and Loughborough, and south of Melton Mowbray.

Safety: This option fails to align with this design principle, because it is expected to conflict or present a hazardous interaction with arrivals to runway 09 and the runway 09 Missed Approach Procedure (MAP).

Programme: This option fails to align with the environmental end of the AMS.

> *Environment*: This option would involve greater track mileage than is necessary by taking traffic north and west before turning it east leading to increased fuel burn and emissions. The track taken over southern Nottingham, Derby and Loughborough means that the number of people impacted by noise for this option in comparison to other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

Continuity: This option fails to align with this design principle, because it would have a prolonged interaction with the departure envelopes north, north west and south which would limit the ability to achieve one minute departure splits and not enable best use of runway capacity. In addition, it is likely to interact with arrivals to runway 09 from the north.

| F11 | S | P | C |
|---|---|---|---|

Description: On departure from runway 09 this option initiates a right-hand wrap-around turn overflying Loughborough and south Derby, before turning further right to an easterly direction overflying Nottingham and heading towards the SID aiming point.

Safety: This option fails to align with this design principle, because it is expected to conflict or present a hazardous interaction with the runway 09 Missed Approach Procedure (MAP).

Programme: This option fails to align with the environmental end of the AMS.

> *Environment*: This option would involve greater track mileage than is necessary by taking traffic south and west before turning it east leading to increased fuel burn and emissions. The track taken over Nottingham, Derby and Loughborough means that the number of people impacted by noise for this option in comparison to other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

Continuity: This option fails to align with this design principle, because it would have a prolonged interaction with the departure envelopes north, north west and south which would limit the ability to achieve one minute departure splits and not enable best use of runway capacity. In addition, it is likely to interact with arrivals to runway 09 from the north.

# 7 Runway 09 North

## 7.1 Runway 09 North Option 1

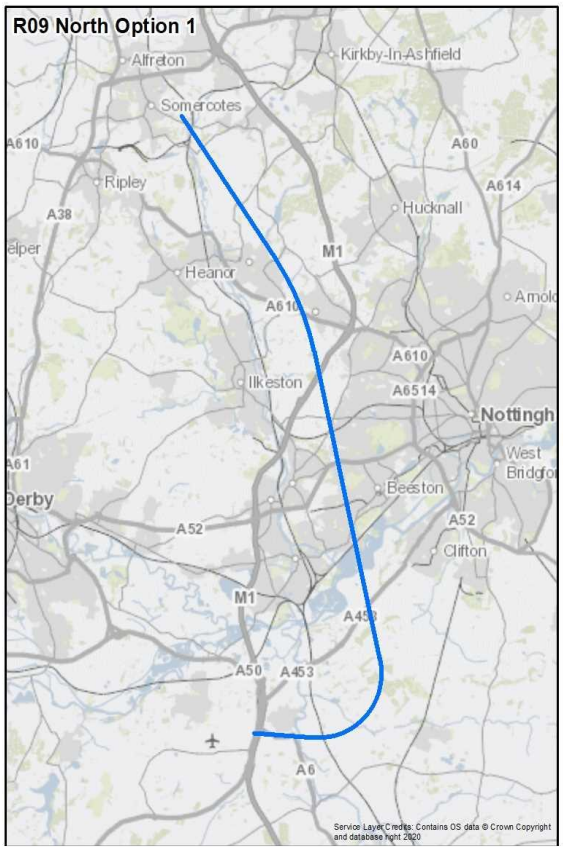
| Design Principle Evaluation | Option No. 1 |
|---|---|
| Option Name: SID RW 09 North Option 1 | ACCEPT |

**Option Description:**

Option 1 is an RNAV 1 replication of the current POL SID and is included as a 'do minimum' option. It has an initial offset of 10° to the south followed by a left turn to the north. The rate of turn of is dictated by following the design speed recommended within CAP778 and the design uses fly-by waypoints to create an approximate replication of the existing conventional departure.

As a replicated route it follows a similar track over the ground as the current POL SID routing to the east of Long Eaton and west of Hucknall to connect to the NATS network.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 1 is 41km (22nm). When compared to the 'do nothing' baseline (40km (22nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

33.4% of the area of the Option 1 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1 is estimated to overfly approximately 11,950 households with an approximate population of 22,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 26,800.

Up to 7,000ft, Option 1 is estimated to overfly approximately 31,450 households with an approximate population of 59,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 60,900.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1 is estimated to overfly, 65 noise sensitive areas.

Up to 7,000ft, Option 1 is estimated to overfly 165 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | MET |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA. | |

## 7.2 Runway 09 North Option 1A

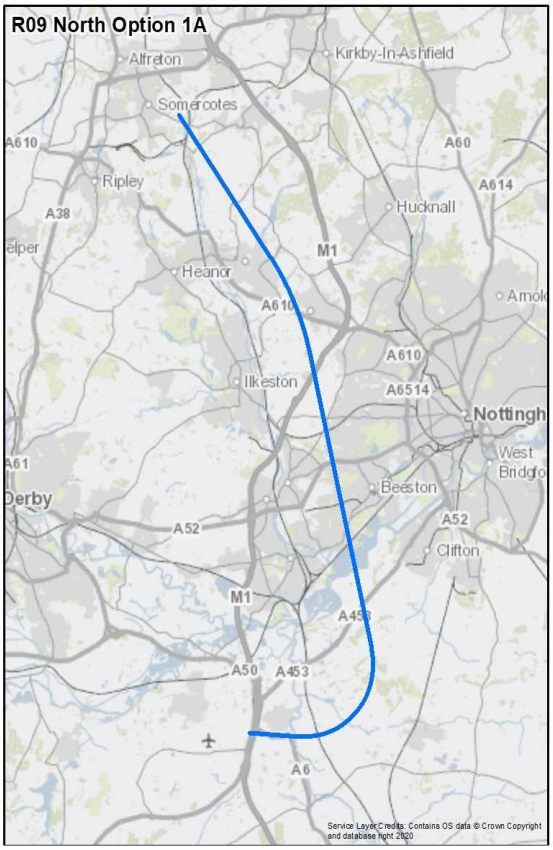
| Design Principle Evaluation | Option No. 1A |
|---|---|
| Option Name: SID RW 09 North Option 1A | ACCEPT |

**Option Description:**

Option 1A is also an RNAV 1 replication of the current POL SID included as a 'do minimum' option. It has an initial offset of 10° to the south followed by a left turn to the north. However, the commencement of the first turn is the same as the current POL SID, i.e. 1.5nm beyond the DER. By commencing the turn at this point a higher speed of 220kts is required. At the apex of the initial turn Option 1A is approximately 200m north west of Option 1.

The design uses fly-by waypoints to create an approximate replication of the existing conventional departure.

As a replicated SID it then follows a similar track over the ground as the current POL routing to the east of Long Eaton and west of Hucknall to connect to the NATS network.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 1A is 40km (22nm). When compared to the 'do nothing' baseline (40km (22nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

33.7% of the area of the Option 1A overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1A is estimated to overfly approximately 12,050 households with an approximate population of 22,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 24,800.

Up to 7,000ft, Option 1A is estimated to overfly approximately 31,300 households with an approximate population of 58,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 60,600.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1A is estimated to overfly, 65 noise sensitive areas.

Up to 7,000ft, Option 1A is estimated to overfly 160 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 7.3 Runway 09 North Option 2

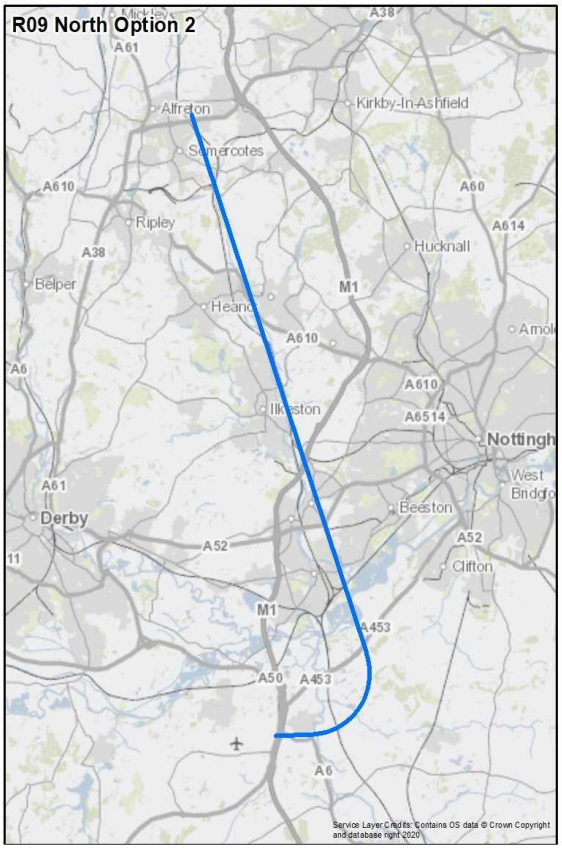
| Design Principle Evaluation | Option No. 2 |
|---|---|
| Option Name: SID RW 09 North Option 2 | ACCEPT |

**Option Description:**

This option follows the extended runway centreline initially, with no offset, with a left turn at 1nm from the DER which is as close as allowed according to CAP 778. It then routes north taking a slightly shorter route to the termination point, whilst seeking to follow the railway line between Long Eaton and Ilkeston.

The route overflies the southern edge of Kegworth, before passing close to the Ratcliffe on Soar power station, Long Eaton and the Toton rail depot. It routes east of Ilkeston before terminating close to Hilcote.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 2 is 38km (21nm). When compared to the 'do nothing' baseline (40km (22nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

41.2% of the area of the Option 2 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 2 is estimated to overfly approximately 14,200 households with an approximate population of 26,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 33,500.

Up to 7,000ft, Option 2 is estimated to overfly approximately 41,800 households with an approximate population of 75,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 77,200.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 2 is estimated to overfly, 60 noise sensitive areas.

Up to 7,000ft, Option 2 is estimated to overfly 195 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 7.4 Runway 09 North Option 3

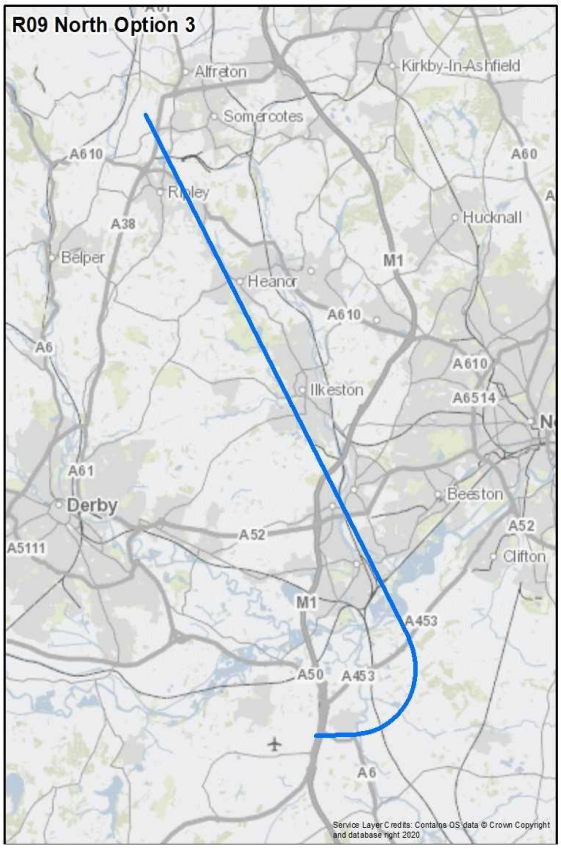
| Design Principle Evaluation | Option No. 3 |
|---|---|
| Option Name: SID RW 09 North Option 3 | ACCEPT |

**Option Description:**

This option follows the extended runway centreline initially with no offset, with a left turn at 1nm from the DER which is as close as allowed according to CAP 778.

The route overflies the southern edge of Kegworth, before passing close to the Ratcliffe on Soar power station, Long Eaton and the Toton rail depot. It routes west of Ilkeston before terminating close to Alfreton.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 3 is 38km (21nm). When compared to the 'do nothing' baseline (40km (22nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

37.5% of the area of the Option 3 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 3 is estimated to overfly approximately 14,250 households with an approximate population of 25,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 36,300.

Up to 7,000ft, Option 3 is estimated to overfly approximately 38,300 households with an approximate population of 70,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 77,000.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 3 is estimated to overfly, 75 noise sensitive areas.

Up to 7,000ft, Option 3 is estimated to overfly 230 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 7.5 Runway 09 North Option 4

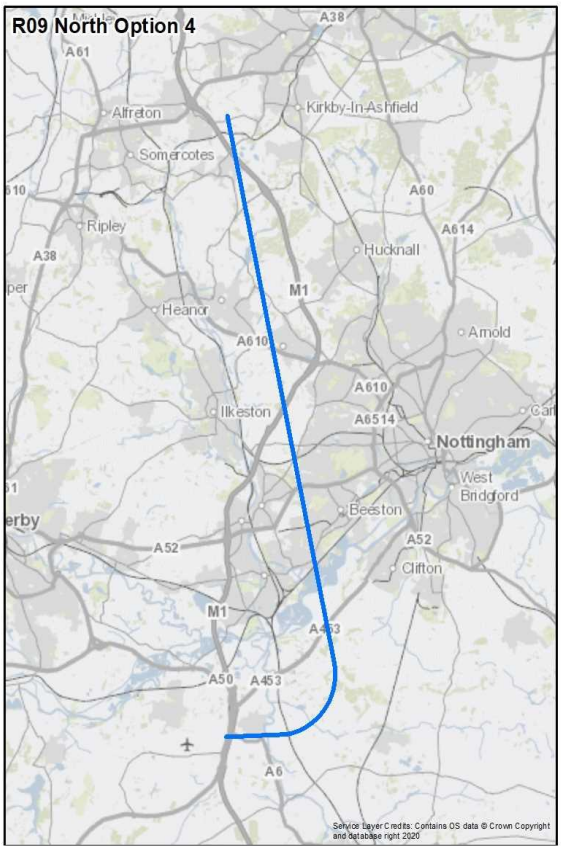
| Design Principle Evaluation | Option No. 4 |
|---|---|
| Option Name: SID RW 09 North Option 4 | ACCEPT |

**Option Description:**

This option is similar to the replicated Option 1 but the route straightens up, after the initial left turn to end on the east side of the design envelope. After departure it follows the extended runway centreline with no offset, with a left turn at 1nm from the DER which is as close as allowed according to CAP 778.

The route overflies the southern edge of Kegworth, before turning north passing between the Ratcliffe on Soar power station and Clifton and routing to the east of Long Eaton and west of Hucknall. The route terminates close to the M1 Junction 28 at South Normanton.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 4 is 41km (22nm). When compared to the 'do nothing' baseline (40km (22nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

59.4% of the area of the Option 4 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 4 is estimated to overfly approximately 11,600 households with an approximate population of 21,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 24,300.

Up to 7,000ft, Option 4 is estimated to overfly approximately 23,450 households with an approximate population of 44,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 46,100.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 4 is estimated to overfly, 55 noise sensitive areas.

Up to 7,000ft, Option 4 is estimated to overfly 115 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 7.6 Runway 09 North Option 5

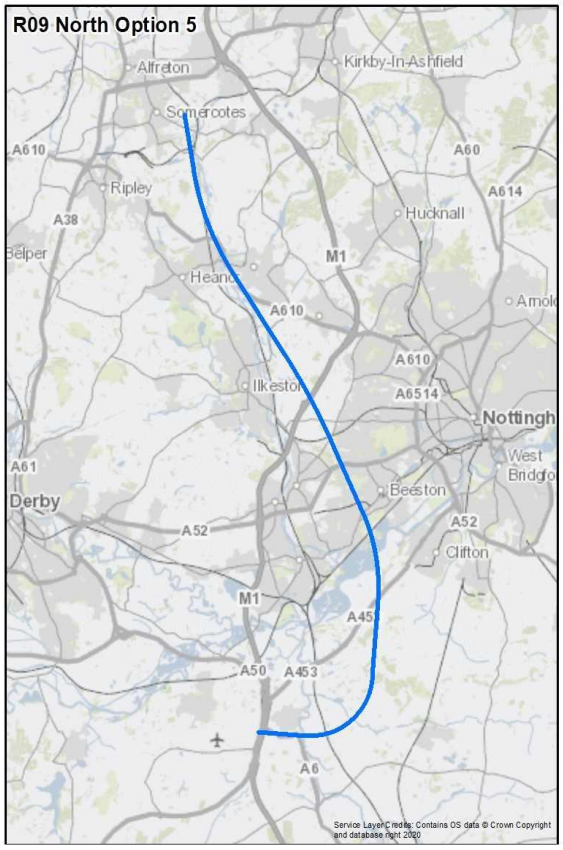
| Design Principle Evaluation | Option No. 5 |
|---|---|
| Option Name: SID RW 09 North Option 5 | ACCEPT |

**Option Description:**

This option has an initial offset by 5o to the south of the extended runway centreline seeking to avoid Kegworth. The route turns left at 1nm from the DER which is as close as allowed according to CAP 778.

The initial 5° offset to the south results in the route, passing just south of Kegworth and it then turns north passing between the Ratcliffe on Soar power station and Clifton, passing between Long Eaton and Beeston before making a second left turn north west. It routes between Ilkeston and Giltbrook before turning north and terminating between Alfreton and South Normanton.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 5 is 40km (22nm). When compared to the 'do nothing' baseline (40km (22nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

37.1% of the area of the Option 5 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 5 is estimated to overfly approximately 10,150 households with an approximate population of 19,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 25,700.

Up to 7,000ft, Option 5 is estimated to overfly approximately 30,550 households with an approximate population of 56,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 58,300.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 5 is estimated to overfly, 55 noise sensitive areas.

Up to 7,000ft, Option 5 is estimated to overfly 170 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 7.7 Runway 09 North Option 6

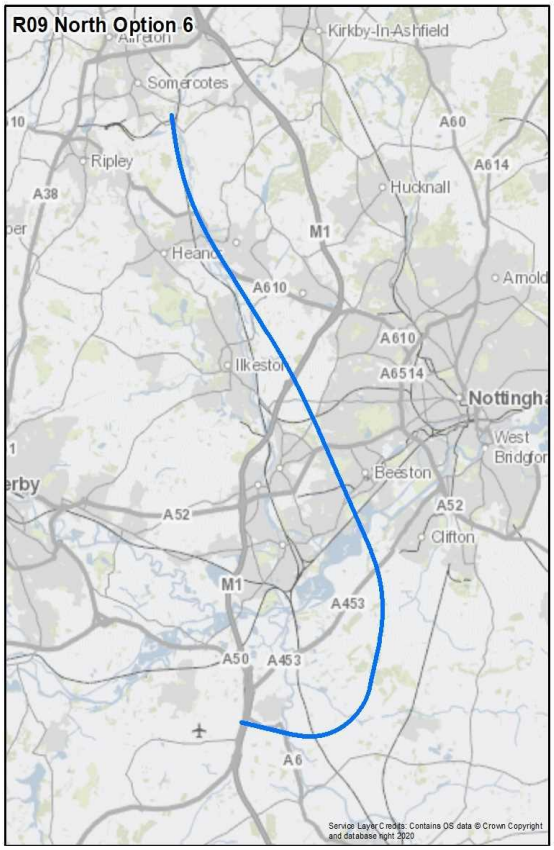
| Design Principle Evaluation | Option No. 6 |
|---|---|
| Option Name: SID RW 09 North Option 6 | ACCEPT |

**Option Description:**

This option has an initial offset of 15o to the south of the extended runway centreline which is the maximum permissible under PANS-OPS rules. The route turns left at 1nm from the DER which is as close as allowed according to CAP 778.

The initial 15° offset to the south results in the route, passing south of Kegworth and this greater offset also takes the route slightly further east than other options before the first turn north, passing between the Ratcliffe on Soar power station and Clifton. It passes between Long Eaton and Beeston before making a second left turn north west between Ilkeston and Giltbrook before turning north and terminating between Alfreton and South Normanton.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 6 is 42km (23nm). When compared to the 'do nothing' baseline (40km (22nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

31.9% of the area of the Option 6 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 6 is estimated to overfly approximately 11,450 households with an approximate population of 21,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 25,300.

Up to 7,000ft, Option 6 is estimated to overfly approximately 31,750 households with an approximate population of 58,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 62,600.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 6 is estimated to overfly, 55 noise sensitive areas.

Up to 7,000ft, Option 6 is estimated to overfly 160 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 7.8 Runway 09 North Summary

| | Option 1 | Option 1A | Option 2 | Option 3 | Option 4 | Option 5 | Option 6 |
|---|---|---|---|---|---|---|---|
| **S - Safety** | MET | MET | MET | MET | PARTIAL | MET | MET |
| **P - Programme** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **C - Continuity** | MET | MET | MET | MET | MET | MET | MET |
| **E - Emissions** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **N1 - Noise** | MET | MET | MET | MET | MET | MET | MET |
| **N2 - Noise** | NOT MET | PARTIAL | MET | MET | MET | PARTIAL | NOT MET |
| **N3 - Noise** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **N4 - Noise** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **A1 - Airspace** | MET | MET | MET | MET | PARTIAL | MET | MET |
| **A2 - Airspace** | MET | MET | MET | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET | MET | MET | MET |
| | 4,000ft beneficial | Replication | Best | Best | Best | Best | 4,000ft beneficial |

## 7.9 Runway 09 North Viable but Poor Fit Options

| Option | Safety | Programme | Continuity |
|---|---|---|---|
| A7 | S | P | C |

Description: On departure from runway 09 this option heads in a north easterly direction, then initiates a gradual left-hand turn to the east of Nottingham onto a north north westerly heading.

Safety: This option fails to align with this design principle, because it would exceed controlled airspace and come into conflict with parachute activity at Syerston.

Programme: This option fails to align with the integration and environmental ends of the AMS.

*Integration*: This option would require additional airspace to mitigate the safety risk of operating in Class G airspace. There is an expectation that this additional airspace would be required 24x7 and therefore would adversely impact other airspace users, particularly GA traffic and parachute activity at Syerston.

*Environment*: This option would involve greater track mileage than is necessary by taking traffic north east before turning it north leading to increased fuel burn and emissions. The track taken would avoid central Nottingham which may result in some noise benefit in comparison to other options.

*Trade-offs*: Whilst there may be a benefit in the number of people impacted by noise, the resultant safety impact, requirement for additional CAS, impact on GA and parachute operations at Syerston and additional fuel burn and emissions mean there is no trade-off to be made to justify an amber rating.

| | | | |
|---|---|---|---|
| B8 | S | P | C |

Description: On departure from runway 09 this option makes an immediate 180-degrees left-hand turn to proceed in a westerly direction. A turn to the right is made to the east of Derby onto a northerly heading towards the SID aiming point.

Programme: This option fails to align with the environmental end of the AMS.

*Environment*: This option would involve greater track mileage than is necessary by taking traffic north and west before turning it east leading to increased fuel burn and emissions. The track taken over Long Eaton and Derby means that the number of people impacted by noise for this option in comparison to other options does not show a material benefit. There is also the potential for interactions with arrivals from the north which would adversely impact either continuous climb or continuous descents with the resultant impact on noise and fuel burn.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

Continuity: This option fails to align with this design principle, because it is likely to interact with arrivals to runway 09 from the north and would have a prolonged interaction with the west and north west departure envelopes. When combined, this would limit the ability to achieve one minute departure splits and not enable best use of runway capacity.

| | | | |
|---|---|---|---|
| C9 | S | P | C |

Description: On departure from Runway 09 this option initiates a wide right-hand wrap-around to pass to the west of EMA in a northerly direction, overflying east Derby and heading north towards the SID aiming point.

Safety: This option fails to align with this design principle, because it is expected to conflict or present a hazardous interaction with arrivals to runway 09 and the runway 09 Missed Approach Procedure (MAP).

Programme: This option fails to align with the environmental end of the AMS.

*Environment*: This option would involve greater track mileage than is necessary by taking traffic south and west before turning it north leading to increased fuel burn and emissions. The track taken over Derby means that the number of people impacted by noise for this option in comparison to other options does not show a material benefit.

Trade-offs: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

Continuity: This option fails to align with this design principle, because it would have a prolonged interaction with the south departure envelope which would limit the ability to achieve one minute departure splits and not enable best use of runway capacity. The potential interaction with arrivals would impact the arrivals traffic flow, which again would not enable best use of runway capacity.

| D10 | S | P | C |
|---|---|---|---|

Description: After departing runway 09 this option routes in a north easterly direction before turning left over central Nottingham and routing north towards the SID aiming point.

Programme: This option fails to align with the environmental end of the AMS.

*Environment*: This option would involve greater track mileage than is necessary by taking traffic north and east before turning it north leading to increased fuel burn and emissions. The track taken over central Nottingham means that a significant number of people are likely to be impacted by noise below 4,000ft, meaning that when compared to other options, this does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

| E11 | S | P | C |
|---|---|---|---|

Description: On departure from runway 09 this option initiates a tight right-hand wrap-around to pass to the west of EMA and routing between Derby and Long Eaton before heading north towards the SID aiming point.

Safety: This option fails to align with this design principle, because it is expected to conflict or present a hazardous interaction with arrivals to runway 09 and the runway 09 Missed Approach Procedure (MAP).

Programme: This option fails to align with the environmental end of the AMS.

*Environment:* The number of people impacted by noise for this option in comparison to other options does not show a material benefit. The emissions generated by this option have been assessed as being greater when compared with other options.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

Continuity: This option fails to align with this design principle, because it would have a prolonged interaction with the south departure envelope which would limit the ability to achieve one minute departure splits and not enable best use of runway capacity. The potential interaction with arrivals would impact the arrivals traffic flow, which again would not enable best use of runway capacity.

# 8 Runway 09 North West

## 8.1 Runway 09 North West Option 1A

| Design Principle Evaluation | Option No. 1A |
|---|---|
| Option Name: SID RW 09 North West Option 1A | ACCEPT |

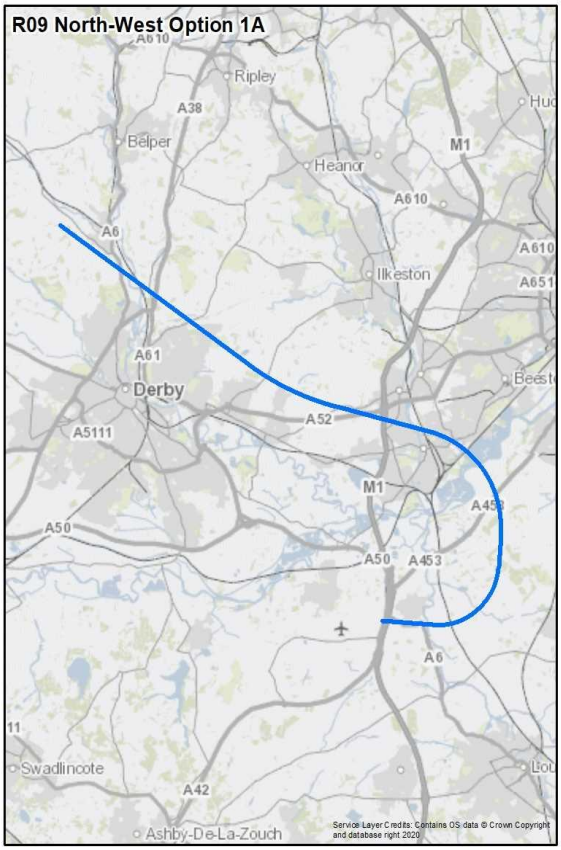
**Option Description:**

Option 1A is an RNAV 1 replication of the current TNT SID departure and is included as a 'do minimum' option.

The initial turn is replicated as closely as possible to the existing SID but cannot be replicated exactly due to requirements in CAP 778 for two waypoints to be created for turns in excess of 120° (rather than a single point). As a replicated route it follows a similar track over the ground as the current SID.

After take-off the route has a 7° southerly offset from the runway heading, to pass to the south of Kegworth. The track then turns north east of West Leake and then north west passing to the north of Long Eaton.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 1A is 39km (21nm). When compared to the 'do nothing' baseline (37km (20nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

31.1% of the area of the Option 1A overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1A is estimated to overfly approximately 10,100 households with an approximate population of 19,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 21,400.

Up to 7,000ft, Option 1A is estimated to overfly approximately 22,150 households with an approximate population of 42,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 42,100.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1A is estimated to overfly, 40 noise sensitive areas.

Up to 7,000ft, Option 1A is estimated to overfly 105 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 8.2 Runway 09 North West Option 2

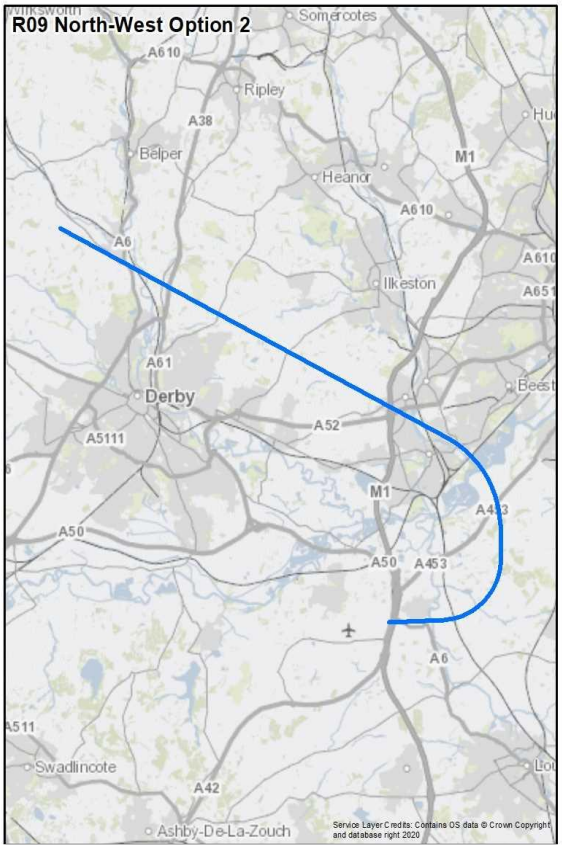
| Design Principle Evaluation | Option No. 2 |
|---|---|
| Option Name: SID RW 09 North West Option 2 | ACCEPT |

**Option Description:**

Option 2 proceeds straight ahead after take-off with no offset and commences the initial left turn 1.4nm from the DER, the closest that is supported by CAP 778 and PANS-OPS when followed by a turn in excess of 120°.

The route overflies the southern edge of Kegworth, before turning left and passing between the Ratcliffe on Soar power station and Clifton. It then turns onto a north west heading passing just north of the M1 junction 25, to the north east of Derby and terminates west of Duffield.

The CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 2 is 38km (21nm). When compared to the 'do nothing' baseline (37km (20nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

28.5% of the area of the Option 2 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 2 is estimated to overfly approximately 8,450 households with an approximate population of 15,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 16,100.

Up to 7,000ft, Option 2 is estimated to overfly approximately 13,700 households with an approximate population of 26,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 26,100.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 2 is estimated to overfly, 30 noise sensitive areas.

Up to 7,000ft, Option 2 is estimated to overfly 70 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 8.3 Runway 09 North West Option 3

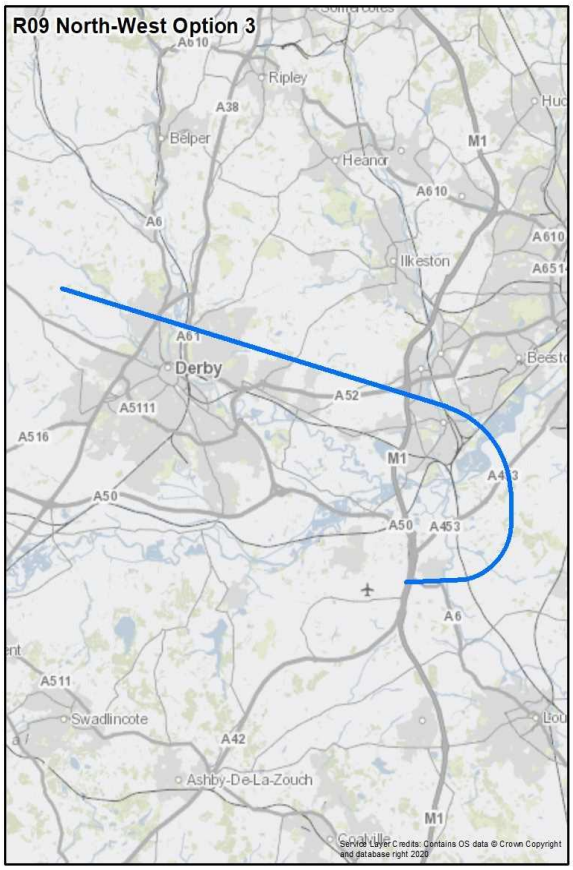
| Design Principle Evaluation | Option No. 3 |
|---|---|
| Option Name: SID RW 09 North West Option 3 | ACCEPT |

**Option Description:**

Option 3 proceeds straight ahead after take-off with no offset and commences the initial left turn 1.4nm from the DER, the closest that is supported by CAP 778 and PANS-OPS when followed by a turn in excess of 120°.

The route overflies the southern edge of Kegworth, before turning left and passing between the Ratcliffe on Soar power station and Clifton. It then turns onto a north west heading passing just south of the M1 junction 25 and maintains this heading passing over northern Derby and terminates at the southern edge of the design envelope close to Kirk Langley.

The CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 3 is 38km (21nm). When compared to the 'do nothing' baseline (37km (20nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

26.9% of the area of the Option 3 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 3 is estimated to overfly approximately 9,850 households with an approximate population of 18,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 21,800.

Up to 7,000ft, Option 3 is estimated to overfly approximately 35,500 households with an approximate population of 66,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 66,200.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 3 is estimated to overfly, 35 noise sensitive areas.

Up to 7,000ft, Option 3 is estimated to overfly 165 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | MET |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA. | |

## 8.4 Runway 09 North West Option 4

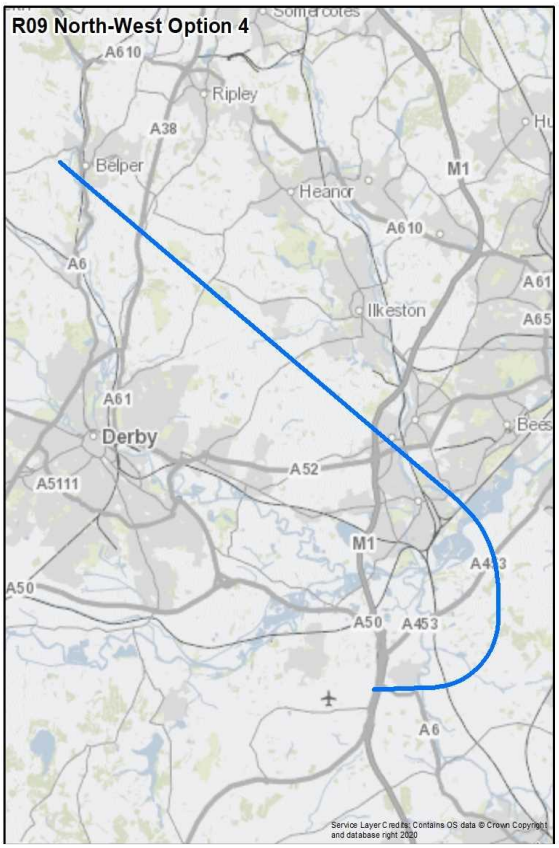
| Design Principle Evaluation | Option No. 4 |
|---|---|
| Option Name: SID RW 09 North West Option 4 | ACCEPT |

**Option Description:**

Option 4 proceeds straight ahead after take-off with no offset and commences the initial left turn 1.4nm from the DER, the closest that is supported by CAP 778 and PANS-OPS when followed by a turn in excess of 120°.

The route overflies the southern edge of Kegworth, before turning left and passing between the Ratcliffe on Soar power station and Clifton. It then turns onto a north west heading passing south of Ilkeston, terminating west of Belper close to Blackbrook.

The CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being similar and reduced, respectively, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 4 is 39km (21nm). When compared to the 'do nothing' baseline (37km (20nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

30.6% of the area of the Option 4 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 4 is estimated to overfly approximately 9,150 households with an approximate population of 17,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 20,100.

Up to 7,000ft, Option 4 is estimated to overfly approximately 21,150 households with an approximate population of 39,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 39,400.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a similar population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 4 is estimated to overfly, 35 noise sensitive areas.

Up to 7,000ft, Option 4 is estimated to overfly 125 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | MET |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA. | |

## 8.5 Runway 09 North West Option 5

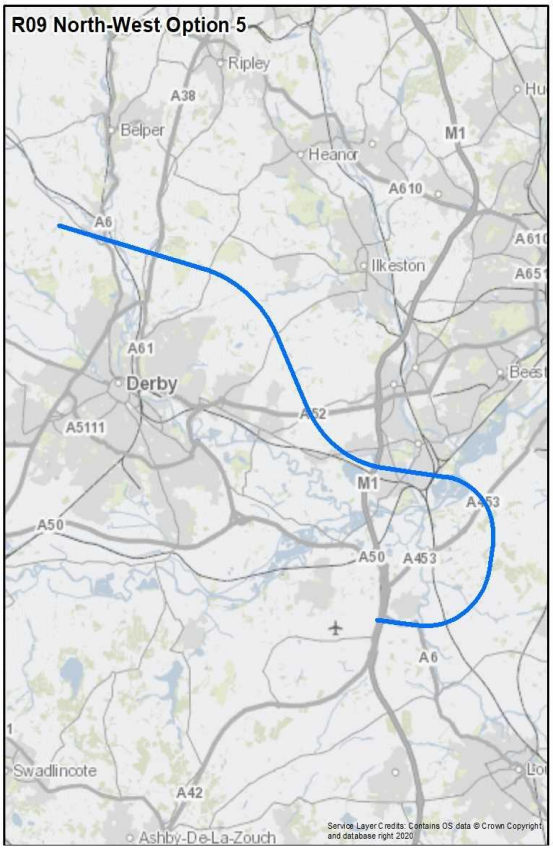
| Design Principle Evaluation | Option No. 5 |
|---|---|
| Option Name: SID RW 09 North West Option 5 | ACCEPT |

**Option Description:**

This option has an initial offset of 10° to the south from the runway heading and has been created to reduce the impact of noise on Long Eaton. The final element of the route was modified after engagement following feedback from NERL to ensure it is orientated in the correct direction to join the NERL network.

The initial 10° offset to the south results in the route, passing south of Kegworth with the first turn to the north made at 1nm after the DER passing between the Ratcliffe on Soar power station and Clifton. This takes it onto westerly heading where it overflies the southern portion of Long Eaton. A right turn to the north west is made to ensure the route passes between Ilkeston and Derby with final left turn occurring north of Derby with the route terminating close to Duffield.

The initial turns have been limited to 190KIAS to enable the tightest turn possible to achieve a more southerly route over Long Eaton. The route is PANS-OPS compliant but should it become a preferred option then it is recommended that it is assessed for flyability as part of the procedure validation process within Stage 4 of CAP1616.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being similar and reduced, respectively, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 5 is 40km (22nm). When compared to the 'do nothing' baseline (37km (20nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

31.9% of the area of the Option 5 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 5 is estimated to overfly approximately 10,100 households with an approximate population of 18,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 18,400.

Up to 7,000ft, Option 5 is estimated to overfly approximately 14,550 households with an approximate population of 26,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 26,800.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a similar population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 5 is estimated to overfly, 40 noise sensitive areas.

Up to 7,000ft, Option 5 is estimated to overfly 75 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | PARTIAL |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS-OPS 8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables CCO to be conducted at EMA. A design speed restriction has been applied to the first turn which allows for the turn radius to be decreased. This speed is PANS-OPS compliant but a flyability check may be required during Stage 4 of the ACP process. | |

## 8.6 Runway 09 North West Option 6

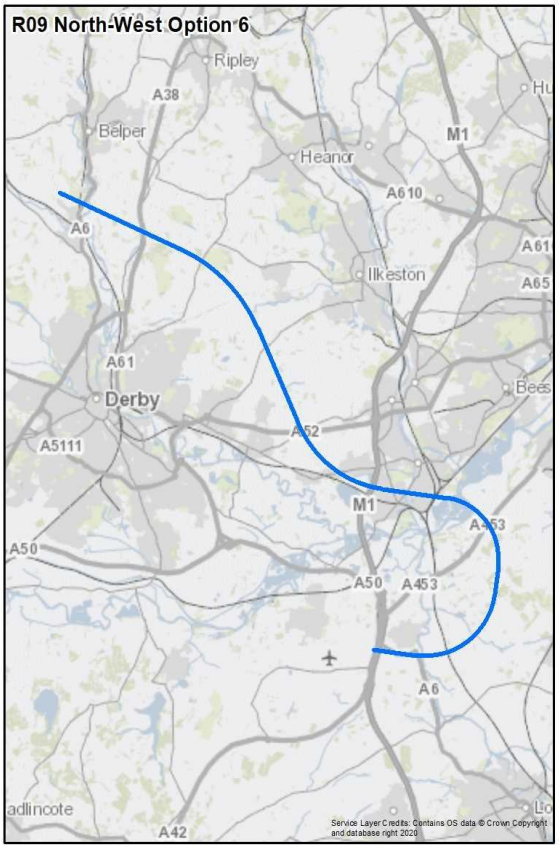
| Design Principle Evaluation | Option No. 6 |
|---|---|
| Option Name: SID RW 09 North West Option 6 | ACCEPT |

**Option Description:**

This option has an initial offset of 10° to the south from the runway heading and has been created to reduce the impact of noise on Long Eaton. It is identical to Option 5 until reaching west of West Hallam at which point this route takes a slightly more northerly track.

The initial 10° offset to the south results in the route, passing south of Kegworth with the first turn to the north made at 1nm after the DER passing between the Ratcliffe on Soar power station and Clifton. This takes it onto westerly heading where it overflies the southern portion of Long Eaton. A right turn to the north west is made to ensure the route passes between Ilkeston and Derby with final left turn occurring north of Derby with the route terminating north of Duffield.

The initial turns have been limited to 190KIAS to enable the tightest turn possible to achieve a more southerly route over Long Eaton. The route is PANS-OPS compliant, but should it become a preferred option then it is recommended that it is assessed for flyability as part of the procedure validation process within Stage 4 of CAP1616.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being similar and reduced, respectively, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 6 is 40km (22nm). When compared to the 'do nothing' baseline (37km (20nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

32.8% of the area of the Option 6 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 6 is estimated to overfly approximately 10,150 households with an approximate population of 18,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 18,800.

Up to 7,000ft, Option 6 is estimated to overfly approximately 15,550 households with an approximate population of 28,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 28,500.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a similar population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 6 is estimated to overfly, 40 noise sensitive areas.

Up to 7,000ft, Option 6 is estimated to overfly 85 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | PARTIAL |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS-OPS 8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables CCO to be conducted at EMA. A design speed restriction has been applied to the first turn which allows for the turn radius to be decreased. This speed is PANS-OPS compliant but a flyability check may be required during Stage 4 of the ACP process. | |

## 8.7 Runway 09 North West Option 7

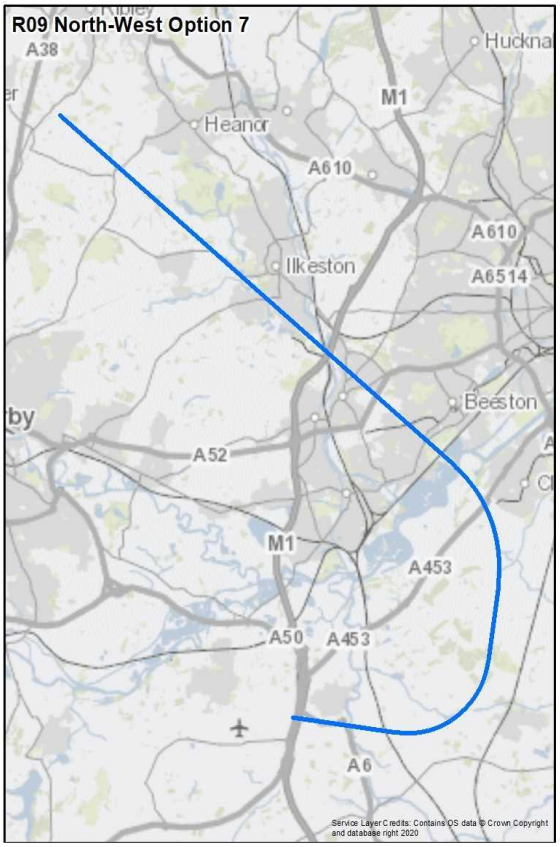
| Design Principle Evaluation | Option No. 7 |
|---|---|
| Option Name: SID RW 09 North West Option 7 | REJECT |

**Option Description:**

This option has an initial offset of 10° to the south from the runway heading and has been created in response to airline stakeholder feedback to consider a wider turn whilst still endeavouring to reduce the impact of noise on Long Eaton.

The initial 10° offset to the south results in the route, passing south of Kegworth, with a left turn onto a northerly heading commencing at 2nm beyond the DER, passing close to East Leake and Clifton. The route then turns north west passing north of Long Eaton and south west of Ilkeston and terminates east of Belper close to Denby village.

The CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 7 is 44km (24nm). When compared to the 'do nothing' baseline (37km (20nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

23.2% of the area of the Option 7 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 7 is estimated to overfly approximately 9,300 households with an approximate population of 17,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 30,600.

Up to 7,000ft, Option 7 is estimated to overfly approximately 29,700 households with an approximate population of 54,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 59,800.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 7 is estimated to overfly, 50 noise sensitive areas.

Up to 7,000ft, Option 7 is estimated to overfly 150 noise sensitive areas.

This is a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | MET |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA. | |

## 8.8 Runway 09 North West Option 8

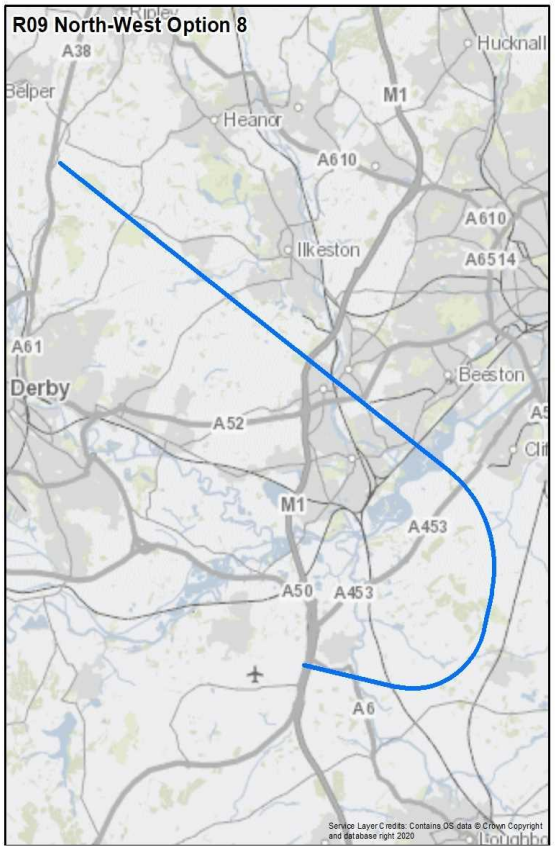
| Design Principle Evaluation | Option No. 8 |
|---|---|
| Option Name: SID RW 09 North West Option 8 | ACCEPT |

**Option Description:**

This option is responding to stakeholder feedback to use the maximum 15° southerly offset to reduce the impact of noise on Kegworth whilst also using the later first turn of Option 7.

The initial 15° offset to the south results in the route, passing south of Kegworth and the route then makes a left turn north at 2nm beyond the DER passing between West Leake and East Leake, and south west of Clifton. The route then turns north west passing north of Long Eaton and south of Ilkeston. The route terminates south east of Belper close to Lower Kilburn.

The CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 8 is 44km (24nm). When compared to the 'do nothing' baseline (37km (20nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

26.5% of the area of the Option 8 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 8 is estimated to overfly approximately 7,200 households with an approximate population of 14,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 17,300.

Up to 7,000ft, Option 8 is estimated to overfly approximately 21,850 households with an approximate population of 40,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 43,900.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 8 is estimated to overfly, 25 noise sensitive areas.

Up to 7,000ft, Option 8 is estimated to overfly 105 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 8.9 Runway 09 North West Option 9

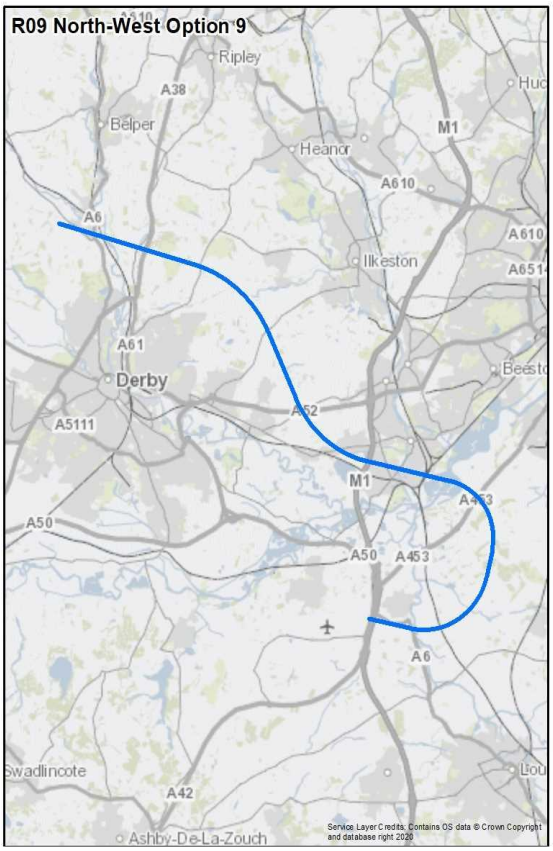
| Design Principle Evaluation | Option No. 9 |
|---|---|
| Option Name: SID RW 09 North West Option 9 | ACCEPT |

**Option Description:**

This option is responding to stakeholder feedback to use the maximum 15° southerly offset to reduce the impact of noise on Kegworth. The final element of the route was modified after engagement following feedback from NERL to ensure it is orientated in the correct direction to join the NERL network. It is similar to Option 5 but uses a greater offset.

The initial 15° offset to the south results in the route, passing south of Kegworth with the first turn to the north made at 1nm after the DER passing between the Ratcliffe on Soar power station and Clifton. This takes it onto westerly heading where it overflies the southern portion of Long Eaton. A right turn to the north west is made to ensure the route passes between Ilkeston and Derby with final left turn occurring north of Derby with the route terminating close to Duffield.

The initial turns have been limited to 190KIAS to enable the tightest turn possible to achieve a more southerly route over Long Eaton. The route is PANS-OPS compliant but should it become a preferred option then it is recommended that it is assessed for flyability as part of the procedure validation process within Stage 4 of CAP1616.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being similar and reduced, respectively, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 9 is 40km (22nm). When compared to the 'do nothing' baseline (37km (20nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

32.2% of the area of the Option 9 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 9 is estimated to overfly approximately 10,100 households with an approximate population of 18,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 18,200.

Up to 7,000ft, Option 9 is estimated to overfly approximately 14,550 households with an approximate population of 26,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 26,600.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a similar population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 9 is estimated to overfly, 40 noise sensitive areas.

Up to 7,000ft, Option 9 is estimated to overfly 75 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | PARTIAL |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS-OPS 8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables CCO to be conducted at EMA. A design speed restriction has been applied to the first turn which allows for the turn radius to be decreased. This speed is PANS-OPS compliant but a flyability check may be required during Stage 4 of the ACP process. | |

## 8.10 Runway 09 North West Option 10

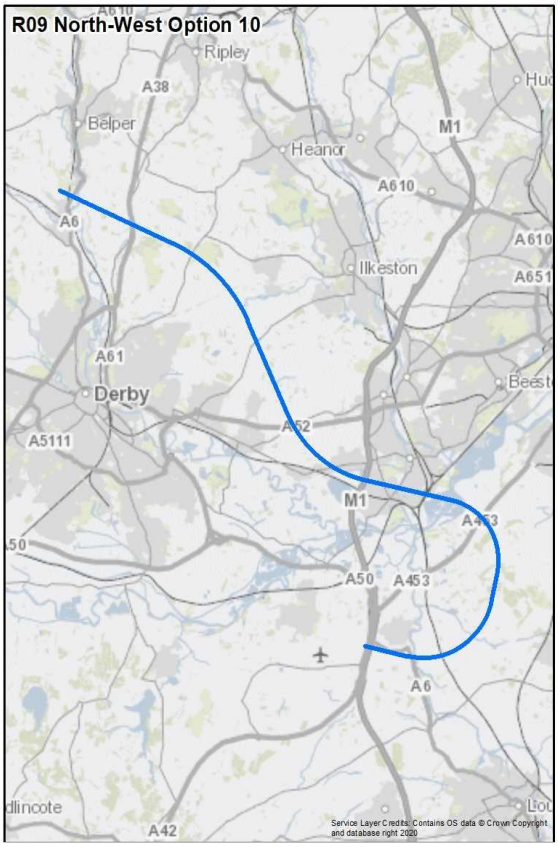
| Design Principle Evaluation | Option No. 10 |
|---|---|
| Option Name: SID RW 09 North West Option 10 | ACCEPT |

**Option Description:**

This option is responding to stakeholder feedback to use the maximum 15° southerly offset to reduce the impact of noise on Kegworth. It is similar to Option 6, but with a greater offset.

The initial 15° offset to the south results in the route, passing south of Kegworth with the first turn to the north made at 1nm after the DER passing between the Ratcliffe on Soar power station and Clifton. This takes it onto westerly heading where it overflies the southern portion of Long Eaton. A right turn to the north west is made to ensure the route passes between Ilkeston and Derby with final left turn occurring north of Derby with the route terminating north of Duffield.

The initial turns have been limited to 190KIAS to enable the tightest turn possible to achieve a more southerly route over Long Eaton. The route is PANS-OPS compliant, but should it become a preferred option then it is recommended that it is assessed for flyability as part of the procedure validation process within Stage 4 of CAP1616.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being similar and reduced, respectively, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 10 is 40km (22nm). When compared to the 'do nothing' baseline (37km (20nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

32.9% of the area of the Option 10 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 10 is estimated to overfly approximately 10,150 households with an approximate population of 18,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 18,700.

Up to 7,000ft, Option 10 is estimated to overfly approximately 15,600 households with an approximate population of 28,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 28,400.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a similar population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 10 is estimated to overfly, 40 noise sensitive areas.

Up to 7,000ft, Option 10 is estimated to overfly 85 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | PARTIAL |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS-OPS 8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables CCO to be conducted at EMA. A design speed restriction has been applied to the first turn which allows for the turn radius to be decreased. This speed is PANS-OPS compliant but a flyability check may be required during Stage 4 of the ACP process. | |

## 8.11 Runway 09 North West Option 11

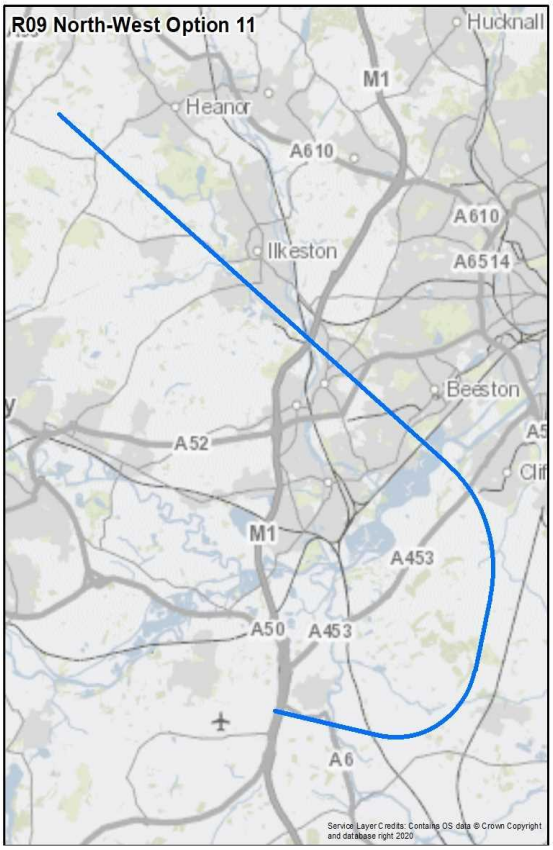
| Design Principle Evaluation | Option No. 11 |
|---|---|
| Option Name: SID RW 09 North West Option 11 | REJECT |

**Option Description:**

This option is responding to stakeholder feedback to use the maximum 15° southerly offset to reduce the impact of noise on Kegworth. It is similar to Option 7, but with a greater offset.

The initial 15° offset to the south results in the route, passing south of Kegworth, with a left turn onto a northerly heading commencing at 2nm beyond the DER, passing close to East Leake and Clifton. The route then turns north west passing north of Long Eaton and south west of Ilkeston and terminates east of Belper close to Denby village.

The CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 11 is 45km (24nm). When compared to the 'do nothing' baseline (37km (20nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

20.4% of the area of the Option 11 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 11 is estimated to overfly approximately 9,300 households with an approximate population of 17,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 22,100.

Up to 7,000ft, Option 11 is estimated to overfly approximately 31,600 households with an approximate population of 58,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 63,300.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 11 is estimated to overfly, 45 noise sensitive areas.

Up to 7,000ft, Option 11 is estimated to overfly 160 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | MET |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA. | |

## 8.12 Runway 09 North West Summary

| | Option 1A | Option 2 | Option 3 | Option 4 | Option 5 | Option 6 | Option 7 | Option 8 | Option 9 | Option 10 | Option 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **S - Safety** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **P - Programme** | PARTIAL | MET | PARTIAL | MET | MET | MET | PARTIAL | MET | MET | MET | PARTIAL |
| **C - Continuity** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **E - Emissions** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | NOT MET | NOT MET | PARTIAL | PARTIAL | NOT MET |
| **N1 - Noise** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **N2 - Noise** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | MET | MET | NOT MET | NOT MET | MET | MET | NOT MET |
| **N3 - Noise** | PARTIAL | MET | PARTIAL | MET | MET | MET | PARTIAL | MET | MET | MET | PARTIAL |
| **N4 - Noise** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **A1 - Airspace** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **A2 - Airspace** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET | PARTIAL | PARTIAL | MET | MET | PARTIAL | PARTIAL | MET |
| | Replication | Best | Best | Best | Best | Best | Rejected | 4,000ft beneficial | Best | Best | Rejected |

## 8.13 Runway 09 North West Viable but Poor Fit Options

| Option | Safety | Programme | Continuity |
|---|---|---|---|
| A12 | S | P | C |

Description: On departure from runway 09 this option proceeds in an east-south east direction for approximately 3nm and then makes a 90-degree left-hand turn north, followed by a left turn over central Nottingham to head in a north westerly direction towards the SID aiming point.

Programme: This option fails to align with the environmental end of the AMS.

> *Environment:* This option would involve greater track mileage than is necessary by taking traffic north and east before turning it north leading to increased fuel burn and emissions. The track taken over central Nottingham means that a significant number of people are likely to be impacted by noise below 4,000ft, meaning that when compared to other options, this does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

| B13 | S | P | C |
|---|---|---|---|

Description: After departure from runway 09 this option initiates a180-degree right turn around EMA to head in a north westerly direction, passing west of Derby.

Safety: This option fails to align with this design principle, because it is expected to conflict or present a hazardous interaction with arrivals to runway 09 and the runway 09 Missed Approach Procedure (MAP).

Programme: This option fails to align with the environmental end of the AMS.

> *Environment*: This option would involve greater track mileage than is necessary by taking traffic south and west before turning it north leading to increased fuel burn and emissions. The track taken over Derby means that the number of people impacted by noise for this option in comparison to other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

Continuity: This option fails to align with this design principle, because it would interact with the south departure envelope which would limit the ability to achieve one minute departure splits and not enable best use of runway capacity. The potential interaction with arrivals would impact the arrivals traffic flow, which again would not enable best use of runway capacity.

| C14 | S | P | C |
|---|---|---|---|

Description: On departure from runway 09 this option proceeds in a north easterly direction, then initiates a gradual left-hand turn to the east of Nottingham onto a north north westerly heading.

Safety: This option fails to align with this design principle, because it would exceed controlled airspace and come into conflict with parachute activity at Syerston.

Programme: This option fails to align with the environmental end of the AMS.

> *Integration:* This option would require additional airspace to mitigate the safety risk of operating in Class G airspace. There is an expectation that this additional airspace would be required 24x7 and therefore would adversely impact other airspace users, particularly GA traffic and parachute activity at Syerston.

*Environment:* This option would involve greater track mileage than is necessary by taking traffic north east before turning it north leading to increased fuel burn and emissions. The track taken would avoid central Nottingham which may result in some noise benefit in comparison to other options.

*Trade-offs:* Whilst there may be a benefit in the number of people impacted by noise, the resultant safety impact, requirement for additional CAS, impact on GA and parachute operations at Syerston and additional fuel burn and emissions mean there is no trade-off to be made to justify an amber rating.

# 9 Runway 09 South

## 9.1 Runway 09 South Option 1

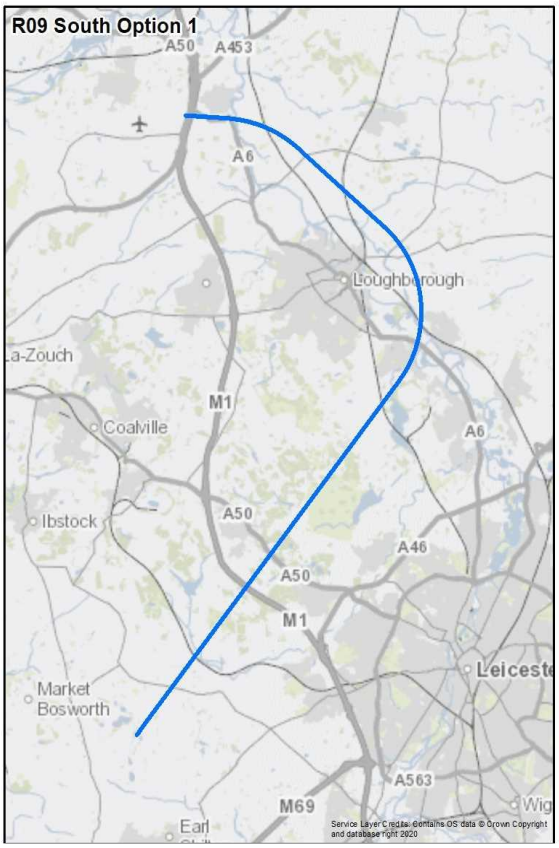
| Design Principle Evaluation | Option No. 1 |
|---|---|
| Option Name: SID RW 09 South Option 1 | ACCEPT |

**Option Description:**

Option 1 is an RNAV 1 replication of the current Daventry 4P SID with a southerly offset included as a 'Do minimum' option. An initial 7° southerly offset leads to the first turn which commences 1nm after the DER which is PANS-OPS compliant but earlier than the current SID. It utilises fly-by waypoints to create an approximate replication of the existing SID.

As a replicated route it follows a similar track over the ground as the current route, turning right after departure to route east of Loughborough, before turning right to the south west and terminating in the vicinity of Mallory Park, west of Leicester.

The CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 1 is 41km (22nm). When compared to the 'do nothing' baseline (42km (23nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

21.0% of the area of the Option 1 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1 is estimated to overfly approximately 2,950 households with an approximate population of 5,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 7,400.

Up to 7,000ft, Option 1 is estimated to overfly approximately 7,050 households with an approximate population of 12,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 14,000.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1 is estimated to overfly, 20 noise sensitive areas.

Up to 7,000ft, Option 1 is estimated to overfly 35 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | MET |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA. | |

## 9.2 Runway 09 South Option 1A

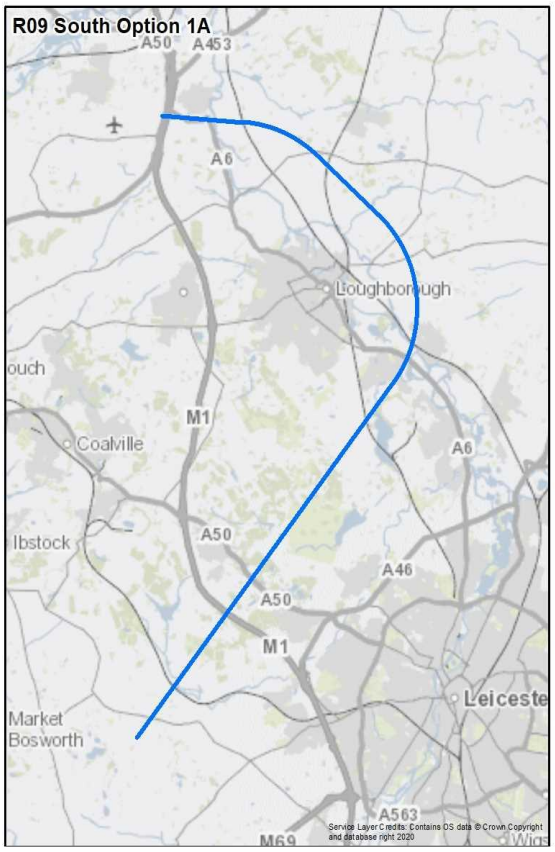
| Design Principle Evaluation | Option No. 1A |
|---|---|
| Option Name: SID RW 09 South Option 1A | ACCEPT |

**Option Description:**

Option 1A is an RNAV 1 replication of the current Daventry 4P SID with a southerly offset included as a 'Do minimum' option. An initial 7° southerly offset leads to the first turn which commences in the same place as the current SID, 2nm beyond the DER, and it uses fly-by waypoints to create an approximate replication of the existing SID.

As a replicated route it follows a similar track over the ground as the current route, turning right after departure to route east of Loughborough, before turning right to the south west and terminating in the vicinity of Mallory Park, west of Leicester.

The CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 1A is 42km (23nm). When compared to the 'do nothing' baseline (42km (23nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

22.0% of the area of the Option 1A overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1A is estimated to overfly approximately 3,900 households with an approximate population of 7,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 8,500.

Up to 7,000ft, Option 1A is estimated to overfly approximately 7,800 households with an approximate population of 14,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 15,700.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1A is estimated to overfly, 35 noise sensitive areas.

Up to 7,000ft, Option 1A is estimated to overfly 55 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 9.3 Runway 09 South Option 2

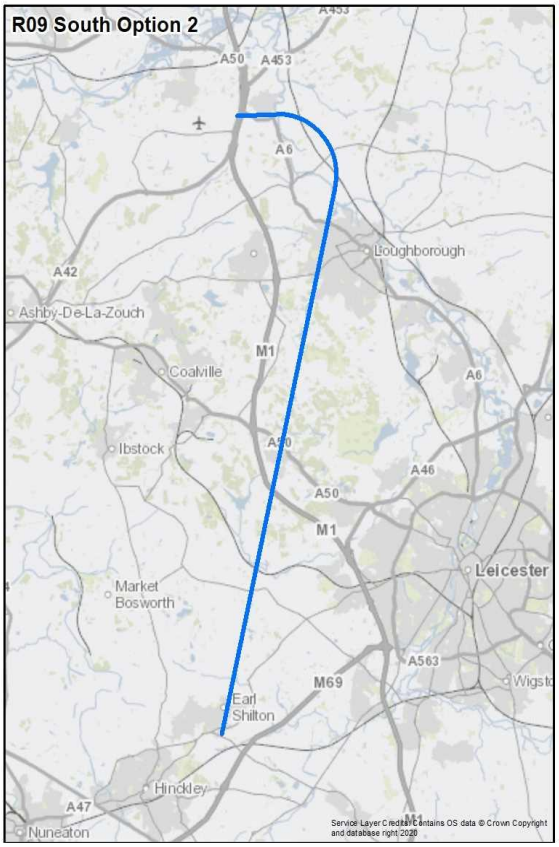
| Design Principle Evaluation | Option No. 2 |
|---|---|
| Option Name: SID RW 09 South Option 2 | REJECT |

**Option Description:**

Option 2 proceeds straight ahead after take-off with no offset and commences the single right turn south at 1.07nm beyond the DER.

The route overflies the southern edge of Kegworth, before turning right and passing between Sutton Bonington and East Leake before routing over western Loughborough and terminating north east of Hinckley near Earl Shilton.

The CAP 778 recommended speed of 210kts has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. This route is deemed not to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being increased, when compared to the baseline values. The emissions generated by the route are expected to be better than the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 2 is 36km (19nm). When compared to the 'do nothing' baseline (42km (23nm)) this option is shorter in length and it is therefore anticipated that emissions would be better.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

35.9% of the area of the Option 2 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 2 is estimated to overfly approximately 6,050 households with an approximate population of 16,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 21,700.

Up to 7,000ft, Option 2 is estimated to overfly approximately 16,950 households with an approximate population of 36,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 36,400.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 2 is estimated to overfly, 35 noise sensitive areas.

Up to 7,000ft, Option 2 is estimated to overfly 85 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | MET |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA. | |

## 9.4 Runway 09 South Option 3

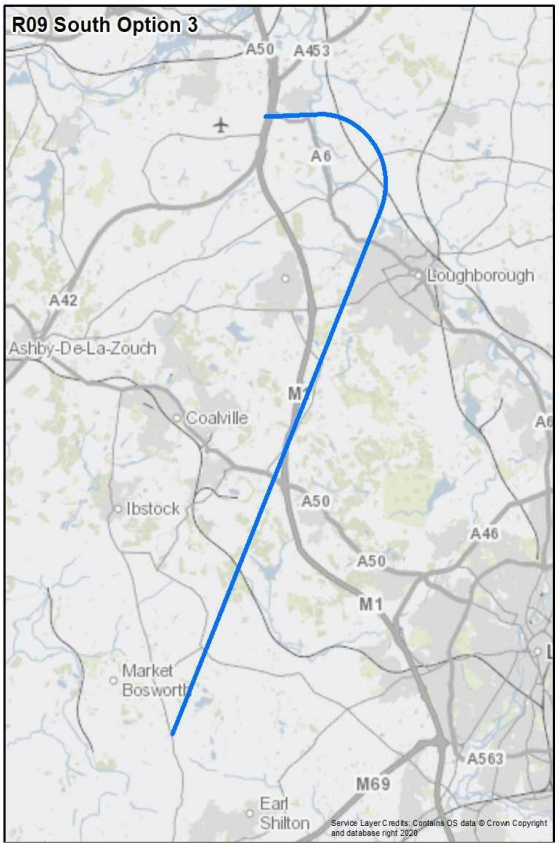
| Design Principle Evaluation | Option No. 3 |
|---|---|
| Option Name: SID RW 09 South Option 3 | ACCEPT |

**Option Description:**

Option 3 proceeds straight ahead after take-off with no offset and commences the single right turn south at 1.2nm beyond the DER. This turn is slightly tighter than Option 2 with the aim of reducing overflight of Loughborough.

The route overflies the southern edge of Kegworth, before turning right and passing between Sutton Bonington and East Leake before routing over the western edge of Loughborough and terminating north of Hinckley near Mallory Park.

The CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be better than the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 3 is 37km (20nm). When compared to the 'do nothing' baseline (42km (23nm)) this option is shorter in length and it is therefore anticipated that emissions would be better.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

42.5% of the area of the Option 3 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 3 is estimated to overfly approximately 4,750 households with an approximate population of 9,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 11,900.

Up to 7,000ft, Option 3 is estimated to overfly approximately 7,600 households with an approximate population of 14,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 16,000.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 3 is estimated to overfly, 30 noise sensitive areas.

Up to 7,000ft, Option 3 is estimated to overfly 50 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 9.5 Runway 09 South Option 4

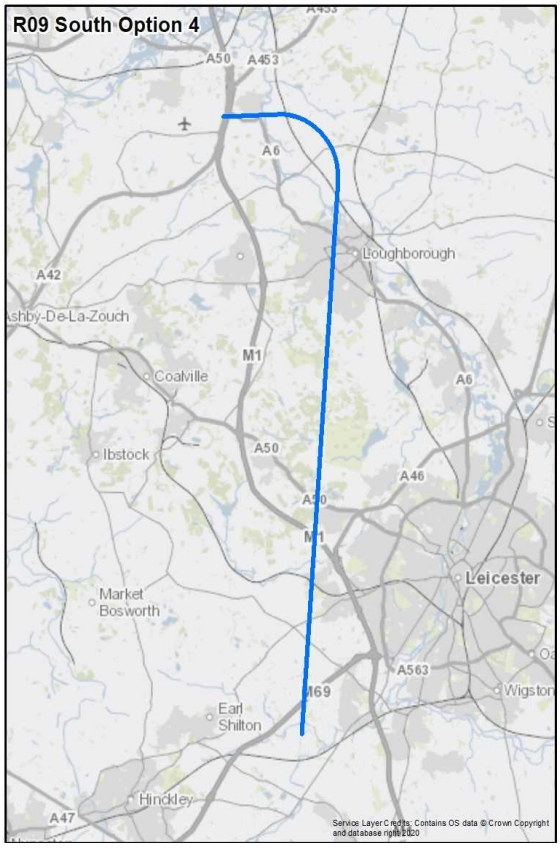
| Design Principle Evaluation | Option No. 4 |
|---|---|
| Option Name: SID RW 09 South Option 4 | REJECT |

**Option Description:**

Option 4 proceeds straight ahead after take-off with no offset and commences the single right turn south at 1.4nm beyond the DER to head almost directly south. This route overflies Loughborough but has been orientated to avoid Leicester.

The route overflies the southern edge of Kegworth, before turning right and passing between Sutton Bonington and East Leake and overflying the centre of Loughborough. It remains on this track and terminates south west of Leicester.

The CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. This route is deemed not to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being increased, when compared to the baseline values. The emissions generated by the route are expected to be better than the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 4 is 37km (20nm). When compared to the 'do nothing' baseline (42km (23nm)) this option is shorter in length and it is therefore anticipated that emissions would be better.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

38.3% of the area of the Option 4 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 4 is estimated to overfly approximately 7,050 households with an approximate population of 18,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 25,100.

Up to 7,000ft, Option 4 is estimated to overfly approximately 17,400 households with an approximate population of 37,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 39,000.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 4 is estimated to overfly, 55 noise sensitive areas.

Up to 7,000ft, Option 4 is estimated to overfly 95 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | MET |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA. | |

## 9.6 Runway 09 South Option 5

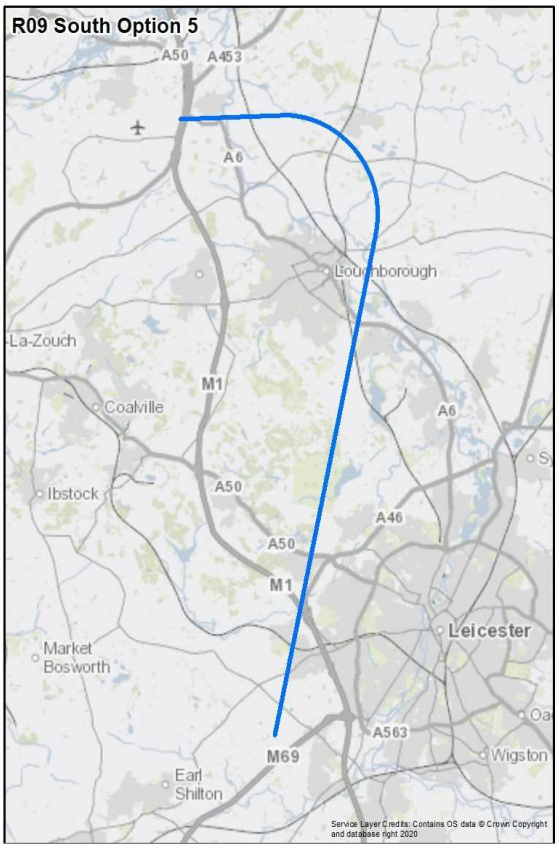
| Design Principle Evaluation | Option No. 5 |
|---|---|
| Option Name: SID RW 09 South Option 5 | REJECT |

**Option Description:**

Option 5 proceeds straight ahead with no offset for approximately 2.4Nm beyond the DER before making the first turn. This is greater than the existing SID and this extended easterly track allows the route to pass to the east and south east of Loughborough, rather than overflying it.

After departure the route overflies the southern edge of Kegworth before making its initial turn close to West Leake onto a south south west heading. The route then passes west of Leicester before terminating south west of Leicester close to Enderby.

The first turn takes place when the aircraft is above 3,000ft and has therefore been designed to be flown at 250 KIAS as per the recommendation in CAP 778.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. This route is deemed not to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being increased, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 5 is 40km (22nm). When compared to the 'do nothing' baseline (42km (23nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

41.7% of the area of the Option 5 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 5 is estimated to overfly approximately 2,050 households with an approximate population of 4,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 15,400.

Up to 7,000ft, Option 5 is estimated to overfly approximately 14,300 households with an approximate population of 27,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 28,700.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 5 is estimated to overfly, 10 noise sensitive areas.

Up to 7,000ft, Option 5 is estimated to overfly 60 noise sensitive areas.

This is a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | MET |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA. | |

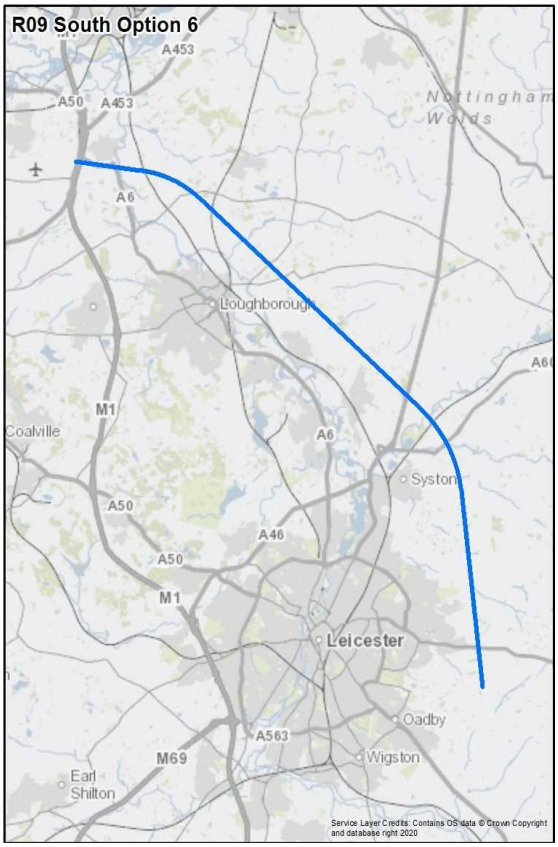
## 9.7 Runway 09 South Option 6

| Design Principle Evaluation | Option No. 6 |
|---|---|
| Option Name: SID RW 09 South Option 6 | ACCEPT |

**Option Description:**

Option 6 is a replication of the existing Brookmans Park (BPK 2P) departure that has a 10° southerly offset, and which has been included as a 'do minimum' option that also avoids large built up areas.

The initial 10° offset to the south results in the route, passing south of Kegworth with the first turn to the south east made at 1.7nm beyond the DER, thereby passing to the north east of Loughborough and Syston. It then turns south and terminates to the east of Leicester, close to Houghton on the Hill.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route. It is deemed to align with the UK AMS end Integration. For Simplification, this south bound option routes in the opposite direction to the northbound traffic flow (above 7,000ft) and could potentially interact with flights inbound to LBA and NCL within the NERL network. Further analysis on this possible misalignment will be conducted with NERL within stage 3.

When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 6 is 43km (23nm). When compared to the 'do nothing' baseline (42km (23nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

7.3% of the area of the Option 6 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 6 is estimated to overfly approximately 600 households with an approximate population of 1,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 4,600.

Up to 7,000ft, Option 6 is estimated to overfly approximately 5,850 households with an approximate population of 11,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 12,100.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 6 is estimated to overfly, 5 noise sensitive areas.

Up to 7,000ft, Option 6 is estimated to overfly 25 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 9.8 Runway 09 South Option 7

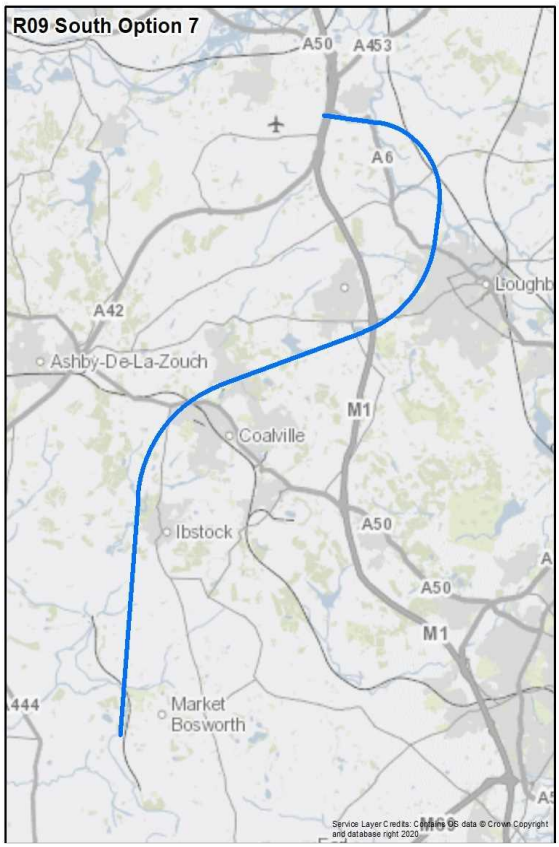
| Design Principle Evaluation | Option No. 7 |
|---|---|
| Option Name: SID RW 09 South Option 7 | REJECT |

**Option Description:**

Option 7 has an initial offset of 10° to the south from the runway heading and has been created with a loop back turn to reduce the overflight of central Loughborough and reduce the impact of noise. It also has benefits in reducing the interaction between departures to the south and arrivals from the south to runway 09.

The initial 10° offset to the south results in the route, passing south of Kegworth with the first turn to the south west commenced 1.2nm beyond the DER. The route overflies Sutton Bonington and the north western edge of Loughborough before routing south of Shepshed. A left turn takes the route south around the north west of Coalville, past the west side of Ibstock to terminate south west of Market Bosworth.

The CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. This route is deemed not to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being increased, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 7 is 41km (22nm). When compared to the 'do nothing' baseline (42km (23nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

18.6% of the area of the Option 7 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 7 is estimated to overfly approximately 7,700 households with an approximate population of 14,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 19,200.

Up to 7,000ft, Option 7 is estimated to overfly approximately 14,700 households with an approximate population of 27,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 30,300.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 7 is estimated to overfly, 35 noise sensitive areas.

Up to 7,000ft, Option 7 is estimated to overfly 80 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | MET |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA. | |

## 9.9 Runway 09 South Option 8

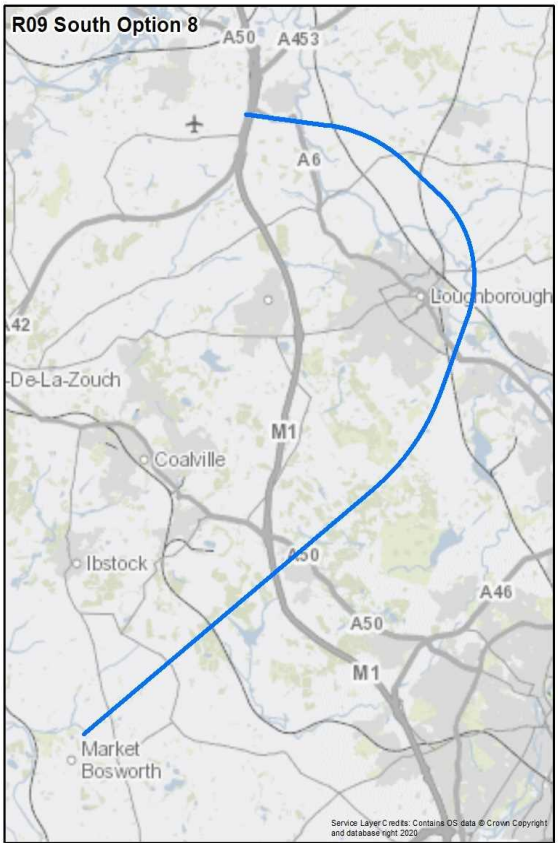
| Design Principle Evaluation | Option No. 8 |
|---|---|
| Option Name: SID RW 09 South Option 8 | ACCEPT |

**Option Description:**

Option 8 has a 10° southerly offset and follows the early part of the current BPK 2P departure but turns south west earlier to route north of Leicester.

The initial 10° offset to the south results in the route, passing south of Kegworth with the first turn to the south east made at 1.7nm beyond the DER, passing to the north east of Loughborough. It then makes a second turn onto a south west heading routing south east of Loughborough and passing between Leicester and Coalville and terminating north east of Market Bosworth.

The CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 8 is 43km (23nm). When compared to the 'do nothing' baseline (42km (23nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

19.2% of the area of the Option 8 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 8 is estimated to overfly approximately 2,000 households with an approximate population of 3,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 7,200.

Up to 7,000ft, Option 8 is estimated to overfly approximately 7,400 households with an approximate population of 13,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 15,300.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 8 is estimated to overfly, 15 noise sensitive areas.

Up to 7,000ft, Option 8 is estimated to overfly 50 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 9.10 Runway 09 South Option 9

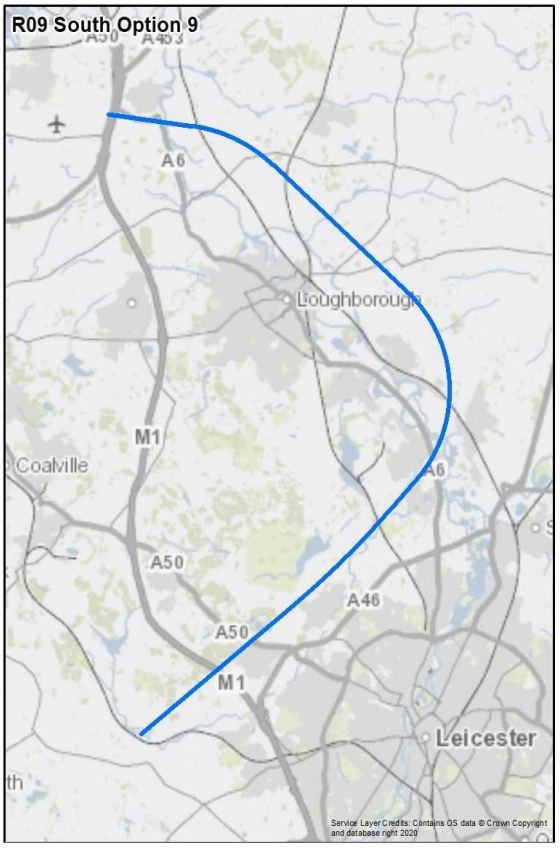
| Design Principle Evaluation | Option No. 9 |
|---|---|
| Option Name: SID RW 09 South Option 9 | REJECT |

**Option Description:**

Option 9 has a 10° southerly offset and follows the early part of the current BPK 2P departure but turns south west earlier to route north of Leicester.

The initial 10° offset to the south results in the route, passing south of Kegworth with the first turn to the south east made at 1.7nm beyond the DER, passing to the north east of Loughborough. It continues south east until approximately Barrow-upon-Soar where it turns right onto a south west heading routing north west of Leicester and terminating near Desford.

The CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. This route is deemed not to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being increased, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 9 is 44km (24nm). When compared to the 'do nothing' baseline (42km (23nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

30.6% of the area of the Option 9 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 9 is estimated to overfly approximately 2,450 households with an approximate population of 4,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 9,900.

Up to 7,000ft, Option 9 is estimated to overfly approximately 17,350 households with an approximate population of 32,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 32,300.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 9 is estimated to overfly, 15 noise sensitive areas.

Up to 7,000ft, Option 9 is estimated to overfly 80 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | MET |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA. | |

## 9.11 Runway 09 South Option 10

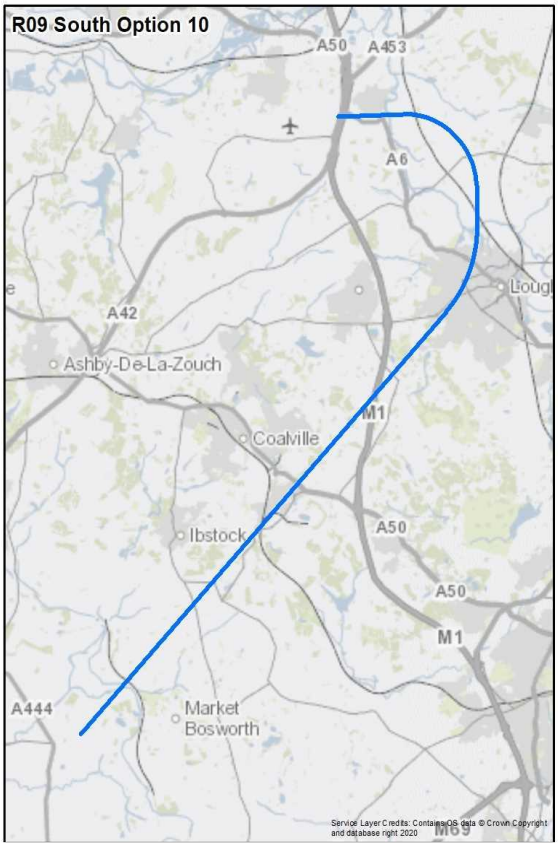
| Design Principle Evaluation | Option No. 10 |
|---|---|
| Option Name: SID RW 09 South Option 10 | ACCEPT |

**Option Description:**

Option 10 has been created to provide a fuel efficient route to the south west.

The route proceeds straight ahead after take-off and overflies the southern edge of Kegworth with no offset and commences a first 90o right turn to the south at 1.4nm beyond the DER. As the route passes over northern Loughborough it turns right onto a south west heading passing over central Loughborough, south of Coalville and terminates to the west of Market Bosworth.

The CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a similar population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be better than the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 10 is 37km (20nm). When compared to the 'do nothing' baseline (42km (23nm)) this option is shorter in length and it is therefore anticipated that emissions would be better.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

31.1% of the area of the Option 10 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 10 is estimated to overfly approximately 6,000 households with an approximate population of 17,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 22,100.

Up to 7,000ft, Option 10 is estimated to overfly approximately 8,000 households with an approximate population of 21,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 22,300.

This is a similar population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 10 is estimated to overfly, 50 noise sensitive areas.

Up to 7,000ft, Option 10 is estimated to overfly 60 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 9.12 Runway 09 South Option 11

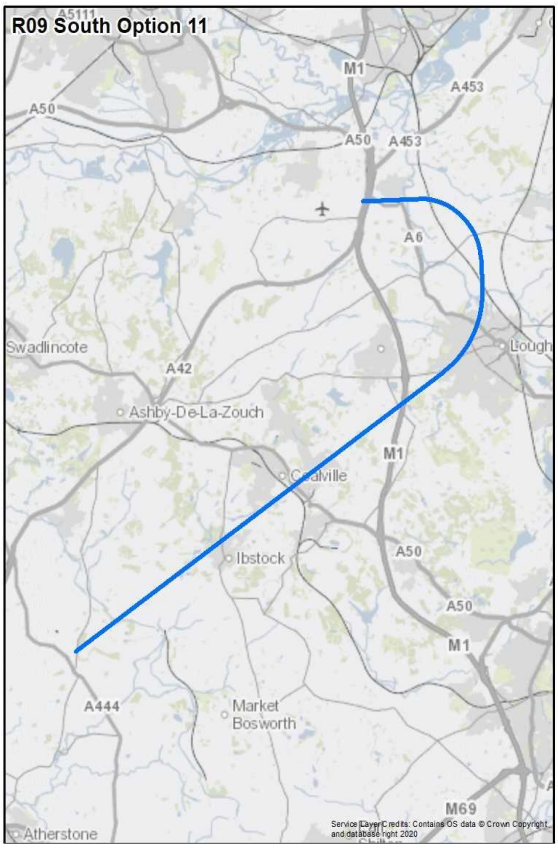
| Design Principle Evaluation | Option No. 11 |
|---|---|
| Option Name: SID RW 09 South Option 11 | REJECT |

**Option Description:**

Option 11 has been created to provide an alternative fuel efficient route to the south west and is similar to Option 10 but terminates slightly further north.

The route proceeds straight ahead after take-off and overflies the southern edge of Kegworth with no offset and commences a first 90o right turn to the south at 1.4nm beyond the DER. As the route passes over northern Loughborough it turns right onto a south west heading passing over central Loughborough, the south eastern portion of Coalville and the north west of Ibstock. The route terminates to the north west of Option 10 close to Twyford.

The CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. This route is deemed not to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being increased, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 11 is 45km (24nm). When compared to the 'do nothing' baseline (42km (23nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

25.1% of the area of the Option 11 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 11 is estimated to overfly approximately 6,650 households with an approximate population of 18,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 28,100.

Up to 7,000ft, Option 11 is estimated to overfly approximately 19,500 households with an approximate population of 42,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 43,600.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 11 is estimated to overfly, 45 noise sensitive areas.

Up to 7,000ft, Option 11 is estimated to overfly 90 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 9.13 Runway 09 South Option 12

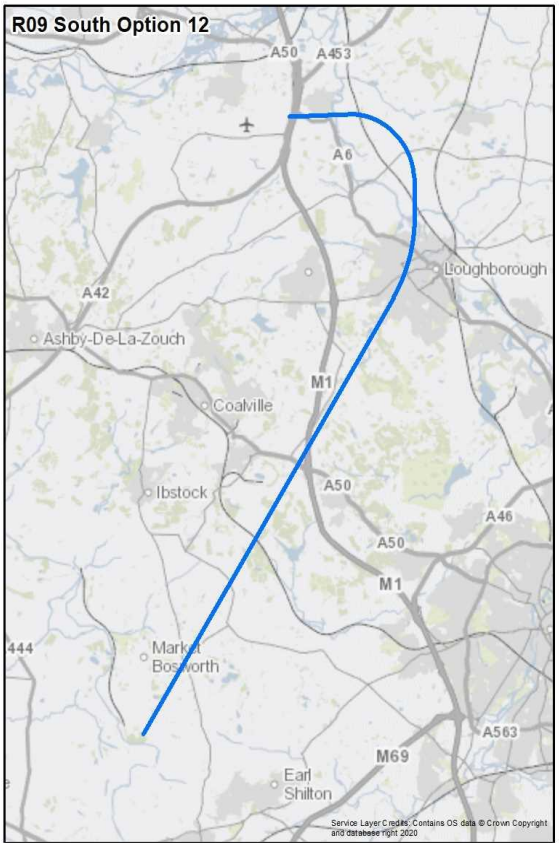
| Design Principle Evaluation | Option No. 12 |
|---|---|
| Option Name: SID RW 09 South Option 12 | REJECT |

**Option Description:**

Option 12 has been created to provide an alternative fuel efficient route to the south west and is similar to Option 10 and 11 but terminates slightly further south.

The route proceeds straight ahead after take-off and overflies the southern edge of Kegworth with no offset and commences a first 90o right turn to the south at 1.4nm beyond the DER. As the route passes over northern Loughborough it turns right onto a south west heading passing over central Loughborough, close to Markfield and terminating south of Market Bosworth.

The CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. This route is deemed not to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being increased, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 12 is 39km (21nm). When compared to the 'do nothing' baseline (42km (23nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

29.5% of the area of the Option 12 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 12 is estimated to overfly approximately 6,000 households with an approximate population of 19,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 21,100.

Up to 7,000ft, Option 12 is estimated to overfly approximately 9,200 households with an approximate population of 25,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 25,700.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 12 is estimated to overfly, 50 noise sensitive areas.

Up to 7,000ft, Option 12 is estimated to overfly 70 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 9.14 Runway 09 South Option 13

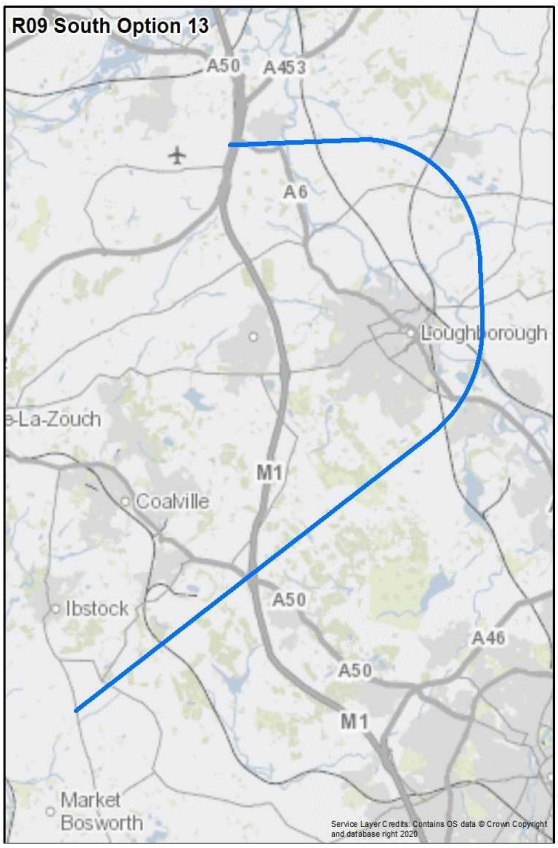
| Design Principle Evaluation | Option No. 13 |
|---|---|
| Option Name: SID RW 09 South Option 13 | ACCEPT |

**Option Description:**

Option 13 proceeds straight ahead with no offset for approximately 2.5nm beyond the DER before making the first turn. This is greater than the existing SID and this extended easterly track allows the route to pass to the east and south east of Loughborough, rather than overflying it.

After departure the route overflies the southern edge of Kegworth before making its first right turn close to West Leake onto a southerly heading. A second turn takes the route south east of Loughborough and south of Coalville to terminate close to Nailstone.

The first turn takes place when the aircraft is above 3,000ft and has therefore been designed to be flown at 250 KIAS as per the recommendation in CAP 778.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 13 is 46km (25nm). When compared to the 'do nothing' baseline (42km (23nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

21.6% of the area of the Option 13 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 13 is estimated to overfly approximately 2,750 households with an approximate population of 5,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 8,400.

Up to 7,000ft, Option 13 is estimated to overfly approximately 6,350 households with an approximate population of 12,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 14,100.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 13 is estimated to overfly, 15 noise sensitive areas.

Up to 7,000ft, Option 13 is estimated to overfly 35 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 9.15 Runway 09 South Option 14

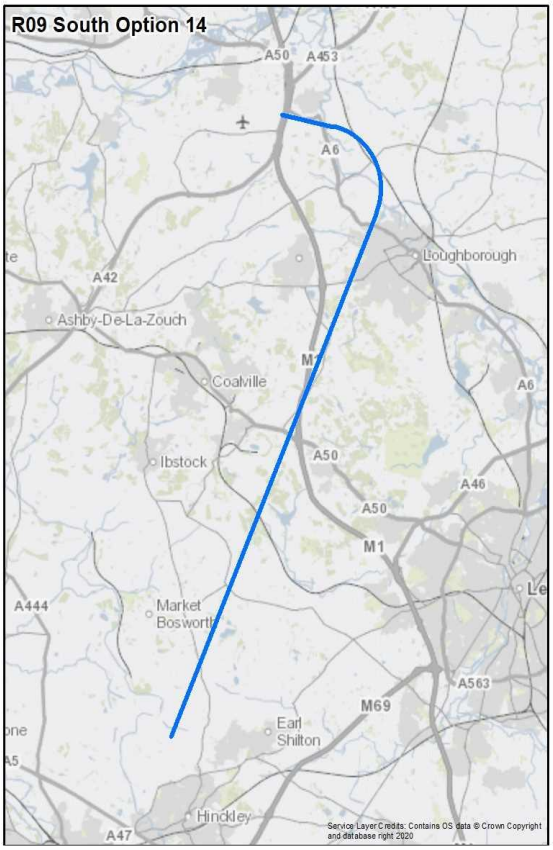
| Design Principle Evaluation | Option No. 14 |
|---|---|
| Option Name: SID RW 09 South Option 14 | ACCEPT |

**Option Description:**

Option 14 is responding to stakeholder feedback to use the maximum 15° southerly offset to reduce the impact of noise on Kegworth. The remainder of the route is similar to Option 3.

The initial 15° offset to the south results in the route, passing south of Kegworth with the first turn to the right turn onto a southerly heading commencing at approximately 1.2nm beyond the DER. This takes it between Sutton Bonington and East Leake before routing over the western edge of Loughborough and terminating north of Hinckley near Mallory Park

The CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be better than the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 14 is 37km (20nm). When compared to the 'do nothing' baseline (42km (23nm)) this option is shorter in length and it is therefore anticipated that emissions would be better.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

41.9% of the area of the Option 14 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 14 is estimated to overfly approximately 4,200 households with an approximate population of 8,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 9,500.

Up to 7,000ft, Option 14 is estimated to overfly approximately 7,700 households with an approximate population of 14,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 15,800.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 14 is estimated to overfly, 25 noise sensitive areas.

Up to 7,000ft, Option 14 is estimated to overfly 50 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 9.16 Runway 09 South Option 15

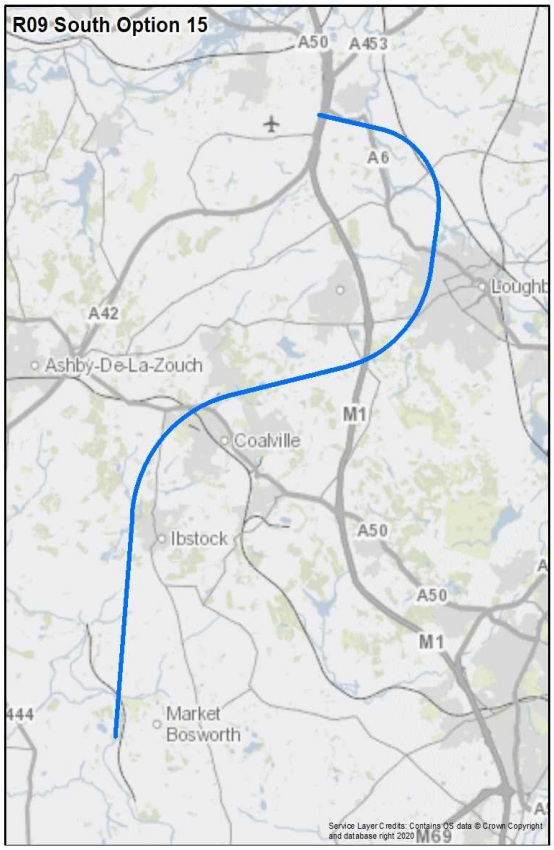
| Design Principle Evaluation | Option No. 15 |
|---|---|
| Option Name: SID RW 09 South Option 15 | REJECT |

**Option Description:**

Option 15 is responding to stakeholder feedback to use the maximum 15° southerly offset to reduce the impact of noise on Kegworth. The remainder of the route is similar to Option 7.

The initial 15° offset to the south results in the route, passing south of Kegworth with the first turn to the right turn commenced 1.4nm beyond the DER. The route then tracks south, commencing a second right turn as soon as possible onto a westerly heading, routing south of Shepshed. A left turn takes the route south around the north west of Coalville, past the west side of Ibstock to terminate south west of Market Bosworth.

The CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. This route is deemed not to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being increased, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 15 is 42km (23nm). When compared to the 'do nothing' baseline (42km (23nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

22.3% of the area of the Option 15 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 15 is estimated to overfly approximately 8,100 households with an approximate population of 19,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 19,400.

Up to 7,000ft, Option 15 is estimated to overfly approximately 16,650 households with an approximate population of 34,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 35,200.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 15 is estimated to overfly, 45 noise sensitive areas.

Up to 7,000ft, Option 15 is estimated to overfly 105 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 9.17 Runway 09 South Option 16

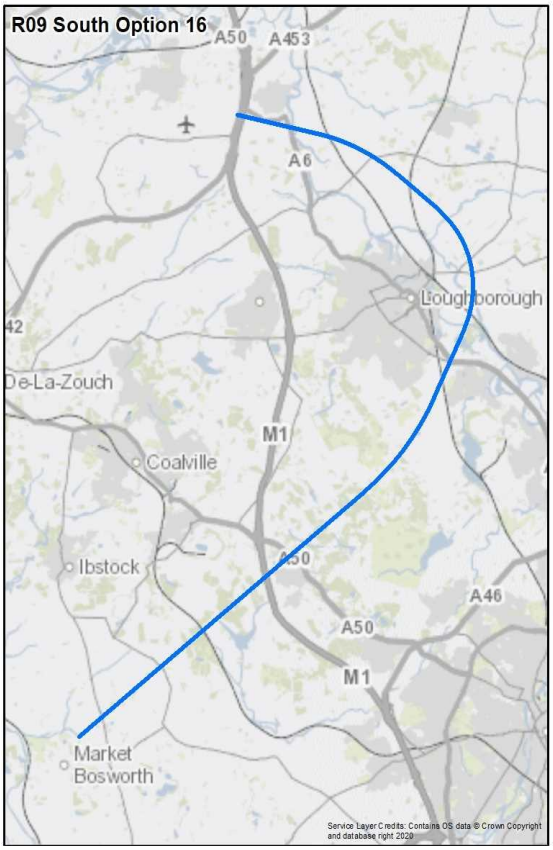
| Design Principle Evaluation | Option No. 16 |
|---|---|
| Option Name: SID RW 09 South Option 16 | ACCEPT |

**Option Description:**

Option 16 is responding to stakeholder feedback to use the maximum 15° southerly offset to reduce the impact of noise on Kegworth whilst also avoiding Loughborough. The remainder of the route is similar to Option 8.

The initial 15° offset to the south results in the route, passing south of Kegworth with the first turn to the south east made at 1.7nm beyond the DER, passing to the north east of Loughborough. It then makes a second turn onto a south west heading routing south east of Loughborough and passing between Leicester and Coalville and terminating north east of Market Bosworth.

The CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 16 is 43km (23nm). When compared to the 'do nothing' baseline (42km (23nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

19.3% of the area of the Option 16 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 16 is estimated to overfly approximately 1,950 households with an approximate population of 3,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 5,500.

Up to 7,000ft, Option 16 is estimated to overfly approximately 7,400 households with an approximate population of 13,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 15,400.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 16 is estimated to overfly, 20 noise sensitive areas.

Up to 7,000ft, Option 16 is estimated to overfly 55 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 9.18 Runway 09 South Option 17

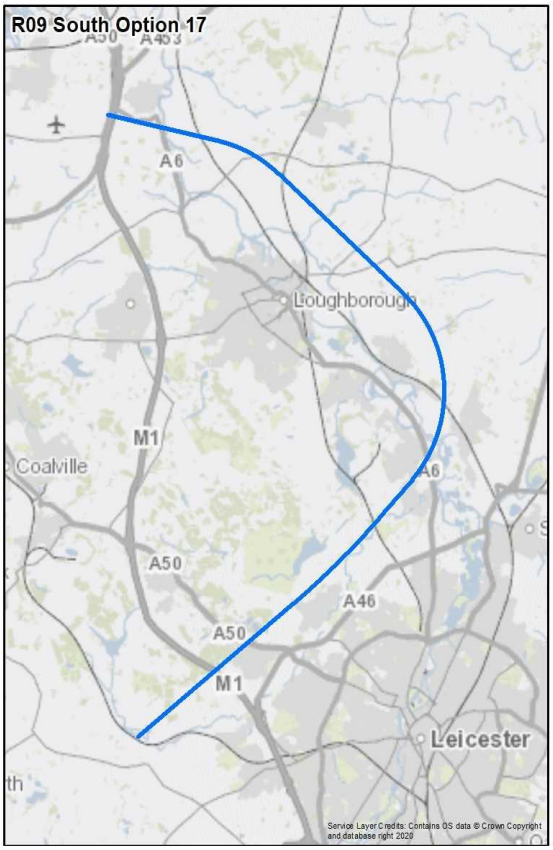
| Design Principle Evaluation | Option No. 17 |
|---|---|
| Option Name: SID RW 09 South Option 17 | REJECT |

**Option Description:**

Option 17 is responding to stakeholder feedback to use the maximum 15° southerly offset to reduce the impact of noise on Kegworth whilst also avoiding Loughborough. The remainder of the route is similar to Option 9.

The initial 15° offset to the south results in the route passing south of Kegworth with the first turn to the south east made at 1.7nm beyond the DER, passing to the north east of Loughborough. It continues south east until approximately Barrow-upon-Soar where it turns right onto a south west heading routing north west of Leicester and terminating near Desford.

The CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. This route is deemed not to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being increased, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 17 is 44km (24nm). When compared to the 'do nothing' baseline (42km (23nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

30.7% of the area of the Option 17 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 17 is estimated to overfly approximately 2,700 households with an approximate population of 5,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 5,200.

Up to 7,000ft, Option 17 is estimated to overfly approximately 17,400 households with an approximate population of 32,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 32,400.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 17 is estimated to overfly, 15 noise sensitive areas.

Up to 7,000ft, Option 17 is estimated to overfly 85 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 9.19 Runway 09 South Summary

| | Option 1 | Option 1A | Option 2 | Option 3 | Option 4 | Option 5 | Option 6 | Option 7 | Option 8 | Option 9 | Option 10 | Option 11 | Option 12 | Option 13 | Option 14 | Option 15 | Option 16 | Option 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **S - Safety** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **P - Programme** | PARTIAL | PARTIAL | NOT MET | PARTIAL | NOT MET | NOT MET | PARTIAL | NOT MET | PARTIAL | NOT MET | PARTIAL | NOT MET | NOT MET | PARTIAL | PARTIAL | NOT MET | PARTIAL | NOT MET |
| **C - Continuity** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **E - Emissions** | PARTIAL | PARTIAL | MET | MET | MET | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | MET | PARTIAL | PARTIAL | PARTIAL | MET | PARTIAL | PARTIAL | PARTIAL |
| **N1 - Noise** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **N2 - Noise** | NOT MET | PARTIAL | MET | MET | MET | MET | NOT MET | NOT MET | NOT MET | PARTIAL | MET | PARTIAL | PARTIAL | NOT MET | MET | PARTIAL | NOT MET | PARTIAL |
| **N3 - Noise** | PARTIAL | PARTIAL | NOT MET | PARTIAL | NOT MET | NOT MET | PARTIAL | NOT MET | PARTIAL | NOT MET | PARTIAL | NOT MET | NOT MET | PARTIAL | PARTIAL | NOT MET | PARTIAL | NOT MET |
| **N4 - Noise** | PARTIAL | PARTIAL | NOT MET | PARTIAL | NOT MET | PARTIAL | MET | NOT MET | PARTIAL | NOT MET | PARTIAL | NOT MET | PARTIAL | PARTIAL | PARTIAL | NOT MET | PARTIAL | NOT MET |
| **A1 - Airspace** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **A2 - Airspace** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| | 4,000ft beneficial | Replication | Rejected | Best | Rejected | Rejected | 4,000ft beneficial | Rejected | 4,000ft beneficial | Rejected | Best | Rejected | Rejected | 4,000ft beneficial | Best | Rejected | 4,000ft beneficial | Rejected |

## 9.20 Runway 09 South Viable but Poor Fit Options

| Option | Safety | Programme | Continuity |
|---|---|---|---|
| A18 | S | P | C |

Description: On departure from runway 09 this option proceeds directly east for approximately 5nm before making a right-hand turn to route in a south westerly direction between Loughborough and Leicester towards Market Bosworth.

Programme: This option fails to align with the environmental end of the AMS.

*Environment:* This option would involve greater track mileage than is necessary by taking traffic east before turning it south leading to increased fuel burn and emissions. Whilst the option avoids large towns and settlements, the track taken does not show a material benefit in comparison to other options.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

Continuity: This option may have a benefit in reducing the interaction with arrivals from the south (by gaining altitude to climb above the inbounds) but would create an interaction with the east departure envelope. This would limit the ability to achieve one minute departure splits and not enable best use of runway capacity.

| | | | |
|---|---|---|---|
| B19 | S | P | C |

Description: On departure from runway 09 this option initiates a left-hand wrap-around, proceeding in a westerly direction and then turning south aiming towards Hinckley.

Safety: This option fails to align with this design principle, because it is expected to conflict or present a hazardous interaction with arrivals to runway 09 and the runway 09 Missed Approach Procedure (MAP).

Programme: This option fails to align with the environmental end of the AMS.

*Environment:* This option would involve greater track mileage than is necessary by taking traffic south and west before turning it north leading to increased fuel burn and emissions. The track taken over southern Nottingham and southern Derby means that the number of people impacted by noise for this option in comparison to other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

Continuity: This option fails to align with this design principle, because it would have a prolonged interaction with the west, north west and north departure envelopes which would limit the ability to achieve one minute departure splits and not enable best use of runway capacity. The potential interaction with arrivals would impact the arrivals traffic flow, which again would not enable best use of runway capacity.

| | | | |
|---|---|---|---|
| C20 | S | P | C |

Description: On departure from runway 09 this option proceeds north east, then initiates a wide right-hand turn to the east of Loughborough, before proceeding in a south westerly direction towards Market Bosworth.

Programme: This option fails to align with the environmental end of the AMS.

*Environment:* This option would involve greater track mileage than is necessary by taking traffic north east before turning it south west leading to increased fuel burn and emissions. The track taken over south Nottingham means the number of people impacted by noise for this option in comparison to other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

Continuity: This option fails to align with this design principle, because it would interact with the east, west, north west, and north departure envelopes which would limit the ability to achieve one minute departure splits and not enable best use of runway capacity.

| D21 | S | P | C |
|---|---|---|---|

Description: On departure from runway 09 this option proceeds east until the A46 and then making a right-hand turn in a south westerly direction.

Safety: This option fails to align with this design principle, because it would exceed controlled airspace and come into conflict with parachute activity at Syerston.

Programme: This option fails to align with the environmental end of the AMS.

*Environment:* This option would involve greater track mileage than is necessary by taking traffic east before turning it south west leading to increased fuel burn and emissions. Whilst the option avoids large towns and settlements, the track taken does not show a material benefit in comparison to other options.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

Continuity: This option may have a benefit in reducing the interaction with arrivals from the south (by gaining altitude to climb above the inbounds) but would create an interaction with the east departure envelope. This would limit the ability to achieve one minute departure splits and not enable best use of runway capacity.

# 10 Runway 09 West

## 10.1 Runway 09 West Option 1

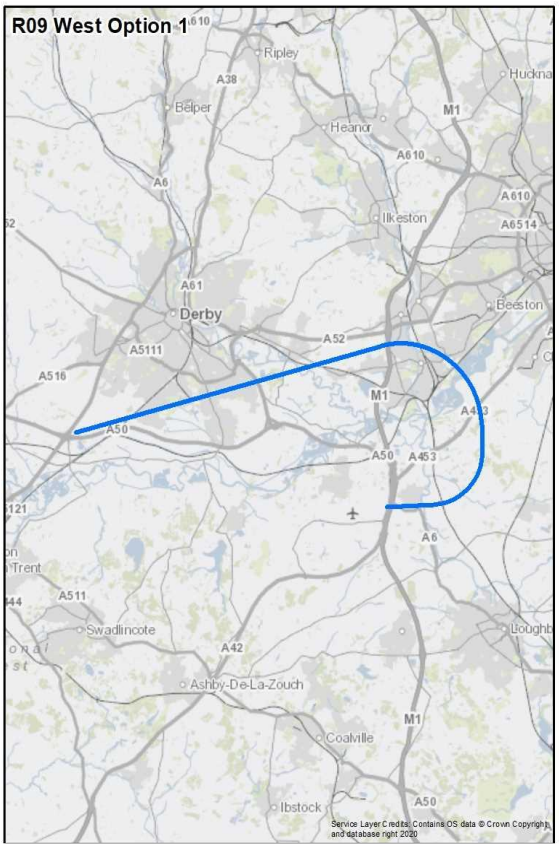
| Design Principle Evaluation | Option No. 1 |
|---|---|
| Option Name: SID RW 09 West Option 1 | ACCEPT |

**Option Description:**

Option 1 proceeds straight ahead after take-off with no offset and then turns north then west.

The route overflies the southern edge of Kegworth, before making a 90o turn to the north at 1.4nm past the DER, passing between the Ratcliffe on Soar power station and Clifton. It then turns left as tightly as permitted by CAP 778, passing over Long Eaton and the Toton rail depot to achieve a westerly heading before routing over south Deby and terminating close to the junction between the A38 and A50, south west of Findern.

The CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route. In relation to the Simplification end of the AMS, feedback from Birmingham Airport has identified a direct potential interaction between this all options within this envelope and Birmingham arrivals positioning for the CHASE hold from the North. Further analysis on scale of this interaction will be conducted during CAF activities in Stage 3 to determine the viability of route options in this envelope. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 1 is 39km (21nm). When compared to the 'do nothing' baseline (37km (20nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

40.7% of the area of the Option 1 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1 is estimated to overfly approximately 11,150 households with an approximate population of 20,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 30,700.

Up to 7,000ft, Option 1 is estimated to overfly approximately 39,750 households with an approximate population of 73,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 73,800.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1 is estimated to overfly, 35 noise sensitive areas.

Up to 7,000ft, Option 1 is estimated to overfly 145 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 10.2 Runway 09 West Option 2

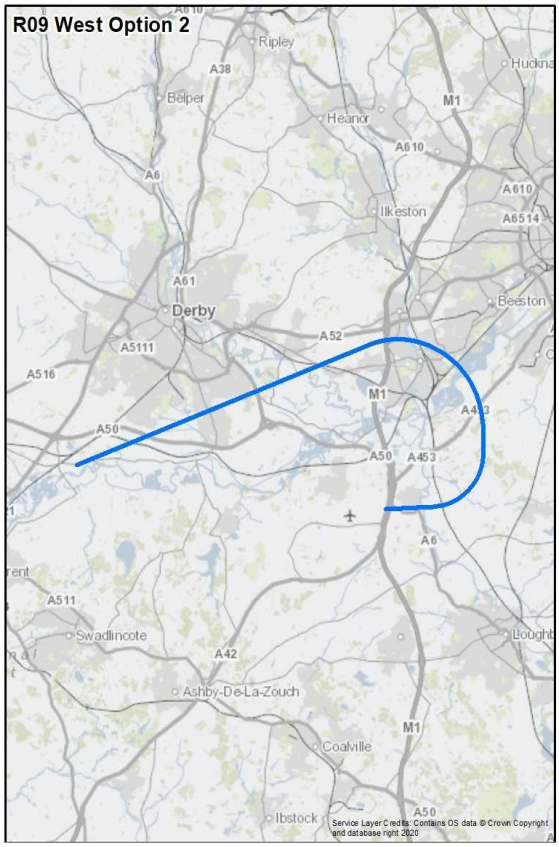
| Design Principle Evaluation | Option No. 2 |
|---|---|
| Option Name: SID RW 09 West Option 2 | ACCEPT |

**Option Description:**

Option 2 proceeds straight ahead after take-off with no offset and then turns north then west. It is similar to Option 1 until crossing the M1 just south of Junction 25 from where it takes a more southerly route.

The route overflies the southern edge of Kegworth, before making a 90o turn to the north at 1.4nm past the DER, passing between the Ratcliffe on Soar power station and Clifton. It then turns left as tightly as permitted by CAP 778, passing over Long Eaton and the Toton rail depot to achieve a westerly heading before just south of Derby and terminating south west of Findern.

The CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route. In relation to the Simplification end of the AMS, feedback from Birmingham Airport has identified a direct potential interaction between this all options within this envelope and Birmingham arrivals positioning for the CHASE hold from the North. Further analysis on scale of this interaction will be conducted during CAF activities in Stage 3 to determine the viability of route options in this envelope. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 2 is 39km (21nm). When compared to the 'do nothing' baseline (37km (20nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

38.0% of the area of the Option 2 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 2 is estimated to overfly approximately 10,900 households with an approximate population of 20,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 30,200.

Up to 7,000ft, Option 2 is estimated to overfly approximately 31,300 households with an approximate population of 58,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 58,700.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 2 is estimated to overfly, 30 noise sensitive areas.

Up to 7,000ft, Option 2 is estimated to overfly 150 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 10.3 Runway 09 West Option 3

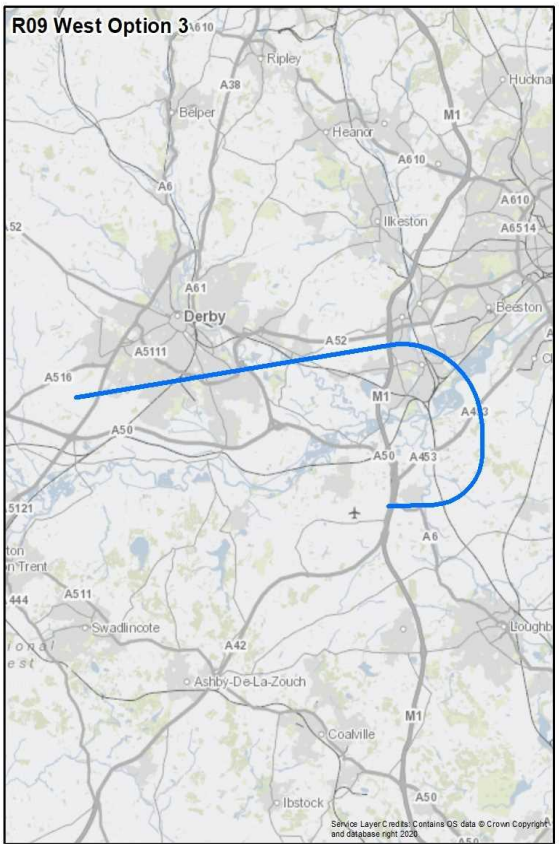
| Design Principle Evaluation | Option No. 3 |
|---|---|
| Option Name: SID RW 09 West Option 3 | ACCEPT |

**Option Description:**

Option 3 proceeds straight ahead after take-off with no offset and then turns north then west. It is similar to Option 1 until crossing the M1 just south of Junction 25 from where it takes a more northerly route.

The route overflies the southern edge of Kegworth, before making a 90o turn to the north at 1.4nm past the DER, passing between the Ratcliffe on Soar power station and Clifton. It then turns left as tightly as permitted by CAP 778, passing over Long Eaton and the Toton rail depot to achieve a westerly heading passing over Derby and terminating close to Etwall, approximately 1nm further north of Option 1.

The CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route. In relation to the Simplification end of the AMS, feedback from Birmingham Airport has identified a direct potential interaction between this all options within this envelope and Birmingham arrivals positioning for the CHASE hold from the North. Further analysis on scale of this interaction will be conducted during CAF activities in Stage 3 to determine the viability of route options in this envelope. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a similar population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 3 is 39km (21nm). When compared to the 'do nothing' baseline (37km (20nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

38.4% of the area of the Option 3 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 3 is estimated to overfly approximately 9,000 households with an approximate population of 16,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 22,300.

Up to 7,000ft, Option 3 is estimated to overfly approximately 48,400 households with an approximate population of 91,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 91,400.

This is a similar population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 3 is estimated to overfly, 30 noise sensitive areas.

Up to 7,000ft, Option 3 is estimated to overfly 250 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

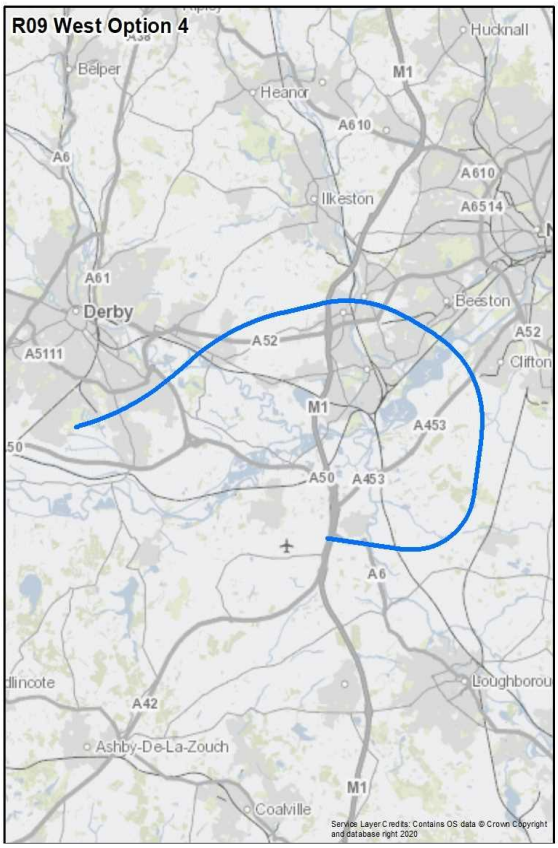
## 10.4 Runway 09 West Option 4

| Design Principle Evaluation | Option No. 4 |
|---|---|
| Option Name: SID RW 09 West Option 4 | REJECT |

**Option Description:**

Option 4 has a 10° southerly offset and has a delayed first turn in comparison to other options, which results in a wide track over southern Nottingham.

The initial 10° offset to the south results in the route, passing south of Kegworth which is maintained for 2nm beyond the DER before commencing a left turn to the north. Once on a northerly heading the route passes close to Clifton before commencing a wide left turn north of Long Eaton, passing over Stapleford, before achieving more south westerly heading. The route terminates close to the south of Derby, near to Sinfin.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route. In relation to the Simplification end of the AMS, feedback from Birmingham Airport has identified a direct potential interaction between this all options within this envelope and Birmingham arrivals positioning for the CHASE hold from the North. Further analysis on scale of this interaction will be conducted during CAF activities in Stage 3 to determine the viability of route options in this envelope. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a similar population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 4 is 40km (22nm). When compared to the 'do nothing' baseline (37km (20nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

30.4% of the area of the Option 4 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 4 is estimated to overfly approximately 12,150 households with an approximate population of 22,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 34,100.

Up to 7,000ft, Option 4 is estimated to overfly approximately 47,150 households with an approximate population of 86,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 91,800.

This is a similar population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 4 is estimated to overfly, 65 noise sensitive areas.

Up to 7,000ft, Option 4 is estimated to overfly 210 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | MET |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA. | |

## 10.5 Runway 09 West Option 5

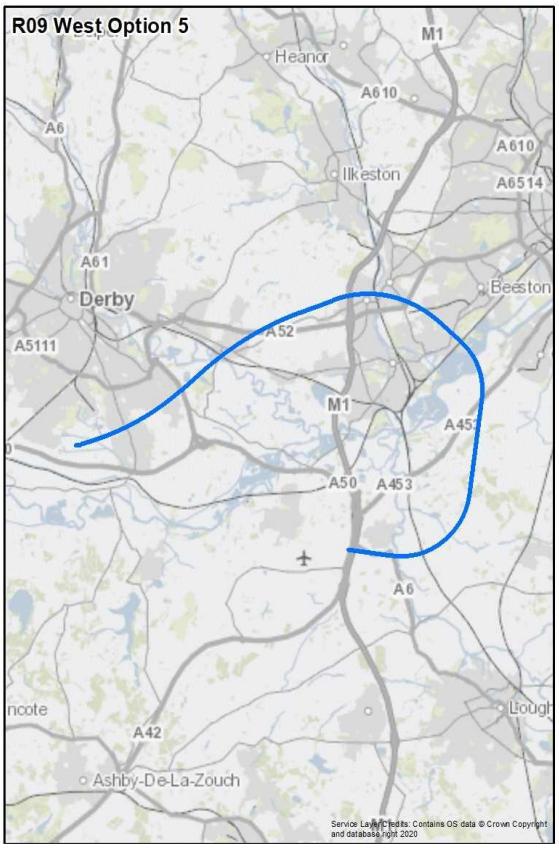
| Design Principle Evaluation | Option No. 5 |
|---|---|
| Option Name: SID RW 09 West Option 5 | ACCEPT |

**Option Description:**

Option 5 has a 10° southerly offset but with an earlier and tighter first turn than Option 1 which results in a track closer to Long Eaton.

The initial 10° offset to the south results in the route, passing south of Kegworth with the first turn to the north commencing at 1nm beyond the DOR. Once on a northerly heading the route passes between the Ratcliffe on Soar power station and Clifton before commencing a left turn just east of Long Eaton, passing over Stapleford, before achieving more south westerly heading. The route terminates close to the south of Derby and south of Sinfin.

The initial two turns have been limited to 190KIAS to enable the tightest turns possible. The route is PANS-OPS compliant, but should it become a preferred option then it is recommended that it is assessed for flyability as part of the procedure validation process within Stage 4 of CAP1616.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route. In relation to the Simplification end of the AMS, feedback from Birmingham Airport has identified a direct potential interaction between this all options within this envelope and Birmingham arrivals positioning for the CHASE hold from the North. Further analysis on scale of this interaction will be conducted during CAF activities in Stage 3 to determine the viability of route options in this envelope. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 5 is 40km (22nm). When compared to the 'do nothing' baseline (37km (20nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

38.3% of the area of the Option 5 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 5 is estimated to overfly approximately 12,300 households with an approximate population of 23,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 32,000.

Up to 7,000ft, Option 5 is estimated to overfly approximately 35,600 households with an approximate population of 66,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 67,000.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 5 is estimated to overfly, 50 noise sensitive areas.

Up to 7,000ft, Option 5 is estimated to overfly 160 noise sensitive areas.

This is a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 10.6 Runway 09 West Option 6

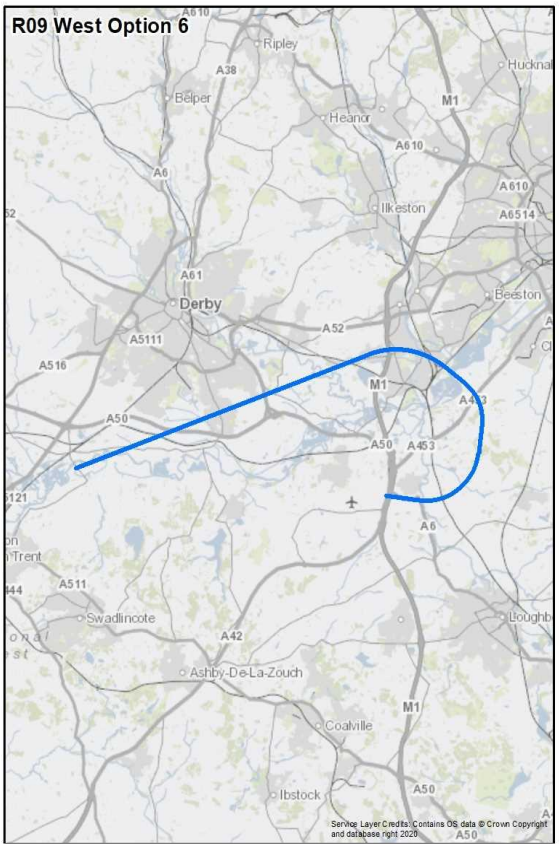
| Design Principle Evaluation | Option No. 6 |
|---|---|
| Option Name: SID RW 09 West Option 6 | ACCEPT |

**Option Description:**

Option 6 has a 10° southerly offset with the same tighter first turn as Option 5 but using multiple turns to create a route aimed at reducing noise impact.

The initial 10° offset to the south results in the route, passing south of Kegworth with the first turn to the north at 1nm beyond the DOR. It passes between the Ratcliffe on Soar power station and Clifton before commencing a second left turn before Long Eaton and a third shortly after to head in a south westerly direction. The route terminates between Willington and Repton to the south of the junction between the A38 and A50.

The initial two turns have been limited to 190KIAS to enable the tightest turns possible. The route is PANS-OPS compliant, but should it become a preferred option then it is recommended that it is assessed for flyability as part of the procedure validation process within Stage 4 of CAP1616.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route. In relation to the Simplification end of the AMS, feedback from Birmingham Airport has identified a direct potential interaction between this all options within this envelope and Birmingham arrivals positioning for the CHASE hold from the North. Further analysis on scale of this interaction will be conducted during CAF activities in Stage 3 to determine the viability of route options in this envelope. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 6 is 41km (22nm). When compared to the 'do nothing' baseline (37km (20nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

36.2% of the area of the Option 6 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 6 is estimated to overfly approximately 11,850 households with an approximate population of 21,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 30,800.

Up to 7,000ft, Option 6 is estimated to overfly approximately 25,450 households with an approximate population of 47,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 47,100.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 6 is estimated to overfly, 65 noise sensitive areas.

Up to 7,000ft, Option 6 is estimated to overfly 150 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | MET |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA. | |

## 10.7 Runway 09 West Option 7

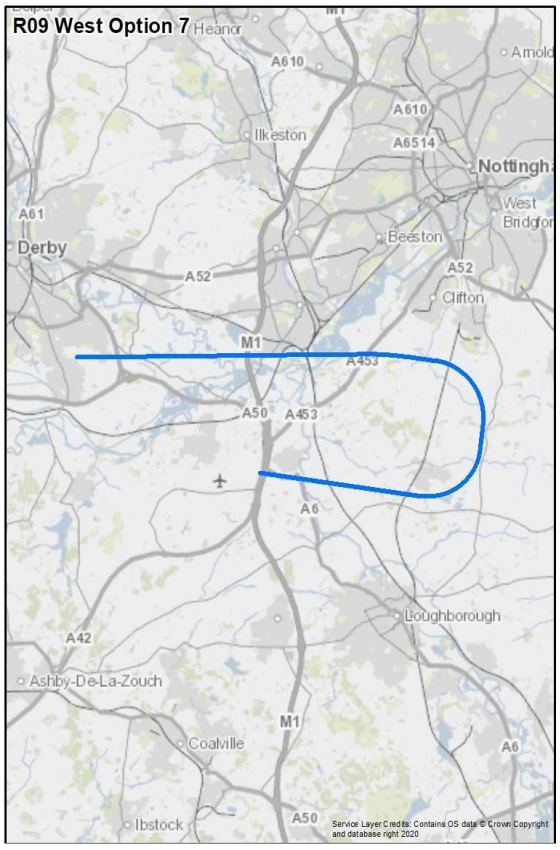
| Design Principle Evaluation | Option No. 7 |
|---|---|
| Option Name: SID RW 09 West Option 7 | ACCEPT |

**Option Description:**

Option 7 has a 10° southerly offset but with an extended route east initially to help avoid the overflight of major urban areas.

This option commences with a 10° offset from the runway heading passing to the south of Kegworth which is maintained for an extended distance of 4.2nm. Once past East Leake it makes a 90o left turn to the to the north and runs parallel to the A60 before commencing a second 90o left turn to achieve a westerly heading and passing just to the south of Long Eaton. The route terminates to the south east of Derby in the vicinity of Boulton Moor.

The route does manage but to achieve avoid the overflight of major urban areas but the initial easterly track is extended and the initial two turns have been limited to 190KIAS to enable the tightest turns possible. The route is PANS-OPS compliant, but should it become a preferred option then it is recommended that it is assessed for flyability as part of the procedure validation process within Stage 4 of CAP1616.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route. In relation to the Simplification end of the AMS, feedback from Birmingham Airport has identified a direct potential interaction between this all options within this envelope and Birmingham arrivals positioning for the CHASE hold from the North. Further analysis on scale of this interaction will be conducted during CAF activities in Stage 3 to determine the viability of route options in this envelope. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 7 is 40km (22nm). When compared to the 'do nothing' baseline (37km (20nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

29.9% of the area of the Option 7 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 7 is estimated to overfly approximately 700 households with an approximate population of 1,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 8,300.

Up to 7,000ft, Option 7 is estimated to overfly approximately 23,750 households with an approximate population of 43,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 45,100.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 7 is estimated to overfly, 5 noise sensitive areas.

Up to 7,000ft, Option 7 is estimated to overfly 85 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 10.8 Runway 09 West Summary

| | Option 1 | Option 2 | Option 3 | Option 4 | Option 5 | Option 6 | Option 7 |
|---|---|---|---|---|---|---|---|
| **S - Safety** | MET | MET | MET | MET | MET | MET | MET |
| **P - Programme** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **C - Continuity** | MET | MET | MET | MET | MET | MET | MET |
| **E - Emissions** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **N1 - Noise** | MET | MET | MET | MET | MET | MET | MET |
| **N2 - Noise** | MET | PARTIAL | MET | NOT MET | MET | PARTIAL | NOT MET |
| **N3 - Noise** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | MET |
| **N4 - Noise** | MET | MET | PARTIAL | PARTIAL | MET | PARTIAL | MET |
| **A1 - Airspace** | MET | MET | MET | MET | MET | MET | MET |
| **A2 - Airspace** | MET | MET | MET | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET | MET | MET | MET |
| | Best | Best | Best | Rejected | Best | Best | 4,000ft beneficial |

## 10.9 Runway 09 West Viable but Poor Fit Options

| Option | Safety | Programme | Continuity |
|---|---|---|---|
| A8 | S | P | C |

Description: On departure from runway 09 this option proceeds in an easterly direction to turn left prior to crossing the A46 and heading in a northerly direction. A second left turn around Nottingham City Airport and heading in a west-south west direction to the SID aiming point.

Programme: This option fails to align with the environmental end of the AMS.

> *Environment*: This option would involve greater track mileage than is necessary by taking traffic east and north before turning west leading to increased fuel burn and emissions. The track taken over central Nottingham means that the number of people impacted by noise for this option in comparison to other options does not show a material benefit.

*Trade-offs:* Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

| | | | |
|---|---|---|---|
| B9 | S | P | C |

Description: On departure from runway 09 this option proceeds in a north easterly direction before initiating a gradual left-hand wrap-around turn, to the east and north of Nottingham, before continuing in a south westerly direction, north of Derby, towards the SID aiming point.

Safety: This option fails to align with this design principle, because it may exceed controlled airspace and come into conflict with parachute activity at Syerston.

Programme: This option fails to align with the integration and environmental ends of the AMS.

> *Integration*: This option may require additional airspace to mitigate the safety risk of operating at the boundary of Class G airspace. There is an expectation that this additional airspace would be required 24x7 and therefore would adversely impact other airspace users, including GA traffic and parachute activity at Syerston.
>
> *Environment*: This option would involve greater track mileage than is necessary by taking traffic north east before turning it east leading to increased fuel burn and emissions. The track taken avoids central Nottingham which may result in some noise benefit in comparison to other options.

*Trade-offs:* Whilst there may be a benefit in the number of people impacted by noise, the resultant safety impact, requirement for additional CAS, impact on GA and parachute operations at Syerston and additional fuel burn and emissions mean there is no trade-off to be made to justify an amber rating.

| | | | |
|---|---|---|---|
| C10 | S | P | C |

Description: On departure from runway 09 this option makes a 90-degree left-hand turn, proceeding north over Nottingham, before conducting a second 90-degree left-hand turn to a westerly direction. The option then initiates a gradual left turn to a south westerly heading to pass over north west Derby.

Programme: This option fails to align with the environmental end of the AMS.

> *Environment:* This option would involve greater track mileage than is necessary by taking traffic north before turning it west leading to increased fuel burn and emissions. The track taken over

central Nottingham and Derby means that the number of people impacted by noise for this option in comparison to other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

Continuity: This option fails to align with this design principle, because it would have a prolonged interaction with the north departure envelope which would limit the ability to achieve one minute departure splits and not enable best use of runway capacity.

# 11 Runway 27 East

## 11.1 Runway 27 East Option 1

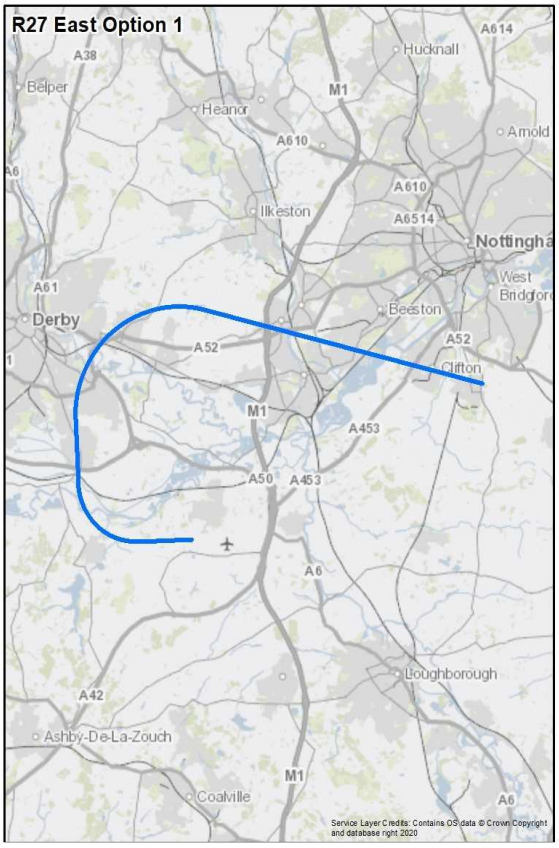
| Design Principle Evaluation | Option No. 1 |
|---|---|
| Option Name: SID RW 27 East Option 1 | REJECT |

**Option Description:**

Option 1 proceeds straight ahead after take-off with no offset before making two right-hand turns to head east.

The route follows a runway heading for 1.4nm before initiating a 90o right turn to the north just to the north east of Melbourne. The option then routes over south east Derby before commencing a second right turn to achieve an east-south east heading, terminating just to the east of Ruddington on the southern edge of Nottingham.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed not to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being increased, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 1 is 61km (33nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

29.7% of the area of the Option 1 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1 is estimated to overfly approximately 15,500 households with an approximate population of 28,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 29,200.

Up to 7,000ft, Option 1 is estimated to overfly approximately 49,000 households with an approximate population of 91,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 99,600.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1 is estimated to overfly, 70 noise sensitive areas.

Up to 7,000ft, Option 1 is estimated to overfly 260 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | MET |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA. | |

## 11.2 Runway 27 East Option 2

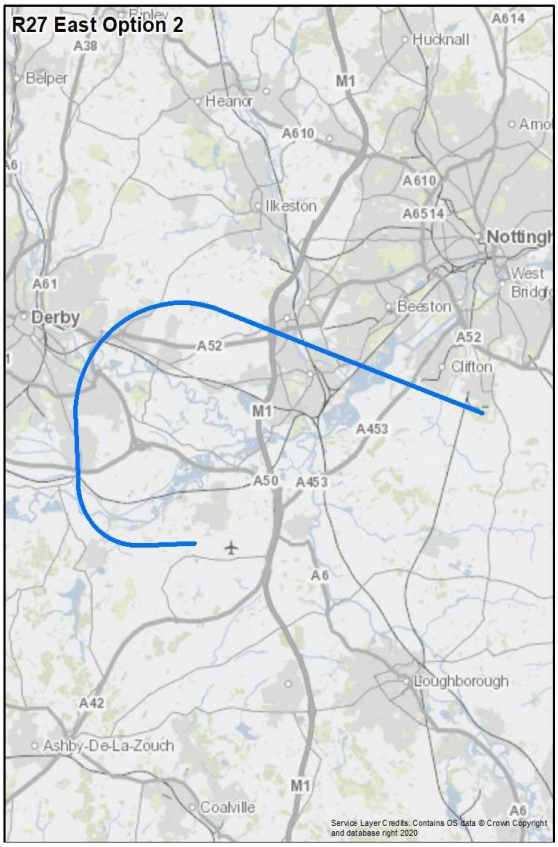
| Design Principle Evaluation | Option No. 2 |
|---|---|
| Option Name: SID RW 27 East Option 2 | REJECT |

**Option Description:**

Option 2 proceeds straight ahead after take-off with no offset before making two right-hand turns to head east. It is similar to Option 1 but terminates slightly further south.

The route follows a runway heading for 1.4nm before initiating a 90o right turn to the north just to the north east of Melbourne. The option then routes over south east Derby before commencing a second right turn to achieve an east-south east heading, terminating just to the south of Ruddington.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed not to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being increased, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 2 is 62km (33nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

26.5% of the area of the Option 2 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 2 is estimated to overfly approximately 15,500 households with an approximate population of 28,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 29,100.

Up to 7,000ft, Option 2 is estimated to overfly approximately 42,800 households with an approximate population of 78,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 86,500.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 2 is estimated to overfly, 70 noise sensitive areas.

Up to 7,000ft, Option 2 is estimated to overfly 195 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | MET |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA. | |

## 11.3 Runway 27 East Option 3

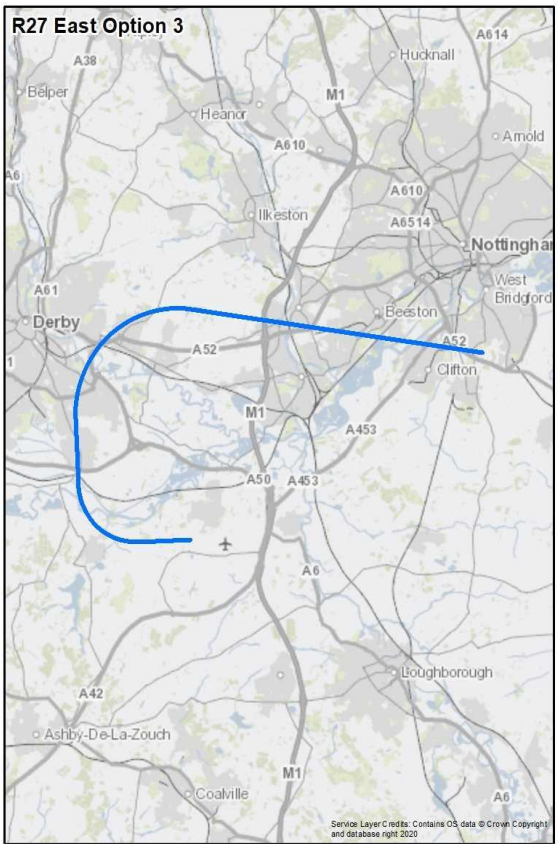
| Design Principle Evaluation | Option No. 3 |
|---|---|
| Option Name: SID RW 27 East Option 3 | REJECT |

**Option Description:**

Option 3 proceeds straight ahead after take-off with no offset before making two right-hand turns to head east. It is similar to Option 1 but terminates slightly further north.

The route follows a runway heading for 1.4nm before initiating a 90o right turn to the north just to the north east of Melbourne. The option then routes over south east Derby before commencing a second right turn to achieve an east-south east heading, terminating just to the south of Ruddington.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed not to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being increased, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 3 is 61km (33nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

32.2% of the area of the Option 3 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 3 is estimated to overfly approximately 15,550 households with an approximate population of 28,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 29,200.

Up to 7,000ft, Option 3 is estimated to overfly approximately 56,200 households with an approximate population of 105,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 111,400.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 3 is estimated to overfly, 70 noise sensitive areas.

Up to 7,000ft, Option 3 is estimated to overfly 305 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 11.4 Runway 27 East Option 4

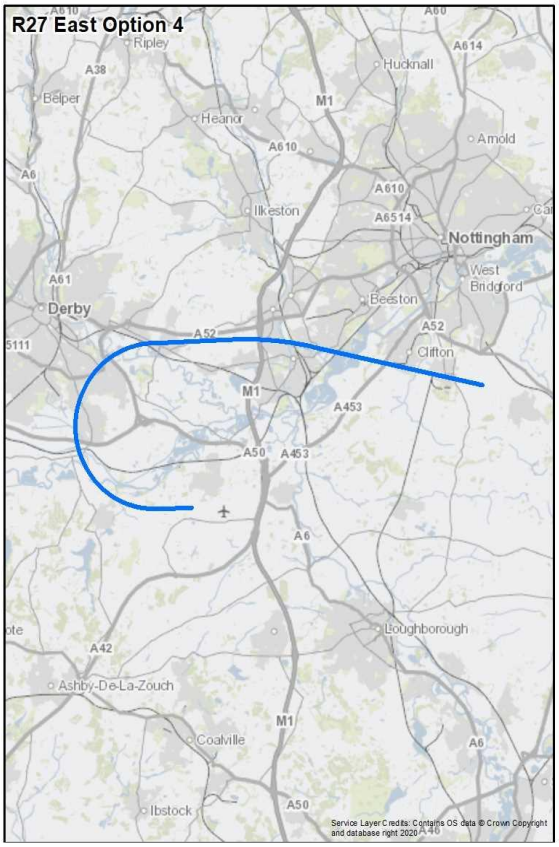
| Design Principle Evaluation | Option No. 4 |
|---|---|
| Option Name: SID RW 27 East Option 4 | REJECT |

**Option Description:**

Option 4 differs to the majority of options in that it is a RNP1 departure using RF turns, rather than RNAV1 with fly-by waypoints. It was created to offer an alternative option to see if an RF turn could minimise the impact of noise on Derby. It proceeds straight ahead after take-off with no offset, and then makes a single right turn to head east.

The initial departure is along the extended runway centreline for 1nm prior to commencing a 180o RF turn to achieve an east heading. This minimises the overflight of south east Derby and the route then continues east with a small right turn to the north of Long Eaton to terminate to the east of Ruddington.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed not to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being increased, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 4 is 60km (32nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

35.6% of the area of the Option 4 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 4 is estimated to overfly approximately 13,050 households with an approximate population of 23,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 24,200.

Up to 7,000ft, Option 4 is estimated to overfly approximately 39,750 households with an approximate population of 72,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 81,000.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 4 is estimated to overfly, 65 noise sensitive areas.

Up to 7,000ft, Option 4 is estimated to overfly 215 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNP 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | MET |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA. | |

## 11.5 Runway 27 East Option 5

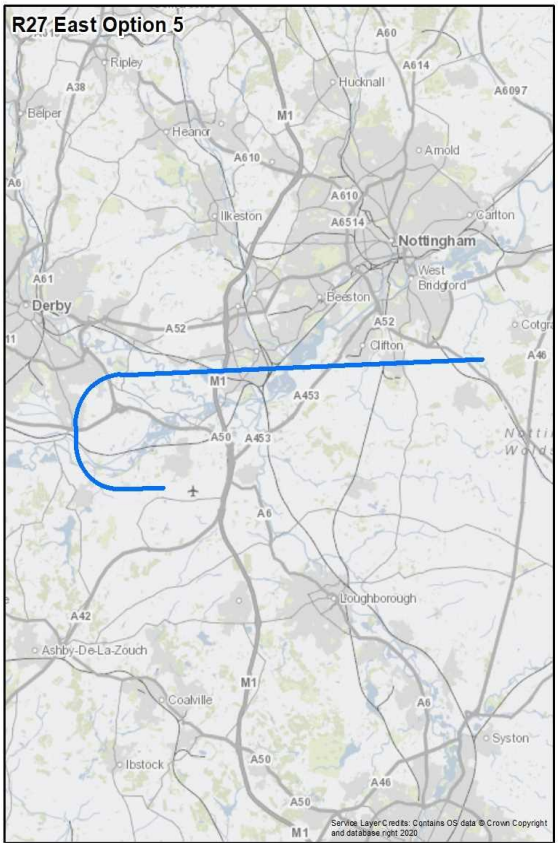
| Design Principle Evaluation | Option No. 5 |
|---|---|
| Option Name: SID RW 27 East Option 5 | REJECT |

**Option Description:**

Option 5 is a tight RNAV1 right-hand wrap-around with no offset, which has been created to see if a combination of RNAV1 turns could minimise the impact of noise on Derby. This is achieved by applying a 200KIAS speed restriction to achieve tighter turns than if the CAP 778 recommended 210KIAS was to be applied.

The route follows a runway heading for 1.4nm before initiating a 90o right turn to the north, restricted to 200KIAS, to achieve a northerly heading. A second 90o turn, also restricted to 200KIAS, commences just as the route crosses the A50 south of Derby and results in a direct track east over Long Eaton and Ruddington to terminate south east of Nottingham.

The 200KIAS turns are PANS-OPS compliant but should this become a preferred option then it should be assessed for flyability as part of the procedure validation process within Stage 4 of CAP1616.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed not to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being increased, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 5 is 57km (31nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

29.4% of the area of the Option 5 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 5 is estimated to overfly approximately 12,050 households with an approximate population of 22,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 26,900.

Up to 7,000ft, Option 5 is estimated to overfly approximately 29,650 households with an approximate population of 53,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 67,600.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 5 is estimated to overfly, 45 noise sensitive areas.

Up to 7,000ft, Option 5 is estimated to overfly 165 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | PARTIAL |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS-OPS 8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables CCO to be conducted at EMA. A design speed restriction has been applied to the first turn which allows for the turn radius to be decreased. This speed is PANS-OPS compliant but a flyability check may be required during Stage 4 of the ACP process. | |

## 11.6 Runway 27 East Option 6

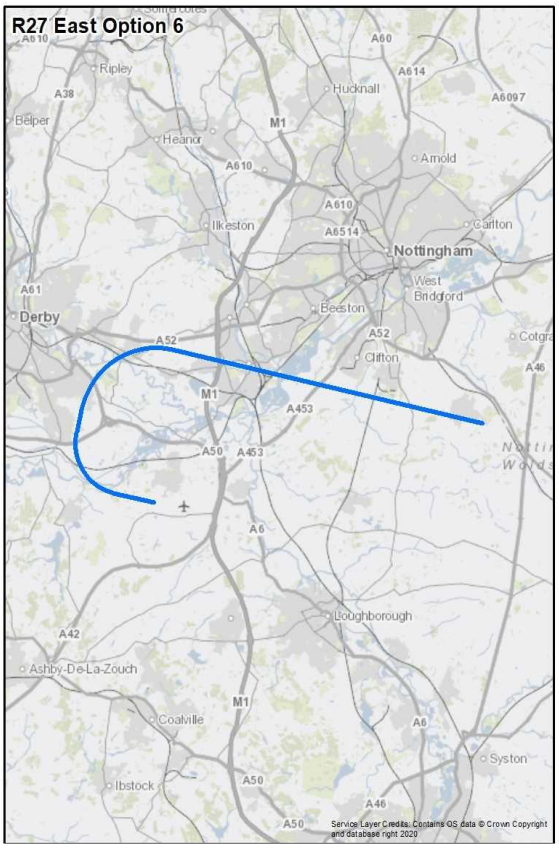
| Design Principle Evaluation | Option No. 6 |
|---|---|
| Option Name: SID RW 27 East Option 6 | REJECT |

**Option Description:**

Option 6 is responding to stakeholder feedback to use the maximum 15° northerly offset to reduce the impact of noise on Melbourne.

The initial 15° offset to the north results in the route passing north of Melbourne with the first 90o turn to the north at 1.3nm beyond the DER. The route makes a second 90o right turn shortly after to achieve an easterly heading. The route avoids all but the very eastern edges of Derby before overflying Long Eaton and terminating to the south east of Keyworth.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed not to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being increased, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 6 is 57km (31nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

31.3% of the area of the Option 6 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 6 is estimated to overfly approximately 11,750 households with an approximate population of 21,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 24,500.

Up to 7,000ft, Option 6 is estimated to overfly approximately 24,650 households with an approximate population of 44,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 55,000.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 6 is estimated to overfly, 55 noise sensitive areas.

Up to 7,000ft, Option 6 is estimated to overfly 140 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | MET |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA. | |

## 11.7 Runway 27 East Summary

| | Option 1 | Option 2 | Option 3 | Option 4 | Option 5 | Option 6 |
|---|---|---|---|---|---|---|
| **S - Safety** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **P - Programme** | NOT MET | NOT MET | NOT MET | NOT MET | NOT MET | NOT MET |
| **C - Continuity** | MET | MET | MET | MET | MET | MET |
| **E - Emissions** | NOT MET | NOT MET | NOT MET | NOT MET | NOT MET | NOT MET |
| **N1 - Noise** | MET | MET | MET | MET | MET | MET |
| **N2 - Noise** | PARTIAL | NOT MET | MET | MET | NOT MET | PARTIAL |
| **N3 - Noise** | NOT MET | NOT MET | NOT MET | NOT MET | NOT MET | NOT MET |
| **N4 - Noise** | NOT MET | NOT MET | NOT MET | NOT MET | NOT MET | NOT MET |
| **A1 - Airspace** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **A2 - Access** | MET | MET | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET | PARTIAL | MET |
| | Rejected | Rejected | Rejected | Rejected | Rejected | Rejected |

## 11.8 Runway 27 East Viable but Poor Fit Options

| Option | Safety | Programme | Continuity |
|---|---|---|---|
| A7 | S | P | C |

Description: This option departs runway 27 in a westerly direction for approximately 7nm in order to avoid Derby. It turns right before Burton upon Trent, proceeding in a northerly direction to the west of Derby, then turning right onto an easterly course to the north of Derby.

Programme: This option partially fails to align with the environmental end of the AMS.

> *Environment:* This option would involve greater track mileage than is necessary by taking traffic a significant distance west turning it east leading to increased fuel burn and emissions. However, there may be some reduction in the number of people impacted by noise below 4,000ft.

*Trade-offs*: There may be a material benefit in the number of people impacted by noise which is a potential trade-off for the increased emissions. This option has therefore been rated as Amber.

Continuity: This option fails to align with this design principle, because it would have a significant interaction with all options within the north west departure envelope which would increase delays for these flights and not enable best use of runway capacity.

| | | | |
|---|---|---|---|
| B8 | S | P | C |

Description: This option initiates an immediate right turn north and continues over Derby for approximately 8nm before turning right onto an easterly course near Ilkeston.

Programme: This option fails to align with the environmental end of the AMS.

> *Environment:* This option would involve greater track mileage than is necessary by taking traffic north before turning it east leading to increased fuel burn and emissions. The track taken over Derby means that the number of people impacted by noise for this option in comparison to other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

Continuity: This option fails to align with this design principle, because it would have an interaction with all options within the north west departure envelope In addition, it is likely to interact with arrivals to runway 27 from the north.

# 12 Runway 27 North

## 12.1 Runway 27 North Option 1

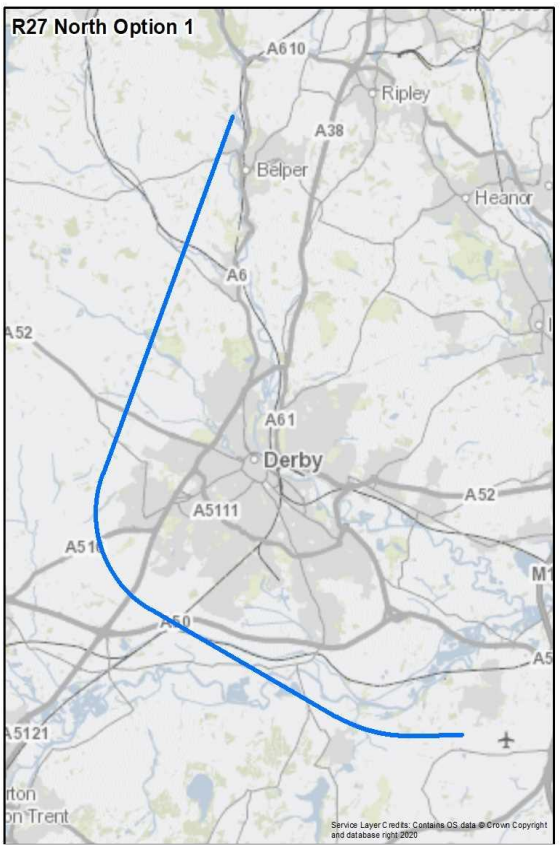
| Design Principle Evaluation | Option No. 1 |
|---|---|
| Option Name: SID RW 27 North Option 1 | ACCEPT |

**Option Description:**

Whilst this is not a replicated route, it reflects the current operational practice of initially using the TNT 2N SID to the north west followed by ATC vectoring to the north.

This follows the runway heading for 1nm before commencing a right turn just to the north east of Melbourne, onto a north west heading to pass to the south west of Derby. A second right turn diverges it from the TNT departure and routes it on a north by north east heading to the terminating point north of Belper.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 1 is 43km (23nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

16.8% of the area of the Option 1 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1 is estimated to overfly approximately 1,450 households with an approximate population of 2,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 7,100.

Up to 7,000ft, Option 1 is estimated to overfly approximately 6,850 households with an approximate population of 12,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 20,800.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1 is estimated to overfly, 10 noise sensitive areas.

Up to 7,000ft, Option 1 is estimated to overfly 65 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 12.2 Runway 27 North Option 2

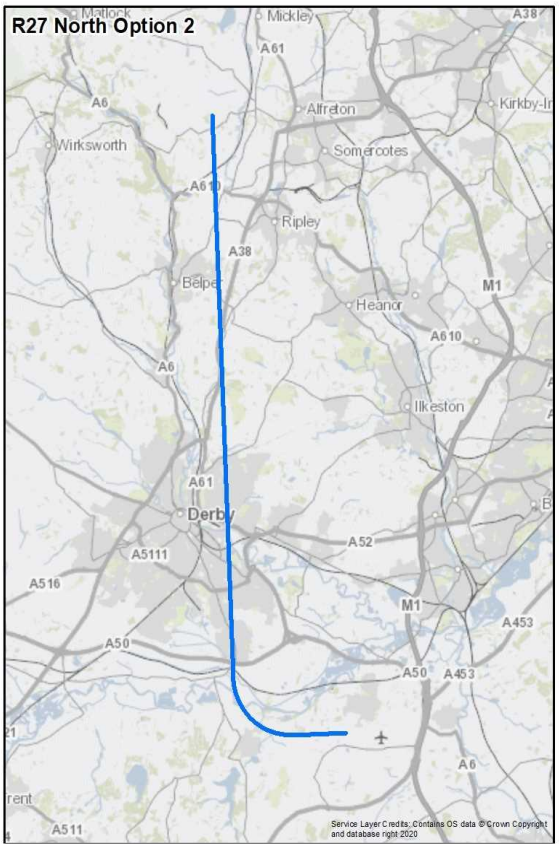
| Design Principle Evaluation | Option No. 2 |
|---|---|
| Option Name: SID RW 27 North Option 2 | REJECT |

**Option Description:**

Option 2 proceeds straight ahead after take-off with no offset before making a single right turn to head directly north.

After initial departure this option follows the runway heading for 1.4nm before commencing a 90o right turn to the north just to the north east of Melbourne. This north heading routes it over eastern Derby and the east edge of Belper and the route terminates to the north east of Crich.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 2 is 39km (21nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

27.7% of the area of the Option 2 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 2 is estimated to overfly approximately 20,500 households with an approximate population of 37,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 39,000.

Up to 7,000ft, Option 2 is estimated to overfly approximately 30,900 households with an approximate population of 57,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 59,700.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 2 is estimated to overfly, 110 noise sensitive areas.

Up to 7,000ft, Option 2 is estimated to overfly 150 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | MET |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA. | |

## 12.3 Runway 27 North Option 3

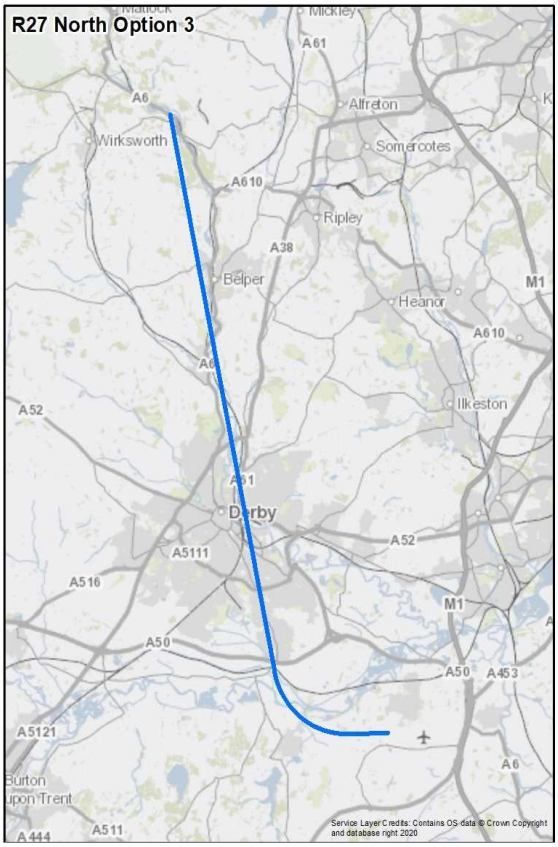
| Design Principle Evaluation | Option No. 3 |
|---|---|
| Option Name: SID RW 27 North Option 3 | REJECT |

**Option Description:**

Option 3 proceeds straight ahead after take-off with no offset before making a single right turn to head north, but on a track that is slightly to the west of Option 2.

After initial departure this option follows the runway heading for 1nm before commencing a right turn north just to the north east of Melbourne. This north heading routes it over central Derby and the west edge of Belper and the route terminates to the north west of Crich.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 3 is 37km (20nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

28.5% of the area of the Option 3 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 3 is estimated to overfly approximately 16,050 households with an approximate population of 28,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 29,400.

Up to 7,000ft, Option 3 is estimated to overfly approximately 25,200 households with an approximate population of 45,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 46,800.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 3 is estimated to overfly, 120 noise sensitive areas.

Up to 7,000ft, Option 3 is estimated to overfly 215 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | MET |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA. | |

## 12.4 Runway 27 North Option 4

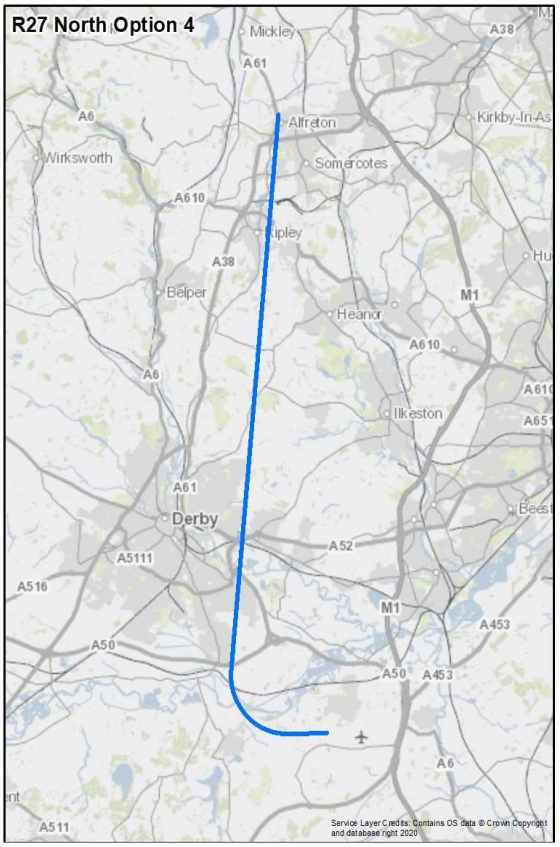
| Design Principle Evaluation | Option No. 4 |
|---|---|
| Option Name: SID RW 27 North Option 4 | REJECT |

**Option Description:**

Option 4 proceeds straight ahead after take-off with no offset before making a single right turn to head north. It is similar to Options 2 and 3 but terminates further east.

After initial departure this option follows the runway heading for 1nm before commencing a 90o right turn just to the north east of Melbourne. This takes it onto a north heading routing close to the eastern edge Derby and passing over eastern Ripley. The route terminates to the north east of Crich.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 4 is 40km (22nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

21.6% of the area of the Option 4 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 4 is estimated to overfly approximately 10,600 households with an approximate population of 20,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 24,600.

Up to 7,000ft, Option 4 is estimated to overfly approximately 28,950 households with an approximate population of 53,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 61,800.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 4 is estimated to overfly, 45 noise sensitive areas.

Up to 7,000ft, Option 4 is estimated to overfly 170 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | MET |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA. | |

## 12.5 Runway 27 North Option 5

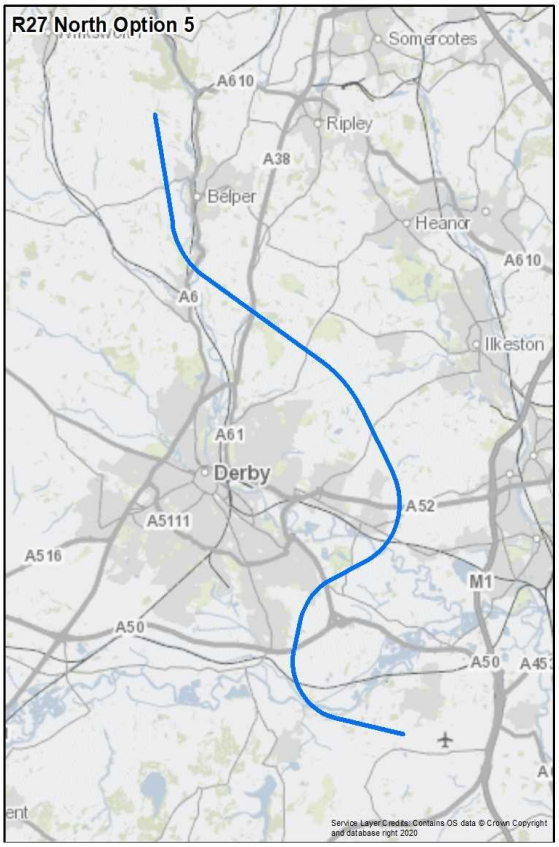
| Design Principle Evaluation | Option No. 5 |
|---|---|
| Option Name: SID RW 27 North Option 5 | REJECT |

**Option Description:**

Option 5 has a 15° northerly offset to avoid Melbourne and is a route that takes multiple turns to avoid overflight of Derby.

The initial 15° offset to the north results in the route passing north of Melbourne with the first turn to the north at 1.54nm beyond the DER onto a northerly heading, before commencing a second right-hand turn onto a north easterly heading to pass just east of Borrowash. A third turn to the left routes it between Derby and Nottingham and the route then turns to a north west heading before finally turning north and terminating north west of Belper.

This route endeavours to avoid overflight of built up and noise sensitive areas; however, all turns have been limited to 190KIAS to enable tight turns. Although PANS-OPS compliant it is a complex route that will require to be assessed for flyability as part of the procedure validation process within Stage 4 of CAP1616.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being similar and reduced, respectively, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 5 is 41km (22nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

20.6% of the area of the Option 5 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 5 is estimated to overfly approximately 2,300 households with an approximate population of 4,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 8,300.

Up to 7,000ft, Option 5 is estimated to overfly approximately 8,850 households with an approximate population of 16,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 21,000.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a similar population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 5 is estimated to overfly, 5 noise sensitive areas.

Up to 7,000ft, Option 5 is estimated to overfly 85 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | PARTIAL |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS-OPS 8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables CCO to be conducted at EMA. A design speed restriction has been applied to the first turn which allows for the turn radius to be decreased. This speed is PANS-OPS compliant but a flyability check may be required during Stage 4 of the ACP process. | |

## 12.6 Runway 27 North Option 6

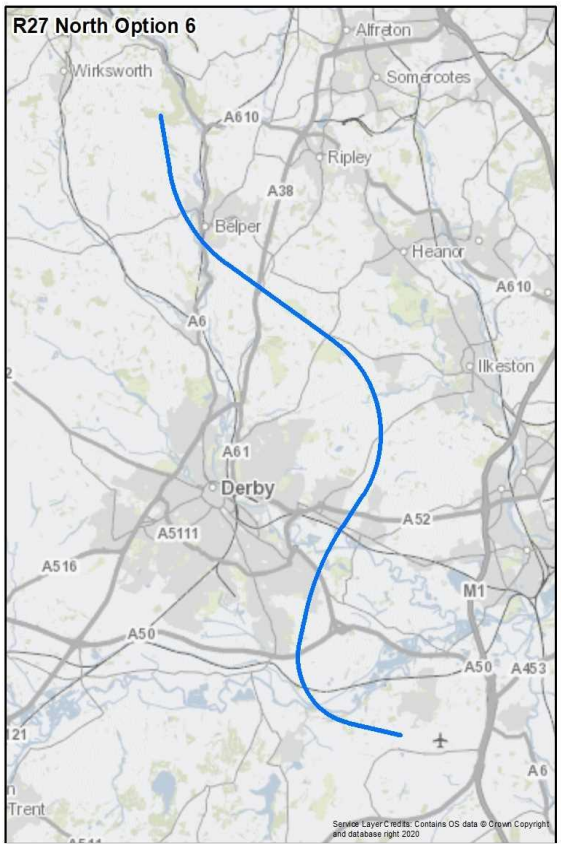
| Design Principle Evaluation | Option No. 6 |
|---|---|
| Option Name: SID RW 27 North Option 6 | REJECT |

**Option Description:**

Option 6 has a 15° northerly offset to avoid Melbourne and is a route designed to avoid overflight of Derby. It is similar to Option 5 however the turns have been designed for 210KIAS to align with the speed recommendations within CAP 778 which results in a slightly different track.

The initial 15° offset to the north results in the route passing north of Melbourne with the first turn to the north at 1.26nm beyond the DER onto a north east heading over the south east edge of Derby and passing between Spondon and Borrowash. A second left turn is made between Derby and Nottingham which leads to a north west heading passing over southern Belper before finally turning north and terminating north east of Belper.

Although PANS-OPS and CAP778 compliant it is a complex route that may require to be assessed for flyability as part of the procedure validation process within Stage 4 of CAP1616.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 6 is 40km (22nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

20.4% of the area of the Option 6 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 6 is estimated to overfly approximately 5,500 households with an approximate population of 10,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 13,500.

Up to 7,000ft, Option 6 is estimated to overfly approximately 15,450 households with an approximate population of 28,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 32,600.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 6 is estimated to overfly, 20 noise sensitive areas.

Up to 7,000ft, Option 6 is estimated to overfly 110 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | MET |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA. | |

## 12.7 Runway 27 North Option 7

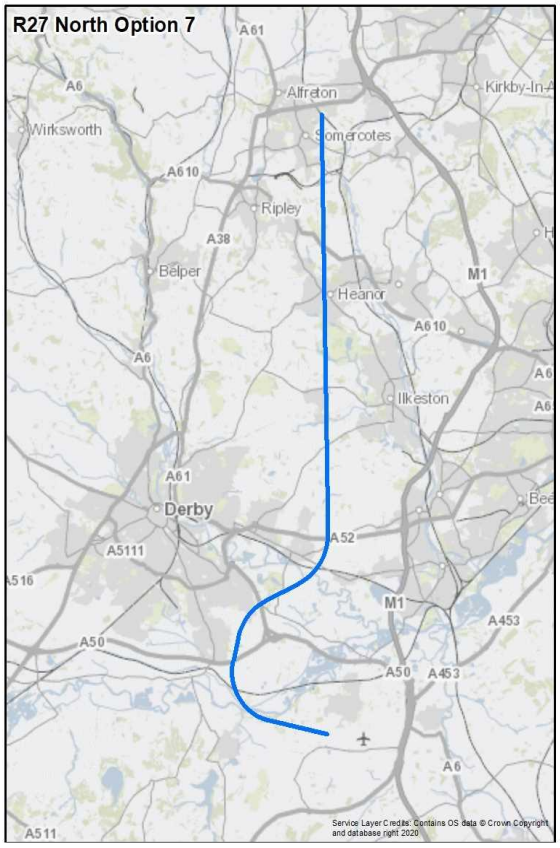
| Design Principle Evaluation | Option No. 7 |
|---|---|
| Option Name: SID RW 27 North Option 7 | ACCEPT |

**Option Description:**

Option 7 has a 15° northerly offset to avoid Melbourne and is a route that takes multiple turns to avoid overflight of Derby. It is similar to Option 5 but heads in a more northerly direction once past Derby.

The initial 15° offset to the north results in the route passing north of Melbourne with the first turn to the north at 1.54nm beyond the DER onto a northerly heading, before commencing a second right-hand turn onto a north easterly heading to pass just east of Borrowash. A third turn to the left takes the route north between Derby and Nottingham and it passes west of Ilkeston and terminates south east of Alfreton.

This route is intended to avoid overflight of built up and noise sensitive areas with all turns being limited to 190KIAS to enable tight turns. Although PANS-OPS compliant it may need to be assessed for flyability as part of the procedure validation process within Stage 4 of CAP1616.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 7 is 43km (23nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

20.2% of the area of the Option 7 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 7 is estimated to overfly approximately 1,650 households with an approximate population of 3,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 7,100.

Up to 7,000ft, Option 7 is estimated to overfly approximately 23,900 households with an approximate population of 44,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 52,300.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 7 is estimated to overfly, 10 noise sensitive areas.

Up to 7,000ft, Option 7 is estimated to overfly 130 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | PARTIAL |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS-OPS 8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables CCO to be conducted at EMA. A design speed restriction has been applied to the first turn which allows for the turn radius to be decreased. This speed is PANS-OPS compliant but a flyability check may be required during Stage 4 of the ACP process. | |

## 12.8 Runway 27 North Option 8

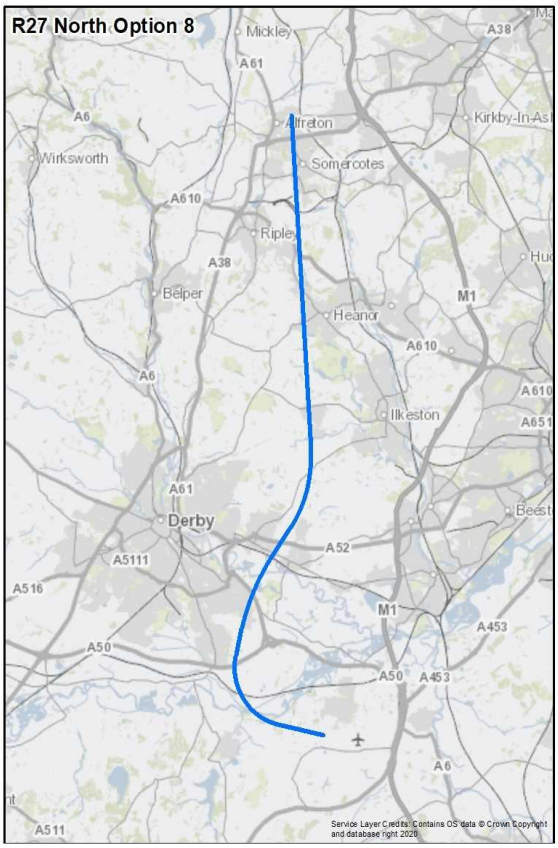
| Design Principle Evaluation | Option No. 8 |
|---|---|
| Option Name: SID RW 27 North Option 8 | ACCEPT |

**Option Description:**

Option 8 has a 15° northerly offset to avoid Melbourne and is a route that takes multiple turns to avoid overflight of Derby. It is similar to Option 7 however the turns have been designed for 210KIAS to align with the speed recommendations within CAP 778 which results in a slightly different track.

The initial 15° offset to the north results in the route passing north of Melbourne with the first turn to the north at 1.26nm beyond the DER onto a north east heading over the south east edge of Derby and passing between Spondon and Borrowash. A second left turn is made between Derby and Nottingham which leads to a northerly heading passing west of Ilkeston and Heanor, and the route terminates over Alfreton.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 8 is 41km (22nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

18.5% of the area of the Option 8 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 8 is estimated to overfly approximately 6,400 households with an approximate population of 11,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 15,200.

Up to 7,000ft, Option 8 is estimated to overfly approximately 27,000 households with an approximate population of 50,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 58,100.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 8 is estimated to overfly, 20 noise sensitive areas.

Up to 7,000ft, Option 8 is estimated to overfly 155 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 12.9 Runway 27 North Summary

| | Option 1 | Option 2 | Option 3 | Option 4 | Option 5 | Option 6 | Option 7 | Option 8 |
|---|---|---|---|---|---|---|---|---|
| **S - Safety** | MET | MET | MET | MET | MET | MET | MET | MET |
| **P - Programme** | MET | PARTIAL | PARTIAL | PARTIAL | MET | PARTIAL | MET | PARTIAL |
| **C - Continuity** | MET | MET | MET | MET | MET | MET | MET | MET |
| **E - Emissions** | NOT MET | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | NOT MET | PARTIAL |
| **N1 - Noise** | MET | MET | MET | MET | MET | MET | MET | MET |
| **N2 - Noise** | NOT MET | MET | MET | MET | PARTIAL | PARTIAL | PARTIAL | NOT MET |
| **N3 - Noise** | MET | PARTIAL | PARTIAL | PARTIAL | MET | PARTIAL | MET | PARTIAL |
| **N4 - Noise** | MET | PARTIAL | PARTIAL | PARTIAL | MET | PARTIAL | MET | PARTIAL |
| **A1 - Airspace** | MET | MET | MET | MET | MET | MET | MET | MET |
| **A2 - Airspace** | MET | MET | MET | MET | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET | PARTIAL | MET | PARTIAL | MET |
| | 4,000ft beneficial | Best | Best | Best | Best | Best | 4,000ft beneficial | 4,000ft beneficial |

## 12.10 Runway 27 North Viable but Poor Fit Options

| Option | Safety | Programme | Continuity |
|---|---|---|---|
| A9 | S | P | C |

Description: On departure from runway 27 the aircraft will make a left-hand wrap-around turn to the south and east, before heading north to the SID aiming point.

Safety: This option fails to align with this design principle, because it is expected to conflict or present a hazardous interaction with arrivals to runway 27 and the runway 27 Missed Approach Procedure (MAP).

Programme: This option partially fails to align to the environmental end of the AMS and the altitude based priorities of the ANG.

> *Environment:* This option would involve greater track mileage than is necessary by taking traffic a significant distance south and east before turning it north leading to increased fuel burn and emissions. However, there may be some reduction in the number of people impacted by noise below 4,000ft.

*Trade-offs*: There may be a material benefit in the number of people impacted by noise which is a potential trade-off for the increased emissions. This option has therefore been rated as Amber.

Continuity: This option fails to align with this design principle, because it would have an interaction with the departure envelopes, south east, south, and south west. In addition, it may interact with arrivals to runway 27 from the south. This would not enable best use of runway capacity.

| | | | |
|---|---|---|---|
| B10 | S | P | C |

Description: This option departs runway 27 in a north westerly direction following the majority of the current TNT SID and turning right between Derby and Ashbourne on to a north eastly heading.

Programme: This option fails to align with the environmental end of the AMS.

> *Environment:* This option would involve greater track mileage than is necessary by taking traffic a significant distance north west before turning it north leading to increased fuel burn and emissions. This option is already created in a more fuel efficient way by Option 1 and the number of people impacted by noise for this option in comparison to this and other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

Continuity: This option fails to align with this design principle, because it would have an interaction with the west and north west departure envelope for an extended period of time. This would not enable best use of runway capacity.

| | | | |
|---|---|---|---|
| C11 | S | P | C |

Description: This option departs runway 27 in a westerly direction for approximately 8nm before turning north at Burton upon Trent, then turning right between Derby and Ashbourne to a north easterly heading.

Programme: This option may align with the environmental end of the AMS and the altitude based priorities of the ANG.

*Environment:* This option would involve greater track mileage than is necessary by taking traffic a significant distance west before turning it north leading to increased fuel burn and emissions. A similar solution is already created in a more fuel efficient way by Option 1 and the number of people impacted by noise for this option in comparison to this and other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

Continuity: This option fails to align with this design principle, because it would have an interaction with the west and north west departure envelope for an extended period of time. This would not enable best use of runway capacity.

| D12 | S | P | C |
|---|---|---|---|

Description: This option departs runway 27 in a south west direction for approximately 8nm over Swadlincote before turning north at Burton upon Trent in a north westerly direction, then turning right between Derby and Ashbourne to a north easterly heading.

Programme: This option fails to align with the environmental end of the AMS.

*Environment:* This option would involve greater track mileage than is necessary by taking traffic a significant distance south west before turning it north leading to increased fuel burn and emissions. By overflying Swadlincote and Burton upon Trent the number of people impacted by noise for this option in comparison to this and other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

Continuity: This option fails to align with this design principle, because it would have an interaction with the west and north west departure envelope for an extended period of time. This would not enable best use of runway capacity.

| E13 | S | P | C |
|---|---|---|---|

Description: On departure from runway 27 the aircraft makes a right turn proceeding in a north easterly direction passing over central Nottingham before heading towards Alfreton.

Programme: This option fails to align with the environmental end of the AMS.

*Environment:* The number of people impacted by noise for this option in comparison to other options does not show a material benefit. The emissions generated by this option have been assessed as being greater when compared with other options.

Continuity: This option fails to align with this design principle, because it would have an interaction with arrivals for runway 27 which would not enable best use of runway capacity.

# 13 Runway 27 North West

## 13.1 Runway 27 North West Option 1

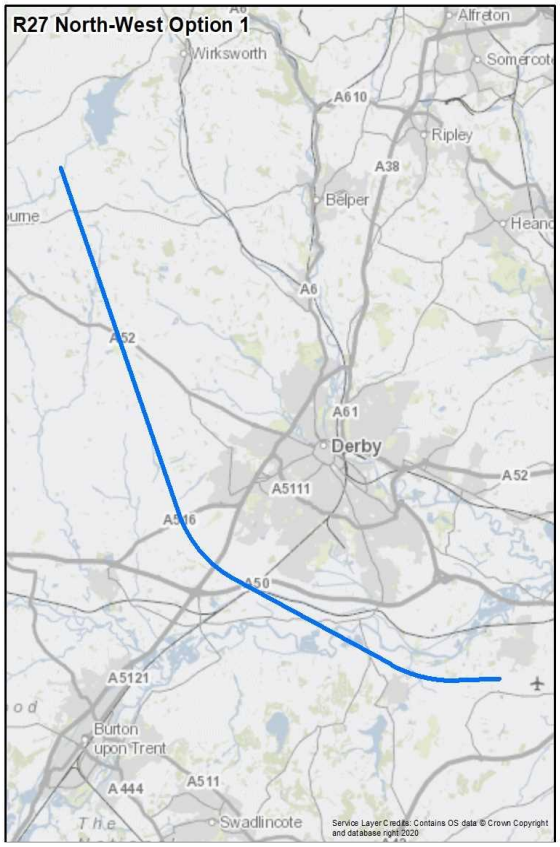
| Design Principle Evaluation | Option No. 1 |
|---|---|
| Option Name: SID RW 27 North West Option 1 | ACCEPT |

**Option Description:**

This is a replication of the current Trent TNT2N SID included as a 'do minimum' option. The first turn uses a speed of 210KIAS and commences at 1nm beyond the DER which is later than the current procedure but CAP778 recommended. As a replicated route it follows a similar track over the ground as the current route to connect to the NATS network.

After departure this follows the runway heading for 1nm with no offset before commencing a right turn onto a north west heading just to the north east of Melbourne. It passes pass south west of Derby and a second right turn turns route it towards the TNT DVOR which is located north east of Ashbourne, just west of Carsington Water.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 1 is 39km (21nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

14.5% of the area of the Option 1 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1 is estimated to overfly approximately 1,150 households with an approximate population of 2,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 2,200.

Up to 7,000ft, Option 1 is estimated to overfly approximately 2,050 households with an approximate population of 3,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 4,000.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1 is estimated to overfly, 10 noise sensitive areas.

Up to 7,000ft, Option 1 is estimated to overfly 25 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 13.2 Runway 27 North West Option 1A

| Design Principle Evaluation | Option No. 1A |
|---|---|
| Option Name: SID RW 27 North West Option 1A | ACCEPT |

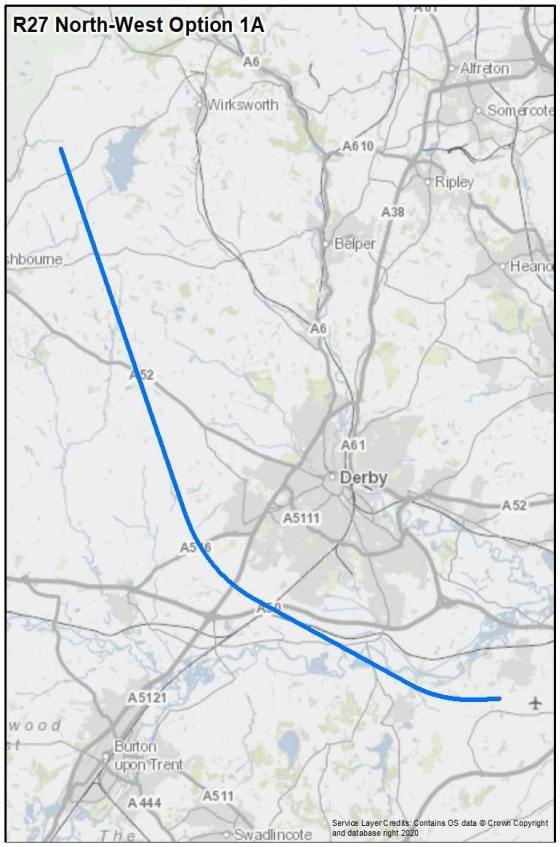
**Option Description:**

This is a replication of the current Trent TNT2N SID included as a 'do minimum' option.

The first turn uses the CAP778 speed of 210KIAS but commences at 0.66nm beyond the DER which is aligned to the first turn of the current procedure but not CAP 778 recommended. This turn point results in a route that passes further north of Melbourne when compared to Option 1. As a replicated route it follows a similar track over the ground as the current route to connect to the NATS network.

After departure this follows the runway heading for 0.66nm with no offset before commencing a right turn onto a north west heading just to the north east of Melbourne. It passes pass south west of Derby and a second right turn turns route it towards the TNT DVOR which is north east of Ashbourne, just west of Carsington Water.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 1A is 39km (21nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

13.7% of the area of the Option 1A overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1A is estimated to overfly approximately 900 households with an approximate population of 1,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 2,200.

Up to 7,000ft, Option 1A is estimated to overfly approximately 1,950 households with an approximate population of 3,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 4,200.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1A is estimated to overfly, 10 noise sensitive areas.

Up to 7,000ft, Option 1A is estimated to overfly 25 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 13.3 Runway 27 North West Option 2

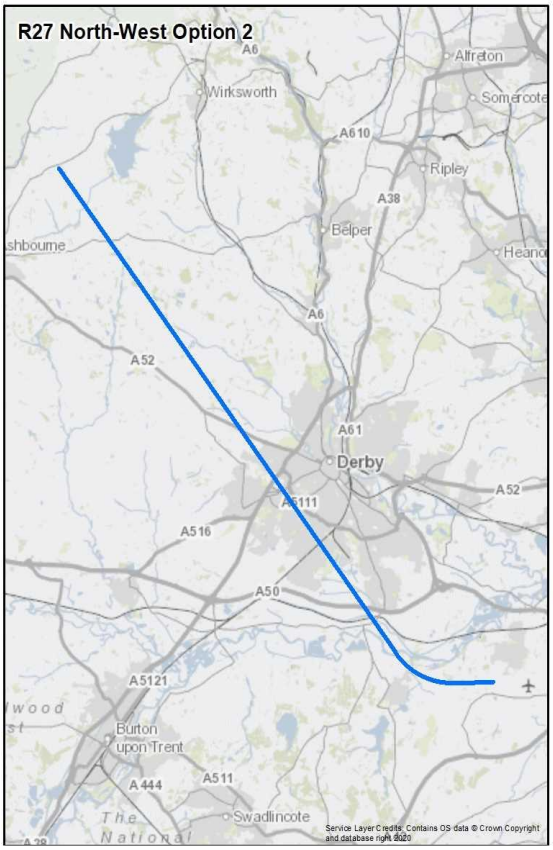
| Design Principle Evaluation | Option No. 2 |
|---|---|
| Option Name: SID RW 27 North West Option 2 | REJECT |

**Option Description:**

Option 2 proceeds straight ahead after take-off with no offset and has been created to provide a direct and fuel efficient route to join the NATS network close to TNT.

After departure this follows the runway heading for 1nm with no offset before commencing a right turn onto a north west heading to the north east of Melbourne. It overflies western Derby and terminates south of the TNT DVOR, close to Kniveton.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS end Integration. However, following the proposal by NERL to relocate the network joining point, to avoid conflicts between EMA north west departures and MAN arrivals, the termination point of this option is misaligned with the NATS network traffic flow and the option is therefore deemed not to align with the UK AMS end Simplification. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 2 is 37km (20nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

12.4% of the area of the Option 2 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 2 is estimated to overfly approximately 13,100 households with an approximate population of 25,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 25,200.

Up to 7,000ft, Option 2 is estimated to overfly approximately 14,050 households with an approximate population of 26,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 26,900.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 2 is estimated to overfly, 85 noise sensitive areas.

Up to 7,000ft, Option 2 is estimated to overfly 100 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 13.4 Runway 27 North West Option 3

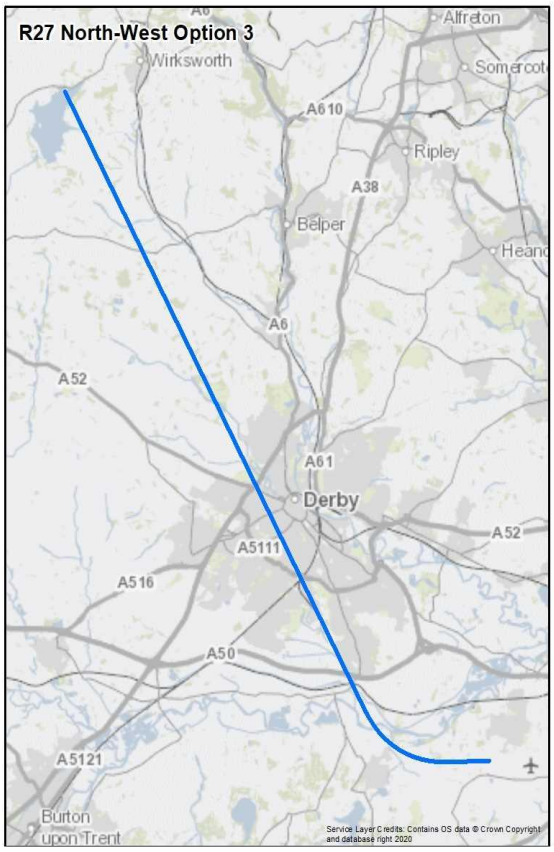
| Design Principle Evaluation | Option No. 3 |
|---|---|
| Option Name: SID RW 27 North West Option 3 | REJECT |

**Option Description:**

Option 2 proceeds straight ahead after take-off with no offset and has been created to provide a direct and fuel efficient route to join the NATS network close to TNT.

After departure this follows the runway heading for 1nm with no offset before commencing a right turn onto a north west heading to the north east of Melbourne. It overflies western Derby and terminates south of the TNT DVOR, close to Kniveton.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS end Integration. However, following the proposal by NERL to relocate the network joining point, to avoid conflicts between EMA north west departures and MAN arrivals, the termination point of this option is misaligned with the NATS network traffic flow and the option is therefore deemed not to align with the UK AMS end Simplification. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 3 is 38km (21nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

8.0% of the area of the Option 3 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 3 is estimated to overfly approximately 24,050 households with an approximate population of 47,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 47,700.

Up to 7,000ft, Option 3 is estimated to overfly approximately 24,850 households with an approximate population of 49,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 49,300.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 3 is estimated to overfly, 225 noise sensitive areas.

Up to 7,000ft, Option 3 is estimated to overfly 235 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 13.5 Runway 27 North West Option 4

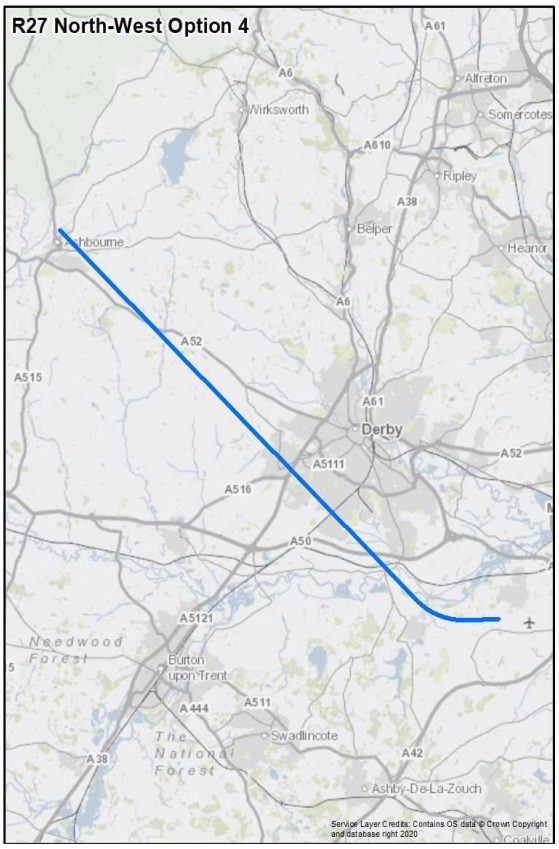
| Design Principle Evaluation | Option No. 4 |
|---|---|
| Option Name: SID RW 27 North West Option 4 | REJECT |

**Option Description:**

Option 4 proceeds straight ahead after take-off with no offset and has been created to provide a direct and fuel efficient route to join the NATS network.

After departure this follows the runway heading for 1nm with no offset before commencing a right turn onto a north west heading to the north east of Melbourne. It passes over the south west edge of Derby on a direct track to the termination point which is located over north Ashbourne.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 4 is 37km (20nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

11.5% of the area of the Option 4 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 4 is estimated to overfly approximately 13,850 households with an approximate population of 27,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 31,500.

Up to 7,000ft, Option 4 is estimated to overfly approximately 18,900 households with an approximate population of 36,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 44,000.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 4 is estimated to overfly, 85 noise sensitive areas.

Up to 7,000ft, Option 4 is estimated to overfly 125 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | MET |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA. | |

## 13.6 Runway 27 North West Option 5

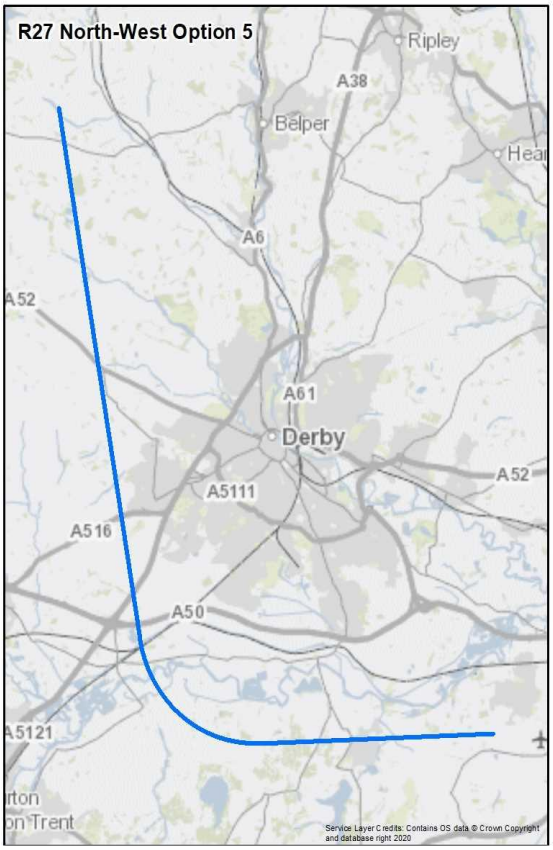
| Design Principle Evaluation | Option No. 5 |
|---|---|
| Option Name: SID RW 27 North West Option 5 | REJECT |

**Option Description:**

Option 5 proceeds straight ahead after take-off before turning directly north to avoid Derby.

After departure this follows the runway heading for approximately 6nm beyond the DER with no offset before commencing a right turn onto a northerly heading. This takes it west of Derby and it continues on this track until the termination point, south east of Carsington Water.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS end Integration. However, following the proposal by NERL to relocate the network joining point, to avoid conflicts between EMA north west departures and MAN arrivals, the termination point of this option is misaligned with the NATS network traffic flow and the option is therefore deemed not to align with the UK AMS end Simplification. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 5 is 42km (23nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

15.5% of the area of the Option 5 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 5 is estimated to overfly approximately 3,000 households with an approximate population of 5,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 5,700.

Up to 7,000ft, Option 5 is estimated to overfly approximately 5,750 households with an approximate population of 10,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 10,900.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 5 is estimated to overfly, 20 noise sensitive areas.

Up to 7,000ft, Option 5 is estimated to overfly 35 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 13.7 Runway 27 North West Option 6

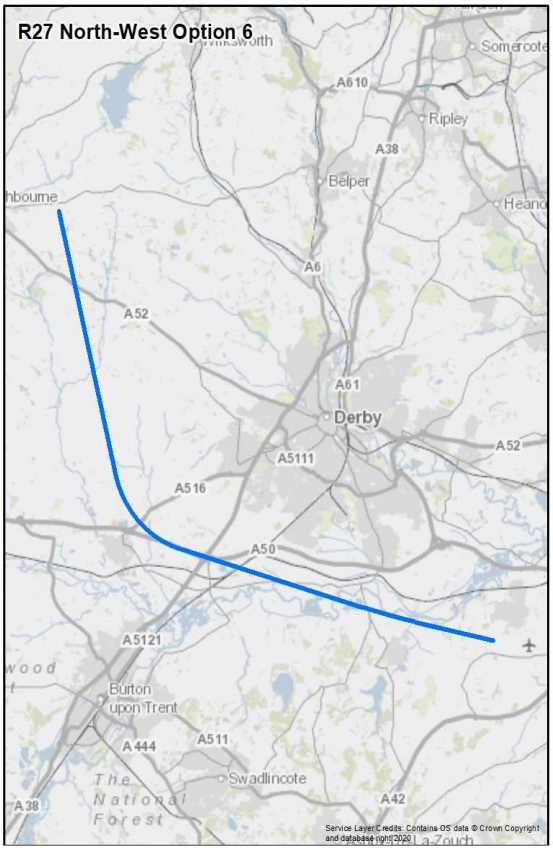
| Design Principle Evaluation | Option No. 6 |
|---|---|
| Option Name: SID RW 27 North West Option 6 | REJECT |

**Option Description:**

Option 6 has a 15° northerly offset to the runway and has been created to reduce the impact of noise immediately after departure and later in the route by avoiding Derby.

The initial 15° offset to the north results in the route passing north of Melbourne and Kings Newton and this route heading is maintained for just over 6.5nm. A right turn is made to the south west of Derby, close to Derby airfield which takes it onto a north westerly heading which it continues on until the termination point to the east of Ashbourne.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS end Integration. However, following the proposal by NERL to relocate the network joining point, to avoid conflicts between EMA north west departures and MAN arrivals, the termination point of this option is misaligned with the NATS network traffic flow and the option is therefore deemed not to align with the UK AMS end Simplification. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 6 is 40km (22nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

25.1% of the area of the Option 6 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 6 is estimated to overfly approximately 1,400 households with an approximate population of 2,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 2,500.

Up to 7,000ft, Option 6 is estimated to overfly approximately 2,050 households with an approximate population of 3,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 3,900.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 6 is estimated to overfly, 30 noise sensitive areas.

Up to 7,000ft, Option 6 is estimated to overfly 40 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | MET |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA. | |

## 13.8 Runway 27 North West Option 7

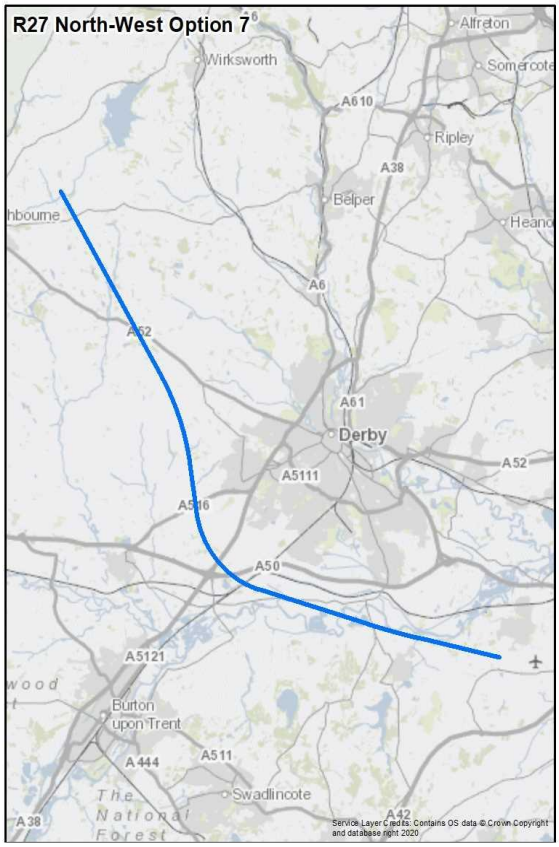
| Design Principle Evaluation | Option No. 7 |
|---|---|
| Option Name: SID RW 27 North West Option 7 | ACCEPT |

**Option Description:**

Option 7 has a 15° northerly offset to the runway and has been created to reduce the impact of noise immediately after departure and later in the route by avoiding Derby.

The initial 15° offset to the north results in the route passing north of Melbourne and Kings Newton and this route heading is maintained for just over 6.5nm. The first turn is made to the south west of Derby, close to the junction of the A38 and A50 which takes it onto a northerly heading before a left turn onto a north westerly heading. The route terminates to the east of Ashbourne.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 7 is 39km (21nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

13.8% of the area of the Option 7 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 7 is estimated to overfly approximately 750 households with an approximate population of 1,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 1,400.

Up to 7,000ft, Option 7 is estimated to overfly approximately 1,600 households with an approximate population of 3,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 3,100.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 7 is estimated to overfly, 15 noise sensitive areas.

Up to 7,000ft, Option 7 is estimated to overfly 20 noise sensitive areas.

This is a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | MET |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA. | |

## 13.9 Runway 27 North West Option 8

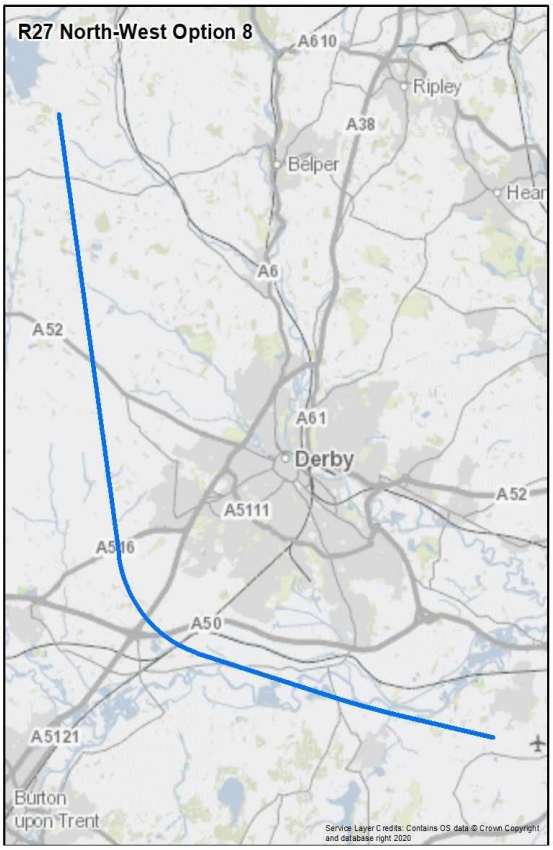
| Design Principle Evaluation | Option No. 8 |
|---|---|
| Option Name: SID RW 27 North West Option 8 | REJECT |

**Option Description:**

Option 8 has a 15° northerly offset to the runway and has been created to reduce the impact of noise immediately after departure and later in the route by avoiding Derby. It is similar to option 6 but terminates further east of TNT.

The initial 15° offset to the north results in the route passing north of Melbourne and Kings Newton and this route heading is maintained for just over 6.5nm. A right turn is made to the south west of Derby, close to the junction of the A38 and A50 which takes it onto a northerly heading which it continues on until the termination point to the south east of Carsington Water.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS end Integration. However, following the proposal by NERL to relocate the network joining point, to avoid conflicts between EMA north west departures and MAN arrivals, the termination point of this option is misaligned with the NATS network traffic flow and the option is therefore deemed not to align with the UK AMS end Simplification. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 8 is 43km (23nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

13.3% of the area of the Option 8 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 8 is estimated to overfly approximately 750 households with an approximate population of 1,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 1,400.

Up to 7,000ft, Option 8 is estimated to overfly approximately 1,850 households with an approximate population of 3,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 3,400.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 8 is estimated to overfly, 15 noise sensitive areas.

Up to 7,000ft, Option 8 is estimated to overfly 25 noise sensitive areas.

This is a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 13.10 Runway 27 North West Option 9

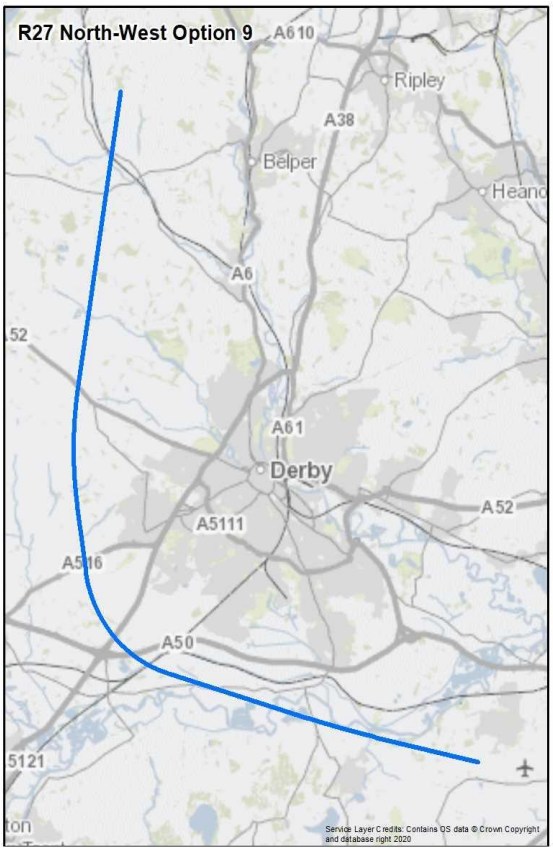
| Design Principle Evaluation | Option No. 9 |
|---|---|
| Option Name: SID RW 27 North West Option 9 | REJECT |

**Option Description:**

Option 9 has a 15° northerly offset to the runway and has been created to reduce the impact of noise immediately after departure and later in the route by avoiding Derby. It is similar to option 6 but terminates further east of TNT.

The initial 15° offset to the north results in the route passing north of Melbourne and Kings Newton and this route heading is maintained for just over 6.5nm. A right turn is made to the south west of Derby, close to the junction of the A38 and A50 which takes it onto a north easterly heading which it continues on until the termination point to the south east of Wirksworth.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS end Integration. However, following the proposal by NERL to relocate the network joining point, to avoid conflicts between EMA north west departures and MAN arrivals, the termination point of this option is misaligned with the NATS network traffic flow and the option is therefore deemed not to align with the UK AMS end Simplification. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 9 is 41km (22nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

12.5% of the area of the Option 9 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 9 is estimated to overfly approximately 700 households with an approximate population of 1,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 1,300.

Up to 7,000ft, Option 9 is estimated to overfly approximately 1,650 households with an approximate population of 3,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 3,000.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 9 is estimated to overfly, 15 noise sensitive areas.

Up to 7,000ft, Option 9 is estimated to overfly 25 noise sensitive areas.

This is a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 13.11 Runway 27 North West Option 10

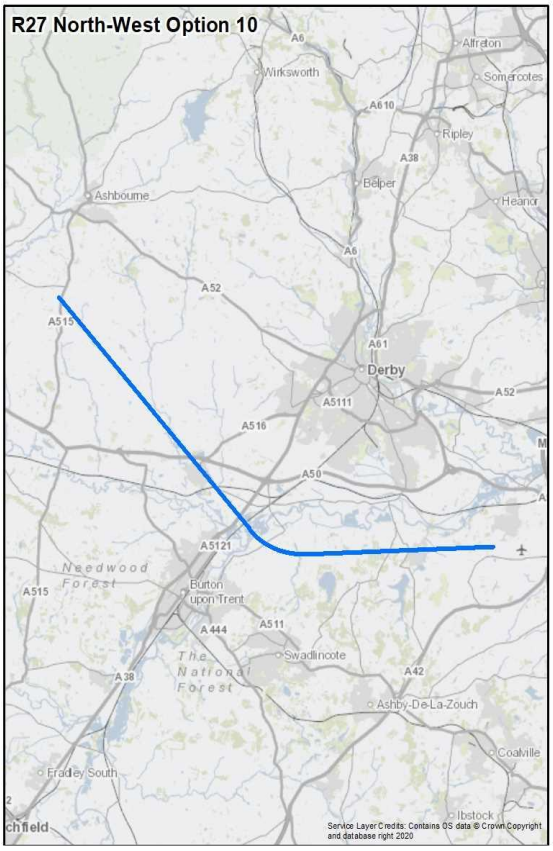
| Design Principle Evaluation | Option No. 10 |
|---|---|
| Option Name: SID RW 27 North West Option 10 | ACCEPT |

**Option Description:**

Option 10 proceeds straight ahead after take-off with no offset and has been created to provide a route that has the maximum avoidance of Derby and Burton upon Trent.

After departure this follows the runway heading with no offset to a point approximately 6.5nm from the DER, where the route passes south of Repton and turns onto to a north west heading. It passes between Derby and Burton upon Trent and overhead Hilton prior to terminating to the south of Ashbourne.

Because there is no immediate turn a higher design speed of 250 KIAS can be used which is the CAP 778 recommended speed when turning above 3000ft.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 10 is 41km (22nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

13.5% of the area of the Option 10 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 10 is estimated to overfly approximately 1,100 households with an approximate population of 2,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 3,000.

Up to 7,000ft, Option 10 is estimated to overfly approximately 5,100 households with an approximate population of 9,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 11,300.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 10 is estimated to overfly, 15 noise sensitive areas.

Up to 7,000ft, Option 10 is estimated to overfly 40 noise sensitive areas.

This is a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 13.12 Runway 27 North West Option 11

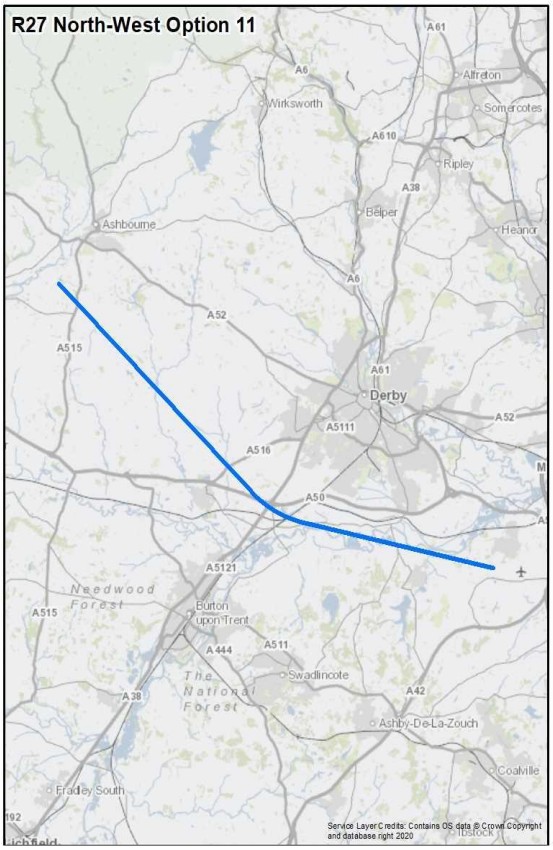
| Design Principle Evaluation | Option No. 11 |
|---|---|
| Option Name: SID RW 27 North West Option 11 | ACCEPT |

**Option Description:**

Option 11 has a 15° northerly offset to the runway and has been created to reduce the impact of noise immediately after departure and later in the route by avoiding Derby.

The initial 15° offset to the north results in the route passing north of Melbourne and Kings Newton and this route heading is maintained for just over 6.5nm. The first turn is made to the south west of Derby, over the junction of the A38 and A50 which takes it onto a north westerly heading and the route terminates on the southern side of envelope, south of Ashbourne.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 11 is 38km (21nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

16.6% of the area of the Option 11 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 11 is estimated to overfly approximately 1,850 households with an approximate population of 3,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 3,800.

Up to 7,000ft, Option 11 is estimated to overfly approximately 2,600 households with an approximate population of 4,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 5,300.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 11 is estimated to overfly, 20 noise sensitive areas.

Up to 7,000ft, Option 11 is estimated to overfly 35 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 13.13 Runway 27 North West Option 12

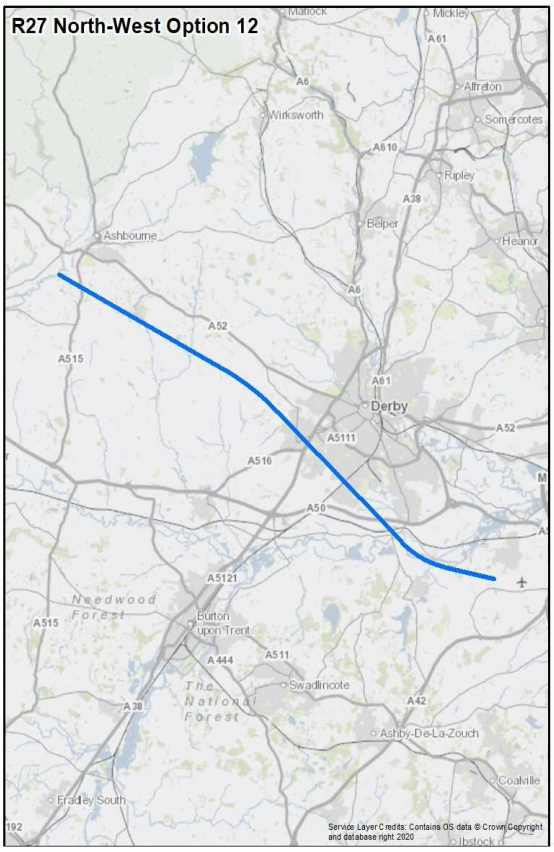
| Design Principle Evaluation | Option No. 12 |
|---|---|
| Option Name: SID RW 27 North West Option 12 | REJECT |

**Option Description:**

Option 12 has a 15° northerly offset to the runway and has been created with a more direct track to reduce fuel burn, and increased divergence from departures on the west envelope to ensure capacity is not impacted.

The initial 15° offset to the north results in the route passing north of Melbourne and Kings Newton where the route turns to a north westerly heading and routes over the south west corner of Derby. When north of Radbourne, the route turns slightly west to track south of the A52 and terminates to the south west of Ashbourne.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 12 is 37km (20nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

7.3% of the area of the Option 12 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 12 is estimated to overfly approximately 13,600 households with an approximate population of 26,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 30,900.

Up to 7,000ft, Option 12 is estimated to overfly approximately 15,000 households with an approximate population of 29,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 33,500.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 12 is estimated to overfly, 80 noise sensitive areas.

Up to 7,000ft, Option 12 is estimated to overfly 95 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 13.14 Runway 27 North West Option 13

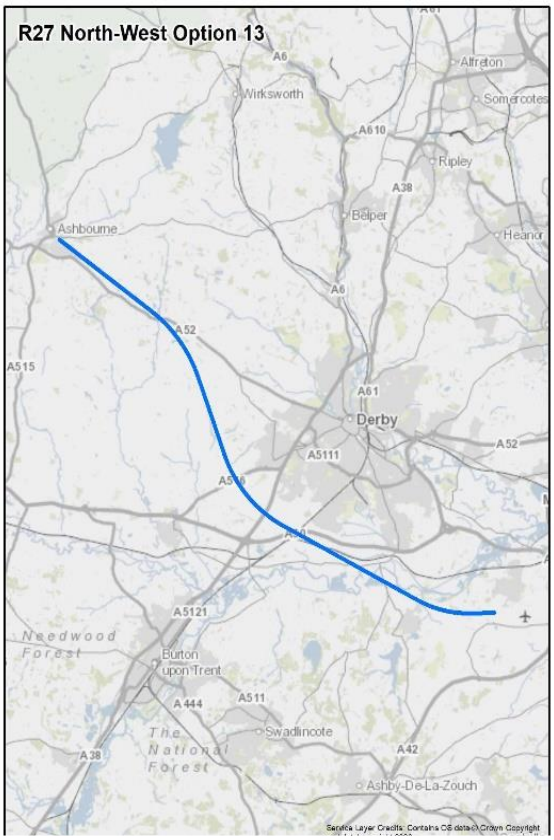
| Design Principle Evaluation | Option No. 13 |
|---|---|
| Option Name: SID RW 27 North West Option 13 | ACCEPT |

**Option Description:**

Option 13 proceeds straight ahead after take-off with no offset and has been created to avoid overflying Derby. It follows the same initial track as the current TNT SID but turns north west in the final part of the route.

After departure this follows the runway heading with no offset along the extended runway centreline with a right turn to the north of Melbourne in a north westerly direction routing to the south west of Derby. Between the A38 and A516 the route turns to a north by north west heading to pass west of Derby. At Brailsford, the route turns west and terminates over south east Ashbourne.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 13 is 38km (21nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

19.7% of the area of the Option 13 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 13 is estimated to overfly approximately 1,000 households with an approximate population of 1,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 2,500.

Up to 7,000ft, Option 13 is estimated to overfly approximately 6,050 households with an approximate population of 10,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 14,800.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 13 is estimated to overfly, 10 noise sensitive areas.

Up to 7,000ft, Option 13 is estimated to overfly 50 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 13.15 Runway 27 North West Option 14

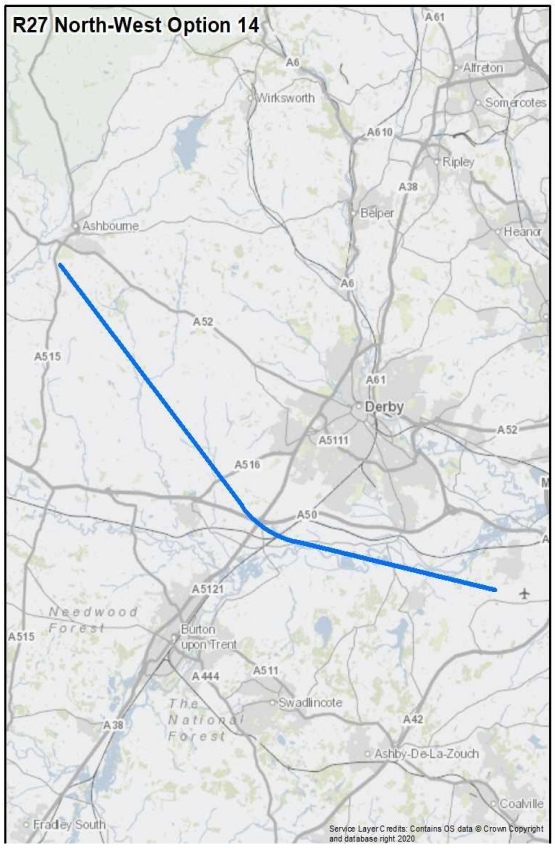
| Design Principle Evaluation | Option No. 14 |
|---|---|
| Option Name: SID RW 27 North West Option 14 | ACCEPT |

**Option Description:**

Option 14 has a 15° northerly offset to the runway and has been created as a route that seeks to reduce the impact of noise by avoiding Derby, Burton upon Trent and remaining south of Ashbourne.

The initial 15° offset to the north results in the route passing north of Melbourne and Kings Newton and the route continues on this heading to pass between Derby and Burton upon Trent. Around the junction of the A50 and A516 the route turns to a north west heading prior to terminating south west of Ashbourne.

The route has a constant climb gradient of 6% terminating at 7,000ft and a speed restriction of 250 KIAS is applied to the first turn which is the CAP 778 recommended speed when turning above 3000ft on a 10% climb.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 14 is 38km (21nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

15.8% of the area of the Option 14 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 14 is estimated to overfly approximately 1,800 households with an approximate population of 3,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 3,800.

Up to 7,000ft, Option 14 is estimated to overfly approximately 3,850 households with an approximate population of 7,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 8,200.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 14 is estimated to overfly, 25 noise sensitive areas.

Up to 7,000ft, Option 14 is estimated to overfly 45 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 13.16 Runway 27 North West Option 15

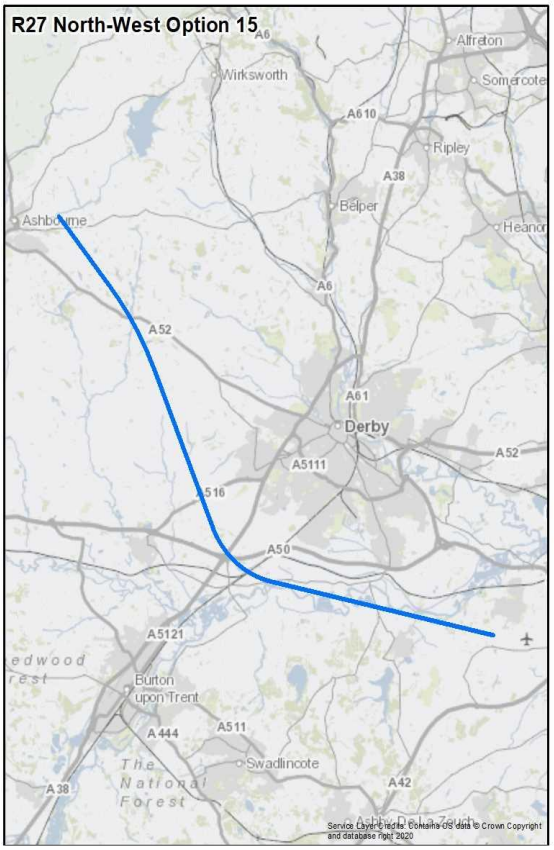
| Design Principle Evaluation | Option No. 15 |
|---|---|
| Option Name: SID RW 27 North West Option 15 | ACCEPT |

**Option Description:**

Option 15 has a 15° northerly offset to the runway and has been created as a route that seeks to reduce the impact of noise by avoiding Derby and Burton upon Trent. It takes the same initial track as Option 14 but routes further north after the first turn.

The initial 15° offset to the north results in the route passing north of Melbourne and Kings Newton and the route continues on this heading to pass between Derby and Burton upon Trent. Around the junction of the A50 and A516 the route turns to a north west passing west of Derby and terminating south east of Ashbourne.

The route has a constant climb gradient of 6% terminating at 7,000ft and a speed restriction of 250 KIAS is applied to the first turn which is the CAP 778 recommended speed when turning above 3000ft on a 10% climb.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 15 is 39km (21nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

14.5% of the area of the Option 15 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 15 is estimated to overfly approximately 500 households with an approximate population of 1,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 1,000.

Up to 7,000ft, Option 15 is estimated to overfly approximately 2,000 households with an approximate population of 3,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 6,600.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 15 is estimated to overfly, 10 noise sensitive areas.

Up to 7,000ft, Option 15 is estimated to overfly 20 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 13.17 Runway 27 North West Summary

| | Option 1 | Option 1A | Option 2 | Option 3 | Option 4 | Option 5 | Option 6 | Option 7 | Option 8 | Option 9 | Option 10 | Option 11 | Option 12 | Option 13 | Option 14 | Option 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **S - Safety** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **P - Programme** | NOT MET | NOT MET | NOT MET | NOT MET | PARTIAL | NOT MET | NOT MET | NOT MET | NOT MET | NOT MET | MET | MET | PARTIAL | MET | MET | MET |
| **C - Continuity** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **E - Emissions** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | NOT MET | PARTIAL | PARTIAL | NOT MET | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **N1 - Noise** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **N2 - Noise** | MET | PARTIAL | NOT MET | NOT MET | NOT MET | MET | MET | PARTIAL | PARTIAL | NOT MET | PARTIAL | MET | NOT MET | MET | MET | PARTIAL |
| **N3 - Noise** | MET | MET | PARTIAL | PARTIAL | PARTIAL | MET | MET | MET | MET | MET | MET | MET | PARTIAL | MET | MET | MET |
| **N4 - Noise** | MET | MET | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | MET | MET | MET | MET | PARTIAL | PARTIAL | MET | PARTIAL | MET |
| **A1 - Airspace** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **A2 - Airspace** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| | Rejected | Rejected | Rejected | Rejected | Rejected | Rejected | Rejected | Rejected | Rejected | Rejected | Best | Best | Rejected | Best | Best | Best |

## 13.18 Runway 27 North West Viable but Poor Fit Options

| Option | Safety | Programme | Continuity |
|---|---|---|---|
| A16 | S | P | C |

Description: On departure from runway 27 aircraft will initiate an immediate left-hand wrap-around turn to the south, east and north before proceeding north west.

Safety: This option fails to align with this design principle, because it is expected to conflict or present a hazardous interaction with arrivals to runway 27 and the runway 27 Missed Approach Procedure (MAP)

Programme: This option fails to align with the simplification and environmental ends of the AMS.

*Simplification*: Following the decision by NERL to relocate the network joining point to avoid conflicts between EMA north west departures and MAN arrivals the termination point of this option in a northerly direction is misaligned with the NATS network traffic flow.

*Environment:* The emissions generated by this option have been assessed as being greater due to the additional track length required to connect to the revised network joining point. By overflying north east Derby, the number of people impacted by noise for this option in comparison to other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the misalignment to the network or increased emissions, and insufficient justification for an Amber rating.

Continuity: This option fails to align with this design principle, because it would have an interaction with the departure envelopes, south east, south, and north. In addition, it may interact with arrivals to runway 27 from the south. This would not enable best use of runway capacity.

| | | | |
|---|---|---|---|
| B17 | S | P | C |

Description: On departure from runway 27 this continues in a westerly direction, turning right north of Burton upon Trent in a north-north easterly direction towards Belper.

Programme: This option fails to align with the simplification and environmental ends of the AMS.

*Simplification*: Following the proposal by NERL to relocate the network joining point to avoid conflicts between EMA north west departures and MAN arrivals the termination point of this option in a north east direction is misaligned with the NATS network traffic flow.

*Environment:* The emissions generated by this option have been assessed as being greater due to the additional track length required to connect to the revised network joining point. By overflying Burton upon Trent, the number of people impacted by noise for this option in comparison to this and other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the misalignment to the network or increased emissions, and insufficient justification for an Amber rating.

Continuity: This option fails to align with this design principle, because it would have an interaction with the west departure envelopes which would not enable best use of runway capacity.

| | | | |
|---|---|---|---|
| C18 | S | P | C |

Description: This option departs runway 27 on a 15 degree offset in a south westerly direction until just south of Burton upon Trent where it turns right in a northerly direction to the east of Ashbourne.

Programme: This option fails to align with the simplification and environmental ends of the AMS.

*Simplification*: Following the decision by NERL to relocate the network joining point to avoid conflicts between EMA north west departures and MAN arrivals the termination point of this option in a northerly direction is misaligned with the NATS network traffic flow.

*Environment:* The emissions generated by this option have been assessed as being greater due to the additional track length required to connect to the revised network joining point. By overflying Burton upon Trent, the number of people impacted by noise for this option in comparison to this and other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the misalignment to the network or increased emissions, and insufficient justification for an Amber rating.

Continuity: This option fails to align with this design principle, because it would have an interaction with the west and south west departure envelopes which would not enable best use of runway capacity.

# 14 Runway 27 South

## 14.1 Runway 27 South Option 1

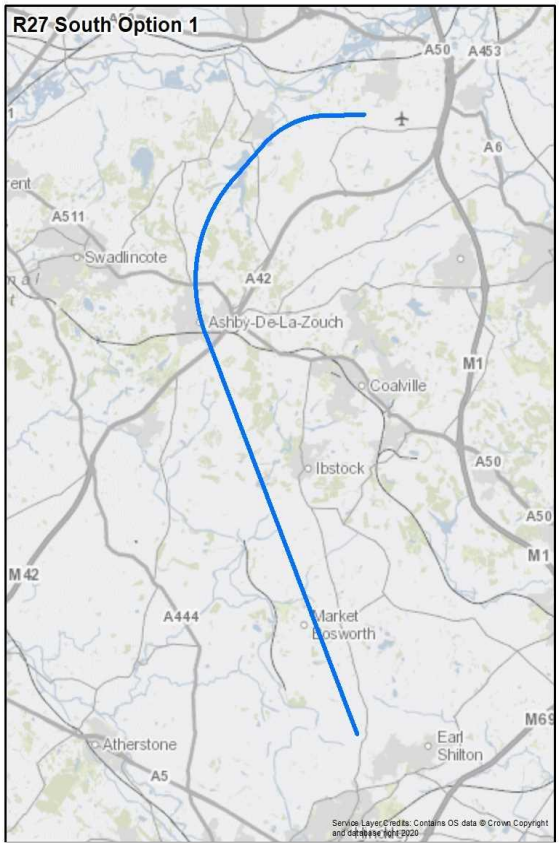
| Design Principle Evaluation | Option No. 1 |
|---|---|
| Option Name: SID RW 27 South Option 1 | ACCEPT |

**Option Description:**

This is a replication of the current Daventry DTY 3N SID included as a 'do minimum' option. The first turn uses a speed of 210KIAS and commences at 1nm beyond the DER which is later than the current procedure but CAP778 recommended. As a replicated route it follows a similar track over the ground as the current route to connect to the NATS network.

After departure this follows the runway heading for 1nm with no offset before commencing a left turn onto a south west heading just to the south east of Melbourne. It then makes a second left turn which overflies Ashby-de-la-Zouch and it then continues south to terminate north of Boswell and Earl Shilton.

The SID is designed to terminate at 7,000ft and the climb gradient has been set at 6%. The CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 1 is 36km (19nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

8.3% of the area of the Option 1 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1 is estimated to overfly approximately 4,900 households with an approximate population of 8,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 12,500.

Up to 7,000ft, Option 1 is estimated to overfly approximately 8,300 households with an approximate population of 15,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 20,800.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1 is estimated to overfly, 40 noise sensitive areas.

Up to 7,000ft, Option 1 is estimated to overfly 60 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 14.2 Runway 27 South Option 1A

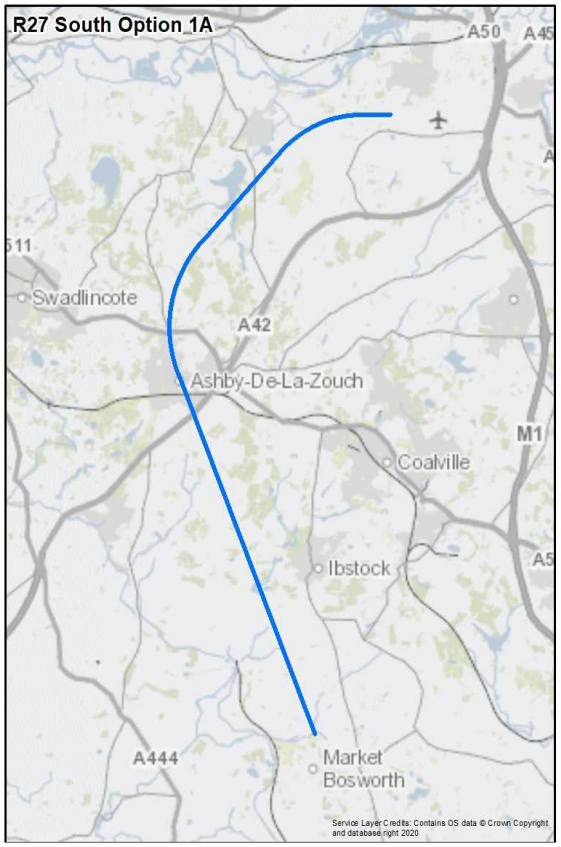
| Design Principle Evaluation | Option No. 1A |
|---|---|
| Option Name: SID RW 27 South Option 1A | ACCEPT |

**Option Description:**

This is a replication of the current Daventry DTY 3N SID included as a 'do minimum' option. However, the first turn commences at 0.66nm beyond the DER which is exactly aligned to the first turn of the current procedure.

After departure this follows the runway heading for 0.66nm with no offset before commencing a left turn onto a south west heading which takes it further to the south east of Melbourne than Option 1. It then makes a second left turn which overflies Ashby-de-la-Zouch and it then continues south to terminate north of Boswell and Earl Shilton.

The SID is designed to terminate at 7,000ft and the climb gradient has been set at 6%. The CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 1A is 36km (19nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

7.8% of the area of the Option 1A overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1A is estimated to overfly approximately 5,300 households with an approximate population of 9,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 13,600.

Up to 7,000ft, Option 1A is estimated to overfly approximately 7,600 households with an approximate population of 13,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 18,200.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1A is estimated to overfly, 45 noise sensitive areas.

Up to 7,000ft, Option 1A is estimated to overfly 60 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 14.3 Runway 27 South Option 2

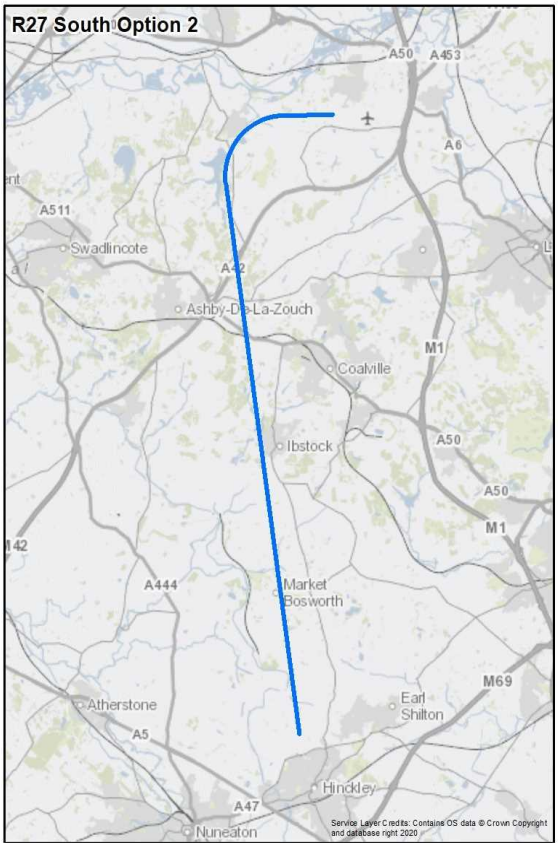
| Design Principle Evaluation | Option No. 2 |
|---|---|
| Option Name: SID RW 27 South Option 2 | ACCEPT |

**Option Description:**

Option 2 proceeds straight ahead after take-off with no offset, and has been created to provide a shorter and more fuel efficient route to the south.

After departure this follows the runway heading for 1.4nm with no offset before commencing a single left turn onto a southerly heading just to the south of Melbourne. It passes between Ashby-de-la-Zouch and Coalville, and just west of Ibstock and terminates north of Hinckley.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 2 is 34km (18nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

10.5% of the area of the Option 2 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 2 is estimated to overfly approximately 1,150 households with an approximate population of 2,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 2,200.

Up to 7,000ft, Option 2 is estimated to overfly approximately 8,950 households with an approximate population of 16,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 18,400.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 2 is estimated to overfly, 20 noise sensitive areas.

Up to 7,000ft, Option 2 is estimated to overfly 60 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 14.4 Runway 27 South Option 3

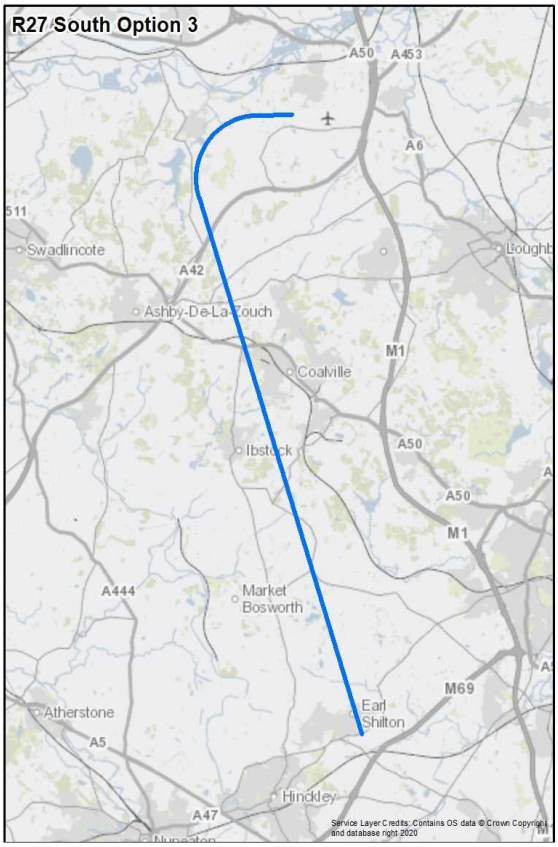
| Design Principle Evaluation | Option No. 3 |
|---|---|
| Option Name: SID RW 27 South Option 3 | REJECT |

**Option Description:**

Option 3 proceeds straight ahead after take-off with no offset and has been created to provide an alternative shorter and more fuel efficient route to the south.

After departure this follows the runway heading for 1nm with no offset passing close to the south east corner of Melbourne. A single left turn is made onto a south-south-easterly heading and it passes east of Ashby-de-la-Zouch and overflies the western edge of Coalville, terminating on the southern edge of Earl Shilton.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplification and Integration. This route is deemed not to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being increased, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 3 is 34km (18nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

14.7% of the area of the Option 3 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 3 is estimated to overfly approximately 5,650 households with an approximate population of 10,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 12,200.

Up to 7,000ft, Option 3 is estimated to overfly approximately 15,000 households with an approximate population of 27,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 31,600.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 3 is estimated to overfly, 10 noise sensitive areas.

Up to 7,000ft, Option 3 is estimated to overfly 50 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 14.5 Runway 27 South Option 4

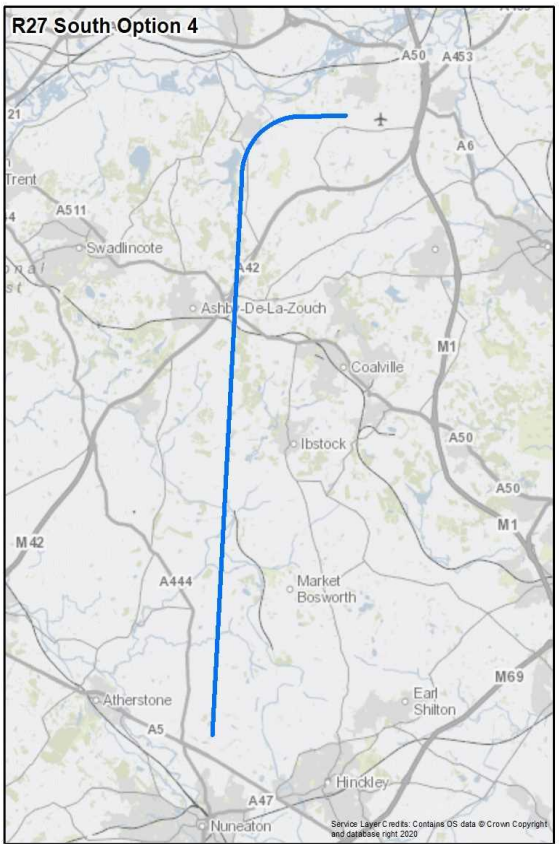
| Design Principle Evaluation | Option No. 4 |
|---|---|
| Option Name: SID RW 27 South Option 4 | ACCEPT |

**Option Description:**

Option 4 proceeds straight ahead after take-off with no offset and has been created to provide the most direct and fuel efficient route to the expected network join to the south.

After departure this follows the runway heading for 1.4nm with no offset passing close to the south east corner of Melbourne. A single left turn is then made onto a southerly heading and it passes between Ashby-de-la-Zouch and Coalville. This option is slightly further west than Option 2, resulting in the route passing to the west of Ibstock and terminating north of Nuneaton.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 4 is 35km (19nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

12.6% of the area of the Option 4 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 4 is estimated to overfly approximately 300 households with an approximate population of 500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 500.

Up to 7,000ft, Option 4 is estimated to overfly approximately 1,500 households with an approximate population of 2,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 4,700.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 4 is estimated to overfly, 10 noise sensitive areas.

Up to 7,000ft, Option 4 is estimated to overfly 20 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 14.6 Runway 27 South Option 5

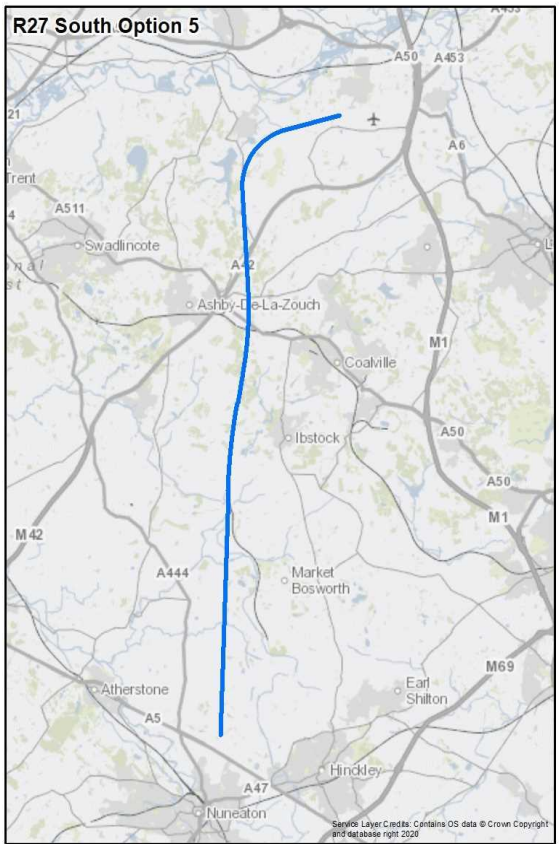
| Design Principle Evaluation | Option No. 5 |
|---|---|
| Option Name: SID RW 27 South Option 5 | ACCEPT |

**Option Description:**

Option 5 has a 12° southerly offset and has been created as a route that specifically seeks to reduce the impact of noise on built up areas, whilst also retaining the fuel benefits of Option 4.

The initial 15° offset to the south results in the route passing south of Melbourne. A left turn is made at approximately 1.6nm beyond the DER onto a southerly heading to pass between Ashby-de-la-Zouch and Coalville, but with slightly greater distance from Ashby-de-la-Zouch than Option 4. It then seeks to avoid Ibstock to the west and terminates to the north of Nuneaton.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 5 is 34km (18nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

11.3% of the area of the Option 5 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 5 is estimated to overfly approximately 450 households with an approximate population of 900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 900.

Up to 7,000ft, Option 5 is estimated to overfly approximately 1,800 households with an approximate population of 3,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 8,200.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 5 is estimated to overfly, 5 noise sensitive areas.

Up to 7,000ft, Option 5 is estimated to overfly 20 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 14.7 Runway 27 South Option 6

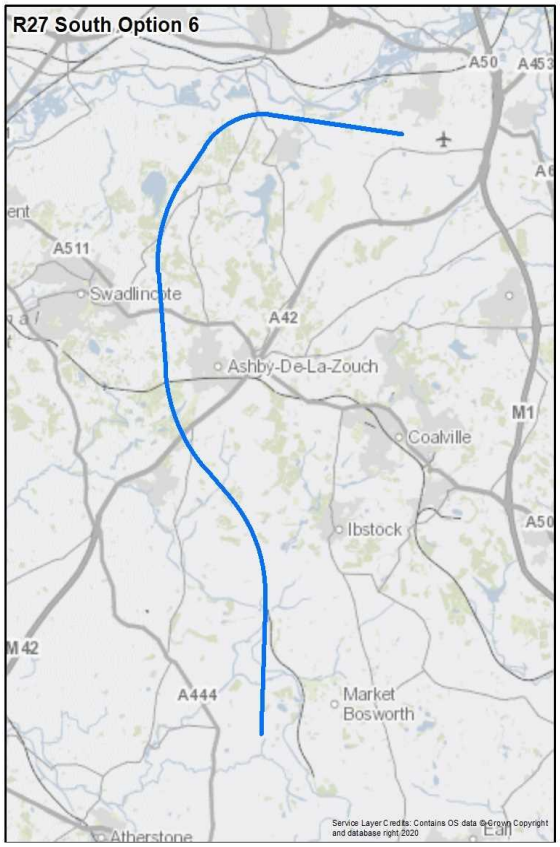
| Design Principle Evaluation | Option No. 6 |
|---|---|
| Option Name: SID RW 27 South Option 6 | ACCEPT |

**Option Description:**

Option 6 has a 10° northerly offset, as an alternative to avoid Melbourne to the north. It also seeks to reduce the impact of noise on built up areas to the south west.

The initial 10° offset to the north results in the route passing north of Melbourne and this heading is continued for approximately 3nm. At this point a turn onto a south westerly heading is made, followed by a second left turn to the west of Hicknall to achieve a more southerly heading passing between Swadlincote and Ashby-de-la-Zouch. A third turn onto a southerly direction is made near Ibstock, and it terminates to the west of Market Bosworth.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 6 is 40km (22nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

4.3% of the area of the Option 6 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 6 is estimated to overfly approximately 1,350 households with an approximate population of 2,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 2,500.

Up to 7,000ft, Option 6 is estimated to overfly approximately 2,200 households with an approximate population of 4,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 4,800.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 6 is estimated to overfly, 10 noise sensitive areas.

Up to 7,000ft, Option 6 is estimated to overfly 20 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 14.8 Runway 27 South Option 7

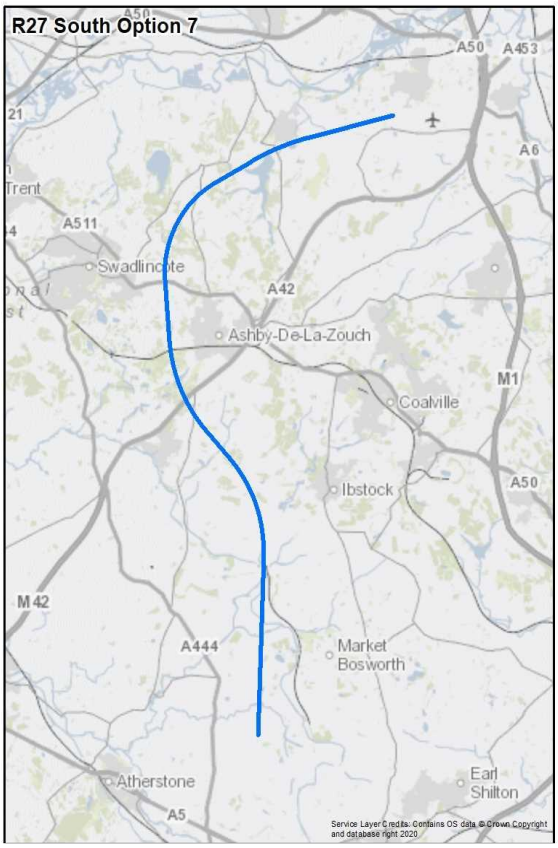
| Design Principle Evaluation | Option No. 7 |
|---|---|
| Option Name: SID RW 27 South Option 7 | ACCEPT |

**Option Description:**

Option 7 has a 12° southerly offset to avoid Melbourne whilst seeking to reduce the impact of noise on built up areas. It is similar to Option 6 once the route options combine to the north of Ashby-de-la-Zouch.

The initial 12° southerly offset results in the route passing south of Melbourne and this heading is continued for approximately 4.5nm until a point close to Ticknall. At this point a turn onto a southerly heading is made where it joins with the track for Option 6 to pass between Swadlincote and Ashby-de-la-Zouch. A third turn onto a southerly direction is made near Ibstock, and it terminates to the south west of Market Bosworth.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 7 is 38km (21nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

6.3% of the area of the Option 7 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 7 is estimated to overfly approximately 1,150 households with an approximate population of 2,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 2,100.

Up to 7,000ft, Option 7 is estimated to overfly approximately 1,900 households with an approximate population of 3,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 3,900.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 7 is estimated to overfly, 5 noise sensitive areas.

Up to 7,000ft, Option 7 is estimated to overfly 15 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 14.9 Runway 27 South Option 8

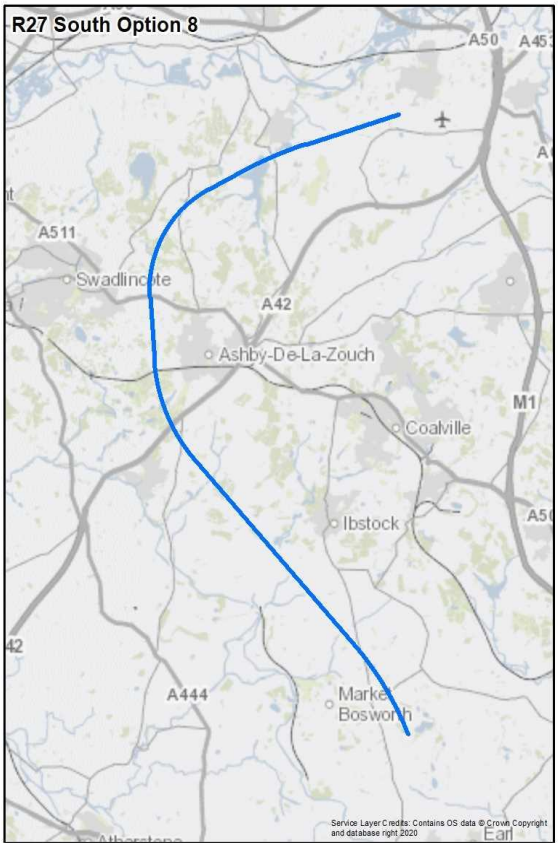
| Design Principle Evaluation | Option No. 8 |
|---|---|
| Option Name: SID RW 27 South Option 8 | ACCEPT |

**Option Description:**

Option 8 has a 15° southerly offset to avoid Melbourne whilst seeking to reduce the impact of noise on built up areas. It is similar to Option 6 and 7 but terminates further east, close to Mallory Park circuit. This higher initial offset achieves a slightly greater divergence from Melbourne.

The initial 15° southerly offset results in the route passing south of Melbourne and this heading is continued for approximately 4.5nm until a point close to Ticknall. At this point a turn onto a southerly heading is made where it joins with the track for Option 6 to pass between Swadlincote and Ashby-de-la-Zouch. A third turn onto a south easterly direction is made close to Measham, and it maintains this heading terminating to the south east of Market Bosworth.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 8 is 40km (22nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

7.6% of the area of the Option 8 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 8 is estimated to overfly approximately 1,050 households with an approximate population of 2,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 2,000.

Up to 7,000ft, Option 8 is estimated to overfly approximately 4,400 households with an approximate population of 8,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 9,300.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 8 is estimated to overfly, 5 noise sensitive areas.

Up to 7,000ft, Option 8 is estimated to overfly 25 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 14.10 Runway 27 South Option 9

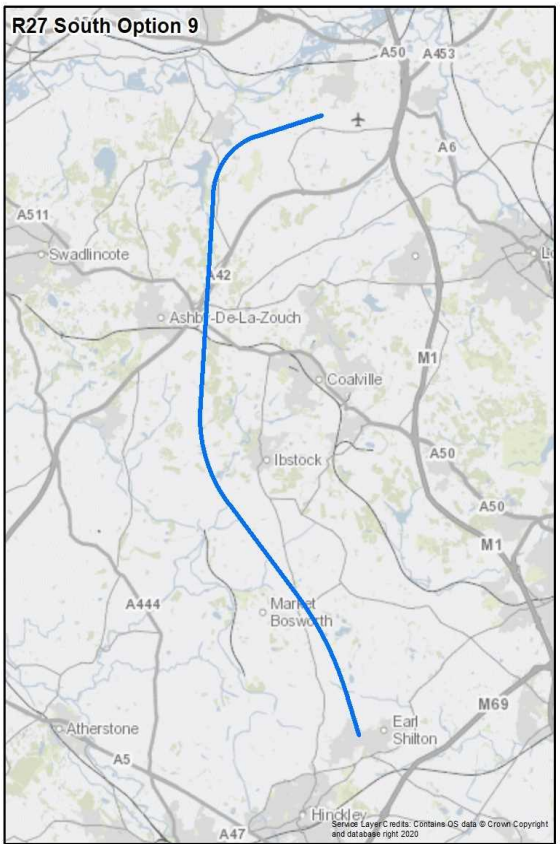
| Design Principle Evaluation | Option No. 9 |
|---|---|
| Option Name: SID RW 27 South Option 9 | ACCEPT |

**Option Description:**

Option 9 has a 15° southerly offset to avoid Melbourne but has a more direct and fuel efficient route that still avoids the impact of noise on built up areas. It is similar to Option 8 but routes to the east of Ashby-de-la-Zouch.

The initial 15° southerly offset results in the route passing south of Melbourne where a turn to the south is made. The track passes to the east of Ashby-de-la-Zouch and once west of Ibstock, it makes a second left turn to achieve a south east heading terminating over Earl Shilton.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 9 is 35km (19nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

14.0% of the area of the Option 9 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 9 is estimated to overfly approximately 300 households with an approximate population of 500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 500.

Up to 7,000ft, Option 9 is estimated to overfly approximately 9,900 households with an approximate population of 18,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 20,200.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 9 is estimated to overfly, 5 noise sensitive areas.

Up to 7,000ft, Option 9 is estimated to overfly 45 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 14.11 Runway 27 South Option 10

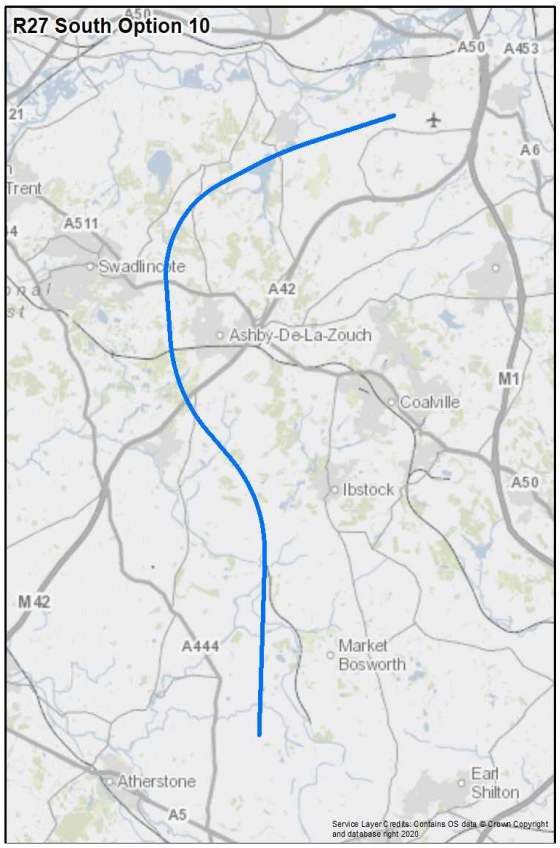
| Design Principle Evaluation | Option No. 10 |
|---|---|
| Option Name: SID RW 27 South Option 10 | ACCEPT |

**Option Description:**

Option 10 has a 12° southerly offset to avoid Melbourne whilst seeking to reduce the impact of noise on built up areas. It is similar to Option 7 but the higher initial offset achieves a slightly greater divergence from Melbourne.

The initial 15° southerly offset results in the route passing south of Melbourne and this heading is continued for approximately 4.5nm until a point close to Ticknall. At this point a turn onto a southerly heading is made where it joins with the track for Option 6 to pass between Swadlincote and Ashby-de-la-Zouch. A third turn onto a southerly direction is made near Ibstock, and it terminates to the south west of Market Bosworth.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 10 is 38km (21nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

6.3% of the area of the Option 10 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 10 is estimated to overfly approximately 1,050 households with an approximate population of 2,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 2,000.

Up to 7,000ft, Option 10 is estimated to overfly approximately 1,800 households with an approximate population of 3,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 3,800.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 10 is estimated to overfly, 5 noise sensitive areas.

Up to 7,000ft, Option 10 is estimated to overfly 10 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 14.12 Runway 27 South Option 11

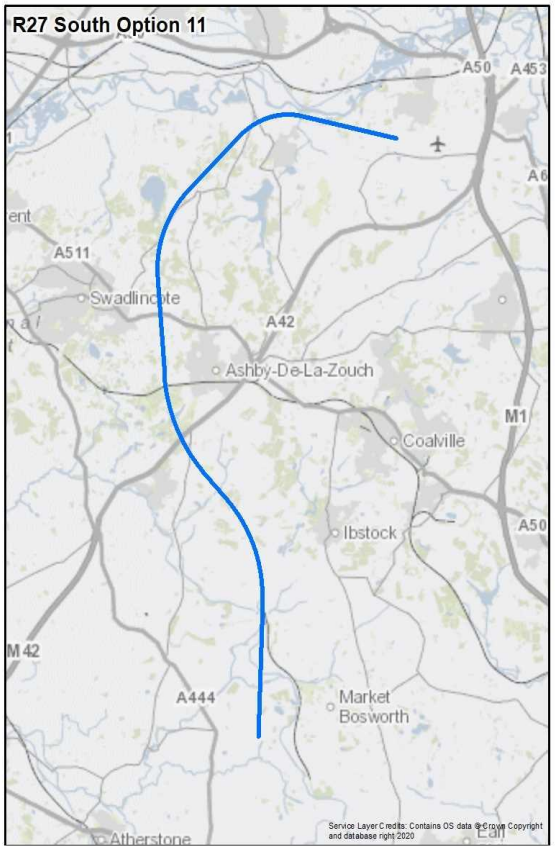
| Design Principle Evaluation | Option No. 11 |
|---|---|
| Option Name: SID RW 27 South Option 11 | ACCEPT |

**Option Description:**

Option 11 has a 15° northerly offset to avoid Melbourne to the north and also seeks to reduce the impact of noise on built up areas to the south west. It is similar to Option 6 but the higher initial offset achieves a slightly greater divergence from Melbourne.

The initial 15° offset to the north results in the route passing north of Melbourne and this heading is continued for approximately 2.2nm beyond the DER, where a turn to south westerly heading is made. To the west of Hicknall a second turn is made to achieve a more southerly heading passing between Swadlincote and Ashby-de-la-Zouch. A third turn is made near Ibstock, and it terminates to the west of Market Bosworth.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 11 is 40km (22nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

4.3% of the area of the Option 11 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 11 is estimated to overfly approximately 1,350 households with an approximate population of 2,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 2,500.

Up to 7,000ft, Option 11 is estimated to overfly approximately 2,200 households with an approximate population of 4,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 4,700.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 11 is estimated to overfly, 15 noise sensitive areas.

Up to 7,000ft, Option 11 is estimated to overfly 20 noise sensitive areas.

This is a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 14.13 Runway 27 South Summary

| | Option 1 | Option 1A | Option 2 | Option 3 | Option 4 | Option 5 | Option 6 | Option 7 | Option 8 | Option 9 | Option 10 | Option 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **S - Safety** | PARTIAL | PARTIAL | MET | MET | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **P - Programme** | PARTIAL | PARTIAL | MET | NOT MET | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **C - Continuity** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **E - Emissions** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | NOT MET | PARTIAL | NOT MET | PARTIAL | PARTIAL | NOT MET |
| **N1 - Noise** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **N2 - Noise** | PARTIAL | PARTIAL | PARTIAL | MET | MET | MET | NOT MET | NOT MET | PARTIAL | MET | NOT MET | NOT MET |
| **N3 - Noise** | PARTIAL | PARTIAL | MET | NOT MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **N4 - Noise** | PARTIAL | PARTIAL | PARTIAL | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **A1 - Airspace** | PARTIAL | PARTIAL | MET | MET | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **A2 - Airspace** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| | Best | Replication | Best | Rejected | Best | Best | 4,000ft beneficial | 4,000ft beneficial | 4,000ft beneficial | Best | 4,000ft beneficial | 4,000ft beneficial |

## 14.14 Runway 27 South Viable but Poor Fit Options

| Option | Safety | Programme | Continuity |
|---|---|---|---|
| A12 | S | P | C |

Description: This option departs runway 27 in a westerly direction for approximately 6nm before turning left overflying Swadlincote in a south easterly direction towards Nuneaton.

Programme: This option fails to align with the environmental end of the AMS.

> *Environment:* The emissions generated by this option have been assessed as being greater due to the additional track length required to connect to the network joining point. By overflying Swadlincote, the number of people impacted by noise for this option in comparison to other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

Continuity: This option fails to align with this design principle, because it would have an interaction with the departure envelopes west, north west and south west. This would not enable best use of runway capacity.

| | | | |
|---|---|---|---|
| B13 | S | P | C |

Description: This option heads west until Burton upon Trent where it turns left onto a south easterly heading towards Nuneaton.

Programme: This option fails to align with the simplification and environmental ends of the AMS.

> *Simplification*: By routing so far west, this option has potential to interact with arrivals and departures to and from Birmingham airport.
>
> *Environment:* The emissions generated by this option have been assessed as being greater due to the additional track length required to connect to the network joining point. By overflying Burton upon Trent, the number of people impacted by noise for this option in comparison to other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions and interaction with traffic to and from Birmingham airport. There is therefore no benefit that could be traded to justify an amber rating.

Meeting demand: This option fails to align with this design principle, because it would have an interaction with the west departure envelope. This would not enable best use of runway capacity.

| | | | |
|---|---|---|---|
| C14 | S | P | C |

Description: This option makes an immediate right-hand wrap-around turn after departure from runway 27, overflying southern Nottingham and proceeding in a south-south westerly direction towards Hinckley.

Safety: This option fails to align with this design principle, because it is expected to conflict or present a hazardous interaction with arrivals to runway 27 and the runway 27 Missed Approach Procedure (MAP).

Programme: This option fails to align with the environmental end of the AMS.

> *Environment:* The emissions generated by this option have been assessed as being greater due to the additional track length required to connect to the revised network joining point. By overflying

south Nottingham, the number of people impacted by noise for this option in comparison to other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

Continuity: This option fails to align with this design principle, because it would have an interaction with the departure envelopes south east and north. In addition, it may interact with arrivals to runway 27 from the south. This would not enable best use of runway capacity.

| D15 | S | P | C |
|---|---|---|---|

Description: This option departs runway 27 in a north westerly direction before making a left-hand turn to the south west of Derby onto a south-south east heading overflying Swadlincote and proceeding towards Nuneaton.

Programme: This option fails to align with the environmental end of the AMS.

*Environment:* The emissions generated by this option have been assessed as being greater due to the additional track length required to connect to the network joining point. By overflying south Derby and Swadlincote, the number of people impacted by noise for this option in comparison to other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions, and insufficient justification for an Amber rating.

Continuity: This option fails to align with this design principle, because it would have an interaction with the departure envelopes north west, west and south west. This would not enable best use of runway capacity.

# 15 Runway 27 South East

## 15.1 Runway 27 South East Option 1

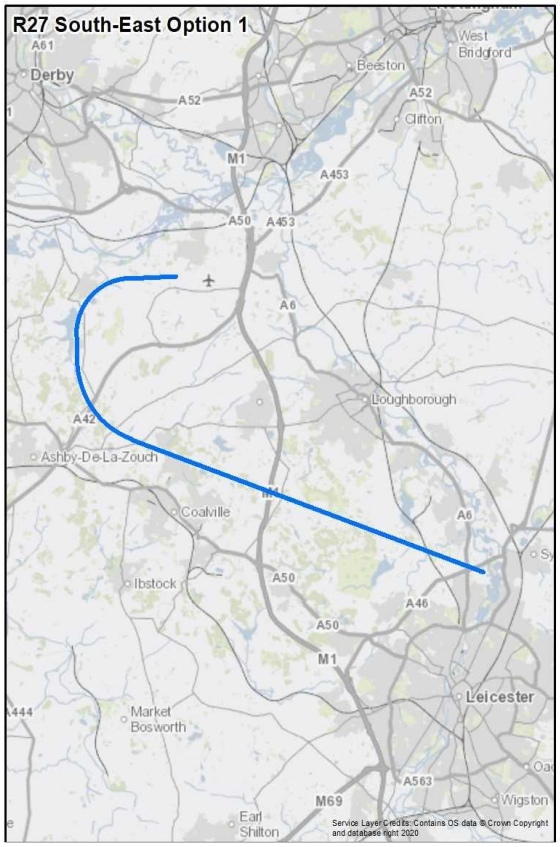
| Design Principle Evaluation | Option No. 1 |
|---|---|
| Option Name: SID RW 27 South East Option 1 | REJECT |

**Option Description:**

Option 1 proceeds straight ahead after take-off with no offset and uses CAP778 speeds and turn criteria to route to the south east.

After departure this follows the runway heading for 1.4nm with no offset passing close to the south east corner of Melbourne. A left turn is then made onto a southerly heading for a short distance before making a second left turn to route north of Coalville and head in a south easterly direction, terminating to the east of the A6 and A46 junction just north of Leicester.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route. It is deemed to align with the UK AMS end Integration. For Simplification, this south east bound option routes in the opposite direction to the northbound traffic flow (above 7,000ft) and could potentially interact with flights inbound to LBA and NCL within the NERL network. Further analysis on this possible misalignment will be conducted with NERL within stage 3.

This route is deemed not to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being increased, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 1 is 52km (28nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

25.9% of the area of the Option 1 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1 is estimated to overfly approximately 4,400 households with an approximate population of 8,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 8,400.

Up to 7,000ft, Option 1 is estimated to overfly approximately 14,250 households with an approximate population of 27,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 32,700.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1 is estimated to overfly, 30 noise sensitive areas.

Up to 7,000ft, Option 1 is estimated to overfly 80 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | MET |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA. | |

## 15.2 Runway 27 South East Option 2

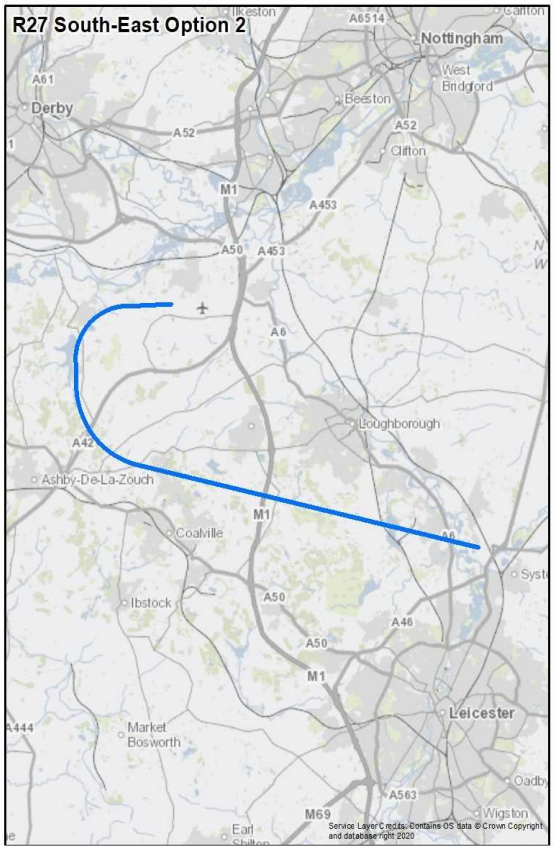
| Design Principle Evaluation | Option No. 2 |
|---|---|
| Option Name: SID RW 27 South East Option 2 | ACCEPT |

**Option Description:**

Option 2 is similar to Option 1 but takes a more northerly track after the second turn.

After departure this follows the runway heading for 1.4nm with no offset passing close to the south-east corner of Melbourne. A left turn is then made onto a southerly heading for a short distance before making a second left turn to route north of Coalville. It heads in a south easterly direction overflying Mountsorrel and terminates close to Syston.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route. It is deemed to align with the UK AMS end Integration. For Simplification, this south east bound option routes in the opposite direction to the northbound traffic flow (above 7,000ft) and could potentially interact with flights inbound to LBA and NCL within the NERL network. Further analysis on this possible misalignment will be conducted with NERL within stage 3.

When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a similar population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be worse than the baseline.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 2 is 53km (29nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

24.7% of the area of the Option 2 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 2 is estimated to overfly approximately 3,450 households with an approximate population of 6,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 6,500.

Up to 7,000ft, Option 2 is estimated to overfly approximately 11,750 households with an approximate population of 22,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 23,300.

This is a similar population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 2 is estimated to overfly, 30 noise sensitive areas.

Up to 7,000ft, Option 2 is estimated to overfly 70 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 15.3 Runway 27 South East Option 3

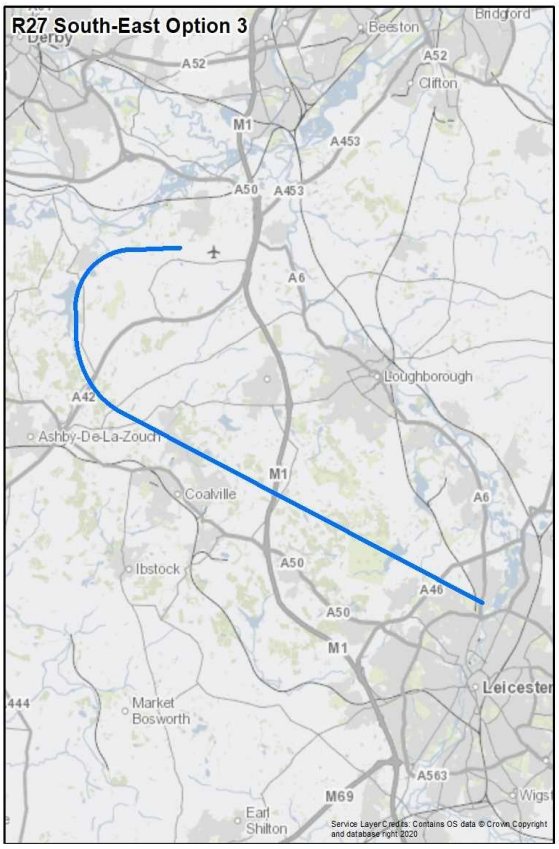
| Design Principle Evaluation | Option No. 3 |
|---|---|
| Option Name: SID RW 27 South East Option 3 | REJECT |

**Option Description:**

Option 3 is similar to Option 1 but takes a more southerly track after the second turn to terminate closer to Leicester.

After departure this follows the runway heading for 1.4nm with no offset passing close to the south east corner of Melbourne. A left turn is then made onto a southerly heading for a short distance before making a second left turn to route north of Coalville. It heads in a south easterly direction overflying Whitwick and terminates over northern Leicester, close to Birstall.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route. It is deemed to align with the UK AMS end Integration. For Simplification, this south east bound option routes in the opposite direction to the northbound traffic flow (above 7,000ft) and could potentially interact with flights inbound to LBA and NCL within the NERL network. Further analysis on this possible misalignment will be conducted with NERL within stage 3.

This route is deemed not to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being increased, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 3 is 52km (28nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

23.0% of the area of the Option 3 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 3 is estimated to overfly approximately 5,600 households with an approximate population of 10,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 10,500.

Up to 7,000ft, Option 3 is estimated to overfly approximately 23,250 households with an approximate population of 45,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 52,300.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 3 is estimated to overfly, 35 noise sensitive areas.

Up to 7,000ft, Option 3 is estimated to overfly 135 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | MET |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA. | |

## 15.4 Runway 27 South East Option 4

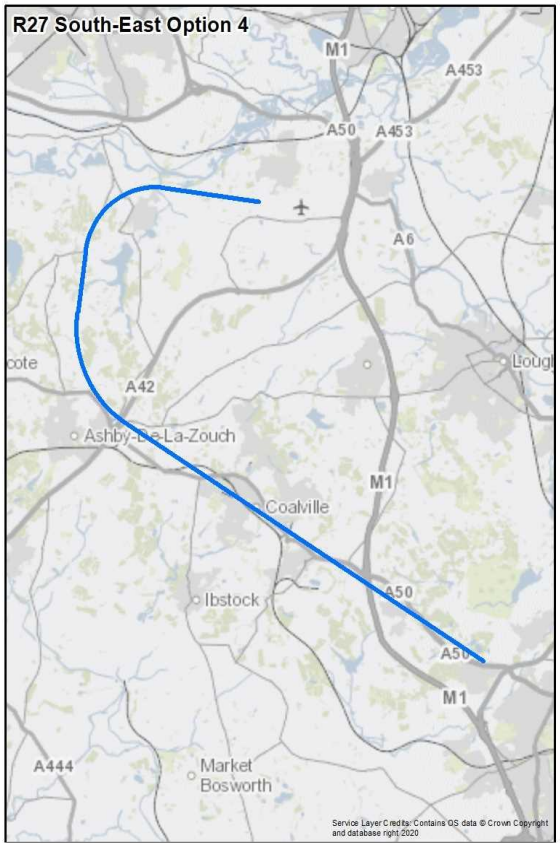
| Design Principle Evaluation | Option No. 4 |
|---|---|
| Option Name: SID RW 27 South East Option 4 | ACCEPT |

**Option Description:**

Option 4 has a 10° northerly offset, as an alternative to avoid Melbourne to the north.

The 10° offset to the north results in the route passing north of Melbourne and then turning left to head south. A second turn is made to the north east of Ashby-de-la-Zouch to route in a south east direction, passing over Coalville. The option terminates to the north west of Leicester close to Groby.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route. It is deemed to align with the UK AMS end Integration. For Simplification, this south east bound option routes in the opposite direction to the northbound traffic flow (above 7,000ft) and could potentially interact with flights inbound to LBA and NCL within the NERL network. Further analysis on this possible misalignment will be conducted with NERL within stage 3.

When considering the Environmental end this option is expected to overfly a reduced population below 4,000ft and an increased population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be worse than the baseline.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 4 is 58km (31nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

42.7% of the area of the Option 4 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 4 is estimated to overfly approximately 600 households with an approximate population of 1,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 3,700.

Up to 7,000ft, Option 4 is estimated to overfly approximately 16,300 households with an approximate population of 30,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 41,600.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 4 is estimated to overfly, 5 noise sensitive areas.

Up to 7,000ft, Option 4 is estimated to overfly 90 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 15.5 Runway 27 South East Option 5

| Design Principle Evaluation | Option No. 5 |
|---|---|
| Option Name: SID RW 27 South East Option 5 | ACCEPT |

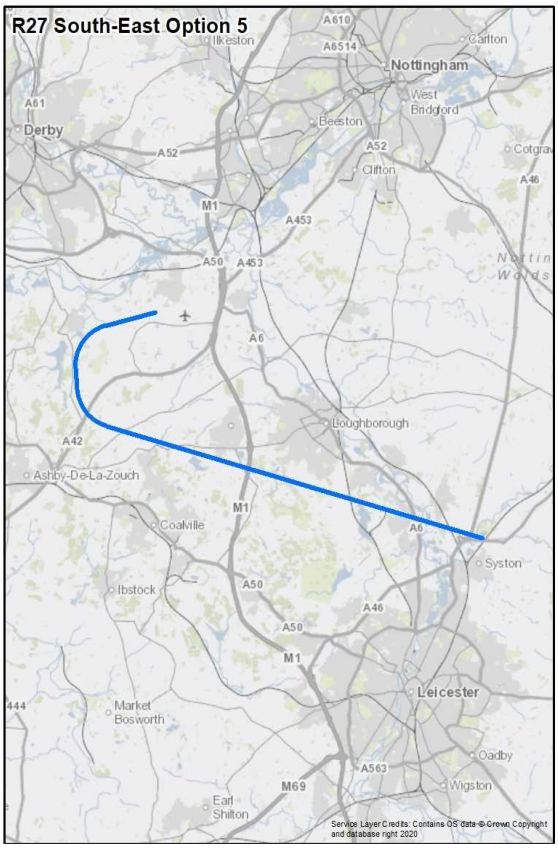
**Option Description:**

Option 5 has a 10° southerly offset followed by a series of tight turns to avoid Coalville and Leicester.

The 10° offset to the south results in the route passing south of Melbourne and then making two turns in quick succession to head to the south east. This results in a track that passes north of Coalville and south of Shepshed and Loughborough before terminating north of Syston just to the north east of Leicester.

The route has a constant climb gradient of 6%, terminating at 7,000ft.

The two initial turns have been limited to 190KIAS to enable the tightest turn possible to achieve a more northerly route to avoid Coalville. The route is PANS-OPS compliant but should it become a preferred option then it is recommended that it is assessed for flyability as part of the procedure validation process within Stage 4 of CAP1616.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route. It is deemed to align with the UK AMS end Integration. For Simplification, this south east bound option routes in the opposite direction to the northbound traffic flow (above 7,000ft) and could potentially interact with flights inbound to LBA and NCL within the NERL network. Further analysis on this possible misalignment will be conducted with NERL within stage 3.

When considering the Environmental end this option is expected to overfly a reduced population below 4,000ft and an increased population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be worse than the baseline.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 5 is 51km (28nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

31.3% of the area of the Option 5 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 5 is estimated to overfly approximately 750 households with an approximate population of 1,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 3,000.

Up to 7,000ft, Option 5 is estimated to overfly approximately 15,700 households with an approximate population of 29,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 35,400.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 5 is estimated to overfly, 5 noise sensitive areas.

Up to 7,000ft, Option 5 is estimated to overfly 80 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|
| *Summary of Assessment:*<br><br>This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction. | |
| Design Principle **Technology** | PARTIAL |
| *Summary of Assessment:*<br><br>This option has been designed in compliance with PANS-OPS 8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables CCO to be conducted at EMA. A design speed restriction has been applied to the first turn which allows for the turn radius to be decreased. This speed is PANS-OPS compliant but a flyability check may be required during Stage 4 of the ACP process. | |

## 15.6 Runway 27 South East Option 6

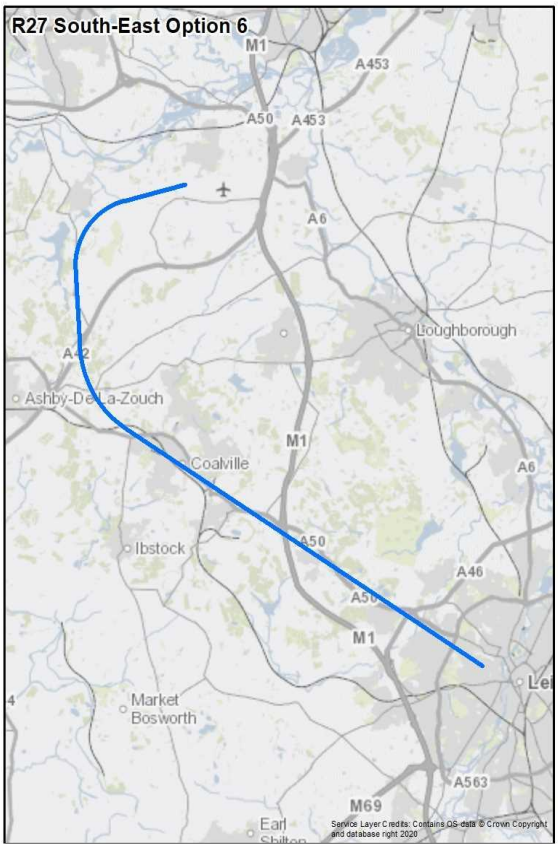
| Design Principle Evaluation | Option No. 6 |
|---|---|
| Option Name: SID RW 27 South East Option 6 | REJECT |

**Option Description:**

Option 6 has a 10° southerly offset to provide a noise benefit and then heads south to follow the similar route as Option 4. This results in a slightly shorter route for fuel burn and emissions benefits.

The 10° offset results in the route passing south of Melbourne and then turning left to head south and route between Ashby-de-la-Zouch and Coalville. A second turn is made at the A42 which delivers a south east heading where it joins the track for Option 5 passing over Coalville. The option terminates over west Leicester.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route. It is deemed to align with the UK AMS end Integration. For Simplification, this south east bound option routes in the opposite direction to the northbound traffic flow (above 7,000ft) and could potentially interact with flights inbound to LBA and NCL within the NERL network. Further analysis on this possible misalignment will be conducted with NERL within stage 3.

This route is deemed not to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being increased, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 6 is 53km (29nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

46.1% of the area of the Option 6 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 6 is estimated to overfly approximately 7,650 households with an approximate population of 14,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 18,200.

Up to 7,000ft, Option 6 is estimated to overfly approximately 43,800 households with an approximate population of 87,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 95,200.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 6 is estimated to overfly, 50 noise sensitive areas.

Up to 7,000ft, Option 6 is estimated to overfly 300 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 15.7 Runway 27 South East Option 7

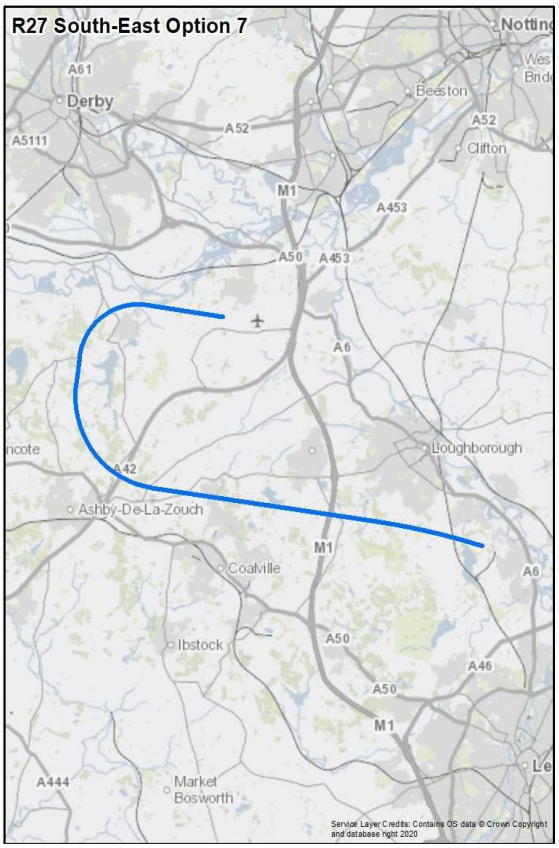
| Design Principle Evaluation | Option No. 7 |
|---|---|
| Option Name: SID RW 27 South East Option 7 | ACCEPT |

**Option Description:**

Option 7 has a 10° northerly offset and then heads south east to follow a similar route to Option 5 to avoid Coalville and Loughborough.

The 10° offset results in the route passing north of Melbourne and then making two turns to head south then south east, remaining north of both Ashby-de-la-Zouch and Coalville. This track continues to pass south of Shepshed and Loughborough before terminating north of Syston.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route. It is deemed to align with the UK AMS end Integration. For Simplification, this south east bound option routes in the opposite direction to the northbound traffic flow (above 7,000ft) and could potentially interact with flights inbound to LBA and NCL within the NERL network. Further analysis on this possible misalignment will be conducted with NERL within stage 3.

This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced and similar, respectively, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 7 is 57km (31nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

18.7% of the area of the Option 7 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 7 is estimated to overfly approximately 850 households with an approximate population of 1,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 1,700.

Up to 7,000ft, Option 7 is estimated to overfly approximately 10,800 households with an approximate population of 20,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 24,000.

This is a similar population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 7 is estimated to overfly, 5 noise sensitive areas.

Up to 7,000ft, Option 7 is estimated to overfly 65 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 15.8 Runway 27 South East Option 12

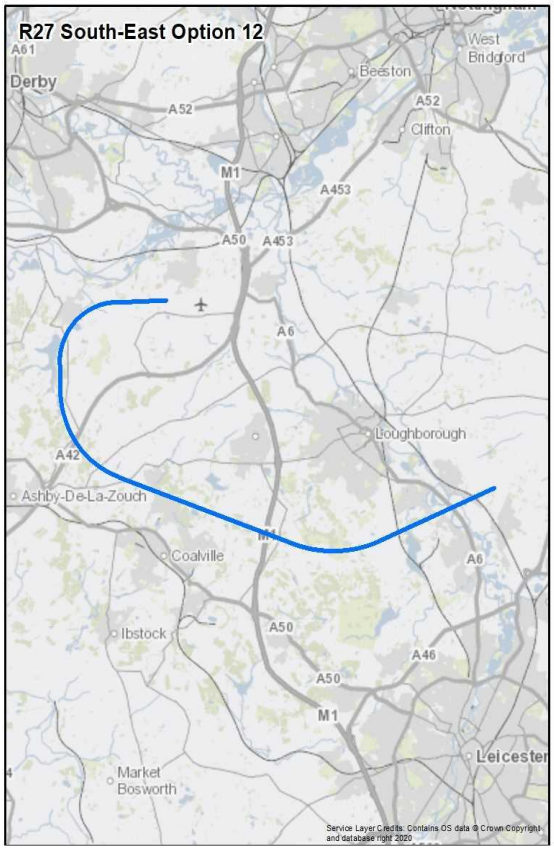
| Design Principle Evaluation | Option No. 12 |
|---|---|
| Option Name: SID RW 27 South East Option 12 | REJECT |

**Option Description:**

Option 12 is initially similar to Option 1 but turns left when south of Loughborough to provide an alternative option for flights to the east.

After departure this follows the runway heading for 1.4nm with no offset passing close to the south east corner of Melbourne. A left turn is then made onto a southerly heading for a short distance before making a second left turn to route north of Coalville and head in a south easterly direction. At a point close to Woodhouse Eaves it makes a left turn to route between Quorn and Mountsorrel before terminating before terminating east of Barrow upon Soar.

The route has a constant climb gradient of 6% terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplicity and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a similar population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 12 is 55km (30nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

20.0% of the area of the Option 12 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 12 is estimated to overfly approximately 4,400 households with an approximate population of 8,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 8,300.

Up to 7,000ft, Option 12 is estimated to overfly approximately 12,950 households with an approximate population of 24,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 24,000.

This is a similar population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 12 is estimated to overfly, 30 noise sensitive areas.

Up to 7,000ft, Option 12 is estimated to overfly 85 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. At present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 15.9 Runway 27 South East Option 13

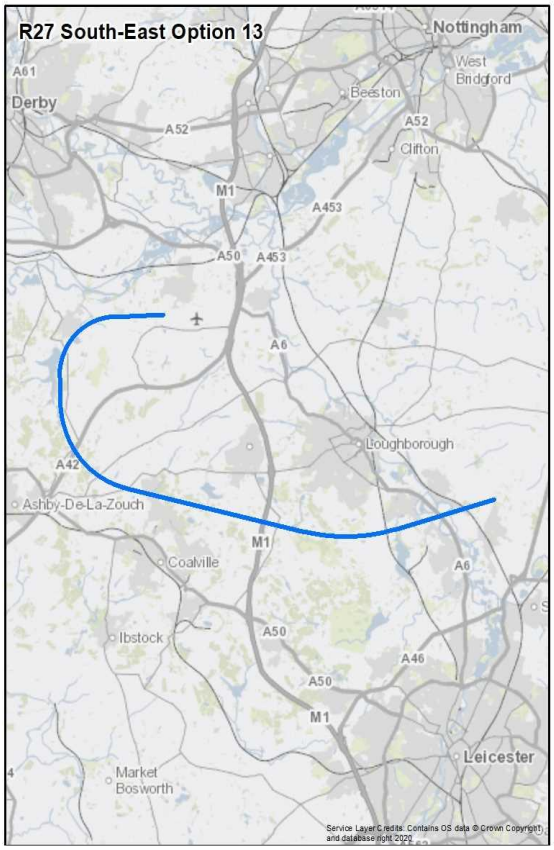
| Design Principle Evaluation | Option No. 13 |
|---|---|
| Option Name: SID RW 27 South East Option 13 | REJECT |

**Option Description:**

Option 13 is initially similar to Option 2 but turns left when south of Loughborough to provide an alternative option for flights to the east.

After departure this follows the runway heading for 1.4nm with no offset passing close to the south east corner of Melbourne. A left turn is then made onto a southerly heading for a short distance before making a second left turn to route north of Coalville. It heads in a south easterly direction flying north of Woodhouse Eaves to route between Quorn and Mountsorrel between Barrow upon Soar and Sileby.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplicity and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a similar population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 13 is 54km (29nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

19.8% of the area of the Option 13 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 13 is estimated to overfly approximately 3,450 households with an approximate population of 6,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 6,400.

Up to 7,000ft, Option 13 is estimated to overfly approximately 13,000 households with an approximate population of 24,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 24,000.

This is a similar population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 13 is estimated to overfly, 30 noise sensitive areas.

Up to 7,000ft, Option 13 is estimated to overfly 90 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. At present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 15.10 Runway 27 South East Option 14

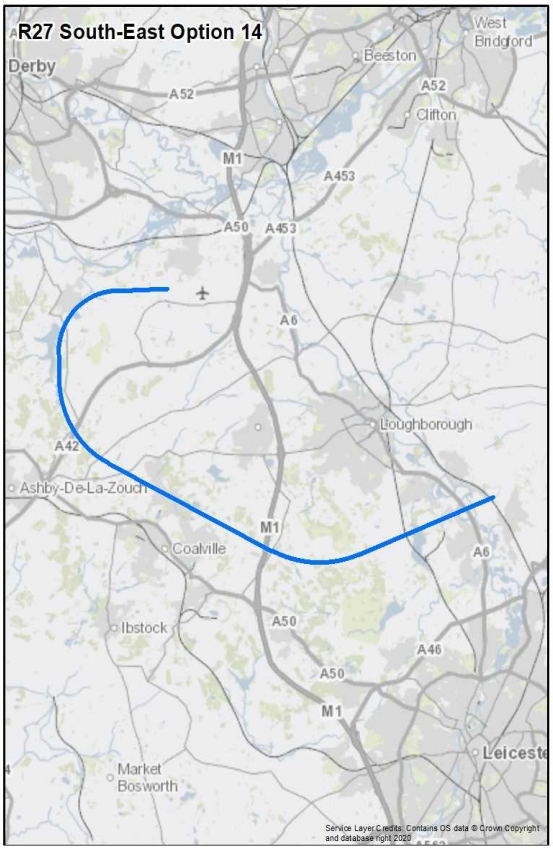
| Design Principle Evaluation | Option No. 14 |
|---|---|
| Option Name: SID RW 27 South East Option 14 | REJECT |

**Option Description:**

Option 14 is initially similar to Option 3 but turns left when mid-way between Loughborough and Leicester to provide an alternative option for flights to the east.

After departure this follows the runway heading for 1.4nm with no offset passing close to the south east corner of Melbourne. A left turn is then made onto a southerly heading for a short distance before making a second left turn to route over Coalville. It heads in a south easterly direction until passing the M1 where it turns left to route south of Woodhouse Eaves and passing north of Mountsorrel before terminating close to Sileby.

The route has a constant climb gradient of 6% terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplicity and Integration. This route is deemed not to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being increased, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 14 is 55km (30nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

19.3% of the area of the Option 14 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 14 is estimated to overfly approximately 5,600 households with an approximate population of 10,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 10,400.

Up to 7,000ft, Option 14 is estimated to overfly approximately 16,250 households with an approximate population of 30,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 30,200.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 14 is estimated to overfly, 35 noise sensitive areas.

Up to 7,000ft, Option 14 is estimated to overfly 80 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. At present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 15.11 Runway 27 South East Option 15

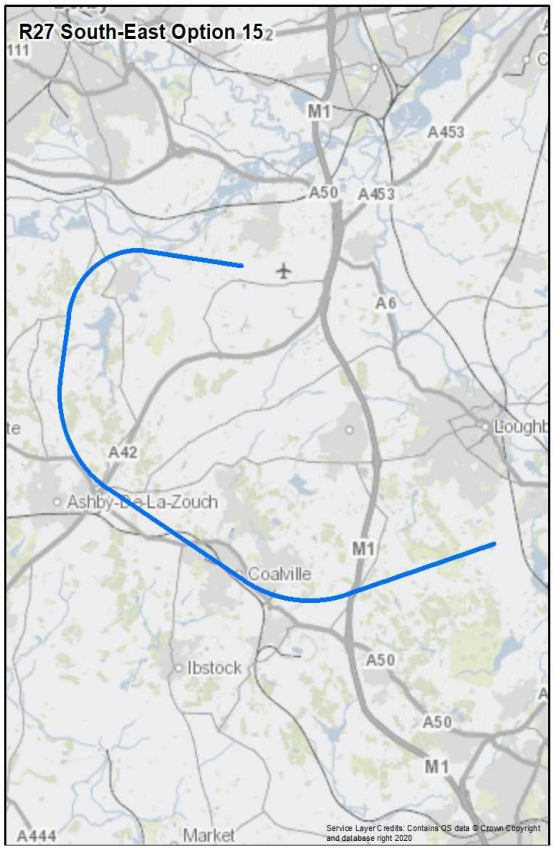
| Design Principle Evaluation | Option No. 15 |
|---|---|
| Option Name: SID RW 27 South East Option 15 | ACCEPT |

**Option Description:**

Option 15 is initially similar to Option 4 and has a 10° northerly offset but turns left south of Coalville to provide an alternative option for flights to the east.

The 10° offset to the north results in the route passing north of Melbourne and then turning left to head south. A second turn is made to the north east of Ashby-de-la-Zouch to route in a south east direction, passing west of Coalville. It continues in this south easterly direction until passing Bardon Hill where it turns left to route towards Woodhouse Eaves and terminates just west of Quorn.

The route has a constant climb gradient of 6% terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplicity and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced and similar, respectively, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 15 is 60km (32nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

26.9% of the area of the Option 15 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 15 is estimated to overfly approximately 600 households with an approximate population of 1,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 1,200.

Up to 7,000ft, Option 15 is estimated to overfly approximately 11,950 households with an approximate population of 22,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 22,700.

This is a similar population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 15 is estimated to overfly, 5 noise sensitive areas.

Up to 7,000ft, Option 15 is estimated to overfly 70 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. At present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 15.12 Runway 27 South East Option 16

| Design Principle Evaluation | Option No. 16 |
|---|---|
| Option Name: SID RW 27 South East Option 16 | ACCEPT |

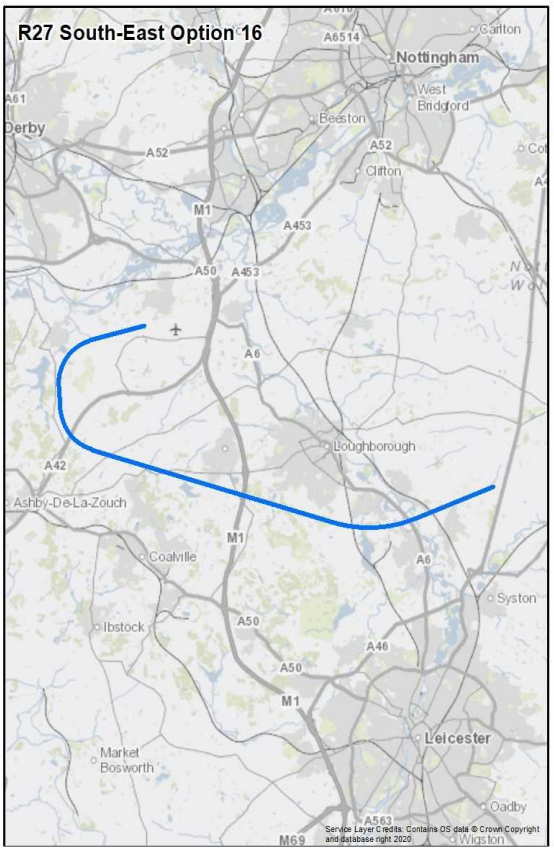
**Option Description:**

Option 16 is initially similar to Option 5 and has a 10° southerly offset but turns left south of Quorn to provide an alternative option for flights to the east.

The 10° offset to the south results in the route passing south of Melbourne and then making two turns in quick succession to head to the south east. This results in a track that passes north of Coalville and south of Shepshed and Loughborough. It continues in this south easterly direction until south of Quorn where it turns left to head in a north easterly direction, passing between Barrow upon Soar and Sileby and terminating west of Seagrave.

The route has a constant climb gradient of 6%, terminating at 7,000ft.

The two initial turns have been limited to 190KIAS. This slower speed enables a tighter turn that helps avoid built up areas. The route is PANS-OPS compliant but should it become a preferred option then it is recommended that it is assessed for flyability as part of the procedure validation process within Stage 4 of CAP1616.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplicity and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 16 is 53km (29nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

27.0% of the area of the Option 16 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 16 is estimated to overfly approximately 750 households with an approximate population of 1,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 1,500.

Up to 7,000ft, Option 16 is estimated to overfly approximately 10,750 households with an approximate population of 20,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 20,500.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 16 is estimated to overfly, 5 noise sensitive areas.

Up to 7,000ft, Option 16 is estimated to overfly 55 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. At present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS-OPS 8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables CCO to be conducted at EMA. A design speed restriction has been applied to the first turn which allows for the turn radius to be decreased. This speed is PANS-OPS compliant but a flyability check may be required during Stage 4 of the ACP process.

## 15.13 Runway 27 South East Option 17

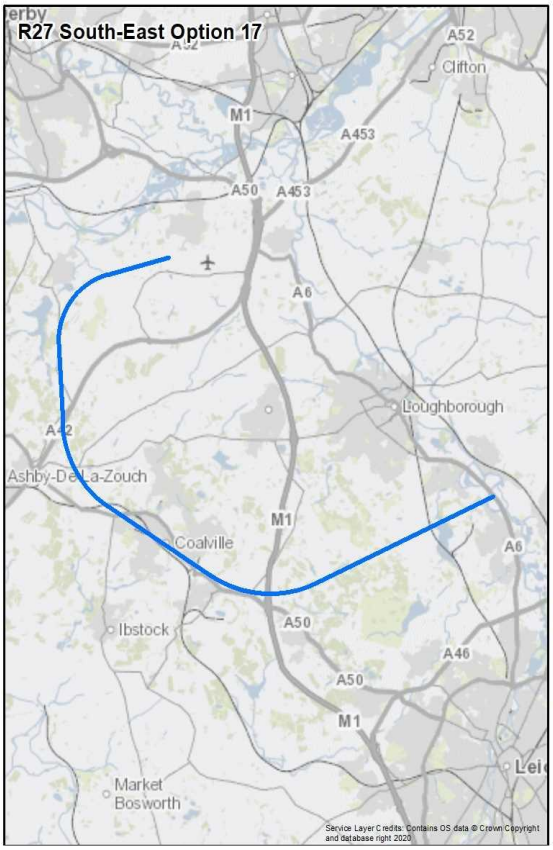
| Design Principle Evaluation | Option No. 17 |
|---|---|
| Option Name: SID RW 27 South East Option 17 | REJECT |

**Option Description:**

Option 17 is initially similar to Option 6 and has a 10° southerly offset but turns left south east of Coalville to provide an alternative option for flights to the east.

The 10° offset results in the route passing south of Melbourne and then turning left to head south and route between Ashby-de-la-Zouch and Coalville. A second turn is made at the A42 onto a south east heading until reaching the M1 just west of Markfield where it turns left to head north east. It continues on this heading to pass between Quorn and Mountsorrel and terminates south of Barrow upon Soar.

The route has a constant climb gradient of 6% terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplicity and Integration. This route is deemed not to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being increased, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 17 is 56km (30nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

28.3% of the area of the Option 17 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 17 is estimated to overfly approximately 7,650 households with an approximate population of 14,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 14,500.

Up to 7,000ft, Option 17 is estimated to overfly approximately 15,850 households with an approximate population of 29,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 29,700.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 17 is estimated to overfly, 50 noise sensitive areas.

Up to 7,000ft, Option 17 is estimated to overfly 100 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. At present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 15.14 Runway 27 South East Option 18

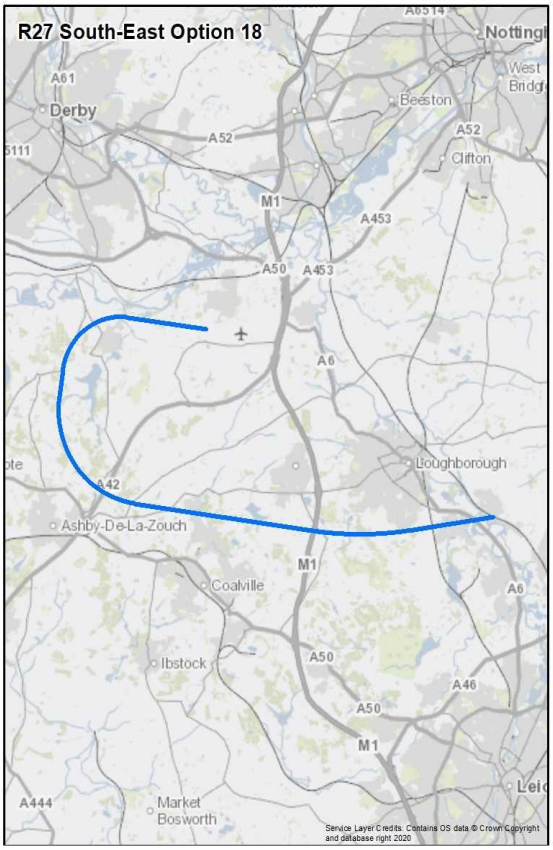
| Design Principle Evaluation | Option No. 18 |
|---|---|
| Option Name: SID RW 27 South East Option 18 | ACCEPT |

**Option Description:**

Option 18 is similar to option 7 and has a 10° northerly offset but turns left south of Loughborough to provide an alternative option for flights to the east.

The 10° offset results in the route passing north of Melbourne and then making two turns to head south then south east, remaining north of both Ashby-de-la-Zouch and Coalville. This track continues to pass south of Shepshed and Loughborough where it makes a left turn to head east and passes overhead Quorn and terminating over Barrow-upon-Soar.

The route has a constant climb gradient of 6% terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route and is deemed to align with the UK AMS ends Simplicity and Integration. When considering the Environmental end this option is expected to overfly a reduced population below 4,000ft and an increased population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 18 is 58km (31nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

23.6% of the area of the Option 18 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 18 is estimated to overfly approximately 1,950 households with an approximate population of 3,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 3,700.

Up to 7,000ft, Option 18 is estimated to overfly approximately 14,100 households with an approximate population of 27,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 27,000.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 18 is estimated to overfly, 10 noise sensitive areas.

Up to 7,000ft, Option 18 is estimated to overfly 65 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. At present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 15.15 Runway 27 South East Summary

| | Option 1 | Option 2 | Option 3 | Option 4 | Option 5 | Option 6 | Option 7 | Option 12 | Option 13 | Option 14 | Option 15 | Option 16 | Option 17 | Option 18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **S - Safety** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **P - Programme** | NOT MET | PARTIAL | NOT MET | PARTIAL | PARTIAL | NOT MET | PARTIAL | PARTIAL | PARTIAL | NOT MET | MET | MET | NOT MET | PARTIAL |
| **C - Continuity** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **E - Emissions** | NOT MET | NOT MET | NOT MET | NOT MET | NOT MET | NOT MET | NOT MET | NOT MET | NOT MET | NOT MET | NOT MET | NOT MET | NOT MET | NOT MET |
| **N1 - Noise** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **N2 - Noise** | MET | MET | PARTIAL | MET | MET | MET | PARTIAL | MET | PARTIAL | PARTIAL | MET | MET | MET | MET |
| **N3 - Noise** | NOT MET | PARTIAL | NOT MET | PARTIAL | PARTIAL | NOT MET | MET | PARTIAL | PARTIAL | NOT MET | MET | MET | NOT MET | PARTIAL |
| **N4 - Noise** | NOT MET | PARTIAL | NOT MET | PARTIAL | PARTIAL | NOT MET | MET | NOT MET | NOT MET | NOT MET | MET | MET | NOT MET | MET |
| **A1 - Airspace** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **A2 - Airspace** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET | PARTIAL | MET | MET | MET | MET | MET | MET | PARTIAL | MET | MET |
| | Rejected | Best | Rejected | Best | Best | Rejected | Best | Rejected | Rejected | Rejected | Best | Best | Rejected | Best |

## 15.16 Runway 27 South East Viable but Poor Fit Options

| Option | Safety | Programme | Continuity |
|---|---|---|---|
| A8 | S | P | C |

Description: This option makes an immediate right-hand wrap-around turn after departure from runway 27, overflying southern Nottingham and proceeding in a south easterly direction over Loughborough and north Leicester.

Safety: This option fails to align with this design principle, because it is expected to conflict or present a hazardous interaction with arrivals to runway 27 and the runway 27 Missed Approach Procedure (MAP).

Programme: This option fails to align with the environmental end of the AMS.

> *Environment:* The emissions generated by this option have been assessed as being greater due to the additional track length required to connect to the revised network joining point. By overflying south Nottingham and Loughborough, the number of people impacted by noise for this option in comparison to other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

Continuity: This option fails to align with this design principle, because it would have an interaction with the departure envelopes to the north and may interact with arrivals to runway 27 from the south. This would not enable best use of runway capacity.

| | | | |
|---|---|---|---|
| B9 | S | P | C |

Description: This option departs runway 27 in a westerly direction for approximately 6nm before turning left overflying Swadlincote and then turning left in a south easterly direction towards Leicester.

Programme: This option fails to align with the environmental end of the AMS.

> *Environment:* The emissions generated by this option have been assessed as being greater due to the additional track length required to connect to the network joining point. By overflying Swadlincote, the number of people impacted by noise for this option in comparison to other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

Continuity: This option fails to align with this design principle, because it would have an interaction with the departure envelopes west, north west and south west. This would not enable best use of runway capacity.

| | | | |
|---|---|---|---|
| C10 | S | P | C |

Description: This makes a left turn in a southerly direction to overfly Ashby-de-la-Zouch and continuing south for around 8nm before turning south east towards Leicester.

Programme: This option fails to align with the environmental end of the AMS.

*Environment:* The emissions generated by this option have been assessed as being greater due to the additional track length required to connect to the network joining point. By overflying Ashby-de-la-Zouch, the number of people impacted by noise for this option in comparison to other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

Continuity: This option fails to align with this design principle, because it would have a prolonged interaction with the departure envelope to the south. This would not enable best use of runway capacity.

| D11 | S | P | C |
|---|---|---|---|

Description: This option departs runway 27 in a north westerly direction before making a left-hand turn to the south west of Derby onto a south-south east heading passing overflying Swadlincote, Ashby de la Zouch and Coalville.

Programme: This option fails to align with the environmental end of the AMS.

*Environment:* The emissions generated by this option have been assessed as being greater due to the additional track length required to connect to the network joining point. By overflying south Derby, Swadlincote, Ashby de la Zouch and Coalville, the number of people impacted by noise for this option in comparison to other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions, and insufficient justification for an Amber rating.

Continuity: This option fails to align with this design principle, because it would have an interaction with the departure envelopes north west, west and south west. This would not enable best use of runway capacity.

# 16 Runway 27 South West

## 16.1 Runway 27 South West Option 1

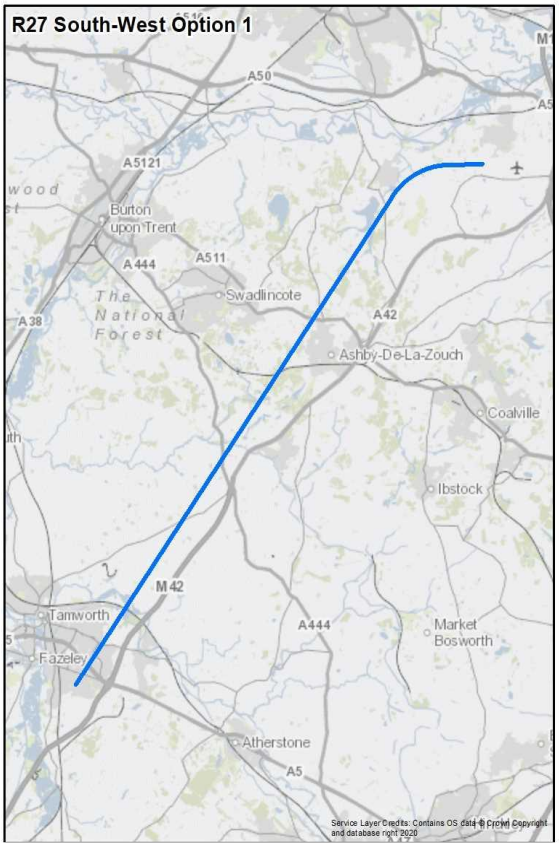
| Design Principle Evaluation | Option No. 1 |
|---|---|
| Option Name: SID RW 27 South West Option 1 | REJECT |

**Option Description:**

Option 1 proceeds straight ahead after take-off and has been created to provide a direct route to the south west.

After departure this follows the runway heading for 1nm with no offset before commencing a left turn onto a south west heading to pass just south east of Melbourne. The route passes between Ashby-de-la-Zouch and Swadlincote and follows a line parallel to the M42 and terminates over southern Tamworth.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route. In relation to the Simplification end of the AMS, feedback from Birmingham Airport has identified a potential interaction with departures to the North on the LUVEM SID and with Birmingham downwind left arrivals for RW 15. Further analysis on scale of this interaction will be conducted during CAF activities in Stage 3 to determine the viability of route options in this envelope. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed not to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being similar and increased, respectively, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes with adjacent FASI programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 1 is 34km (18nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

37.7% of the area of the Option 1 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1 is estimated to overfly approximately 2,600 households with an approximate population of 4,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 5,000.

Up to 7,000ft, Option 1 is estimated to overfly approximately 20,000 households with an approximate population of 38,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 45,900.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and a similar population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1 is estimated to overfly, 15 noise sensitive areas.

Up to 7,000ft, Option 1 is estimated to overfly 95 noise sensitive areas.

This is a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 16.2 Runway 27 South West Option 2

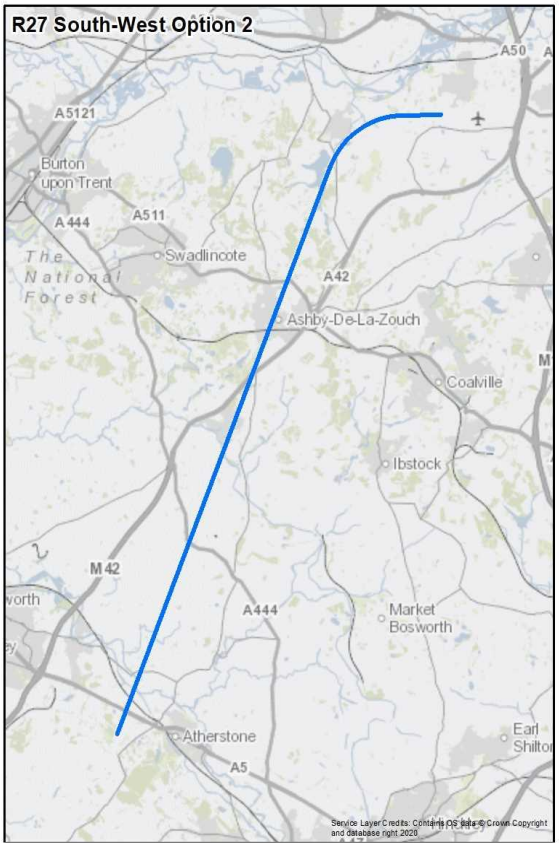
| Design Principle Evaluation | Option No. 2 |
|---|---|
| Option Name: SID RW 27 South West Option 2 | REJECT |

**Option Description:**

Option 2 is similar to Option 1 but takes a more southerly track after the first turn.

After departure this follows the runway heading for 1nm with no offset before commencing a left turn onto a south west heading to pass just south east of Melbourne. The route passes overhead Ashby-de-la-Zouch and follows a line south of the M42 to terminate south east of Tamworth.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route. In relation to the Simplification end of the AMS, feedback from Birmingham Airport has identified a potential interaction with departures to the North on the LUVEM SID and with Birmingham downwind left arrivals for RW 15. Further analysis on scale of this interaction will be conducted during CAF activities in Stage 3 to determine the viability of route options in this envelope. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed not to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being increased, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes with adjacent FASI programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 2 is 35km (19nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

18.7% of the area of the Option 2 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 2 is estimated to overfly approximately 6,650 households with an approximate population of 12,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 18,200.

Up to 7,000ft, Option 2 is estimated to overfly approximately 9,250 households with an approximate population of 17,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 27,500.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 2 is estimated to overfly, 40 noise sensitive areas.

Up to 7,000ft, Option 2 is estimated to overfly 60 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 16.3 Runway 27 South West Option 3

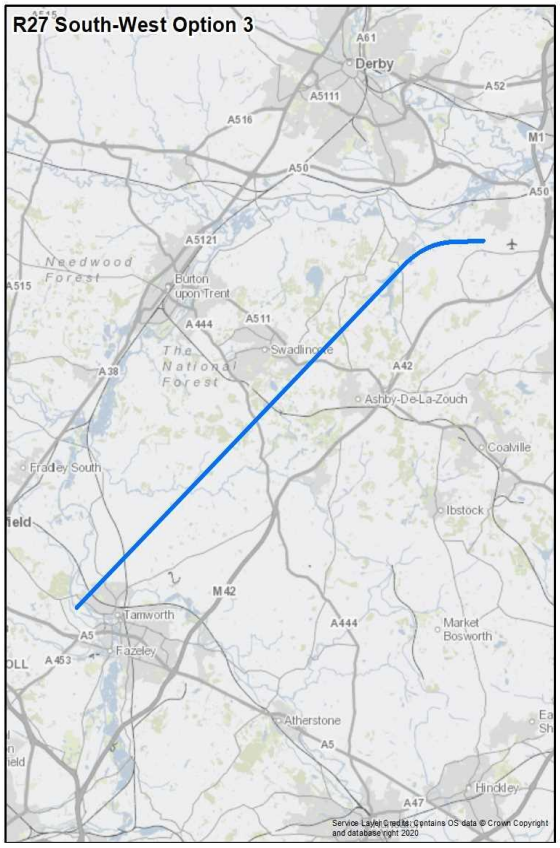
| Design Principle Evaluation | Option No. 3 |
|---|---|
| Option Name: SID RW 27 South West Option 3 | REJECT |

**Option Description:**

Option 3 is similar to Option 1 but takes a more northerly track after the first turn.

After departure this follows the runway heading for 1nm with no offset before commencing a left turn onto a south west heading to pass just south east of Melbourne. The route passes between Ashby-de-la-Zouch and Swadlincote and terminates north of Tamworth.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route. In relation to the Simplification end of the AMS, feedback from Birmingham Airport has identified a potential interaction with departures to the North on the LUVEM SID and with Birmingham downwind left arrivals for RW 15. Further analysis on scale of this interaction will be conducted during CAF activities in Stage 3 to determine the viability of route options in this envelope. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a similar population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes with adjacent FASI programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 3 is 35km (19nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

7.8% of the area of the Option 3 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 3 is estimated to overfly approximately 3,200 households with an approximate population of 5,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 6,400.

Up to 7,000ft, Option 3 is estimated to overfly approximately 11,200 households with an approximate population of 20,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 25,500.

This is a similar population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 3 is estimated to overfly, 15 noise sensitive areas.

Up to 7,000ft, Option 3 is estimated to overfly 65 noise sensitive areas.

This is a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 16.4 Runway 27 South West Option 4

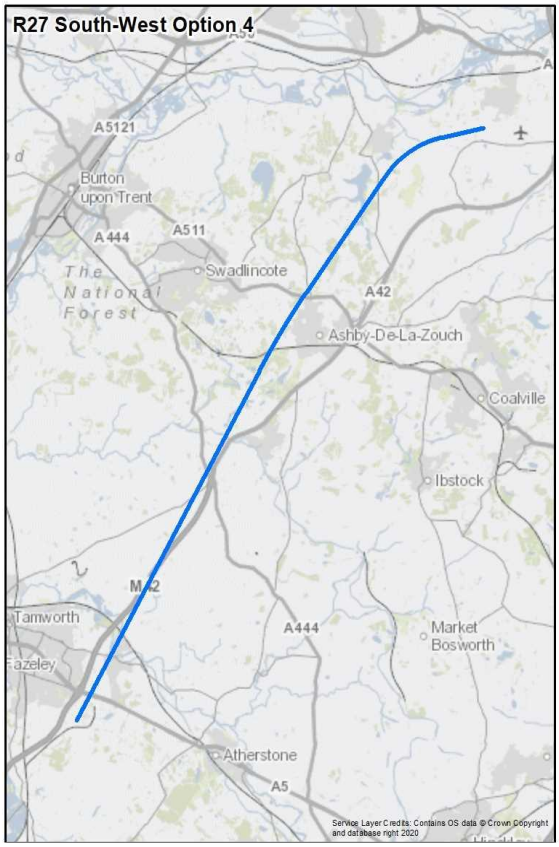
| Design Principle Evaluation | Option No. 4 |
|---|---|
| Option Name: SID RW 27 South West Option 4 | ACCEPT |

**Option Description:**

Option 4 has a 10° southerly offset to avoid Melbourne and has been created to avoid Ashby-de-la-Zouch and Tamworth.

The 10° offset results in the route passing south east of Melbourne and it then makes a left turn to pass north of Ashby-de-la-Zouch prior to turning slightly more to the south to follow the line of the M42 and terminates south east of Tamworth and the A5 and M42 junction.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route. In relation to the Simplification end of the AMS, feedback from Birmingham Airport has identified a potential interaction with departures to the North on the LUVEM SID and with Birmingham downwind left arrivals for RW 15. Further analysis on scale of this interaction will be conducted during CAF activities in Stage 3 to determine the viability of route options in this envelope. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. When considering the Environmental end this option is expected to overfly a reduced population below 4,000ft and an increased population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes with adjacent FASI programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 4 is 34km (18nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

51.6% of the area of the Option 4 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 4 is estimated to overfly approximately 2,200 households with an approximate population of 4,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 4,400.

Up to 7,000ft, Option 4 is estimated to overfly approximately 11,650 households with an approximate population of 22,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 28,600.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 4 is estimated to overfly, 15 noise sensitive areas.

Up to 7,000ft, Option 4 is estimated to overfly 60 noise sensitive areas.

This is a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 16.5 Runway 27 South West Option 5

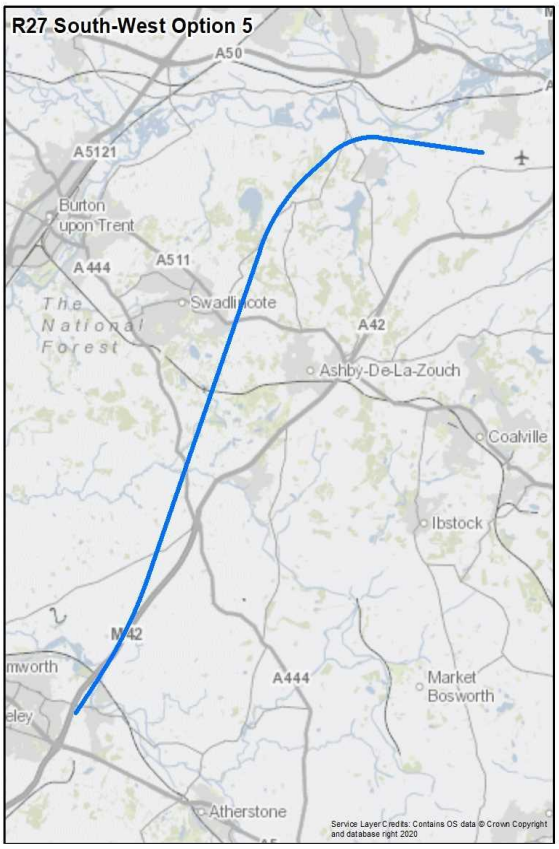
| Design Principle Evaluation | Option No. 5 |
|---|---|
| Option Name: SID RW 27 South West Option 5 | REJECT |

**Option Description:**

Option 5 is similar to Option 4 but instead uses a 10° northerly offset to avoid Melbourne and has been created to avoid Swadlincote, Ashby-de-la-Zouch and Tamworth.

The 10° offset results in the route passing north of Melbourne and it then makes a left turn to pass between Ashby-de-la-Zouch and Swadlincote. It continues on this heading but turns very slightly to the north as it crosses the M42, terminating south east of Tamworth and north east of the A5 and M42 junction.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route. In relation to the Simplification end of the AMS, feedback from Birmingham Airport has identified a potential interaction with departures to the North on the LUVEM SID and with Birmingham downwind left arrivals for RW 15. Further analysis on scale of this interaction will be conducted during CAF activities in Stage 3 to determine the viability of route options in this envelope. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed not to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being increased, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes with adjacent FASI programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 5 is 37km (20nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

39.0% of the area of the Option 5 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 5 is estimated to overfly approximately 3,850 households with an approximate population of 7,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 7,400.

Up to 7,000ft, Option 5 is estimated to overfly approximately 12,450 households with an approximate population of 23,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 31,700.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 5 is estimated to overfly, 20 noise sensitive areas.

Up to 7,000ft, Option 5 is estimated to overfly 75 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 16.6 Runway 27 South West Option 6

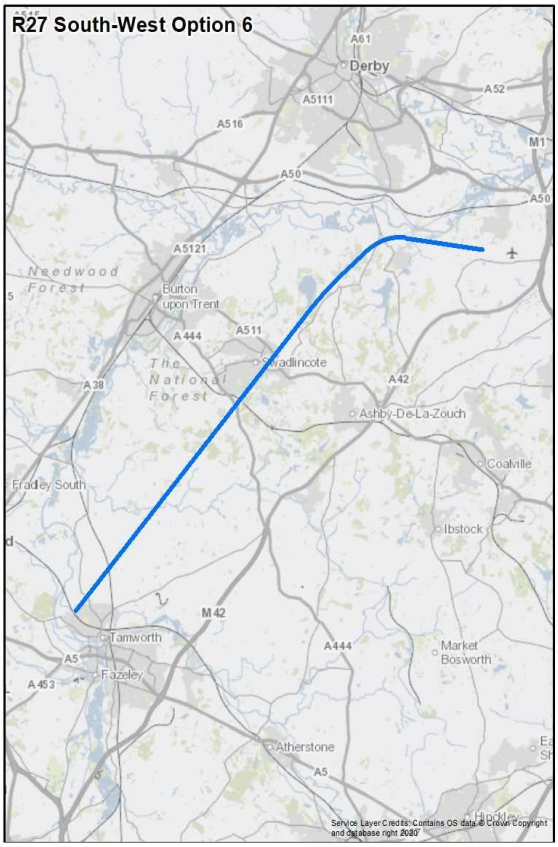
| Design Principle Evaluation | Option No. 6 |
|---|---|
| Option Name: SID RW 27 South West Option 6 | REJECT |

**Option Description:**

Option 6 has the same 10° northerly offset as Option 5 but tracks further north.

The 10° offset results in the route passing north of Melbourne and it then makes a left turn passing overhead Swadlincote. It continues on this heading terminating over north west Tamworth.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route. In relation to the Simplification end of the AMS, feedback from Birmingham Airport has identified a potential interaction with departures to the North on the LUVEM SID and with Birmingham downwind left arrivals for RW 15. Further analysis on scale of this interaction will be conducted during CAF activities in Stage 3 to determine the viability of route options in this envelope. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed not to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being increased, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes with adjacent FASI programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 6 is 37km (20nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

7.4% of the area of the Option 6 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 6 is estimated to overfly approximately 9,000 households with an approximate population of 16,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 18,300.

Up to 7,000ft, Option 6 is estimated to overfly approximately 16,850 households with an approximate population of 30,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 35,800.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 6 is estimated to overfly, 90 noise sensitive areas.

Up to 7,000ft, Option 6 is estimated to overfly 140 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 16.7 Runway 27 South West Option 7

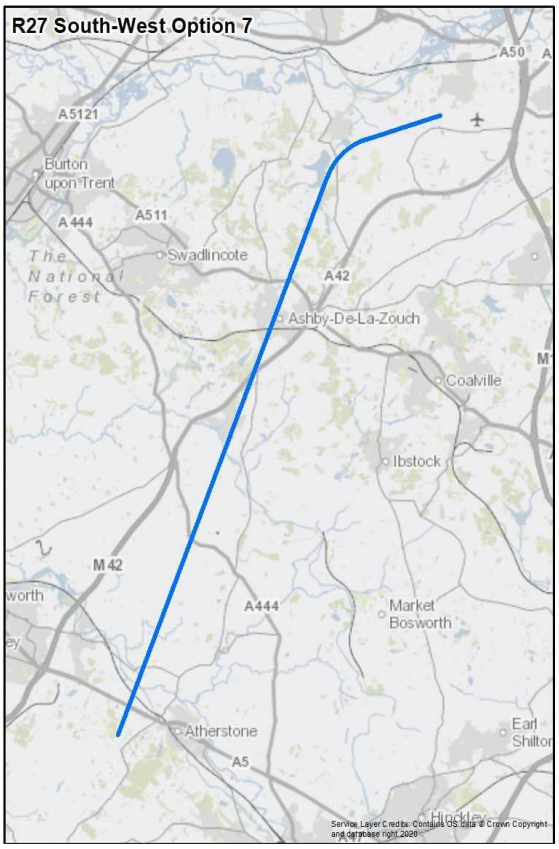
| Design Principle Evaluation | Option No. 7 |
|---|---|
| Option Name: SID RW 27 South West Option 7 | REJECT |

**Option Description:**

Option 7 has the maximum 15° southerly offset to avoid Melbourne and then takes the same track as Option 2 to avoid Tamworth.

The 15° offset results in the route passing south east of Melbourne and it then makes a left turn to pass overhead Ashby-de-la-Zouch. It continues on this heading and follows a line south of the M42 to terminate south east of Tamworth.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | NOT MET |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route. In relation to the Simplification end of the AMS, feedback from Birmingham Airport has identified a potential interaction with departures to the North on the LUVEM SID and with Birmingham downwind left arrivals for RW 15. Further analysis on scale of this interaction will be conducted during CAF activities in Stage 3 to determine the viability of route options in this envelope. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed not to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being increased, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes with adjacent FASI programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 7 is 35km (19nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

18.4% of the area of the Option 7 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | NOT MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 7 is estimated to overfly approximately 6,700 households with an approximate population of 12,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 18,300.

Up to 7,000ft, Option 7 is estimated to overfly approximately 9,050 households with an approximate population of 16,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 27,200.

This is an increased population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 7 is estimated to overfly, 40 noise sensitive areas.

Up to 7,000ft, Option 7 is estimated to overfly 55 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 16.8 Runway 27 South West Option 9

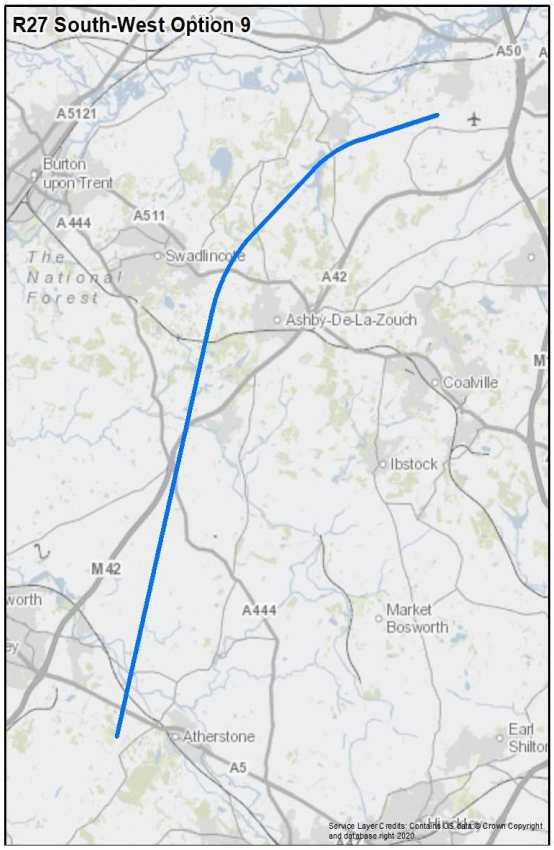
| Design Principle Evaluation | Option No. 9 |
|---|---|
| Option Name: SID RW 27 South West Option 9 | ACCEPT |

**Option Description:**

Option 9 also has a 15° southerly offset to avoid Melbourne but then routes to avoid both Swadlincote and Ashby-de-la-Zouch.

The 15° offset results in the route passing south east of Melbourne. At 2nm beyond the DER the route turns left to a south westerly heading, making a second left turn to pass between Swadlincote and Ashby-de-la-Zouch. It cuts across the M42 and terminates south east of Tamworth in the same position as Option 7.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route. In relation to the Simplification end of the AMS, feedback from Birmingham Airport has identified a potential interaction with departures to the North on the LUVEM SID and with Birmingham downwind left arrivals for RW 15. Further analysis on scale of this interaction will be conducted during CAF activities in Stage 3 to determine the viability of route options in this envelope. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being similar and reduced, respectively, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver CCO and is expected to be able to connect to the ATC network structure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes with adjacent FASI programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 9 is 38km (21nm). When compared to the 'do nothing' baseline (35km (19nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

24.7% of the area of the Option 9 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 9 is estimated to overfly approximately 2,750 households with an approximate population of 5,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 5,400.

Up to 7,000ft, Option 9 is estimated to overfly approximately 6,400 households with an approximate population of 12,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 17,300.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a similar population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 9 is estimated to overfly, 15 noise sensitive areas.

Up to 7,000ft, Option 9 is estimated to overfly 40 noise sensitive areas.

This is a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 16.9 Runway 27 South West Summary

| | Option 1 | Option 2 | Option 3 | Option 4 | Option 5 | Option 6 | Option 7 | Option 9 |
|---|---|---|---|---|---|---|---|---|
| **S - Safety** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **P - Programme** | NOT MET | NOT MET | PARTIAL | PARTIAL | NOT MET | NOT MET | NOT MET | PARTIAL |
| **C - Continuity** | MET | MET | MET | MET | MET | MET | MET | MET |
| **E - Emissions** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **N1 - Noise** | MET | MET | MET | MET | MET | MET | MET | MET |
| **N2 - Noise** | MET | PARTIAL | NOT MET | MET | MET | NOT MET | PARTIAL | PARTIAL |
| **N3 - Noise** | NOT MET | NOT MET | PARTIAL | PARTIAL | NOT MET | NOT MET | NOT MET | MET |
| **N4 - Noise** | NOT MET | PARTIAL | PARTIAL | PARTIAL | NOT MET | NOT MET | PARTIAL | MET |
| **A1 - Airspace** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **A2 - Airspace** | MET | MET | MET | MET | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET | MET | MET | MET | MET |
| | Rejected | Rejected | Rejected | Best | Rejected | Rejected | Rejected | Best |

## 16.10 Runway 27 South West Viable but Poor Fit Options

| Option | Safety | Programme | Continuity |
|---|---|---|---|
| A8 | S | P | C |

Description: This option departs runway 27 in a westerly direction for approximately 8nm before turning left overflying Burton upon Trent and heading in a south west direction.

Programme: This option fails to align with the simplification and environmental ends of the AMS.

*Simplification*: The extended westbound track taken by this option has potential to interact with the routes to and from Birmingham airport.

*Environment:* The emissions generated by this option have been assessed as being greater due to the additional track length required to connect to the network joining point. By overflying Burton upon Trent, the number of people impacted by noise this option in comparison to other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions or interaction with Birmingham airport routes to justify an amber rating.

Continuity: This option fails to align with this design principle, because it would have an interaction with the departure envelopes west and north west. This would not enable best use of runway capacity.

| | | | |
|---|---|---|---|
| B10 | S | P | C |

Description: On departure from runway 27, this option initiates an immediate left turn, proceeding in a southerly direction over Coalville before turning right prior to Market Bosworth to a south westerly direction.

Programme: This option fails to align with the environmental end of the AMS.

*Environment:* The emissions generated by this option have been assessed as being greater due to the additional track length required to connect to the network. By overflying Coalville, the number of people impacted by noise for this option in comparison to other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

Continuity: This option fails to align with this design principle, because it would have a prolonged interaction with the departure envelope to the south. This would not enable best use of runway capacity.

| | | | |
|---|---|---|---|
| C11 | S | P | C |

Description: This option makes an immediate right-hand wrap-around turn after departure from runway 27, overflying southern Nottingham and then proceeding in a south westerly direction over Loughborough and Coalville.

Safety: This option fails to align with this design principle, because it is expected to conflict or present a hazardous interaction with arrivals to runway 27 and the runway 27 Missed Approach Procedure (MAP).

Programme: This option fails to align with the environmental end of the AMS.

*Environment:* The emissions generated by this option have been assessed as being greater due to the additional track length required to connect to the network. By overflying south Nottingham

Loughborough and Coalville, the number of people impacted by noise for this option in comparison to other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

Continuity: This option fails to align with this design principle, because it would have an interaction with the departure envelopes to the north and south east and may interact with arrivals to runway 27 from the south. This would not enable best use of runway capacity.

# 17 Runway 27 West

## 17.1 Runway 27 West Option 1

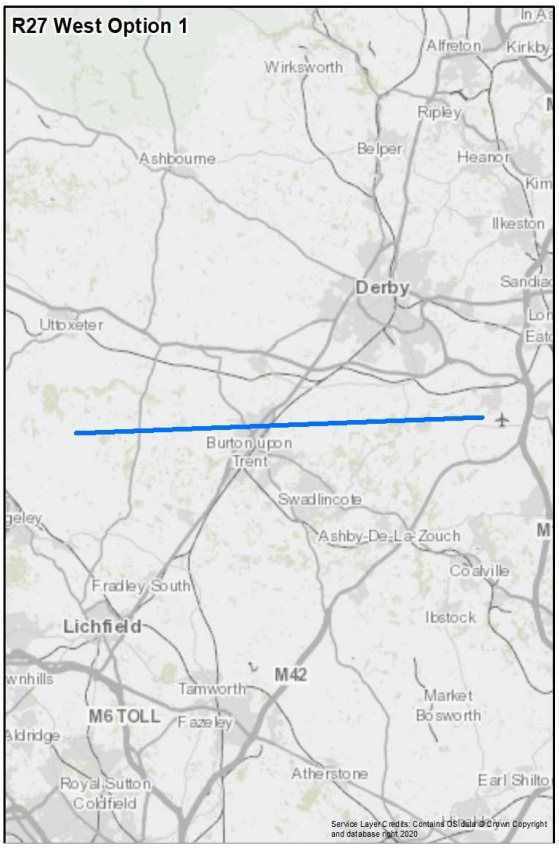
| Design Principle Evaluation | Option No. 1 |
|---|---|
| Option Name: SID RW 27 West Option 1 | REJECT |

**Option Description:**

This option provides a direct route to the west and proceeds straight ahead without making any turns. It has the least track mileage within this envelope as the route flies directly on runway heading.

After departure this follows the runway heading with no offset and overflies Melbourne and northern portion of Burton upon Trent before terminating close to Blithfield reservoir and Abbots Bromley.

There would be no speed restrictions applied to the procedure; therefore, the maximum speed of 250kts would apply. This will permit many aircraft to fly this route in a clean configuration (without the use of flaps) which has potential benefits in terms of noise.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route. In relation to the Simplification end of the AMS, feedback from Birmingham Airport has identified a potential interaction between all options within this envelope and Birmingham arrivals from the CHASE hold. Further analysis on scale of this interaction will be conducted during CAF activities in Stage 3 to determine the viability of route options in this envelope. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, whilst this option is deemed to be able to deliver CCO, it is not expected to be able to connect to the current or planned ATC network structure. Based on current available information, there is no known confliction with adjacent FASI programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 1 is 40km (22nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

4.5% of the area of the Option 1 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1 is estimated to overfly approximately 7,600 households with an approximate population of 13,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 13,900.

Up to 7,000ft, Option 1 is estimated to overfly approximately 11,600 households with an approximate population of 21,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 24,500.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 1 is estimated to overfly, 40 noise sensitive areas.

Up to 7,000ft, Option 1 is estimated to overfly 80 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. At present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 17.2 Runway 27 West Option 2

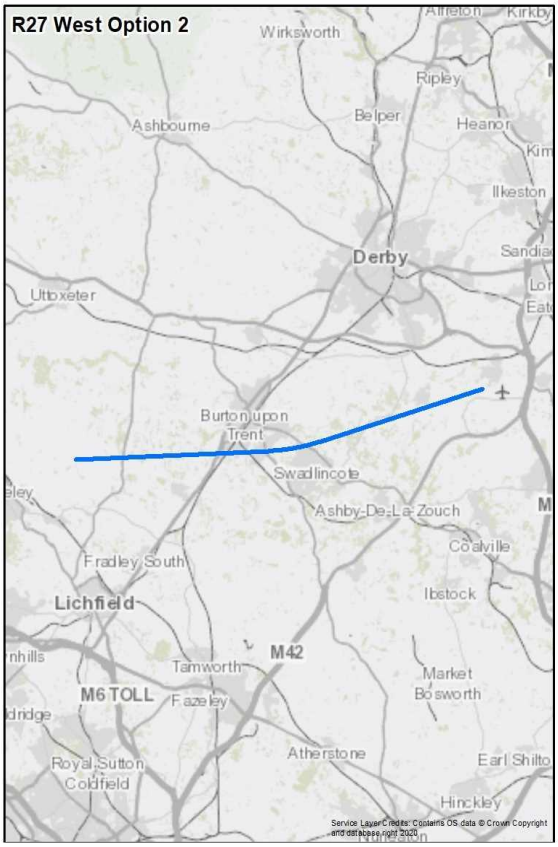
| Design Principle Evaluation | Option No. 2 |
|---|---|
| Option Name: SID RW 27 West Option 2 | REJECT |

**Option Description:**

Option 2 has a 15° southerly offset to avoid Melbourne before routing west to avoid both Swadlincote and Burton upon Trent.

The 15° offset results in the route passing south east of Melbourne and it continues on this heading for approximately 7.5nm passing north west of Wilson. A right turn is made to head west passing just north of Swadlincote and south of Burton upon Trent. The route terminates south east of Abbots Bromley.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route. In relation to the Simplification end of the AMS, feedback from Birmingham Airport has identified a potential interaction between all options within this envelope and Birmingham arrivals from the CHASE hold. Further analysis on scale of this interaction will be conducted during CAF activities in Stage 3 to determine the viability of route options in this envelope. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, whilst this option is deemed to be able to deliver CCO, it is not expected to be able to connect to the current or planned ATC network structure. Based on current available information, there is no known confliction with adjacent FASI programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 2 is 41km (22nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

6.0% of the area of the Option 2 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 2 is estimated to overfly approximately 7,700 households with an approximate population of 14,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 14,500.

Up to 7,000ft, Option 2 is estimated to overfly approximately 13,100 households with an approximate population of 24,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 31,600.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 2 is estimated to overfly, 50 noise sensitive areas.

Up to 7,000ft, Option 2 is estimated to overfly 75 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 17.3 Runway 27 West Option 3

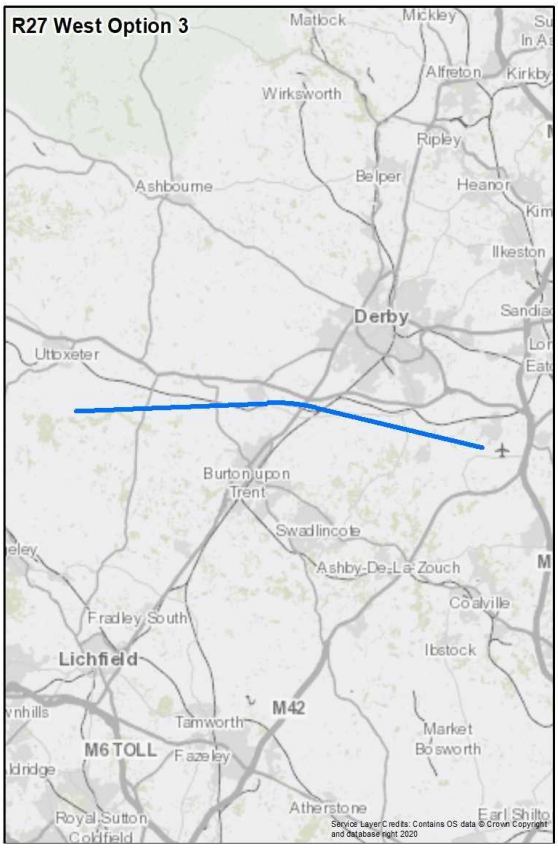
| Design Principle Evaluation | Option No. 3 |
|---|---|
| Option Name: SID RW 27 West Option 3 | ACCEPT |

**Option Description:**

Option 3 has a 15° northerly offset to avoid Melbourne and has been created to avoid both Derby and Burton upon Trent.

The 15° offset results in the route passing north of Melbourne and it continues on this heading for approximately 7.5nm until a point north of Willington and close to Derby aerodrome. A left turn is made to head west, passing north of Burton upon Trent and terminating north east of Abbots Bromley and south of Uttoxeter.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route. In relation to the Simplification end of the AMS, feedback from Birmingham Airport has identified a potential interaction between all options within this envelope and Birmingham arrivals from the CHASE hold. Further analysis on scale of this interaction will be conducted during CAF activities in Stage 3 to determine the viability of route options in this envelope. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, whilst this option is deemed to be able to deliver CCO, it is not expected to be able to connect to the current or planned ATC network structure. Based on current available information, there is no known confliction with adjacent FASI programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 3 is 40km (22nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

15.4% of the area of the Option 3 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 3 is estimated to overfly approximately 2,900 households with an approximate population of 5,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 7,000.

Up to 7,000ft, Option 3 is estimated to overfly approximately 7,200 households with an approximate population of 14,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 16,500.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 3 is estimated to overfly, 20 noise sensitive areas.

Up to 7,000ft, Option 3 is estimated to overfly 45 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. At present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 17.4 Runway 27 West Option 4

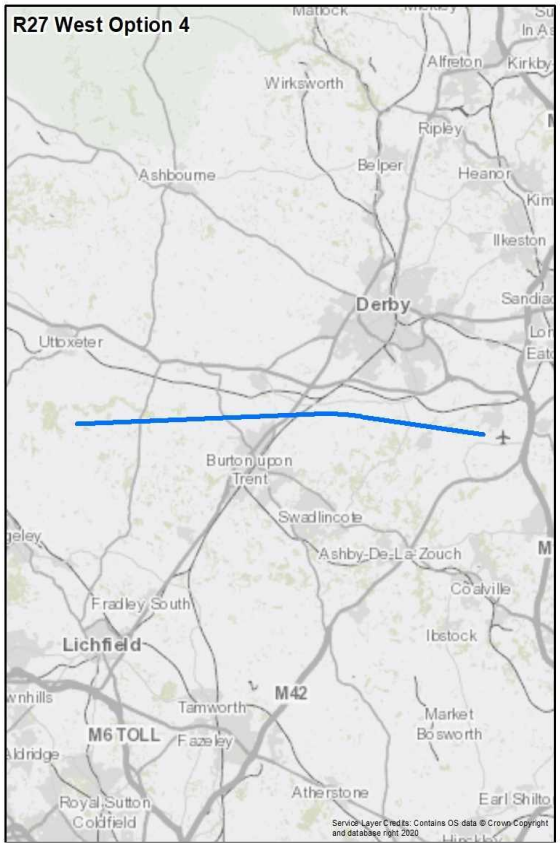
| Design Principle Evaluation | Option No. 4 |
|---|---|
| Option Name: SID RW 27 West Option 4 | ACCEPT |

**Option Description:**

Option 4 has a 10° northerly offset and has a track that is a hybrid of Options 1 and 3 avoiding Burton upon Trent.

The 10° northerly offset results in the route passing north of Melbourne and it continues on this heading until south of Willington where it makes a turn left to head west, routing just north of Burton upon Trent terminating north east of Abbots Bromley.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route. In relation to the Simplification end of the AMS, feedback from Birmingham Airport has identified a potential interaction between all options within this envelope and Birmingham arrivals from the CHASE hold. Further analysis on scale of this interaction will be conducted during CAF activities in Stage 3 to determine the viability of route options in this envelope. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, whilst this option is deemed to be able to deliver CCO, it is not expected to be able to connect to the current or planned ATC network structure. Based on current available information, there is no known confliction with adjacent FASI programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 4 is 40km (22nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

10.2% of the area of the Option 4 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 4 is estimated to overfly approximately 2,400 households with an approximate population of 4,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 5,300.

Up to 7,000ft, Option 4 is estimated to overfly approximately 4,600 households with an approximate population of 8,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 10,500.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 4 is estimated to overfly, 30 noise sensitive areas.

Up to 7,000ft, Option 4 is estimated to overfly 40 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 17.5 Runway 27 West Option 5

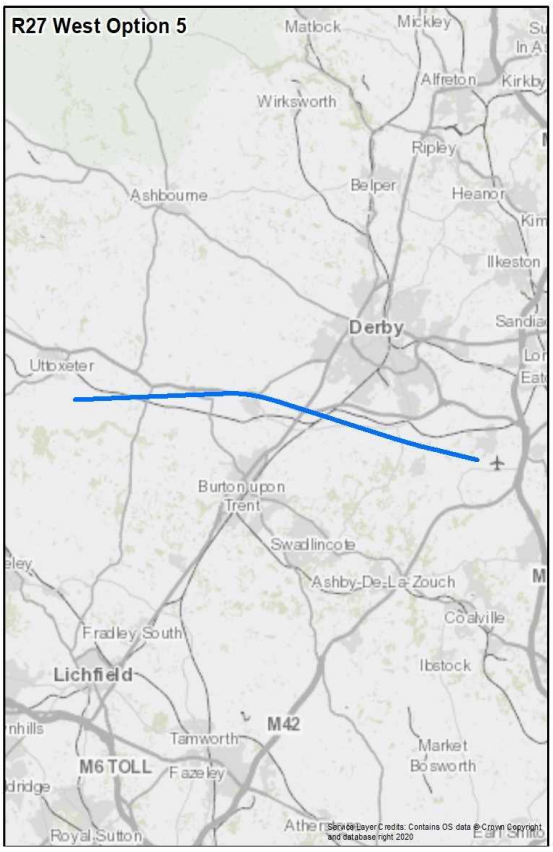
| Design Principle Evaluation | Option No. 5 |
|---|---|
| Option Name: SID RW 27 West Option 5 | ACCEPT |

**Option Description:**

Option 5 is similar to Option 3 but deviates slight further north west and is the most northerly option in this envelope.

A 15° northerly offset results in the route passing north of Melbourne and it continues on this heading until the vicinity of Hilton on the A50 where it makes a turn left to head west following the line of the A50 and terminating just south of Uttoxeter.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route. In relation to the Simplification end of the AMS, feedback from Birmingham Airport has identified a potential interaction between all options within this envelope and Birmingham arrivals from the CHASE hold. Further analysis on scale of this interaction will be conducted during CAF activities in Stage 3 to determine the viability of route options in this envelope. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, whilst this option is deemed to be able to deliver CCO, it is not expected to be able to connect to the current or planned ATC network structure. Based on current available information, there is no known confliction with adjacent FASI programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 5 is 40km (22nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

37.2% of the area of the Option 5 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 5 is estimated to overfly approximately 2,550 households with an approximate population of 4,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 5,200.

Up to 7,000ft, Option 5 is estimated to overfly approximately 5,500 households with an approximate population of 11,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 12,800.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 5 is estimated to overfly, 25 noise sensitive areas.

Up to 7,000ft, Option 5 is estimated to overfly 45 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track at a minimum climb gradient that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 17.6 Runway 27 West Option 6

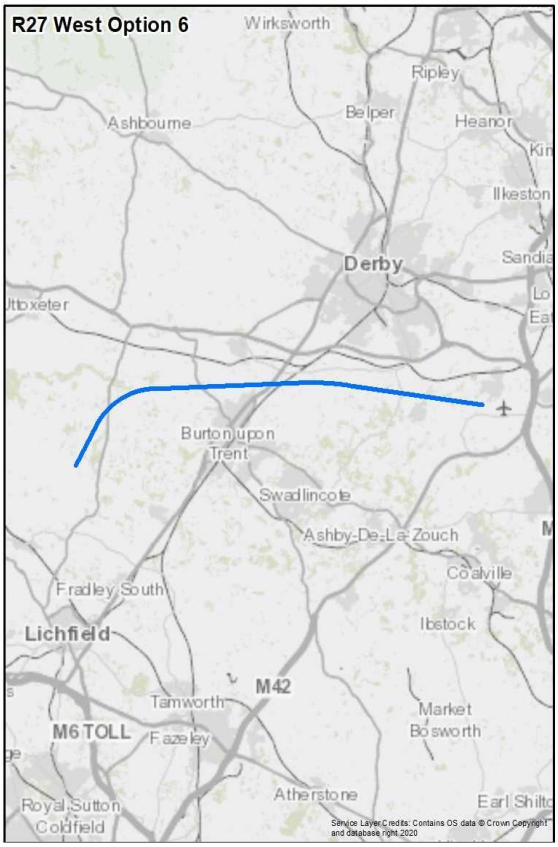
| Design Principle Evaluation | Option No. 6 |
|---|---|
| Option Name: SID RW 27 West Option 6 | ACCEPT |

**Option Description:**

This option is the same as Option 4 until north west of Burton upon Trent where it turns south by south west to provide an alternative joining point.

The 10° northerly offset results in the route passing north of Melbourne and it continues on this heading until south of Willington where it makes a turn left to head west, routing just north of Burton upon Trent. Once north west of Burton upon Trent the route turns south by south west and terminates to the south east of Abbots Bromley.

The route has a constant climb gradient of 6%, terminating at 7,000ft and the CAP 778 recommended speed of 210 KIAS has been applied to the first turn.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This departure option has been designed as a RNAV1 route. In relation to the Simplification end of the AMS, feedback from Birmingham Airport has identified a potential interaction between all options within this envelope and Birmingham arrivals from the CHASE hold. Further analysis on scale of this interaction will be conducted during CAF activities in Stage 3 to determine the viability of route options in this envelope. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, whilst this option is deemed to be able to deliver CCO, it is not expected to be able to connect to the current or planned ATC network structure. Based on current available information, there is no known confliction with adjacent FASI programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 6 is 43km (23nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

10.2% of the area of the Option 6 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 6 is estimated to overfly approximately 2,400 households with an approximate population of 4,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 5,300.

Up to 7,000ft, Option 6 is estimated to overfly approximately 4,600 households with an approximate population of 8,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 10,600.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise N4** | PARTIAL |
|---|---|

*Summary of Assessment:*

Up to 4,000ft, Option 6 is estimated to overfly, 30 noise sensitive areas.

Up to 7,000ft, Option 6 is estimated to overfly 40 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168, at a minimum climb gradient that can achieved by all current and future aircraft operating from EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. At present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CCO to be conducted at EMA.

## 17.7 Runway 27 West Summary

| | Option 1 | Option 2 | Option 3 | Option 4 | Option 5 | Option 6 |
|---|---|---|---|---|---|---|
| **S - Safety** | MET | PARTIAL | MET | PARTIAL | PARTIAL | MET |
| **P - Programme** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **C - Continuity** | MET | MET | MET | MET | MET | MET |
| **E - Emissions** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | NOT MET |
| **N1 - Noise** | MET | MET | MET | MET | MET | MET |
| **N2 - Noise** | NOT MET | NOT MET | MET | PARTIAL | MET | PARTIAL |
| **N3 - Noise** | PARTIAL | PARTIAL | MET | MET | MET | MET |
| **N4 - Noise** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **A1 - Airspace** | MET | PARTIAL | MET | PARTIAL | PARTIAL | MET |
| **A2 - Airspace** | MET | MET | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET | MET | MET |
| | Rejected | Rejected | Best | Best | Best | 4,000ft beneficial |

## 17.8 Runway 27 West Viable but Poor Fit Options

| Option | Safety | Programme | Continuity |
|---|---|---|---|
| A7 | S | P | C |

Description: This option makes a 90 degree right turn overhead Derby, commencing a left turn to continue over north west Derby in a south westerly direction towards Uttoxeter.

Programme: This option fails to align with the environmental end of the AMS.

> *Environment:* The emissions generated by this option have been assessed as being greater due to the additional track length required to connect to the network. By overflying Derby, the number of people impacted by noise for this option in comparison to other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

Continuity: This option fails to align with this design principle, because it would have a prolonged interaction with the departure envelope to the north and north west. This would not enable best use of runway capacity.

| | | | |
|---|---|---|---|
| B8 | S | P | C |

Description: This option makes an immediate right-hand wrap-around turn after departure from runway 27, overflying southern Nottingham and then proceeding in a south westerly direction over Loughborough and Swadlincote.

Safety: This option fails to align with this design principle, because it is expected to conflict or present a hazardous interaction with arrivals to runway 27 and the runway 27 Missed Approach Procedure (MAP).

Programme: This option fails to align with the environmental end of the AMS.

> *Environment:* The emissions generated by this option have been assessed as being greater due to the additional track length required to connect to the network. By overflying south Nottingham Loughborough and Swadlincote, the number of people impacted by noise for this option in comparison to other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

Continuity: This option fails to align with this design principle, because it would have an interaction with the departure envelopes to the north and south east and may interact with arrivals to runway 27 from the south. This would not enable best use of runway capacity.

| | | | |
|---|---|---|---|
| C9 | S | P | C |

Description: This option makes an immediate left-hand wrap-around turn after departure from runway 27and routing in an easterly direction over Loughborough and then north and west over southern Nottingham and south Derby.

Safety: This option fails to align with this design principle, because it is expected to conflict or present a hazardous interaction with arrivals to runway 27 and the runway 27 Missed Approach Procedure (MAP).

Programme: This option fails to align with the environmental end of the AMS.

> *Environment:* The emissions generated by this option have been assessed as being greater due to the additional track length required to connect to the network. By overflying Loughborough, south Nottingham and Derby, the number of people impacted by noise for this option in comparison to other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

Continuity: This option fails to align with this design principle, because it would have an interaction with the departure envelopes to the north, north west and south east and may interact with arrivals to runway 27 from the south. This would not enable best use of runway capacity.

| D10 | S | P | C |
|---|---|---|---|

Description: This option makes a 90-degree left turn over Ashby de la Zouch, then making a gradual right turn over the M42 to a north westerly direction passing north of Lichfield.

Programme: This option fails to align with the environmental end of the AMS.

> *Environment:* The emissions generated by this option have been assessed as being greater due to the additional track length required to connect to the network. By overflying Ashby-de-la-Zouch the number of people impacted by noise for this option in comparison to other options does not show a material benefit.

*Trade-offs*: Without a material benefit in the number of people impacted by noise there is no trade-off to be made for the increased emissions. Similarly, simplification and integration do not offer material benefits that could be traded to justify an amber rating.

Continuity: This option fails to align with this design principle, because it would have a prolonged interaction with the departure envelope to the south and south west. This would not enable best use of runway capacity.

# 18 Transitions Evaluation

# 19 Transitions Runway 09 North

## 19.1 Transition Runway 09 North Option 1

| Design Principle Evaluation | Option No. 1 |
|---|---|
| Option Name: Transition RW 09 North Option 1 | ACCEPT |

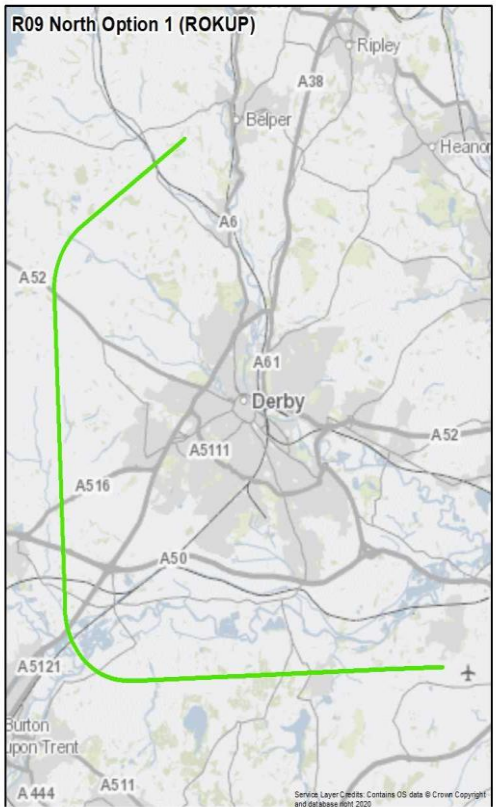
**Option Description:**

This option starts at IAF ROKUP which is the hold currently used for arrivals from the north. The style of the route is 'direct' which means the distance to the final approach has been minimised.

The option starts at IAF ROKUP which is situated to the south west of Belper and the route initially tracks south west turning to a southerly heading just north of the A52 and passing west of Derby. The route turns to join the extended runway centreline east of Burton upon Trent.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 3.45° which is above the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 1 is 40km (22nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

16.4% of the area of the Option 1 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 1 is estimated to overfly approximately 2,500 households with an approximate population of 4,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 5,200.

From 7,000ft, Option 1 is estimated to overfly approximately 3,700 households with an approximate population of 6,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 7,400.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 1 is estimated to overfly 45 noise sensitive areas.

From 7,000ft, Option 1 is estimated to overfly 60 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.2 Transition Runway 09 North Option 2

| Design Principle Evaluation | Option No. 2 |
|---|---|
| Option Name: Transition RW 09 North Option 2 | ACCEPT |

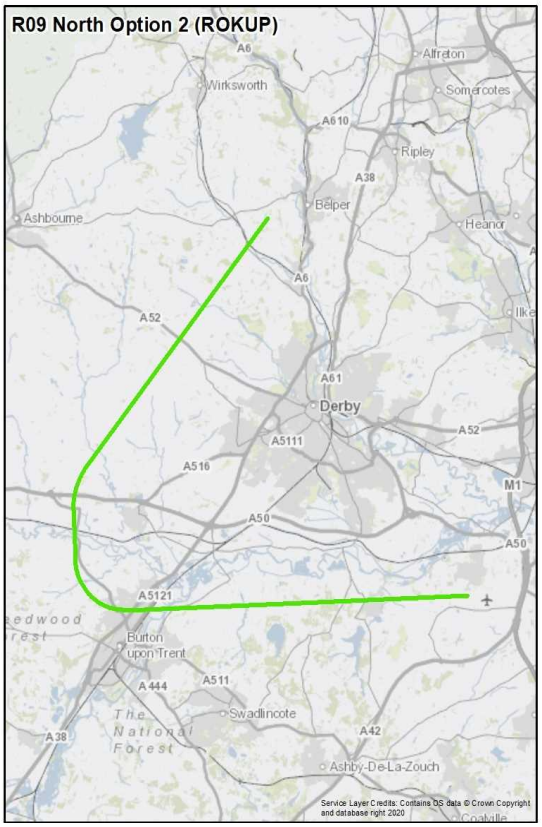
**Option Description:**

Option 2 starts at IAF ROKUP which is the hold currently used for arrivals from the north. The style of the route is 'direct' which means the distance to the final approach has been minimised. It is similar to Option 1 but has a longer final approach.

The option starts at IAF ROKUP which is situated to the south west of Belper and the route tracks west of Derby before turning onto a southerly heading just north of Hatton before turning to join the extended runway centreline and over flying Burton upon Trent.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (6.9nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 2.7° which is within the optimum range for low noise approaches and the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 2 is 47km (25nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

8.2% of the area of the Option 2 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 2 is estimated to overfly approximately 11,300 households with an approximate population of 20,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 24,100.

From 7,000ft, Option 2 is estimated to overfly approximately 12,500 households with an approximate population of 22,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 26,800.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 2 is estimated to overfly 55 noise sensitive areas.

From 7,000ft, Option 2 is estimated to overfly 65 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.3 Transition Runway 09 North Option 3

| Design Principle Evaluation | Option No. 3 |
|---|---|
| Option Name: Transition RW 09 North Option 3 | ACCEPT |

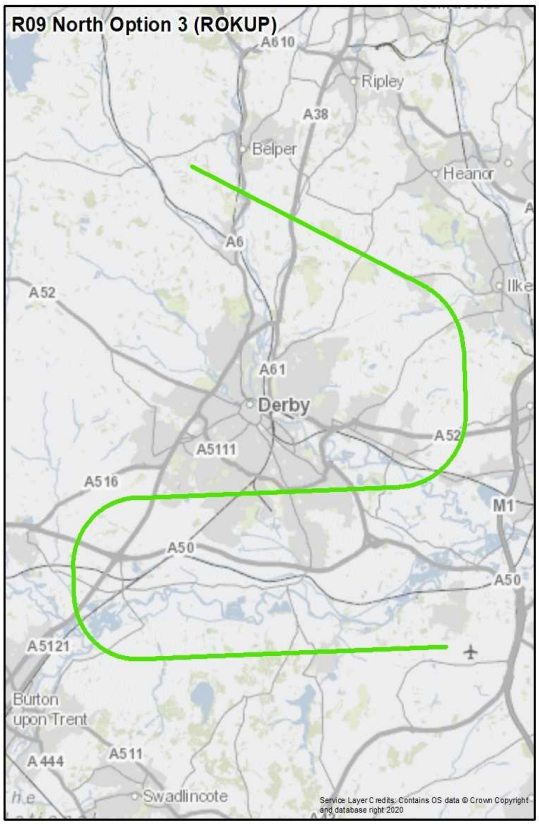
**Option Description:**

The IAF for this option is ROKUP and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route.

The option starts at IAF ROKUP which is situated to the south west of Belper and the route tracks south east between Derby and Nottingham, turning south over West Hallam, before turning west between Derby and Long Eaton. To the south west of Derby the route turns south before turning to join the extended runway centreline east of Burton upon Trent.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 1.96° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being similar and reduced, respectively, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 3 is 59km (32nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

22.7% of the area of the Option 3 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 3 is estimated to overfly approximately 21,550 households with an approximate population of 41,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 45,800.

From 7,000ft, Option 3 is estimated to overfly approximately 38,050 households with an approximate population of 71,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 80,000.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a similar population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 3 is estimated to overfly 120 noise sensitive areas.

From 7,000ft, Option 3 is estimated to overfly 230 noise sensitive areas.

This is a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.4 Transition Runway 09 North Option 4

| Design Principle Evaluation | Option No. 4 |
|---|---|
| Option Name: Transition RW 09 North Option 4 | ACCEPT |

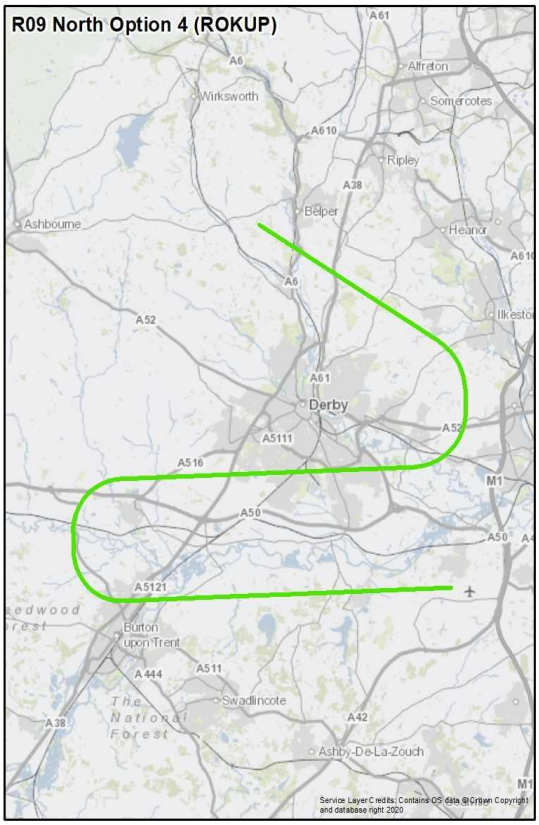
**Option Description:**

The IAF for this option is ROKUP and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route. It is similar to Option 3 but has a longer final approach.

The option starts at IAF ROKUP which is situated to the south west of Belper and the route tracks south east between Derby and Nottingham, turning south to the west of Stapleford, before turning west between Derby and Long Eaton. To the north of Burton upon Trent and Hatton the route turns south before turning to join the extended runway centreline and over flying Burton upon Trent.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (6.9nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 1.57° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 4 is 70km (38nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

23.6% of the area of the Option 4 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 4 is estimated to overfly approximately 14,000 households with an approximate population of 26,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 34,400.

From 7,000ft, Option 4 is estimated to overfly approximately 45,850 households with an approximate population of 85,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 98,700.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 4 is estimated to overfly 90 noise sensitive areas.

From 7,000ft, Option 4 is estimated to overfly 265 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.5 Transition Runway 09 North Option 4A

| Design Principle Evaluation | Option No. 4A |
|---|---|
| Option Name: Transition RW 09 North Option 4A | ACCEPT |

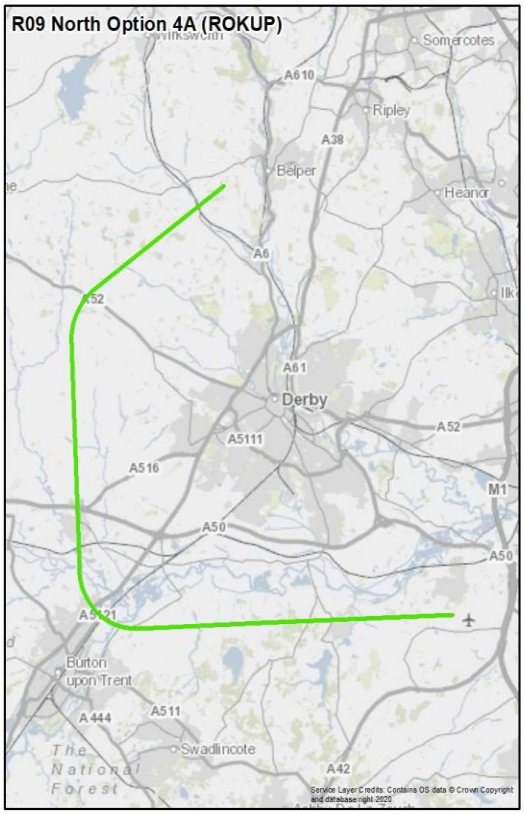
**Option Description:**

The IAF for this option is ROKUP and the style of the route is 'direct' which means the distance to the final approach has been minimised. This option has an IF at 2,500ft which is at a point 5nm from the FAF, thereby falling mid-way between the 3.85nm and 6.9nm utilised by other arrival options to runway 09 from the North.

The option starts at IAF ROKUP which is situated to the south west of Belper and the route tracks south west from ROKUP before turning onto a southerly heading as the track crosses the A52 mid-way between Ashbourne and Derby. The option routes directly south, over Hilton, and turns to join the extended runway centreline at a point north east of Burton upon Trent.

This RNAV 1 arrival connects the IAF to the IF, at 2,500ft, which is placed as close as possible to the FAF (5nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 3.06° which is above the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 4A is 43km (23nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

8.8% of the area of the Option 4A overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 4A is estimated to overfly approximately 6,700 households with an approximate population of 12,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 14,900.

From 7,000ft, Option 4A is estimated to overfly approximately 8,050 households with an approximate population of 15,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 17,400.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 4A is estimated to overfly 45 noise sensitive areas.

From 7,000ft, Option 4A is estimated to overfly 60 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.6 Transition Runway 09 North ROKUP Summary

| | Option 1 | Option 2 | Option 3 | Option 4 | Option 4A |
|---|---|---|---|---|---|
| **S - Safety** | MET | PARTIAL | MET | PARTIAL | MET |
| **P - Programme** | MET | PARTIAL | MET | PARTIAL | MET |
| **C - Continuity** | MET | MET | MET | MET | MET |
| **E - Emissions** | PARTIAL | NOT MET | NOT MET | NOT MET | NOT MET |
| **N1 - Noise** | MET | MET | MET | MET | MET |
| **N2 - Noise** | MET | MET | MET | MET | MET |
| **N3 - Noise** | MET | MET | MET | MET | MET |
| **N4 - Noise** | MET | MET | MET | MET | MET |
| **A1 - Airspace** | MET | PARTIAL | MET | PARTIAL | MET |
| **A2 - Airspace** | MET | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET | MET |
| | Best | Best | Best | Best | Best |

## 19.7 Transition Runway 09 North Option 5

| Design Principle Evaluation | Option No. 5 |
|---|---|
| Option Name: Transition RW 09 North Option 5 | ACCEPT |

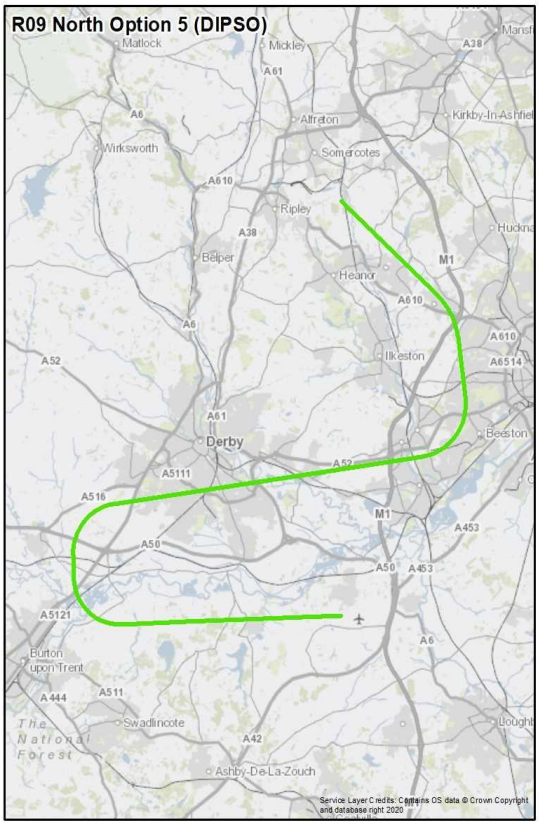
**Option Description:**

The IAF for this option is DIPSO and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route.

The option starts at IAF DIPSO which is east of Ripley and tracks south east towards Nottingham turning south over Hucknall, before turning before turning west parallel to the final approach path at Beeston. It overflies southern Derby and to the south west of Derby the route turns south before turning to join the extended runway centreline east of Burton upon Trent.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 1.77° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 5 is 64km (35nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

36.7% of the area of the Option 5 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 5 is estimated to overfly approximately 24,250 households with an approximate population of 46,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 50,100.

From 7,000ft, Option 5 is estimated to overfly approximately 81,300 households with an approximate population of 153,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 158,300.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | PARTIAL |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 5 is estimated to overfly 150 noise sensitive areas.

From 7,000ft, Option 5 is estimated to overfly 505 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.8 Transition Runway 09 North Option 6

| Design Principle Evaluation | Option No. 6 |
|---|---|
| Option Name: Transition RW 09 North Option 6 | ACCEPT |

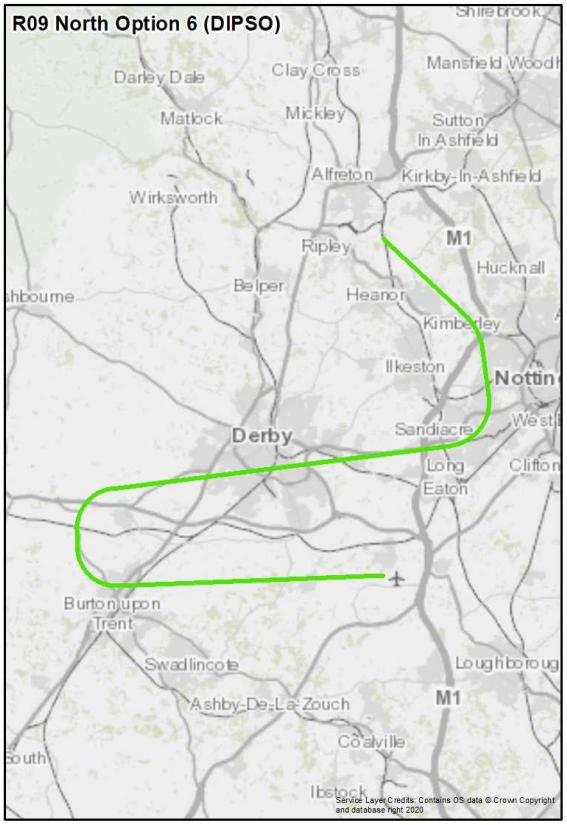
**Option Description:**

The IAF for this option is DIPSO and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route. It is similar to Option 5 but has a longer final approach.

The option starts at IAF DIPSO which is east of Ripley and tracks south east towards Nottingham turning south over Hucknall, before turning before turning west parallel to the final approach path at Beeston. It overflies southern Derby and to the north west of Burton upon Trent it turns south before turning to join the extended runway centreline.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (6.9nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 1.5° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a similar population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 6 is 75km (40nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

34.4% of the area of the Option 6 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 6 is estimated to overfly approximately 27,550 households with an approximate population of 54,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 60,900.

From 7,000ft, Option 6 is estimated to overfly approximately 94,950 households with an approximate population of 180,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 187,800.

This is a similar population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | PARTIAL |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 6 is estimated to overfly 210 noise sensitive areas.

From 7,000ft, Option 6 is estimated to overfly 625 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.9 Transition Runway 09 North Option 7

| Design Principle Evaluation | Option No. 7 |
|---|---|
| Option Name: Transition RW 09 North Option 7 | ACCEPT |

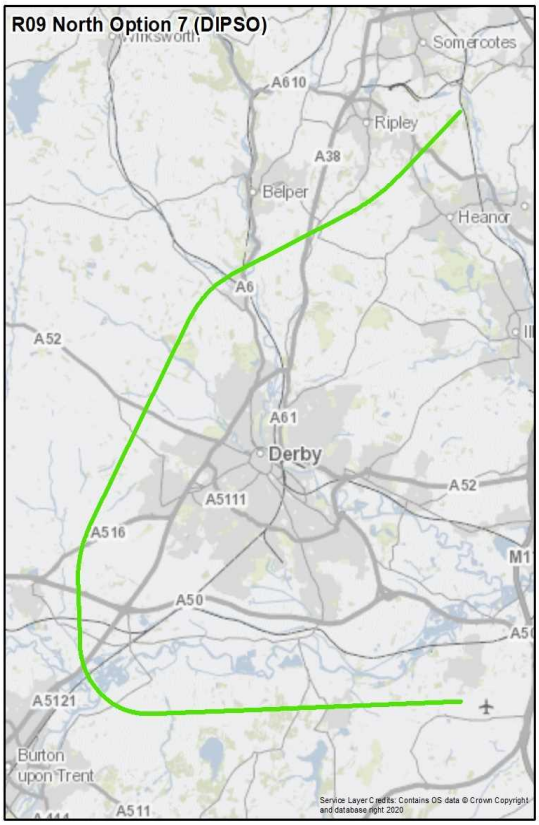
**Option Description:**

The IAF for this option is DIPSO and the style of the route is 'direct' which means the distance to the final approach has been minimised.

The option starts at IAF DIPSO which is east of Ripley and tracks south west avoiding Belper. After passing Duffield it turns south and tracks west of Derby before turning over Etwall onto a southerly heading before turning to join the extended runway centreline east of Burton upon Trent.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 2.56° which is within the optimum range for low noise approaches and the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 7 is 48km (26nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

18.5% of the area of the Option 7 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 7 is estimated to overfly approximately 2,250 households with an approximate population of 4,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 4,800.

From 7,000ft, Option 7 is estimated to overfly approximately 15,600 households with an approximate population of 29,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 34,200.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 7 is estimated to overfly 35 noise sensitive areas.

From 7,000ft, Option 7 is estimated to overfly 105 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.10 Transition Runway 09 North Option 8

| Design Principle Evaluation | Option No. 8 |
|---|---|
| Option Name: Transition RW 09 North Option 8 | ACCEPT |

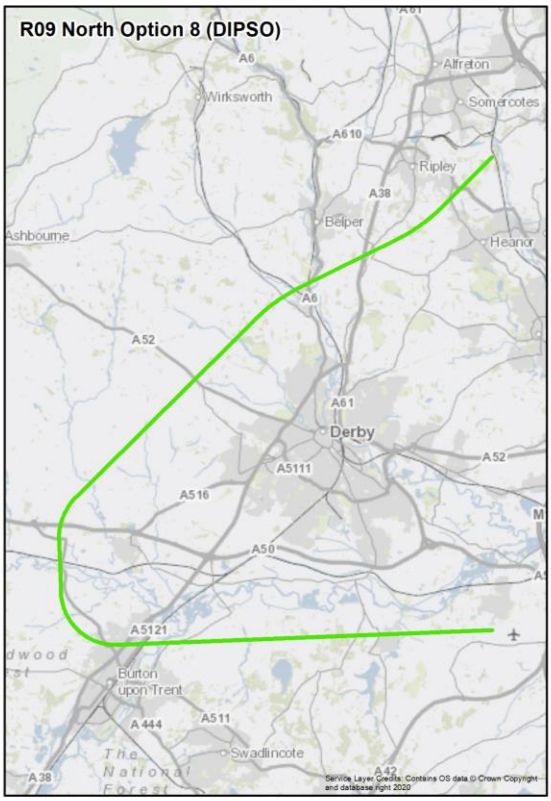
**Option Description:**

The IAF for this option is DIPSO and the style of the route is 'direct' which means the distance to the final approach has been minimised. It is initially similar to Option 7 but diverges south of Belper to give a longer final approach.

The option starts at IAF DIPSO which is east of Ripley and tracks south west avoiding Belper. It continues on this heading beyond Duffield and until Church Broughton where it turns onto a southerly heading before turning to join the extended runway centreline west of Burton upon Trent.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (6.9nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 2° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 8 is 48km (26nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

13.3% of the area of the Option 8 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 8 is estimated to overfly approximately 6,800 households with an approximate population of 12,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 15,200.

From 7,000ft, Option 8 is estimated to overfly approximately 20,200 households with an approximate population of 37,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 42,700.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 8 is estimated to overfly 40 noise sensitive areas.

From 7,000ft, Option 8 is estimated to overfly 110 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.11 Transition Runway 09 North Option 8A

| Design Principle Evaluation | Option No. 8A |
|---|---|
| Option Name: Transition RW 09 North Option 8A | ACCEPT |

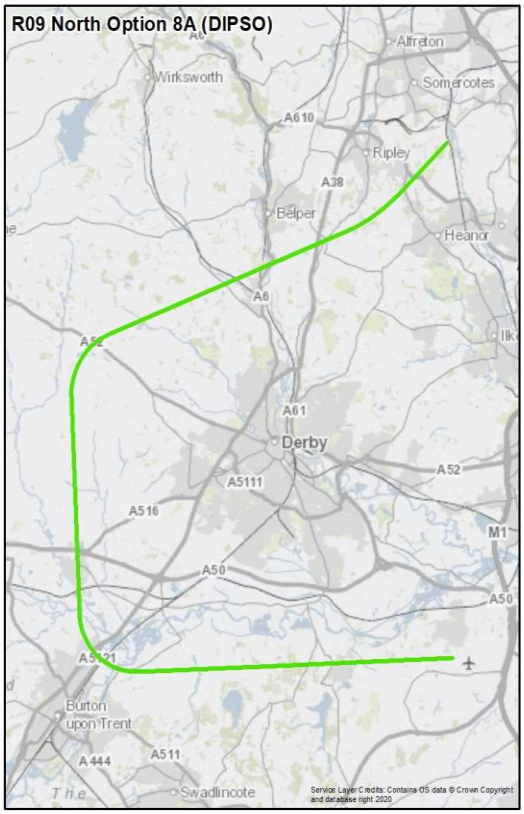
**Option Description:**

The IAF for this option is DIPSO and the style of the route is 'direct' which means the distance to the final approach has been minimised. This option has an IF at 2,500ft which is at a point 5nm from the FAF, thereby falling mid-way between the 3.85nm and 6.9nm utilised by other arrival options to runway 09 from the North.

The option starts at IAF DIPSO which is east of Ripley and tracks south west similar to Options 7 and 8, staying to the south west of Belper before turning onto a southerly heading as the track crosses the A52 mid-way between Ashbourne and Derby. The option routes directly south over Hilton and turns to join the extended runway centreline at a point north east of Burton upon Trent.

This RNAV 1 arrival connects the IAF to the IF, at 2,500ft, which is placed as close as possible to the FAF (5nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 2.16° which is close to the optimum range for low noise approaches and is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 8A is 55km (30nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

11.0% of the area of the Option 8A overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 8A is estimated to overfly approximately 6,250 households with an approximate population of 11,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 13,700.

From 7,000ft, Option 8A is estimated to overfly approximately 20,100 households with an approximate population of 37,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 42,300.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 8A is estimated to overfly 40 noise sensitive areas.

From 7,000ft, Option 8A is estimated to overfly 115 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.12 Transition Runway 09 North Option 29

| Design Principle Evaluation | Option No. 29 |
|---|---|
| Option Name: Transition RW 09 North Option 29 | ACCEPT |

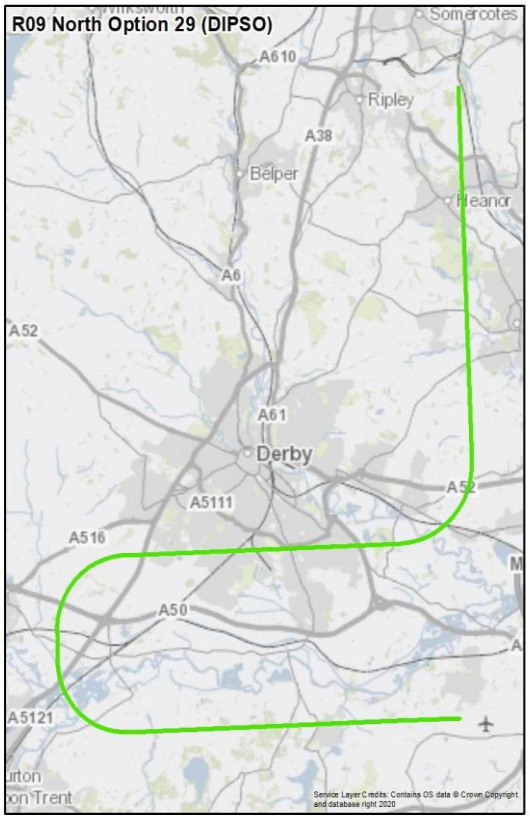
**Option Description:**

The IAF for this option is DIPSO and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route.

This option starts at IAF DIPSO, east of Ripley and initially tracks directly south from the IAF passing over the western side of Langley Mill and between West Hallam and Ilkeston. It continues south until it passes over the A52 near Risley where it turns west to track across the southern suburbs of Derby. It turns south close to Etwall before turning to join the extended runway centreline east of Burton upon Trent.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 2.12° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 29 is 55km (30nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

21.6% of the area of the Option 29 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 29 is estimated to overfly approximately 15,250 households with an approximate population of 29,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 34,400.

From 7,000ft, Option 29 is estimated to overfly approximately 45,700 households with an approximate population of 85,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 97,400.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 29 is estimated to overfly 90 noise sensitive areas.

From 7,000ft, Option 29 is estimated to overfly 250 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.13 Transition Runway 09 North Option 30

| Design Principle Evaluation | Option No. 30 |
|---|---|
| Option Name: Transition RW 09 North Option 30 | ACCEPT |

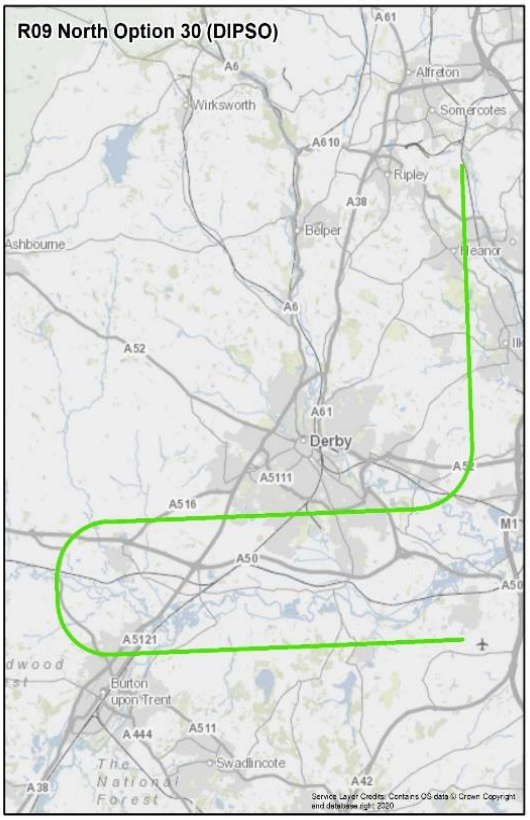
**Option Description:**

The IAF for this option is DIPSO and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route. It follows the same track as Option 29 but routes further west before joining the final approach.

This option starts at IAF DIPSO, east of Ripley and initially tracks directly south from the IAF passing over the western side of Langley Mill and between West Hallam and Ilkeston. It continues south until it passes over the A52 near Risley where it turns west to track across the southern suburbs of Derby. It continues on this heading until Church Broughton where it turns onto a southerly heading before turning left to join the extended runway centreline west of Burton upon Trent.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (6.9nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 1.66° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 30 is 67km (36nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

22.7% of the area of the Option 30 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 30 is estimated to overfly approximately 11,550 households with an approximate population of 21,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 28,300.

From 7,000ft, Option 30 is estimated to overfly approximately 57,550 households with an approximate population of 107,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 123,400.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 30 is estimated to overfly 75 noise sensitive areas.

From 7,000ft, Option 30 is estimated to overfly 310 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.14 Transition Runway 09 North DIPSO Summary

| | Option 5 | Option 6 | Option 7 | Option 8 | Option 8A | Option 29 | Option 30 |
|---|---|---|---|---|---|---|---|
| **S - Safety** | PARTIAL | PARTIAL | MET | PARTIAL | MET | MET | PARTIAL |
| **P - Programme** | PARTIAL | PARTIAL | MET | PARTIAL | MET | MET | PARTIAL |
| **C - Continuity** | MET | MET | MET | MET | MET | MET | MET |
| **E - Emissions** | NOT MET | NOT MET | NOT MET | NOT MET | NOT MET | NOT MET | NOT MET |
| **N1 - Noise** | MET | MET | MET | MET | MET | MET | MET |
| **N2 - Noise** | MET | MET | MET | MET | MET | NOT MET | NOT MET |
| **N3 - Noise** | PARTIAL | PARTIAL | MET | MET | MET | MET | MET |
| **N4 - Noise** | PARTIAL | PARTIAL | MET | MET | MET | MET | MET |
| **A1 - Airspace** | PARTIAL | PARTIAL | MET | PARTIAL | MET | MET | PARTIAL |
| **A2 - Airspace** | MET | MET | MET | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET | MET | MET | MET |
| | Best | Best | Best | Best | Best | 4,000ft beneficial | 4,000ft beneficial |

## 19.15 Transition Runway 09 North Option 9

| Design Principle Evaluation | Option No. 9 |
|---|---|
| Option Name: Transition RW 09 North Option 9 | ACCEPT |

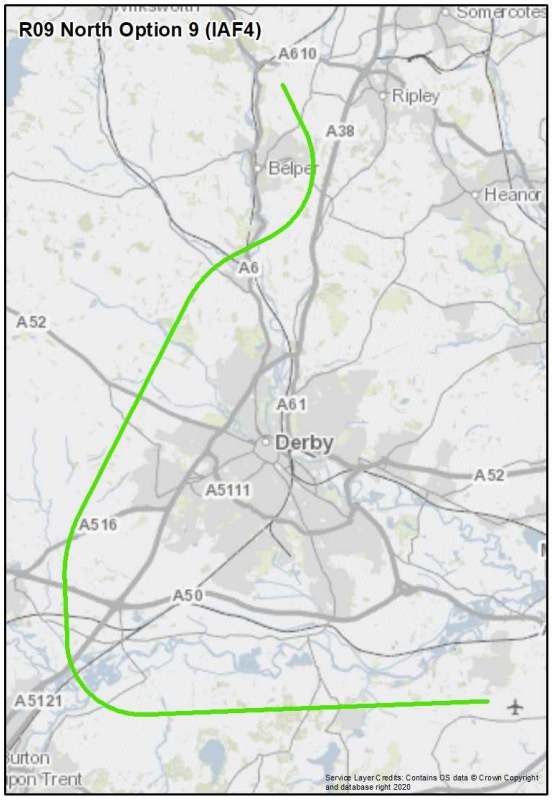
**Option Description:**

The IAF for this option is IAF4 and the style of the route is 'direct' which means the distance to the final approach has been minimised.

The option starts at IAF4 which is north of Belper and from this point it tracks around Belper to the east and then south passing just north of Duffield and routing to the west of Derby. The option turns over Etwall, onto a southerly heading before turning to join the extended runway centreline east of Burton upon Trent.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 2.87° which is close to the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 9 is 45km (24nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

23.0% of the area of the Option 9 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 9 is estimated to overfly approximately 2,400 households with an approximate population of 4,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 5,100.

From 7,000ft, Option 9 is estimated to overfly approximately 15,450 households with an approximate population of 29,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 33,700.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 9 is estimated to overfly 40 noise sensitive areas.

From 7,000ft, Option 9 is estimated to overfly 100 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.16 Transition Runway 09 North Option 10

| Design Principle Evaluation | Option No. 10 |
|---|---|
| Option Name: Transition RW 09 North Option 10 | ACCEPT |

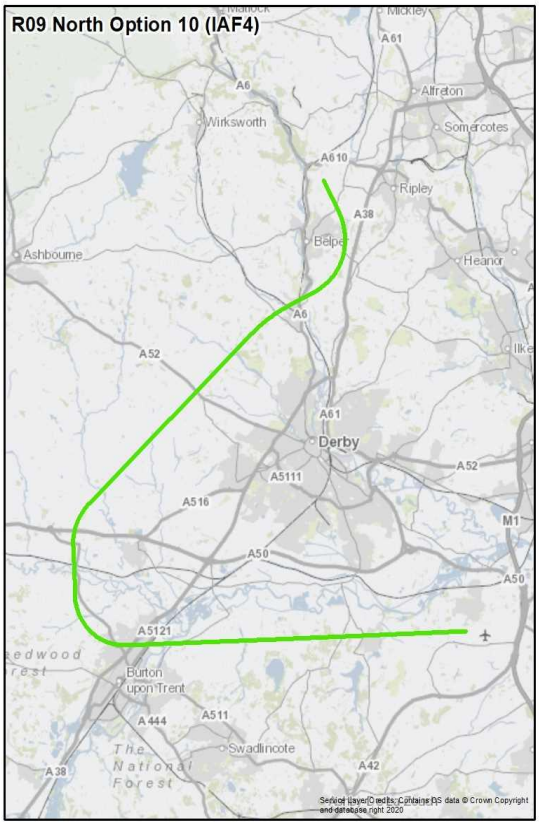
**Option Description:**

The IAF for this option is IAF4 and the style of the route is 'direct' which means the distance to the final approach has been minimised. It is initially the same as option 9 but takes a more westerly track after Duffield to take the same track as Option 8.

The option starts at IAF4 which is north of Belper and from this point it tracks around Belper to the east and then south passing just north of Duffield. It continues on this heading until Church Broughton where it turns onto a southerly heading before turning to join the extended runway centreline west of Burton upon Trent.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (6.9nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 2.19° which is close to the optimum range for low noise approaches and is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 10 is 54km (29nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

16.1% of the area of the Option 10 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 10 is estimated to overfly approximately 10,100 households with an approximate population of 18,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 22,200.

From 7,000ft, Option 10 is estimated to overfly approximately 23,550 households with an approximate population of 43,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 49,300.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 10 is estimated to overfly 45 noise sensitive areas.

From 7,000ft, Option 10 is estimated to overfly 115 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.17 Transition Runway 09 North Option 10A

| Design Principle Evaluation | Option No. 10A |
|---|---|
| Option Name: Transition RW 09 North Option 10A | ACCEPT |

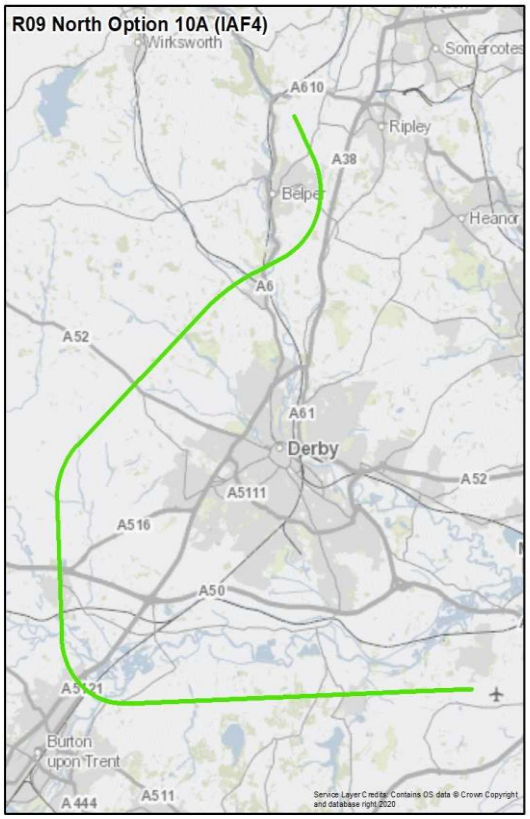
**Option Description:**

The IAF for this option is IAF4 and the style of the route is 'direct' which means the distance to the final approach has been minimised. This option has an IF at 2,500ft which is at a point 5nm from the FAF, thereby falling mid-way between the 3.85nm and 6.9nm utilised by other arrival options to runway 09 from the North. It initially routes on the same track as Option 10 but the slightly more easterly track helps avoid the overflight of Burton upon Trent

The option starts at IAF4 which is north of Belper and from this point it tracks around Belper to the east and then south passing just north of Duffield. It continues on heading until north of Hilton and then overflies Hilton before turning left to join the extended runway centreline and passing just north east of Burton upon Trent.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (5nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 2.5° which is within the optimum range for low noise approaches and the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 10A is 49km (26nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

15.3% of the area of the Option 10A overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 10A is estimated to overfly approximately 6,500 households with an approximate population of 12,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 14,400.

From 7,000ft, Option 10A is estimated to overfly approximately 19,850 households with an approximate population of 37,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 41,100.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 10A is estimated to overfly 40 noise sensitive areas.

From 7,000ft, Option 10A is estimated to overfly 100 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.18 Transition Runway 09 North Option 25

| Design Principle Evaluation | Option No. 25 |
|---|---|
| Option Name: Transition RW 09 North Option 25 | ACCEPT |

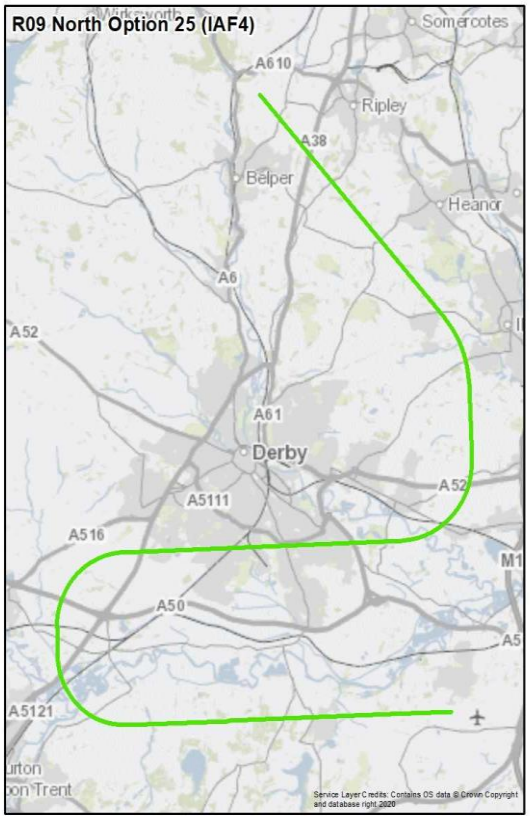
**Option Description:**

The IAF for this option is IAF4 and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route.

The option starts at IAF4 north of Belper and initially tracks south east between Belper and Ripley until West Hallam where the route turns to a southerly heading and passes between West Hallam and Ilkeston. It continues south until it passes over the A52 near Risley where it turns west to track across the southern suburbs of Derby. It turns south close to Etwall before turning to join the extended runway centreline east of Burton upon Trent.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 1.95° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being similar and reduced, respectively, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 25 is 59km (32nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

22.3% of the area of the Option 25 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 25 is estimated to overfly approximately 22,000 households with an approximate population of 41,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 46,500.

From 7,000ft, Option 25 is estimated to overfly approximately 40,250 households with an approximate population of 76,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 85,800.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a similar population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 25 is estimated to overfly 120 noise sensitive areas.

From 7,000ft, Option 25 is estimated to overfly 200 noise sensitive areas.

This is a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.19 Transition Runway 09 North Option 26

| Design Principle Evaluation | Option No. 26 |
|---|---|
| Option Name: Transition RW 09 North Option 26 | ACCEPT |

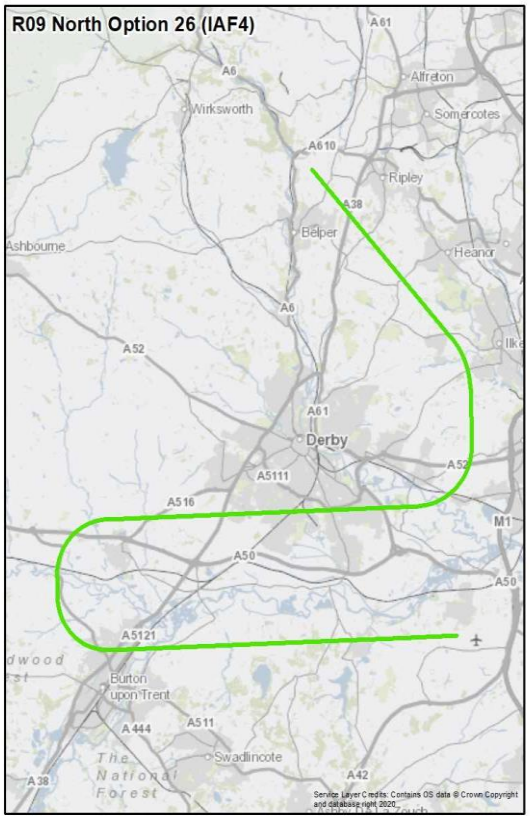
**Option Description:**

The IAF for this option is IAF4 and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route. It follows the same track as Option 25 but routes further west before joining the final approach.

The option starts at IAF4 north of Belper and initially tracks south east between Belper and Ripley until West Hallam where the route turns to a southerly heading and passes between West Hallam and Ilkeston. It continues south until it passes over the A52 near Risley where it turns west to track across the southern suburbs of Derby. It continues on this heading until Church Broughton where it turns onto a southerly heading before turning left to join the extended runway centreline west of Burton upon Trent.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (6.9nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 1.55° which is not the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 26 is 70km (38nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

23.0% of the area of the Option 26 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 26 is estimated to overfly approximately 15,400 households with an approximate population of 29,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 37,400.

From 7,000ft, Option 26 is estimated to overfly approximately 51,950 households with an approximate population of 97,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 111,400.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 26 is estimated to overfly 90 noise sensitive areas.

From 7,000ft, Option 26 is estimated to overfly 265 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.20 Transition Runway 09 North IAF4 Summary

| | Option 9 | Option 10 | Option 10A | Option 25 | Option 26 |
|---|---|---|---|---|---|
| **S - Safety** | MET | PARTIAL | MET | MET | PARTIAL |
| **P - Programme** | MET | PARTIAL | MET | MET | PARTIAL |
| **C - Continuity** | MET | MET | MET | MET | MET |
| **E - Emissions** | NOT MET | NOT MET | NOT MET | NOT MET | NOT MET |
| **N1 - Noise** | MET | MET | MET | MET | MET |
| **N2 - Noise** | MET | MET | MET | MET | MET |
| **N3 - Noise** | MET | MET | MET | MET | MET |
| **N4 - Noise** | MET | MET | MET | MET | MET |
| **A1 - Airspace** | MET | PARTIAL | MET | MET | PARTIAL |
| **A2 - Airspace** | MET | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET | MET |
| | Best | Best | Best | Best | Best |

## 19.21 Transition Runway 09 North Option 11

| Design Principle Evaluation | Option No. 11 |
|---|---|
| Option Name: Transition RW 09 North Option 11 | ACCEPT |

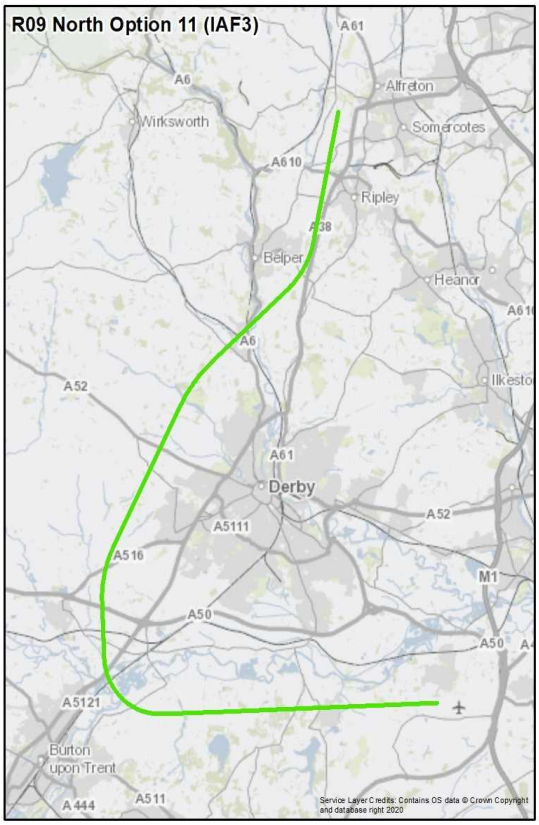
**Option Description:**

The IAF for this option is IAF3 and the style of the route is 'direct' which means the distance to the final approach has been minimised.

This option starts at IAF3 which is west of Alfreton and from this point it routes between Ripley and Belper and turns south west passing overhead Duffield. It then turns slightly left to pass to the west of Derby, turning onto a southerly heading over Etwall, before turning to join the extended runway centreline north east of Burton upon Trent.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (3.85nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 2.56° which is within the optimum range for low noise approaches and the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 11 is 48km (26nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

26.9% of the area of the Option 11 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 11 is estimated to overfly approximately 2,300 households with an approximate population of 4,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 4,900.

From 7,000ft, Option 11 is estimated to overfly approximately 16,250 households with an approximate population of 30,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 35,200.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 11 is estimated to overfly 40 noise sensitive areas.

From 7,000ft, Option 11 is estimated to overfly 145 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.22 Transition Runway 09 North Option 12

| Design Principle Evaluation | Option No. 12 |
|---|---|
| Option Name: Transition RW 09 North Option 12 | ACCEPT |

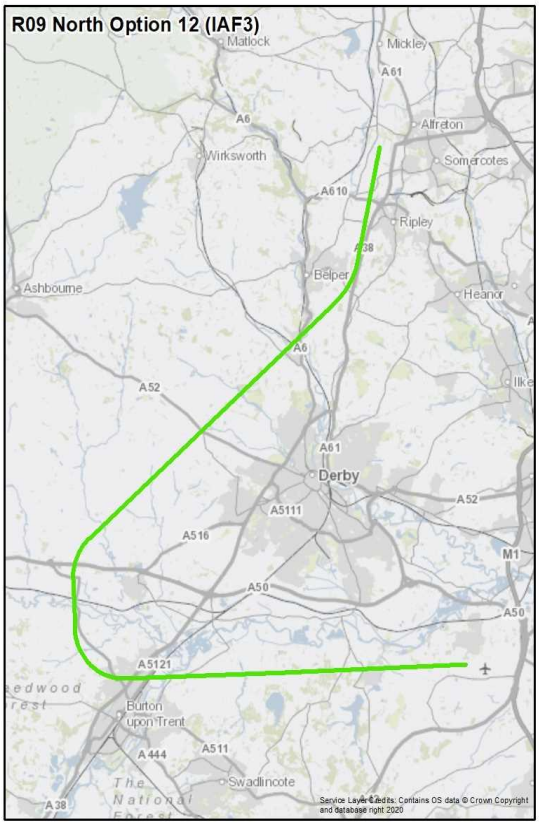
**Option Description:**

The IAF for this option is IAF3 and the style of the route is 'direct' which means the distance to the final approach has been minimised. It is initially the same as option 11 but takes a more westerly track after Duffield.

The option starts at IAF3 west of Alfreton and from this point and from this point it routes between Ripley and Belper and turns south west passing overhead Duffield. It continues on this heading until Church Broughton where it turns onto a southerly heading before turning to join the extended runway centreline west of Burton upon Trent.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (6.9nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 2.01° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 12 is 58km (31nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

20.1% of the area of the Option 12 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 12 is estimated to overfly approximately 9,900 households with an approximate population of 17,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 21,700.

From 7,000ft, Option 12 is estimated to overfly approximately 24,850 households with an approximate population of 45,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 52,200.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 12 is estimated to overfly 50 noise sensitive areas.

From 7,000ft, Option 12 is estimated to overfly 160 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.23 Transition Runway 09 North Option 12A

| Design Principle Evaluation | Option No. 12A |
|---|---|
| Option Name: Transition RW 09 North Option 12A | ACCEPT |

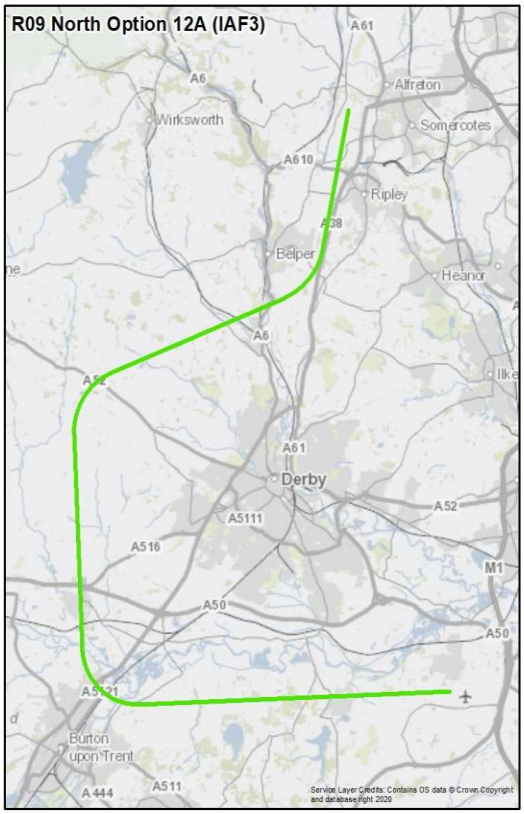
**Option Description:**

The IAF for this option is IAF3 and the style of the route is 'direct' which means the distance to the final approach has been minimised. This option has an IF at 2,500ft which is at a point 5nm from the FAF, thereby falling between the 3.85nm and 6.9nm utilised by other arrival options to runway 09 from the North. It initially routes on the same track as Option 12 but the slightly more easterly track helps avoid the overflight of Burton upon Trent

The option starts at IAF3 west of Alfreton and from this point it routes between Ripley and Belper and turns south west passing north of Duffield. It continues on this heading until the track crosses the A52 mid-way between Ashbourne and Derby. The option routes directly south and overflies Hilton before turning left to join the extended runway centreline and passing just north east of Burton upon Trent.

This RNAV 1 arrival connects the IAF to the IF, at 2,500ft, which is placed as close as possible to the FAF (5nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 2.16° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 12A is 55km (30nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

18.4% of the area of the Option 12A overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 12A is estimated to overfly approximately 6,250 households with an approximate population of 11,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 13,700.

From 7,000ft, Option 12A is estimated to overfly approximately 20,500 households with an approximate population of 38,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 42,700.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 12A is estimated to overfly 40 noise sensitive areas.

From 7,000ft, Option 12A is estimated to overfly 145 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.24 Transition Runway 09 North Option 23

| Design Principle Evaluation | Option No. 23 |
|---|---|
| Option Name: Transition RW 09 North Option 23 | ACCEPT |

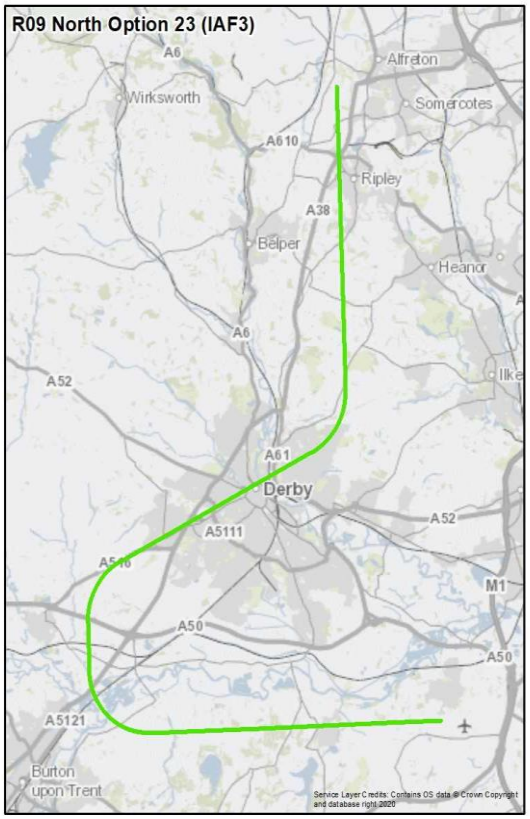
**Option Description:**

The IAF for this option is IAF3 and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route.

This option starts at IAF IAF3 west of Alfreton and tracks almost direct south from the IAF, overflying west Ripley. On the north east boundary of Derby the route turns to a south west heading and overflies Derby. It turns left over Etwall, onto a southerly heading before turning to join the extended runway centreline east of Burton upon Trent.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 2.35° which is within the optimum range for low noise approaches and the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 23 is 51km (28nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

30.1% of the area of the Option 23 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 23 is estimated to overfly approximately 10,250 households with an approximate population of 19,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 24,300.

From 7,000ft, Option 23 is estimated to overfly approximately 50,500 households with an approximate population of 94,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 103,900.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 23 is estimated to overfly 95 noise sensitive areas.

From 7,000ft, Option 23 is estimated to overfly 430 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.25 Transition Runway 09 North Option 24

| Design Principle Evaluation | Option No. 24 |
|---|---|
| Option Name: Transition RW 09 North Option 24 | ACCEPT |

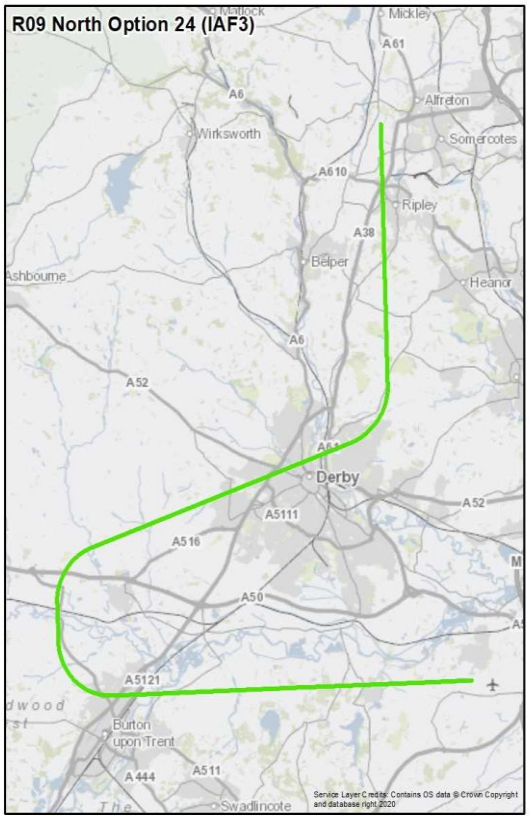
**Option Description:**

The IAF for this option is IAF3 and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route. It follows the same track as Option 23 but routes further west on reaching Derby.

This option starts at IAF3 west of Alfreton and tracks almost direct south from the IAF, overflying west Ripley. On the north east boundary of Derby the route turns to a south west heading and overflies Derby. It continues on this heading until Church Broughton where it turns onto a southerly heading before turning left to join the extended runway centreline west of Burton upon Trent.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (6.9nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 1.83° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 24 is 62km (33nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

20.0% of the area of the Option 24 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 24 is estimated to overfly approximately 9,300 households with an approximate population of 16,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 20,600.

From 7,000ft, Option 24 is estimated to overfly approximately 55,050 households with an approximate population of 102,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 117,400.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 24 is estimated to overfly 50 noise sensitive areas.

From 7,000ft, Option 24 is estimated to overfly 395 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.26 Transition Runway 09 North IAF3 Summary

| | Option 11 | Option 12 | Option 12A | Option 23 | Option 24 |
|---|---|---|---|---|---|
| **S - Safety** | MET | PARTIAL | MET | MET | PARTIAL |
| **P - Programme** | MET | PARTIAL | MET | MET | PARTIAL |
| **C - Continuity** | MET | MET | MET | MET | MET |
| **E - Emissions** | NOT MET | NOT MET | NOT MET | NOT MET | NOT MET |
| **N1 - Noise** | MET | MET | MET | MET | MET |
| **N2 - Noise** | MET | MET | MET | MET | MET |
| **N3 - Noise** | MET | MET | MET | MET | MET |
| **N4 - Noise** | MET | MET | MET | MET | MET |
| **A1 - Airspace** | MET | PARTIAL | MET | MET | PARTIAL |
| **A2 - Airspace** | MET | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET | MET |
| | Best | Best | Best | Best | Best |

## 19.27 Transition Runway 09 North Option 17

| Design Principle Evaluation | Option No. 17 |
|---|---|
| Option Name: Transition RW 09 North Option 17 | ACCEPT |

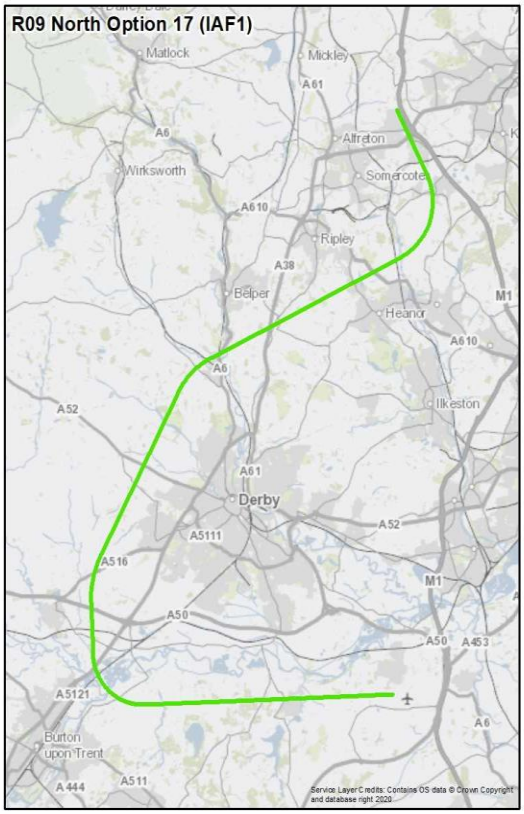
**Option Description:**

The IAF for this option is IAF1 and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route.

The option starts at IAF1, west of Sutton-in-Ashfield and initially tracks south east before turning south west and routing between Heanor and Ripley and south of Belper. North of Duffield the route turns south by south west and tracks west of Derby before turning over Etwall onto a southerly heading and turning to join the extended runway centreline east of Burton upon Trent.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 2.03° which is below the optimum range for low noise approaches but within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 17 is 58km (31nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

30.0% of the area of the Option 17 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 17 is estimated to overfly approximately 2,150 households with an approximate population of 4,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 6,100.

From 7,000ft, Option 17 is estimated to overfly approximately 25,150 households with an approximate population of 46,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 51,500.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 17 is estimated to overfly 35 noise sensitive areas.

From 7,000ft, Option 17 is estimated to overfly 160 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.28 Transition Runway 09 North Option 18

| Design Principle Evaluation | Option No. 18 |
|---|---|
| Option Name: Transition RW 09 North Option 18 | ACCEPT |

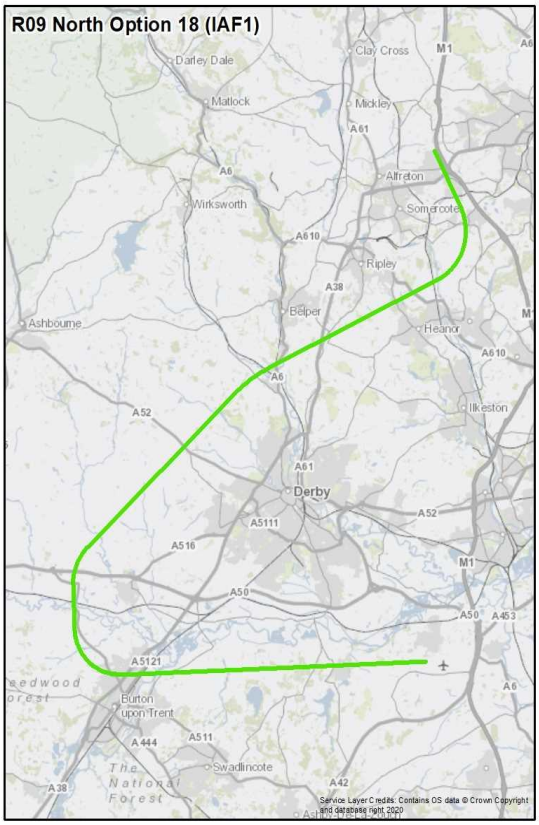
**Option Description:**

The IAF for this option is IAF1 and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route. It initially routes on the same track as Option 17 but takes a more westerly track after passing Duffield.

The option starts at IAF1, west of Sutton-in-Ashfield and initially tracks south east before turning south west and routing between Heanor and Ripley and south of Belper. North of Duffield the route turns slightly south and continues on this heading until Church Broughton where it turns onto a southerly heading before turning left to join the extended runway centreline west of Burton upon Trent.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (6.9nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 1.67° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 18 is 67km (36nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

24.0% of the area of the Option 18 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 18 is estimated to overfly approximately 8,950 households with an approximate population of 16,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 19,700.

From 7,000ft, Option 18 is estimated to overfly approximately 32,900 households with an approximate population of 60,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 67,300.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 18 is estimated to overfly 50 noise sensitive areas.

From 7,000ft, Option 18 is estimated to overfly 175 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.29 Transition Runway 09 North Option 19

| Design Principle Evaluation | Option No. 19 |
|---|---|
| Option Name: Transition RW 09 North Option 19 | ACCEPT |

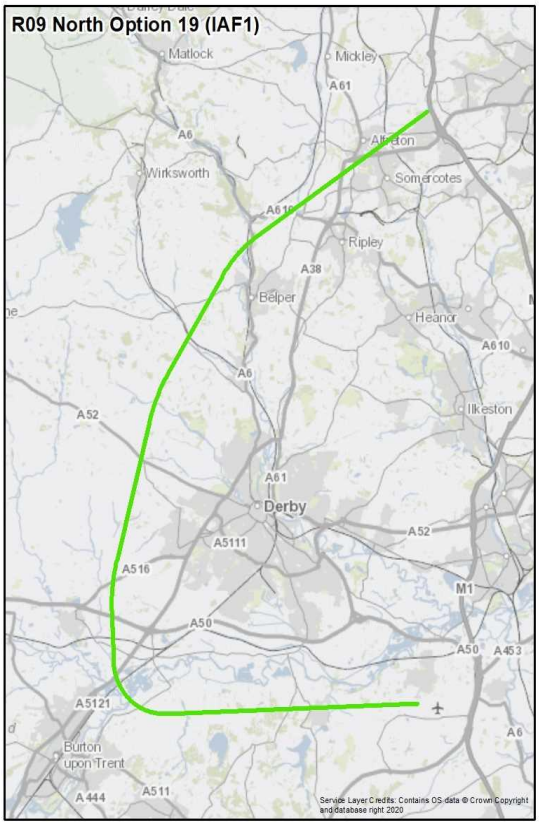
**Option Description:**

The IAF for this option is IAF1 and the style of the route is 'direct' which means the distance to the final approach has been minimised.

The option starts at IAF1, west of Sutton-in-Ashfield and tracks south west over Alfreton passing north of Ripley and west of Belper. It then turns slightly left onto a south west heading to route to the west of Derby. The route turns over Etwall onto a southerly heading before turning to join the extended runway centreline east of Burton upon Trent.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 2.17° which is close to the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 19 is 54km (29nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

25.5% of the area of the Option 19 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 19 is estimated to overfly approximately 2,300 households with an approximate population of 4,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 4,900.

From 7,000ft, Option 19 is estimated to overfly approximately 18,750 households with an approximate population of 34,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 38,500.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 19 is estimated to overfly 35 noise sensitive areas.

From 7,000ft, Option 19 is estimated to overfly 145 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.30 Transition Runway 09 North Option 20

| Design Principle Evaluation | Option No. 20 |
|---|---|
| Option Name: Transition RW 09 North Option 20 | ACCEPT |

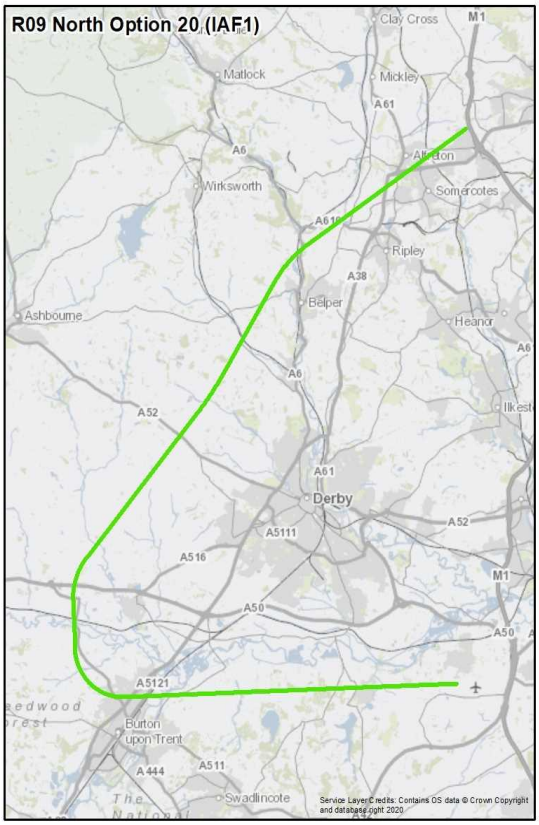
**Option Description:**

The IAF for this option is IAF1 and the style of the route is 'direct' which means the distance to the final approach has been minimised. It initially routes on the same track as Option 19 but takes a more westerly track after passing Duffield.

The option starts at IAF1, west of Sutton-in-Ashfield and tracks south west over Alfreton passing north of Ripley and west of Belper. It then turns slightly left onto a south west heading to route north west of Derby and continues on this heading until Church Broughton. Here it turns onto a southerly heading before turning left to join the extended runway centreline west of Burton upon Trent.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (6.9nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 1.79° which is below the optimum range for low noise approaches but within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 20 is 63km (34nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

20.0% of the area of the Option 20 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 20 is estimated to overfly approximately 9,400 households with an approximate population of 16,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 20,600.

From 7,000ft, Option 20 is estimated to overfly approximately 26,300 households with an approximate population of 48,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 55,100.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 20 is estimated to overfly 50 noise sensitive areas.

From 7,000ft, Option 20 is estimated to overfly 160 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.31 Transition Runway 09 North Option 20A

| Design Principle Evaluation | Option No. 20A |
|---|---|
| Option Name: Transition RW 09 North Option 20A | ACCEPT |

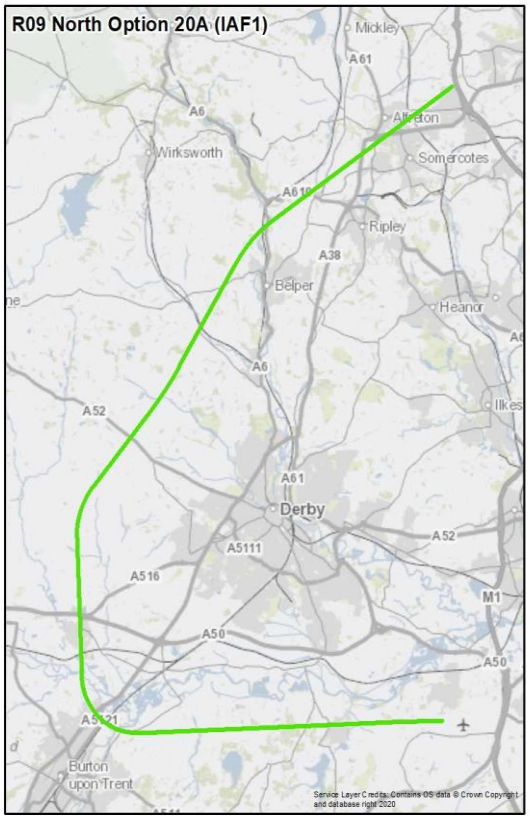
**Option Description:**

The IAF for this option is IAF1 and the style of the route is 'direct' which means the distance to the final approach has been minimised. This option has an IF at 2,500ft which is at a point 5nm from the FAF, thereby falling between the 3.85nm and 6.9nm utilised by other arrival options to runway 09 from the North. It initially routes on the same track as Option 20 but the slightly more easterly track helps avoid the overflight of Burton upon Trent.

The option starts at IAF1, west of Sutton-in-Ashfield and tracks south west over Alfreton passing north of Ripley and west of Belper. It then turns slightly left onto a south west heading to route north west of Derby. Once west of Derby it turns directly south and overflies Hilton before turning left to join the extended runway centreline and passing just north east of Burton upon Trent.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (5nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 2° which is below the optimum range for low noise approaches but within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 20A is 58km (31nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

19.6% of the area of the Option 20A overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 20A is estimated to overfly approximately 5,950 households with an approximate population of 11,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 13,300.

From 7,000ft, Option 20A is estimated to overfly approximately 22,550 households with an approximate population of 41,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 47,000.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 20A is estimated to overfly 40 noise sensitive areas.

From 7,000ft, Option 20A is estimated to overfly 145 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.32 Transition Runway 09 North IAF1 Summary

| | Option 17 | Option 18 | Option 19 | Option 20 | Option 20A |
|---|---|---|---|---|---|
| **S - Safety** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **P - Programme** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **C - Continuity** | MET | MET | MET | MET | MET |
| **E - Emissions** | NOT MET | NOT MET | NOT MET | NOT MET | NOT MET |
| **N1 - Noise** | MET | MET | MET | MET | MET |
| **N2 - Noise** | MET | MET | MET | MET | MET |
| **N3 - Noise** | MET | MET | MET | MET | MET |
| **N4 - Noise** | MET | MET | MET | MET | MET |
| **A1 - Airspace** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **A2 - Airspace** | MET | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET | MET |
| | Best | Best | Best | Best | Best |

## 19.33 Transition Runway 09 North Option 13

| Design Principle Evaluation | Option No. 13 |
|---|---|
| Option Name: Transition RW 09 North Option 13 | ACCEPT |

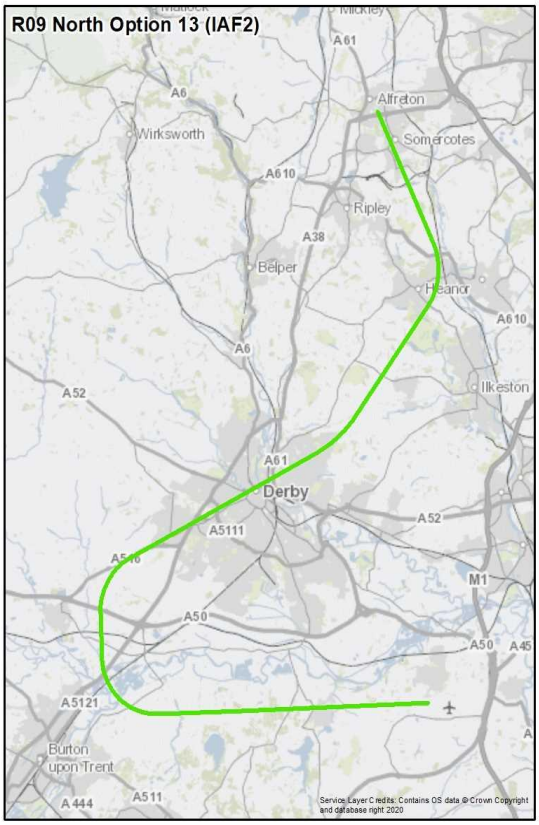
**Option Description:**

The IAF for this option is IAF2 and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route.

This option starts at IAF2 near Alfreton and track south towards Heanor prior to turning south by south west to pass north of West Hallam. At the north east edge of Derby it route turns to a south west heading and overflies central Derby and once over Etwall it turns left onto a southerly heading before turning to join the extended runway centreline east of Burton upon Trent.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 2.17° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being similar and reduced, respectively, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 13 is 54km (29nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

24.3% of the area of the Option 13 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 13 is estimated to overfly approximately 19,950 households with an approximate population of 38,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 42,800.

From 7,000ft, Option 13 is estimated to overfly approximately 59,850 households with an approximate population of 111,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 122,800.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a similar population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | PARTIAL |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 13 is estimated to overfly 190 noise sensitive areas.

From 7,000ft, Option 13 is estimated to overfly 465 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.34 Transition Runway 09 North Option 14

| Design Principle Evaluation | Option No. 14 |
|---|---|
| Option Name: Transition RW 09 North Option 14 | ACCEPT |

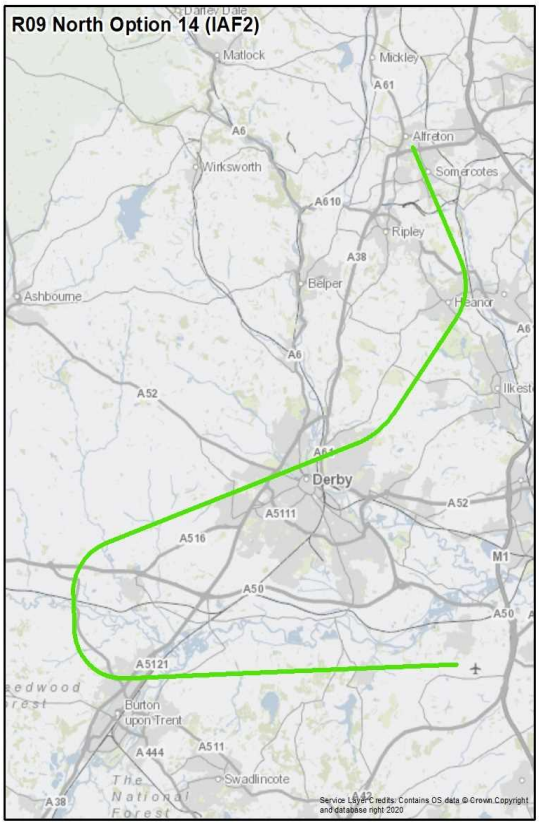
**Option Description:**

The IAF for this option is IAF2 and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route. It initially routes on the same track as Option 13 but takes a more westerly track after passing Derby.

This option starts at IAF2 near Alfreton and track south towards Heanor prior to turning south by south west to pass north of West Hallam. At the north east edge of Derby it route turns to a south west heading and overflies north Derby. It continues on this heading until Church Broughton where it turns onto a southerly heading before turning to join the extended runway centreline west of Burton upon Trent.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (6.9nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 1.71° which is within the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 14 is 65km (35nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

15.4% of the area of the Option 14 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 14 is estimated to overfly approximately 9,200 households with an approximate population of 16,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 23,300.

From 7,000ft, Option 14 is estimated to overfly approximately 64,800 households with an approximate population of 120,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 137,000.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 14 is estimated to overfly 45 noise sensitive areas.

From 7,000ft, Option 14 is estimated to overfly 440 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.35 Transition Runway 09 North Option 21

| Design Principle Evaluation | Option No. 21 |
|---|---|
| Option Name: Transition RW 09 North Option 21 | ACCEPT |

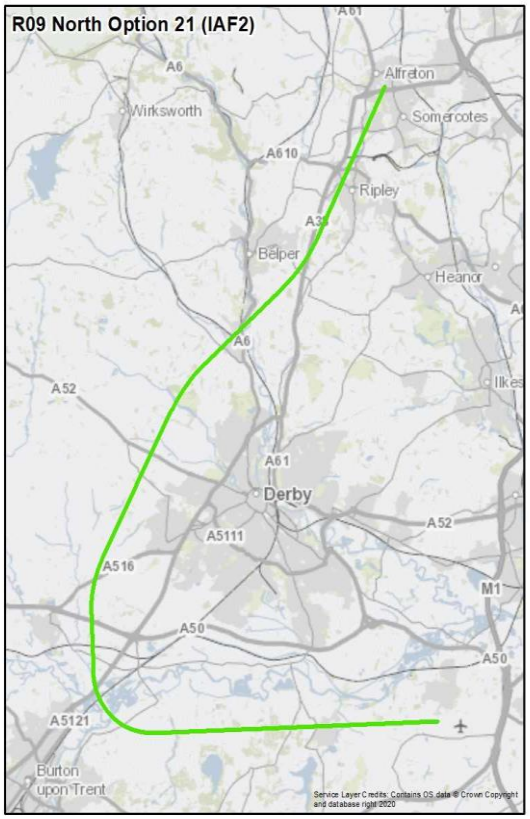
**Option Description:**

The IAF for this option is IAF2 and the style of the route is 'direct' which means the distance to the final approach has been minimised.

The option starts at IAF2 near Alfreton and initially follows the line of the A38 south to pass over Ripley and south of Belper where it turns slightly south west to track to the west of Derby. The option turns, over Etwall, onto a southerly heading before turning to join the extended runway centreline east of Burton upon Trent.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 2.46° which is within the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 21 is 50km (27nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

25.6% of the area of the Option 21 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 21 is estimated to overfly approximately 2,350 households with an approximate population of 4,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 5,400.

From 7,000ft, Option 21 is estimated to overfly approximately 26,050 households with an approximate population of 47,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 53,800.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 21 is estimated to overfly 40 noise sensitive areas.

From 7,000ft, Option 21 is estimated to overfly 200 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.36 Transition Runway 09 North Option 22

| Design Principle Evaluation | Option No. 22 |
|---|---|
| Option Name: Transition RW 09 North Option 22 | ACCEPT |

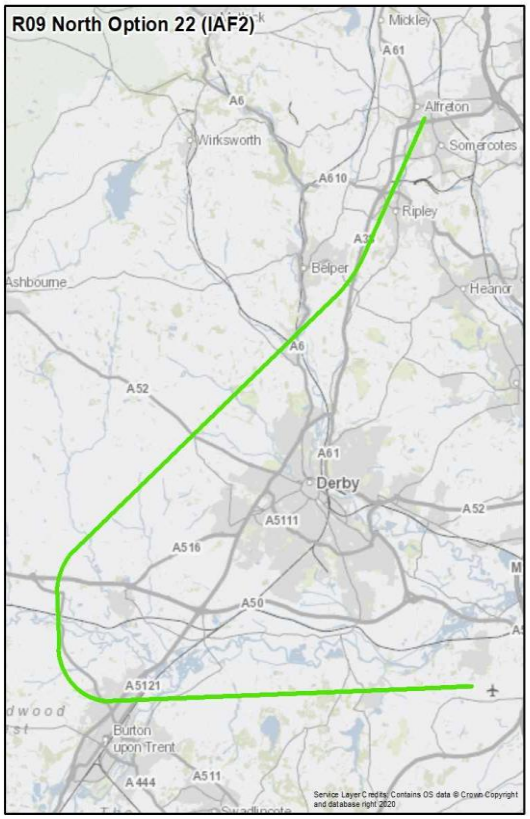
**Option Description:**

The IAF for this option is IAF2 and the style of the route is 'direct' which means the distance to the final approach has been minimised. It initially routes on the same track as Option 21 but takes a more westerly track after passing Duffield.

The option starts at IAF2 near Alfreton and initially follows the line of the A38 south to pass over Ripley and south of Belper where it turns slightly south west to track to the west of Derby. It continues on this heading until Church Broughton where it turns onto a southerly heading before turning left to join the extended runway centreline west of Burton upon Trent.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (6.9nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 1.95° which is within the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 22 is 59km (32nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

19.3% of the area of the Option 22 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 22 is estimated to overfly approximately 9,800 households with an approximate population of 17,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 21,500.

From 7,000ft, Option 22 is estimated to overfly approximately 34,250 households with an approximate population of 62,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 70,200.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 22 is estimated to overfly 50 noise sensitive areas.

From 7,000ft, Option 22 is estimated to overfly 215 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.37 Transition Runway 09 North Option 22A

| Design Principle Evaluation | Option No. 22A |
|---|---|
| Option Name: Transition RW 09 North Option 22A | ACCEPT |

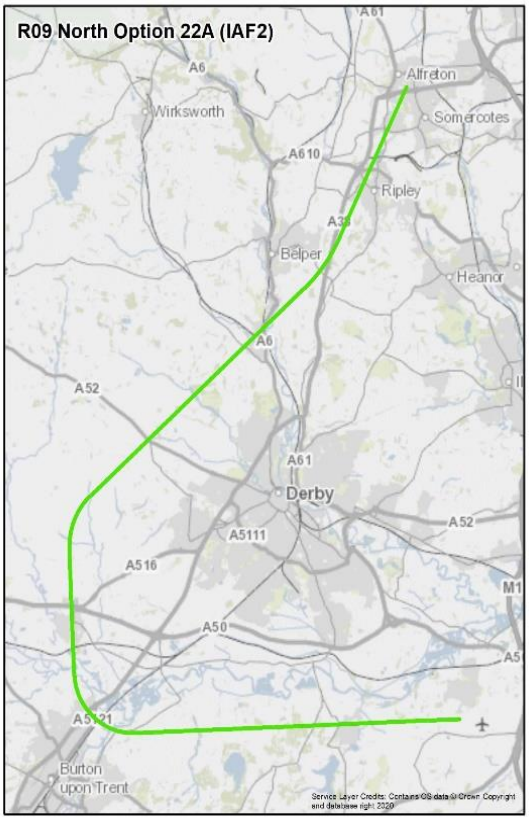
**Option Description:**

The IAF for this option is IAF2 and the style of the route is 'direct' which means the distance to the final approach has been minimised. This option has an IF at 2,500ft which is at a point 5nm from the FAF, thereby falling between the 3.85nm and 6.9nm utilised by other arrival options to runway 09 from the North. It initially routes on the same track as Option 22 but the slightly more easterly track helps avoid the overflight of Burton upon Trent.

The option starts at IAF2 near Alfreton and initially follows the line of the A38 south to pass over Ripley and south of Belper where it turns slightly south west to track to the west of Derby. It continues on this heading until north of Hilton where it makes a left turn south and overflies Hilton before turning to join the extended runway centreline over north east Burton upon Trent.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (5nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 2.21° which is close to the optimum range for low noise approaches and is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 22A is 54km (29nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

18.9% of the area of the Option 22A overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 22A is estimated to overfly approximately 6,350 households with an approximate population of 11,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 13,900.

From 7,000ft, Option 22A is estimated to overfly approximately 30,350 households with an approximate population of 55,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 61,600.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 22A is estimated to overfly 35 noise sensitive areas.

From 7,000ft, Option 22A is estimated to overfly 200 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.38 Transition Runway 09 North IAF2 Summary

| | Option 13 | Option 14 | Option 21 | Option 22 | Option 22A |
|---|---|---|---|---|---|
| **S - Safety** | MET | PARTIAL | MET | PARTIAL | MET |
| **P - Programme** | MET | PARTIAL | MET | PARTIAL | MET |
| **C - Continuity** | MET | MET | MET | MET | MET |
| **E - Emissions** | NOT MET | NOT MET | NOT MET | NOT MET | NOT MET |
| **N1 - Noise** | MET | MET | MET | MET | MET |
| **N2 - Noise** | MET | MET | MET | MET | MET |
| **N3 - Noise** | MET | MET | MET | MET | MET |
| **N4 - Noise** | PARTIAL | MET | MET | MET | MET |
| **A1 - Airspace** | MET | PARTIAL | MET | PARTIAL | MET |
| **A2 - Airspace** | MET | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET | MET |
| | Best | Best | Best | Best | Best |

## 19.39 Transition Runway 09 North Option 15

| Design Principle Evaluation | Option No. 15 |
|---|---|
| Option Name: Transition RW 09 North Option 15 | ACCEPT |

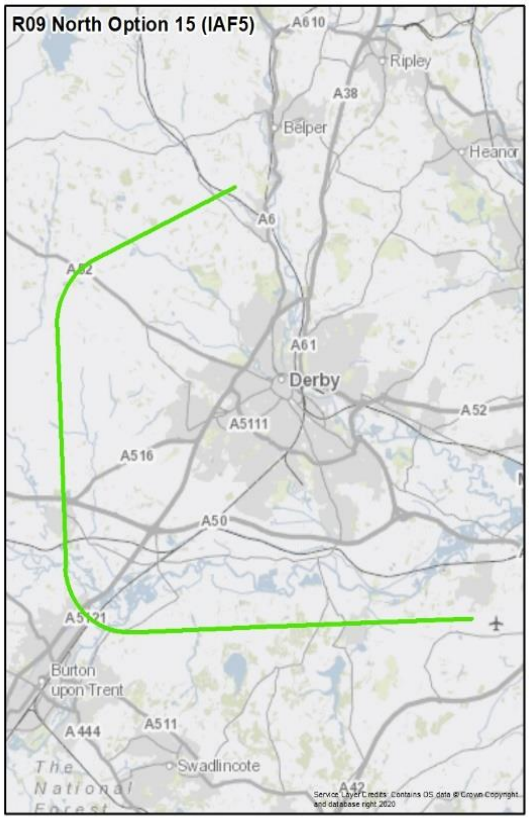
**Option Description:**

The IAF for this option is IAF5 and the style of the route is 'direct' which means the distance to the final approach has been minimised.

The option starts at IAF5 north of Duffield and initially routes south west, crossing the A52 close to Ednaston, where it turns to track south and to the west of Derby and over flying Hilton. South of Hilton the route turns to join the extended runway centreline east of Burton upon Trent.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (5nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 3.15° which is above the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 15 is 42km (23nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

9.1% of the area of the Option 15 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 15 is estimated to overfly approximately 6,650 households with an approximate population of 12,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 14,800.

From 7,000ft, Option 15 is estimated to overfly approximately 8,450 households with an approximate population of 15,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 18,300.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 15 is estimated to overfly 40 noise sensitive areas.

From 7,000ft, Option 15 is estimated to overfly 60 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.40 Transition Runway 09 North Option 16

| Design Principle Evaluation | Option No. 16 |
|---|---|
| Option Name: Transition RW 09 North Option 16 | ACCEPT |

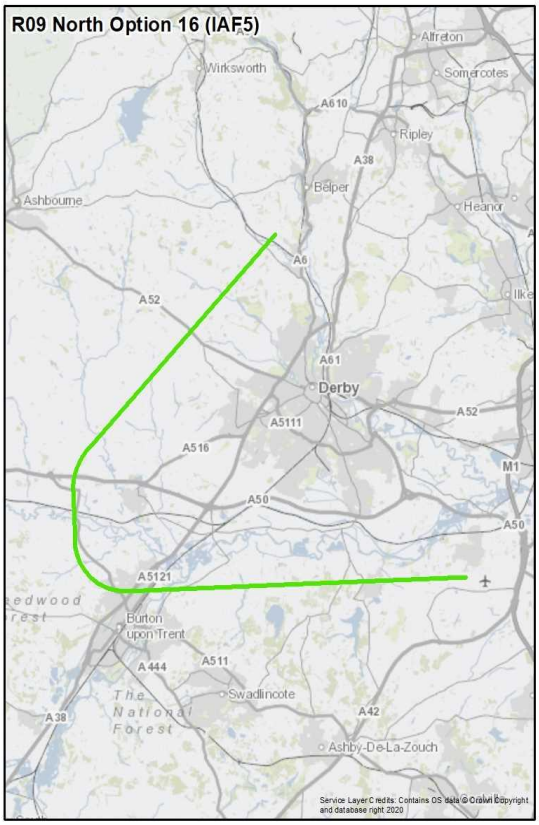
**Option Description:**

The IAF for this option is IAF5 and the style of the route is 'direct' which means the distance to the final approach has been minimised.

The option starts at IAF5 north of Duffield and heads in a south west direction to route west of Derby before turning onto a southerly heading just north of Hatton and joining the extended runway centreline west of Burton upon Trent.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (6.9nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 2.8° which is close to the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 16 is 45km (24nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

9.0% of the area of the Option 16 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 16 is estimated to overfly approximately 10,550 households with an approximate population of 18,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 22,500.

From 7,000ft, Option 16 is estimated to overfly approximately 13,250 households with an approximate population of 23,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 28,400.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 16 is estimated to overfly 55 noise sensitive areas.

From 7,000ft, Option 16 is estimated to overfly 75 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.41 Transition Runway 09 North Option 27

| Design Principle Evaluation | Option No. 27 |
|---|---|
| Option Name: Transition RW 09 North Option 27 | ACCEPT |

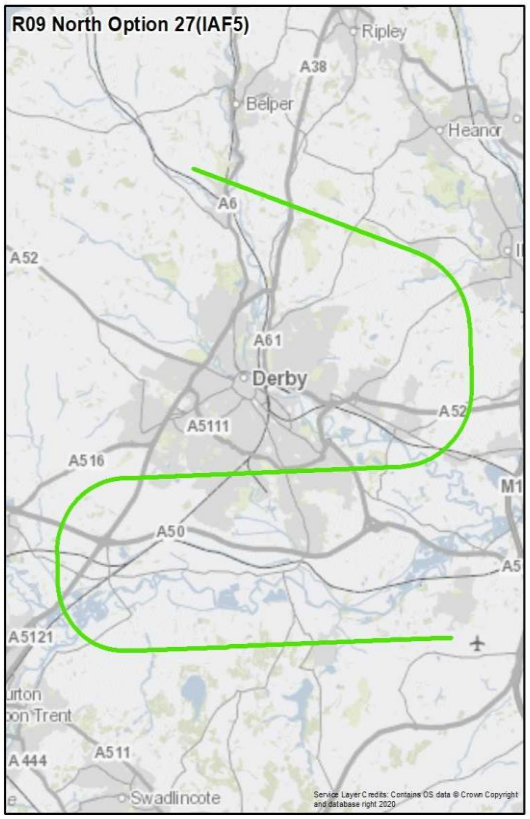
**Option Description:**

The IAF for this option is IAF5 and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route.

This option starts at IAF5 north of Duffield and tracks south east until West Hallam where the route turns to a southerly heading and passes between West Hallam and Ilkeston. It continues south until it passes over the A52 near Risley where it turns west to track across the southern suburbs of Derby. It turns south close to Etwall before turning to join the extended runway centreline east of Burton upon Trent.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 2.02° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being similar and reduced, respectively, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 27 is 58km (31nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

23.9% of the area of the Option 27 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 27 is estimated to overfly approximately 19,150 households with an approximate population of 36,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 41,200.

From 7,000ft, Option 27 is estimated to overfly approximately 35,900 households with an approximate population of 67,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 75,900.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a similar population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 27 is estimated to overfly 110 noise sensitive areas.

From 7,000ft, Option 27 is estimated to overfly 200 noise sensitive areas.

This is a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.42 Transition Runway 09 North Option 28

| Design Principle Evaluation | Option No. 28 |
|---|---|
| Option Name: Transition RW 09 North Option 28 | ACCEPT |

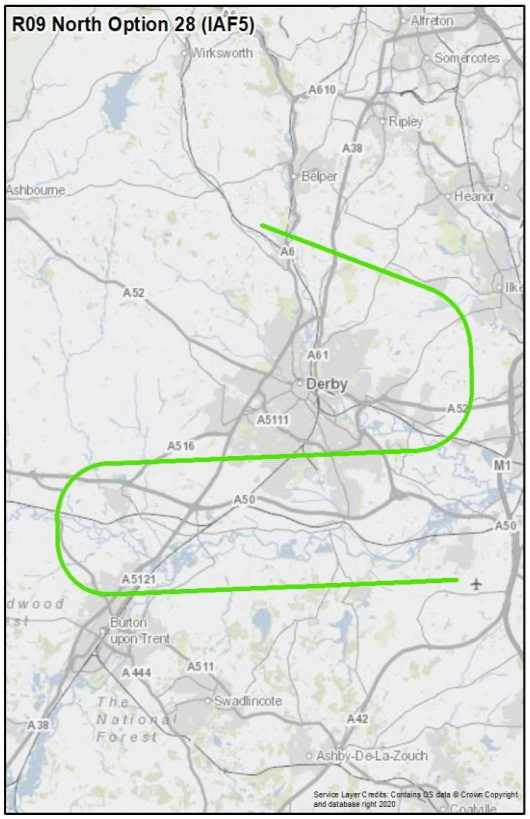
**Option Description:**

The IAF for this option is IAF5 and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route. It follows the same track as Option 27 but routes further west before joining the final approach.

This option starts at IAF5 north of Duffield and tracks south east until West Hallam where the route turns to a southerly heading and passes between West Hallam and Ilkeston. It continues south until it passes over the A52 near Risley where it turns west to track across the southern suburbs of Derby. It continues on this heading until Church Broughton where it turns onto a southerly heading before turning left to join the extended runway centreline west of Burton upon Trent.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (6.9nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 1.59° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 28 is 69km (37nm). When compared to the 'do nothing' baseline (38km (21nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

24.4% of the area of the Option 28 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 28 is estimated to overfly approximately 13,000 households with an approximate population of 24,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 32,000.

From 7,000ft, Option 28 is estimated to overfly approximately 47,550 households with an approximate population of 88,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 101,500.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 28 is estimated to overfly 80 noise sensitive areas.

From 7,000ft, Option 28 is estimated to overfly 265 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 19.43 Transition Runway 09 North IAF5 Summary

| | Option 15 | Option 16 | Option 27 | Option 28 |
|---|---|---|---|---|
| **S - Safety** | MET | PARTIAL | MET | PARTIAL |
| **P - Programme** | MET | PARTIAL | MET | PARTIAL |
| **C - Continuity** | MET | MET | MET | MET |
| **E - Emissions** | NOT MET | NOT MET | NOT MET | NOT MET |
| **N1 - Noise** | MET | MET | MET | MET |
| **N2 - Noise** | MET | MET | MET | MET |
| **N3 - Noise** | MET | MET | MET | MET |
| **N4 - Noise** | MET | MET | MET | MET |
| **A1 - Airspace** | MET | PARTIAL | MET | PARTIAL |
| **A2 - Airspace** | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET |
| | Best | Best | Best | Best |

# 20 Transitions Runway 09 South

## 20.1 Transition Runway 09 South Option 1

| Design Principle Evaluation | Option No. 1 |
|---|---|
| Option Name: Transition RW 09 South Option 1 | ACCEPT |

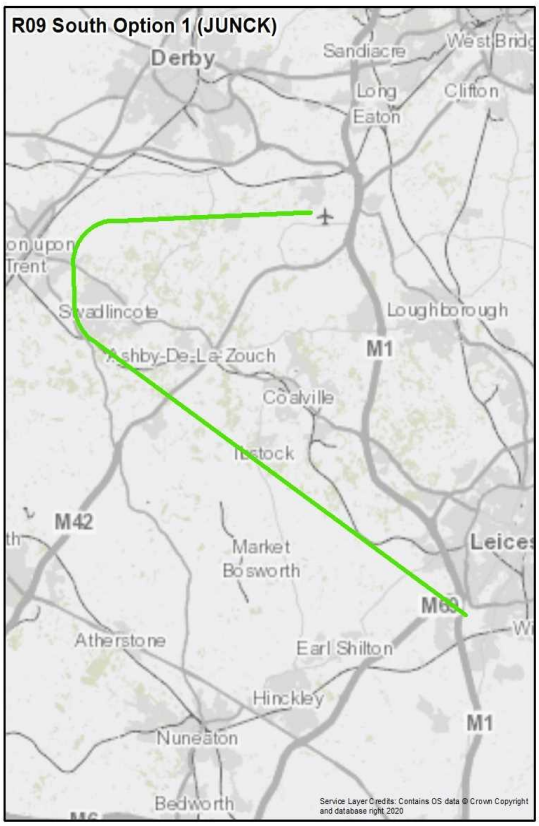
**Option Description:**

The IAF for this option is JUNCK and the style of the route is 'direct' which means the distance to the final approach has been minimised.

This option starts at IAF JUNCK, southwest of Leicester from where the route tracks north west overflying the south western edge of Ibstock and turning north just to the west of Swadlincote before turning right to join the extended runway centreline east of Burton upon Trent.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 2.11° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.



| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 1 is 56km (30nm). When compared to the 'do nothing' baseline (57km (31nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

21.5% of the area of the Option 1 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 1 is estimated to overfly approximately 7,400 households with an approximate population of 13,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 14,500.

From 7,000ft, Option 1 is estimated to overfly approximately 19,400 households with an approximate population of 35,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 46,700.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 1 is estimated to overfly 35 noise sensitive areas.

From 7,000ft, Option 1 is estimated to overfly 95 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 20.2 Transition Runway 09 South Option 2

| Design Principle Evaluation | Option No. 2 |
|---|---|
| Option Name: Transition RW 09 South Option 2 | ACCEPT |

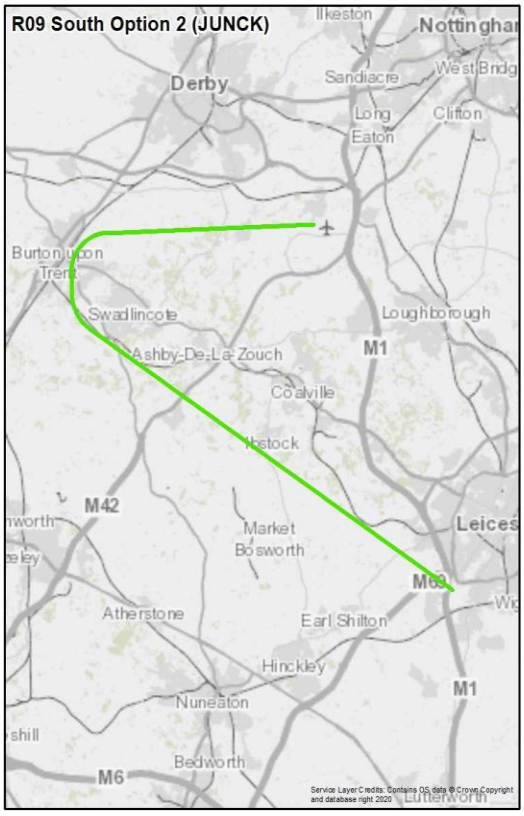
**Option Description:**

The IAF for this option is JUNCK and the style of the route is 'direct' which means the distance to the final approach has been minimised. It follows a near identical track as option 1 but routes further west before joining the final approach.

This option starts at IAF JUNCK, southwest of Leicester from where the route tracks north west overflying the south western edge of Ibstock. The route turns north to the west of Swadlincote and overflies the edge of Burton upon Trent before turning right to join the extended runway centreline.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (5.1nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 1.93° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 2 is 59km (32nm). When compared to the 'do nothing' baseline (57km (31nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | PARTIAL |
|---|---|

*Summary of Assessment:*

19.9% of the area of the Option 2 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the mid-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 2 is estimated to overfly approximately 10,500 households with an approximate population of 18,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 20,300.

From 7,000ft, Option 2 is estimated to overfly approximately 21,950 households with an approximate population of 39,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 52,000.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 2 is estimated to overfly 100 noise sensitive areas.

From 7,000ft, Option 2 is estimated to overfly 160 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 20.3 Transition Runway 09 South Option 3

| Design Principle Evaluation | Option No. 3 |
|---|---|
| Option Name: Transition RW 09 South Option 3 | ACCEPT |

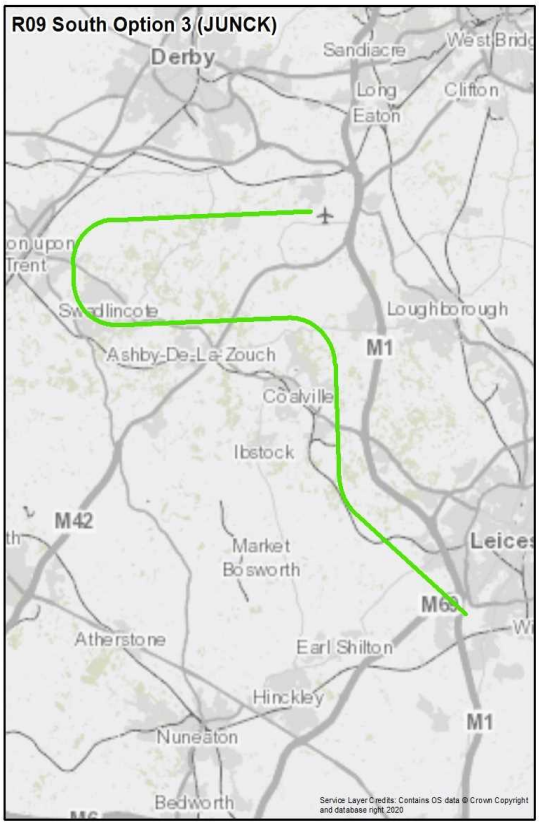
**Option Description:**

The IAF for this option is JUNCK and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route.

The option starts at IAF JUNCK, southwest of Leicester from where it tracks north west before turning north to pass east of Coalville. The route then turns west and passes to the north of Ashby-de-la-Zouch and over the southern portion of Swadlincote, before turning right to join the extended runway centreline.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 1.84° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 3 is 62km (33nm). When compared to the 'do nothing' baseline (57km (31nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

30.5% of the area of the Option 3 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 3 is estimated to overfly approximately 11,100 households with an approximate population of 20,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 24,100.

From 7,000ft, Option 3 is estimated to overfly approximately 24,150 households with an approximate population of 44,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 58,800.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 3 is estimated to overfly 60 noise sensitive areas.

From 7,000ft, Option 3 is estimated to overfly 120 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 20.4 Transition Runway 09 South Option 4

| Design Principle Evaluation | Option No. 4 |
|---|---|
| Option Name: Transition RW 09 South Option 4 | ACCEPT |

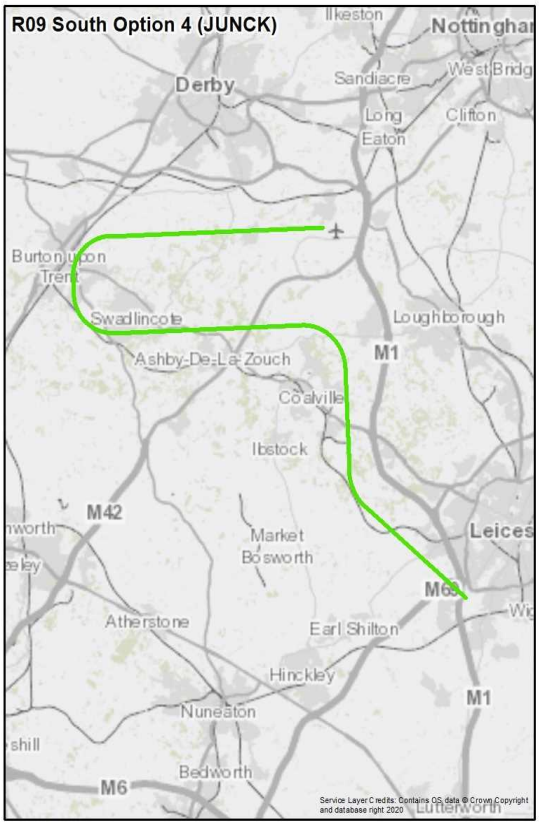
**Option Description:**

The IAF for this option is JUNCK and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route. It follows the same route as Option 3 but routes further west before joining the final approach.

The option starts at IAF JUNCK, southwest of Leicester from where it tracks north west before turning north to pass east of Coalville. The route then turns west and passes to the north of Ashby-de-la-Zouch and over the southern portion of Swadlincote, before turning right over the eastern edge of Burton upon Trent to join the extended runway centreline.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (5.1nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 1.67° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 4 is 66km (36nm). When compared to the 'do nothing' baseline (57km (31nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

30.3% of the area of the Option 4 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 4 is estimated to overfly approximately 15,400 households with an approximate population of 27,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 31,600.

From 7,000ft, Option 4 is estimated to overfly approximately 29,150 households with an approximate population of 52,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 67,400.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 4 is estimated to overfly 115 noise sensitive areas.

From 7,000ft, Option 4 is estimated to overfly 180 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 20.5 Transition Runway 09 South Option 7

| Design Principle Evaluation | Option No. 7 |
|---|---|
| Option Name: Transition RW 09 South Option 7 | ACCEPT |

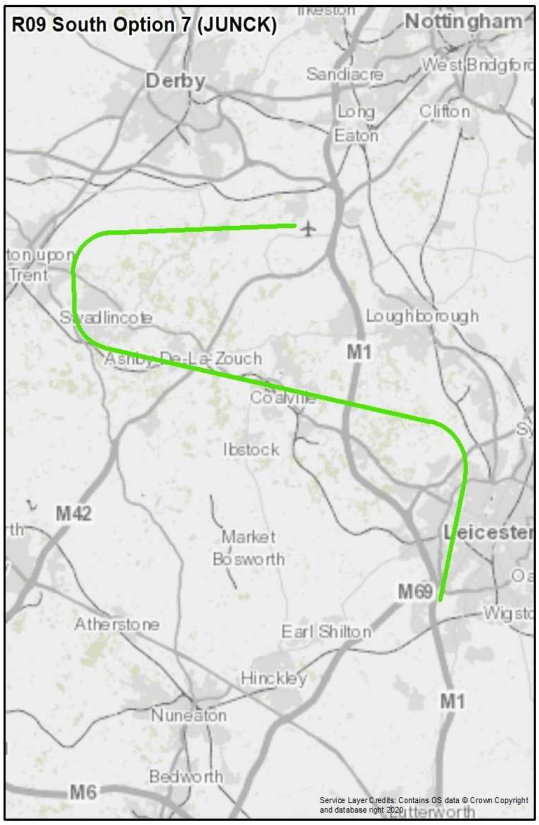
**Option Description:**

The IAF for this option is JUNCK and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route.

The option starts at IAF JUNCK, southwest of Leicester and initially tracks north east and overflies the western portion of Leicester. To the north of Leicester the route turns north west passing over Coalville and the southern edge of Ashby-de-la-Zouch. The route turns north just to the west of Swadlincote before turning right to join the extended runway centreline east of Burton upon Trent.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 1.76° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 7 is 64km (35nm). When compared to the 'do nothing' baseline (57km (31nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

30.1% of the area of the Option 7 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 7 is estimated to overfly approximately 11,300 households with an approximate population of 20,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 21,400.

From 7,000ft, Option 7 is estimated to overfly approximately 69,050 households with an approximate population of 132,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 143,300.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 7 is estimated to overfly 60 noise sensitive areas.

From 7,000ft, Option 7 is estimated to overfly 340 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 20.6 Transition Runway 09 South Option 8

| Design Principle Evaluation | Option No. 8 |
|---|---|
| Option Name: Transition RW 09 South Option 8 | ACCEPT |

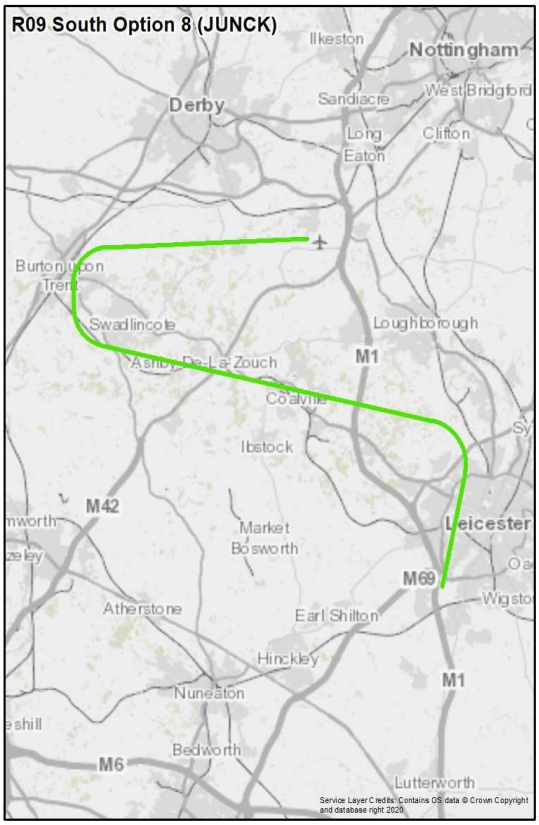
**Option Description:**

The IAF for this option is JUNCK and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route. It follows an identical initial track as Option 7 but routes further west before joining the final approach.

The option starts at IAF JUNCK, southwest of Leicester and initially tracks north east and overflies the western portion of Leicester. To the north of Leicester the route turns north west passing over Coalville and the southern edge of Ashby-de-la-Zouch. The route turns north to the west of Swadlincote and overflies the edge of Burton upon Trent before turning right to join the extended runway centreline.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (5.1nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 1.62° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 8 is 68km (37nm). When compared to the 'do nothing' baseline (57km (31nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

28.6% of the area of the Option 8 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 8 is estimated to overfly approximately 13,500 households with an approximate population of 23,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 25,600.

From 7,000ft, Option 8 is estimated to overfly approximately 72,300 households with an approximate population of 138,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 149,700.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 8 is estimated to overfly 115 noise sensitive areas.

From 7,000ft, Option 8 is estimated to overfly 400 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 20.7 Transition Runway 09 South Option 9

| Design Principle Evaluation | Option No. 9 |
|---|---|
| Option Name: Transition RW 09 South Option 9 | ACCEPT |

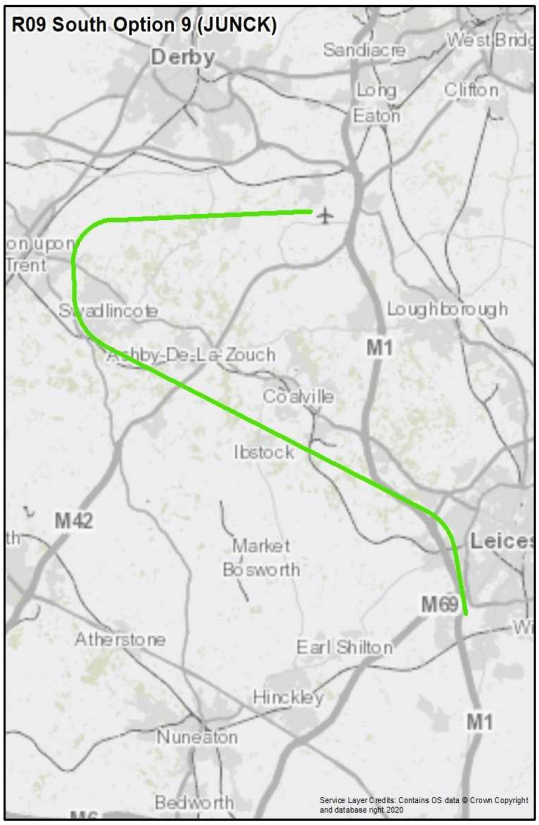
**Option Description:**

The IAF for this option is JUNCK and the style of the route is 'direct' which means the distance to the final approach has been minimised.

The option starts at IAF JUNCK, southwest of Leicester and tracks north following the line of the M1 and overflying the western edge of Leicester. The route turns north west at Ratby and continues to follow the M1 initially but continuing on this heading to track south of Coalville until south west of Swadlincote. The route turns north just to the west of Swadlincote before turning right to join the extended runway centreline east of Burton upon Trent.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 2.03° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 9 is 57km (31nm). When compared to the 'do nothing' baseline (57km (31nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

36.4% of the area of the Option 9 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 9 is estimated to overfly approximately 7,800 households with an approximate population of 14,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 15,200.

From 7,000ft, Option 9 is estimated to overfly approximately 39,500 households with an approximate population of 73,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 83,900.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 9 is estimated to overfly 35 noise sensitive areas.

From 7,000ft, Option 9 is estimated to overfly 155 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 20.8 Transition Runway 09 South Option 10

| Design Principle Evaluation | Option No. 10 |
|---|---|
| Option Name: Transition RW 09 South Option 10 | ACCEPT |

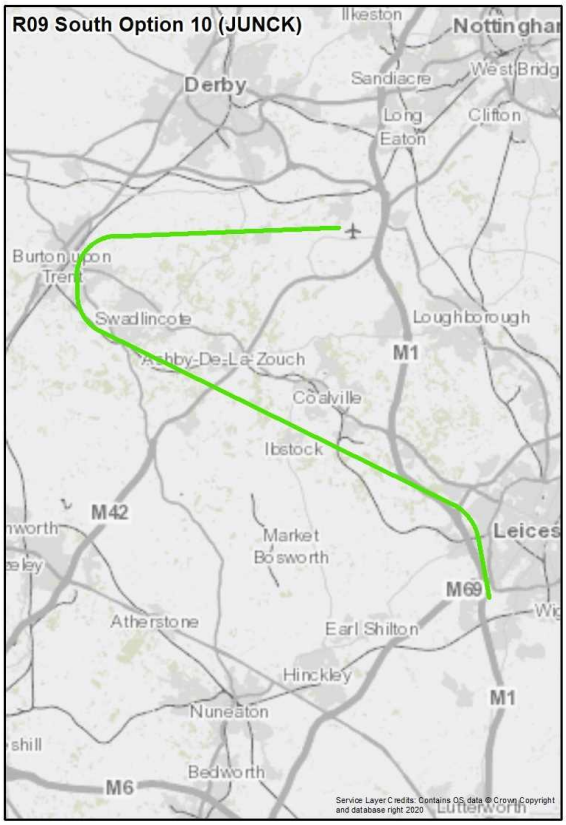
**Option Description:**

The IAF for this option is JUNCK and the style of the route is 'direct' which means the distance to the final approach has been minimised. It follows an identical initial track as Option 9 but routes further west before joining the final approach.

The option starts at IAF JUNCK, southwest of Leicester and tracks north following the line of the M1 and overflying the western edge of Leicester. The route turns north west at Ratby and continues to follow the M1 initially but continuing on this heading to track south of Coalville until west of Swadlincote. It then turns north and overflies the edge of Burton upon Trent before turning right to join the extended runway centreline.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (5.1nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 1.86° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 10 is 61km (33nm). When compared to the 'do nothing' baseline (57km (31nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

35.0% of the area of the Option 10 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 10 is estimated to overfly approximately 10,550 households with an approximate population of 18,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 20,200.

From 7,000ft, Option 10 is estimated to overfly approximately 43,050 households with an approximate population of 79,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 90,700.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 10 is estimated to overfly 90 noise sensitive areas.

From 7,000ft, Option 10 is estimated to overfly 210 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 20.9 Transition Runway 09 South Option 17

| Design Principle Evaluation | Option No. 17 |
|---|---|
| Option Name: Transition RW 09 South Option 17 | REJECT |

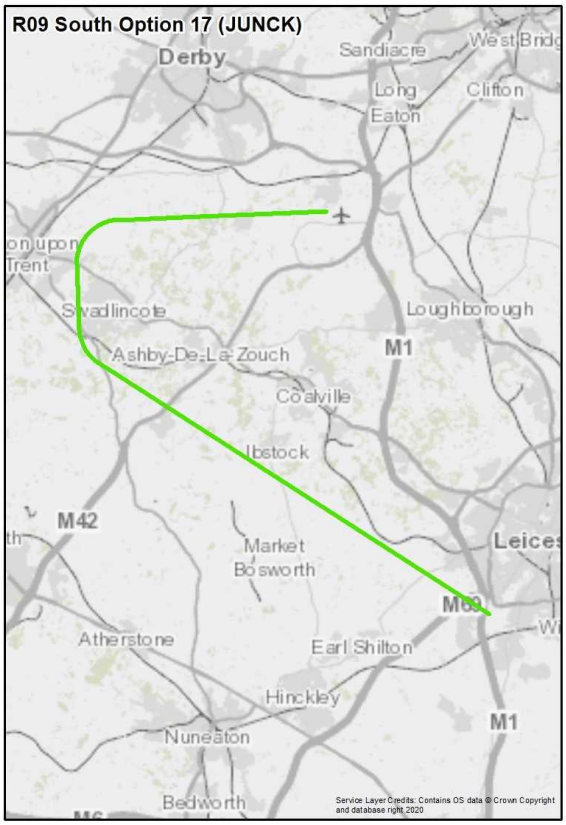
**Option Description:**

The IAF for this option is JUNCK and the style of the route is 'direct' which means the distance to the final approach has been minimised.

The option starts at IAF JUNCK, southwest of Leicester from where the route tracks north west passing south of Ibstock and Ashby-de-la-Zouch until south west of Swadlincote. At this point the route turns north before turning right to join the extended runway centreline east of Burton upon Trent.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 2.08° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 17 is 56km (30nm). When compared to the 'do nothing' baseline (57km (31nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

20.9% of the area of the Option 17 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 17 is estimated to overfly approximately 9,050 households with an approximate population of 16,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 18,600.

From 7,000ft, Option 17 is estimated to overfly approximately 19,350 households with an approximate population of 35,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 47,600.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 17 is estimated to overfly 55 noise sensitive areas.

From 7,000ft, Option 17 is estimated to overfly 110 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 20.10 Transition Runway 09 South Option 18

| Design Principle Evaluation | Option No. 18 |
|---|---|
| Option Name: Transition RW 09 South Option 18 | ACCEPT |

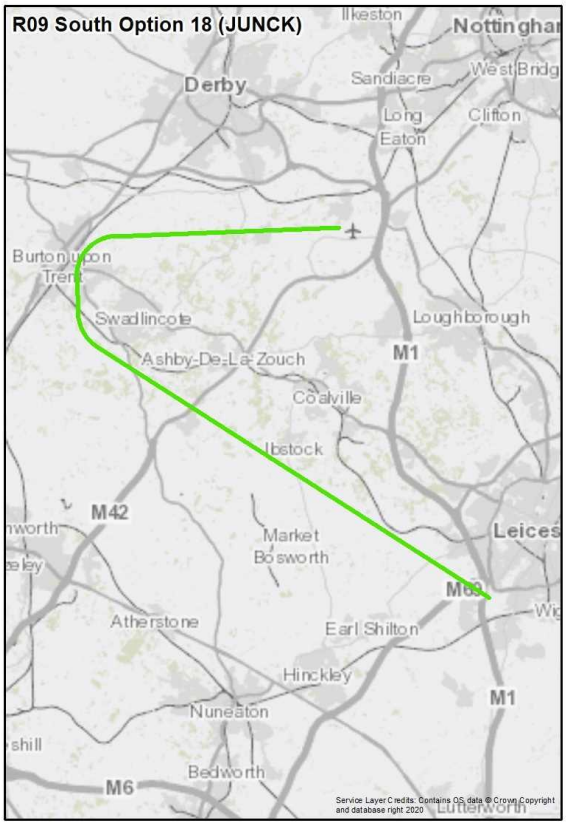
**Option Description:**

The IAF for this option is JUNCK and the style of the route is 'direct' which means the distance to the final approach has been minimised. It follows an identical initial track as Option 17 but routes further west before joining the final approach.

The option starts at IAF JUNCK, southwest of Leicester from where the route tracks north west passing south of Ibstock and Ashby-de-la-Zouch until west of Swadlincote. At this point the route turns north and overflies the edge of Burton upon Trent before turning right to join the extended runway centreline.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (5.1nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 1.91° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 18 is 60km (32nm). When compared to the 'do nothing' baseline (57km (31nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

18.8% of the area of the Option 18 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 18 is estimated to overfly approximately 10,400 households with an approximate population of 18,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 20,200.

From 7,000ft, Option 18 is estimated to overfly approximately 22,200 households with an approximate population of 40,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 52,800.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 18 is estimated to overfly 100 noise sensitive areas.

From 7,000ft, Option 18 is estimated to overfly 165 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 20.11 Transition Runway 09 South JUNCK Summary

| | Option 1 | Option 2 | Option 3 | Option 4 | Option 7 | Option 8 | Option 9 | Option 10 | Option 17 | Option 18 |
|---|---|---|---|---|---|---|---|---|---|---|
| **S - Safety** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **P - Programme** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **C - Continuity** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **E - Emissions** | PARTIAL | PARTIAL | PARTIAL | NOT MET | NOT MET | NOT MET | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **N1 - Noise** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **N2 - Noise** | PARTIAL | PARTIAL | MET | MET | NOT MET | NOT MET | MET | MET | NOT MET | NOT MET |
| **N3 - Noise** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **N4 - Noise** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **A1 - Airspace** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **A2 - Airspace** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET | MET | MET | MET | MET | MET | MET |
| | Best | Best | Best | Best | 4,000ft beneficial | 4,000ft beneficial | Best | Best | Rejected | 4,000ft beneficial |

## 20.12 Transition Runway 09 South Option 5

| Design Principle Evaluation | Option No. 5 |
|---|---|
| Option Name: Transition RW 09 South Option 5 | ACCEPT |

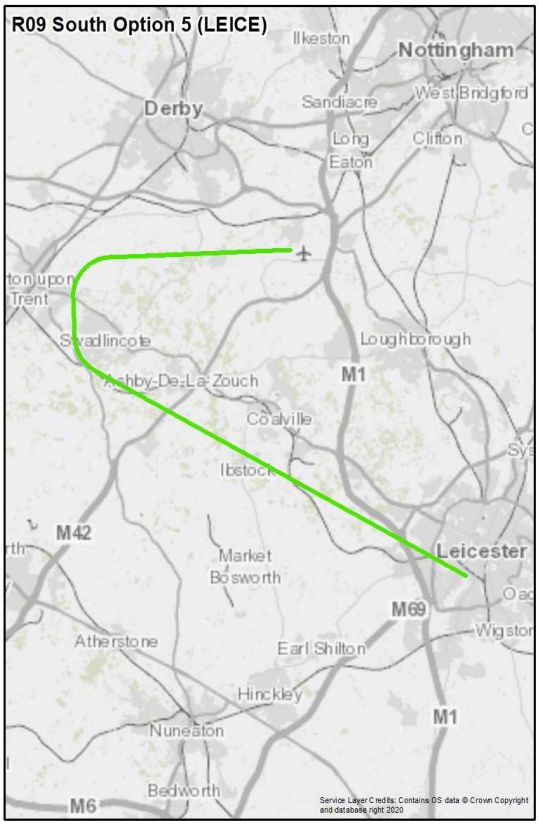
**Option Description:**

The IAF for this option is LEICE and the style of the route is 'direct' which means the distance to the final approach has been minimised.

This option starts at IAF LEICE, near the King Power Stadium in Leicester from where the route tracks north west over the junction between the M1 and the A46 and passes the northern edge of Ibstock. The route turns north just to the west of Swadlincote before turning right to join the extended runway centreline east of Burton upon Trent.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 2.08° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 5 is 56km (30nm). When compared to the 'do nothing' baseline (57km (31nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

26.9% of the area of the Option 5 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 5 is estimated to overfly approximately 7,150 households with an approximate population of 13,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 13,900.

From 7,000ft, Option 5 is estimated to overfly approximately 54,350 households with an approximate population of 110,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 113,200.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 5 is estimated to overfly 35 noise sensitive areas.

From 7,000ft, Option 5 is estimated to overfly 305 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 20.13 Transition Runway 09 South Option 6

| Design Principle Evaluation | Option No. 6 |
|---|---|
| Option Name: Transition RW 09 South Option 6 | ACCEPT |

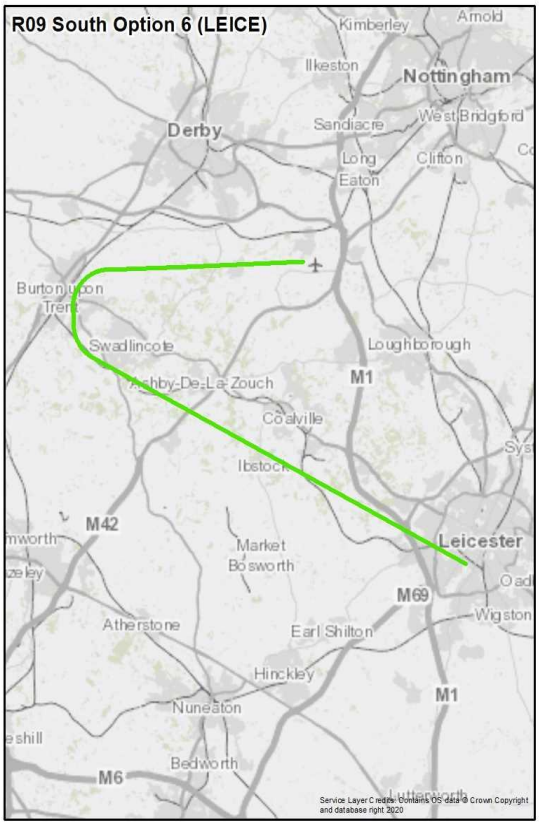
**Option Description:**

The IAF for this option is LEICE and the style of the route is 'direct' which means the distance to the final approach has been minimised. It follows a near identical track as Option 5 but routes further west before joining the final approach.

The option starts at IAF LEICE, near the King Power Stadium in Leicester from where the route tracks north west over the junction between the M1 and the A46 and passes the northern edge of Ibstock. The route turns north to the west of Swadlincote and overflies the edge of Burton upon Trent before turning right to join the extended runway centreline.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (5.1nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 1.91° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 6 is 60km (32nm). When compared to the 'do nothing' baseline (57km (31nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

25.4% of the area of the Option 6 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 6 is estimated to overfly approximately 10,300 households with an approximate population of 18,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 19,900.

From 7,000ft, Option 6 is estimated to overfly approximately 57,900 households with an approximate population of 116,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 119,900.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 6 is estimated to overfly 90 noise sensitive areas.

From 7,000ft, Option 6 is estimated to overfly 360 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 20.14 Transition Runway 09 South Option 11

| Design Principle Evaluation | Option No. 11 |
|---|---|
| Option Name: Transition RW 09 South Option 11 | ACCEPT |

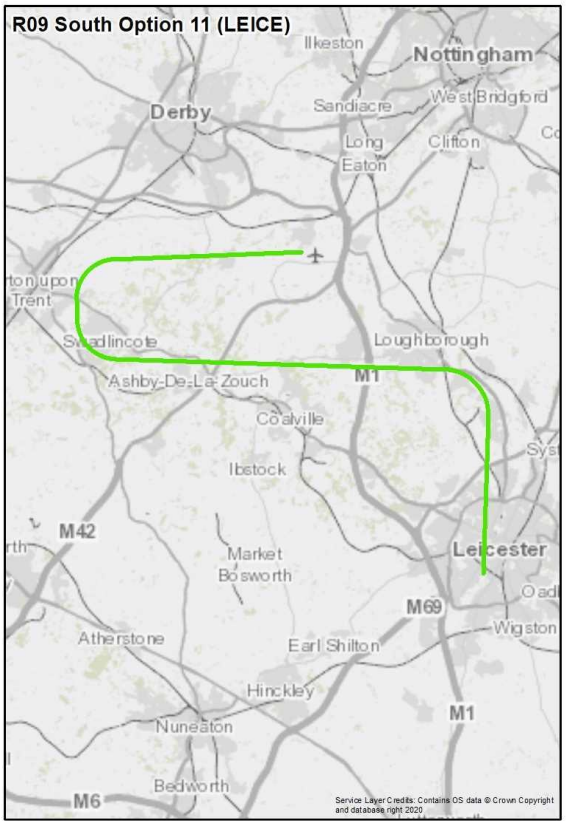
**Option Description:**

The IAF for this option is LEICE and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route.

The option starts at IAF LEICE, near the King Power Stadium in Leicester from where the route tracks directly north over Leicester to Mountsorrel where the route turns west. It overflies the southern part of Loughborough, passing south of Shepshed and just north of Ashby-de-la-Zouch until south west of Swadlincote. The route turns north just to the west of Swadlincote before turning right to join the extended runway centreline east of Burton upon Trent.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 1.7° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 11 is 65km (35nm). When compared to the 'do nothing' baseline (57km (31nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

26.2% of the area of the Option 11 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 11 is estimated to overfly approximately 11,850 households with an approximate population of 21,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 28,200.

From 7,000ft, Option 11 is estimated to overfly approximately 87,900 households with an approximate population of 181,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 203,900.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 11 is estimated to overfly 50 noise sensitive areas.

From 7,000ft, Option 11 is estimated to overfly 535 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 20.15 Transition Runway 09 South Option 12

| Design Principle Evaluation | Option No. 12 |
|---|---|
| Option Name: Transition RW 09 South Option 12 | ACCEPT |

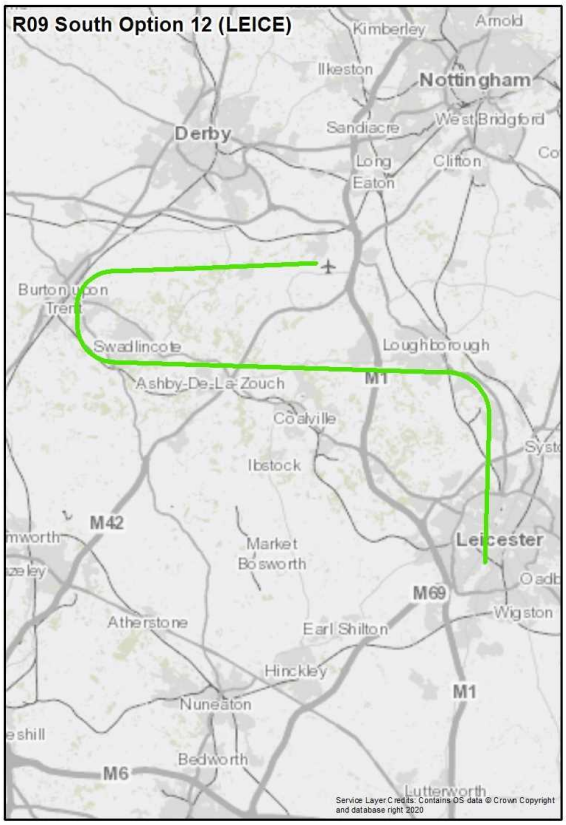
**Option Description:**

The IAF for this option is LEICE and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route. It follows an identical initial track as Option 11 but routes further west before joining the final approach.

The option starts at IAF LEICE, near the King Power Stadium in Leicester from where the route tracks directly north over Leicester to Mountsorrel where the route turns west. It overflies the southern part of Loughborough, passing south of Shepshed and just north of Ashby-de-la-Zouch until west of Swadlincote. It then turns north and overflies the edge of Burton upon Trent before turning right to join the extended runway centreline.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (5.1nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 1.57° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 12 is 70km (38nm). When compared to the 'do nothing' baseline (57km (31nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

26.0% of the area of the Option 12 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 12 is estimated to overfly approximately 14,650 households with an approximate population of 25,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 32,900.

From 7,000ft, Option 12 is estimated to overfly approximately 92,800 households with an approximate population of 189,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 213,000.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 12 is estimated to overfly 105 noise sensitive areas.

From 7,000ft, Option 12 is estimated to overfly 595 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 20.16 Transition Runway 09 South LEICE Summary

| | Option 5 | Option 6 | Option 11 | Option 12 |
|---|---|---|---|---|
| **S - Safety** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **P - Programme** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **C - Continuity** | MET | MET | MET | MET |
| **E - Emissions** | PARTIAL | PARTIAL | NOT MET | NOT MET |
| **N1 - Noise** | MET | MET | MET | MET |
| **N2 - Noise** | MET | MET | MET | MET |
| **N3 - Noise** | MET | MET | MET | MET |
| **N4 - Noise** | MET | MET | MET | MET |
| **A1 - Airspace** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **A2 - Airspace** | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET |
| | Best | Best | Best | Best |

## 20.17 Transition Runway 09 South Option 13

| Design Principle Evaluation | Option No. 13 |
|---|---|
| Option Name: Transition RW 09 South Option 13 | ACCEPT |

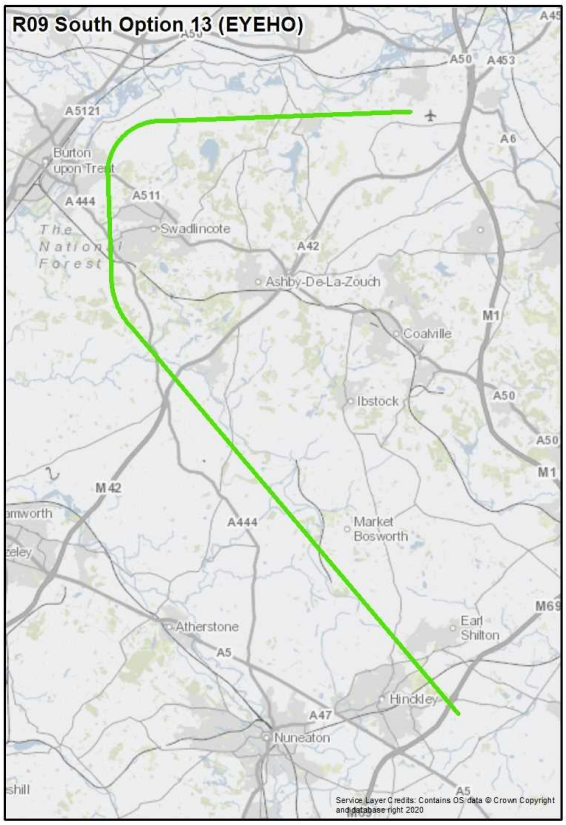
**Option Description:**

The IAF for this option is EYEHO and the style of the route is 'direct' which means the distance to the final approach has been minimised.

The option starts at IAF EYEHO, south east of Hinkley from where the route heads north west passing between Earl Shilton and Hinckley. It continues on this heading until just south of Swadlincote where it turns north and passes between Swadlincote and Burton upon Trent before turning right to join the extended runway centreline.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 2.15° which is close to the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 13 is 55km (30nm). When compared to the 'do nothing' baseline (57km (31nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

17.2% of the area of the Option 13 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 13 is estimated to overfly approximately 6,000 households with an approximate population of 11,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 11,800.

From 7,000ft, Option 13 is estimated to overfly approximately 15,550 households with an approximate population of 28,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 32,900.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 13 is estimated to overfly 35 noise sensitive areas.

From 7,000ft, Option 13 is estimated to overfly 75 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 20.18 Transition Runway 09 South Option 14

| Design Principle Evaluation | Option No. 14 |
|---|---|
| Option Name: Transition RW 09 South Option 14 | ACCEPT |

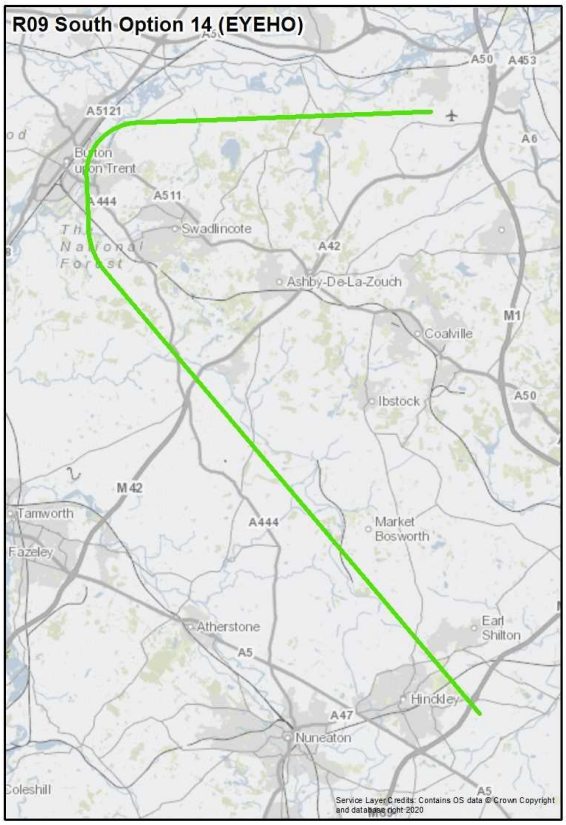
**Option Description:**

The IAF for this option is EYEHO and the style of the route is 'direct' which means the distance to the final approach has been minimised. It follows an identical initial track as Option 13 but routes further west before joining the final approach.

The option starts at IAF EYEHO, south east of Hinkley from where the route heads north west passing between Earl Shilton and Hinckley. It continues on this heading until south west of Swadlincote where it turns north and overflies the edge of Burton upon Trent before turning right to join the extended runway centreline.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (5.1nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 2° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 14 is 58km (31nm). When compared to the 'do nothing' baseline (57km (31nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

15.2% of the area of the Option 14 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 14 is estimated to overfly approximately 7,650 households with an approximate population of 13,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 15,000.

From 7,000ft, Option 14 is estimated to overfly approximately 17,350 households with an approximate population of 31,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 36,100.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 14 is estimated to overfly 90 noise sensitive areas.

From 7,000ft, Option 14 is estimated to overfly 130 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 20.19 Transition Runway 09 South Option 23

| Design Principle Evaluation | Option No. 23 |
|---|---|
| Option Name: Transition RW 09 South Option 23 | ACCEPT |

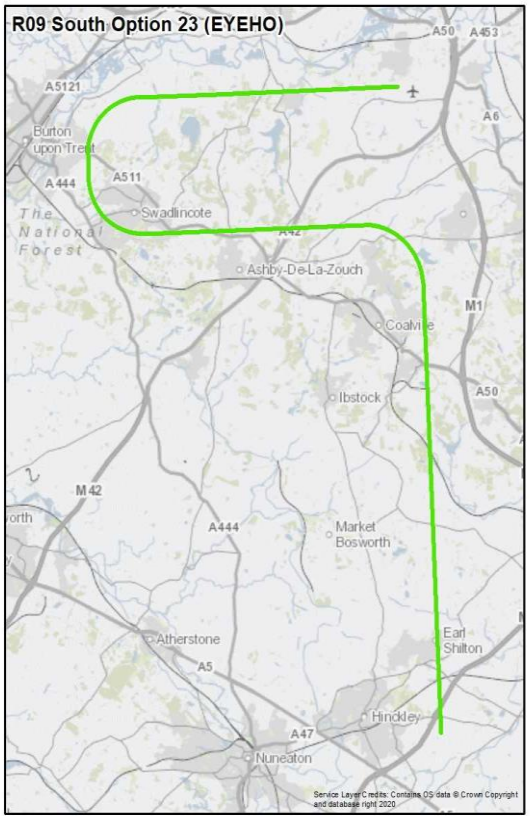
**Option Description:**

The IAF for this option is EYEHO and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route.

The option starts at IAF EYEHO, south east of Hinkley from where the route tracks north to pass east of Coalville. It then turns west and passes to the north of Coalville and Ashby-de-la-Zouch and over the southern portion of Swadlincote, before turning right to join the extended runway centreline east of Burton upon Trent.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 1.75° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 23 is 64km (35nm). When compared to the 'do nothing' baseline (57km (31nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

21.1% of the area of the Option 23 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 23 is estimated to overfly approximately 10,550 households with an approximate population of 19,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 23,000.

From 7,000ft, Option 23 is estimated to overfly approximately 23,500 households with an approximate population of 42,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 49,500.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 23 is estimated to overfly 55 noise sensitive areas.

From 7,000ft, Option 23 is estimated to overfly 110 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 20.20 Transition Runway 09 South Option 24

| Design Principle Evaluation | Option No. 24 |
|---|---|
| Option Name: Transition RW 09 South Option 24 | ACCEPT |

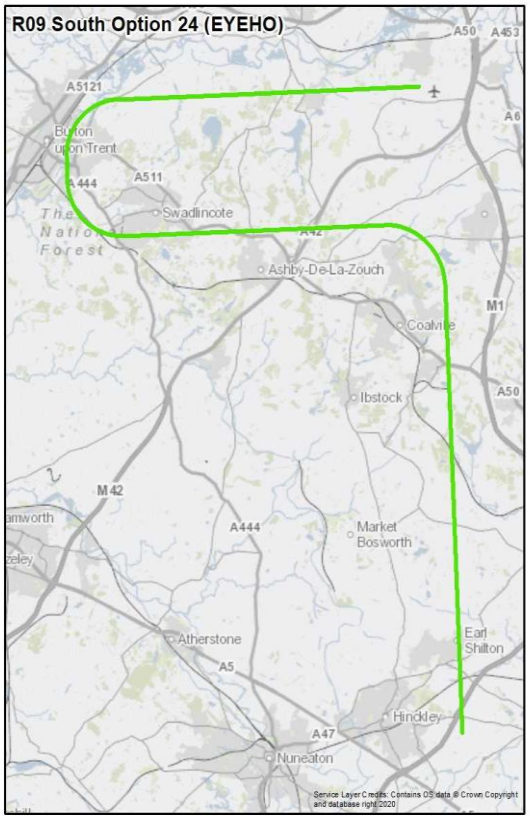
**Option Description:**

The IAF for this option is EYEHO and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route.

The option starts at IAF EYEHO, south east of Hinkley from where the route tracks north to pass east of Coalville. It then turns west and passes to the north of Coalville and Ashby-de-la-Zouch and over the southern portion of Swadlincote, before turning right over the eastern edge of Burton upon Trent to join the extended runway centreline.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (5.1nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 1.6° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 24 is 69km (37nm). When compared to the 'do nothing' baseline (57km (31nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

21.7% of the area of the Option 24 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 24 is estimated to overfly approximately 15,350 households with an approximate population of 27,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 31,300.

From 7,000ft, Option 24 is estimated to overfly approximately 28,350 households with an approximate population of 50,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 58,200.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 24 is estimated to overfly 115 noise sensitive areas.

From 7,000ft, Option 24 is estimated to overfly 170 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 20.21 Transition Runway 09 South EYEHO Summary

| | Option 13 | Option 14 | Option 23 | Option 24 |
|---|---|---|---|---|
| **S - Safety** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **P - Programme** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **C - Continuity** | MET | MET | MET | MET |
| **E - Emissions** | PARTIAL | PARTIAL | NOT MET | NOT MET |
| **N1 - Noise** | MET | MET | MET | MET |
| **N2 - Noise** | MET | MET | MET | MET |
| **N3 - Noise** | MET | MET | MET | MET |
| **N4 - Noise** | MET | MET | MET | MET |
| **A1 - Airspace** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **A2 - Airspace** | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET |
| | Best | Best | Best | Best |

## 20.22 Transition Runway 09 South Option 15

| Design Principle Evaluation | Option No. 15 |
|---|---|
| Option Name: Transition RW 09 South Option 15 | ACCEPT |

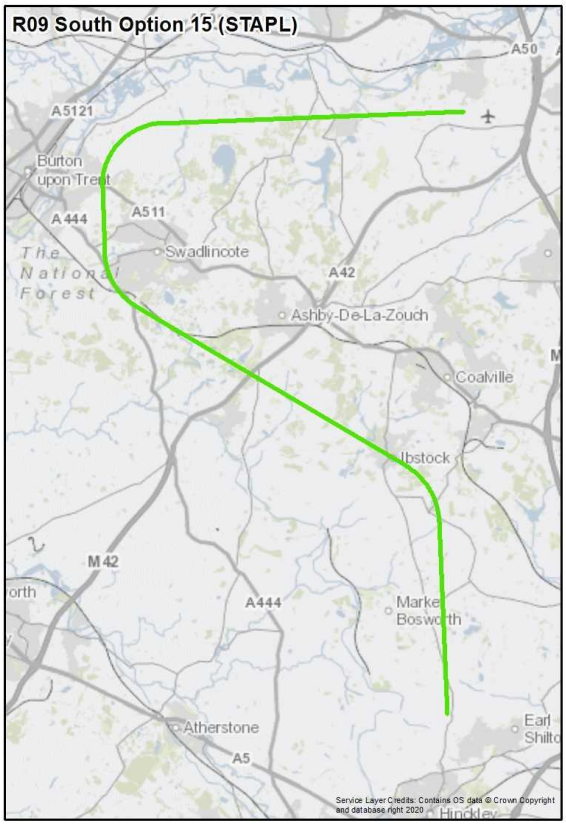
**Option Description:**

The IAF for this option is STAPL and the style of the route is 'direct' which means the distance to the final approach has been minimised.

The option starts at IAF STAPL at Stapleton north of Hinkley from where it tracks north, turning north west to over fly Ibstock but remaining south of Coalville. It continues on this track to fly south of Ashby-de-la-Zouch until south west of Swadlincote where the route turns north before turning right to join the extended runway centreline east of Burton upon Trent.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 2.39° which is within the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be better than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 15 is 51km (28nm). When compared to the 'do nothing' baseline (57km (31nm)) this option is shorter in length and it is therefore anticipated that emissions would be better.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

7.0% of the area of the Option 15 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 15 is estimated to overfly approximately 7,800 households with an approximate population of 14,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 15,100.

From 7,000ft, Option 15 is estimated to overfly approximately 16,450 households with an approximate population of 30,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 34,000.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 15 is estimated to overfly 40 noise sensitive areas.

From 7,000ft, Option 15 is estimated to overfly 75 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 20.23 Transition Runway 09 South Option 16

| Design Principle Evaluation | Option No. 16 |
|---|---|
| Option Name: Transition RW 09 South Option 16 | ACCEPT |

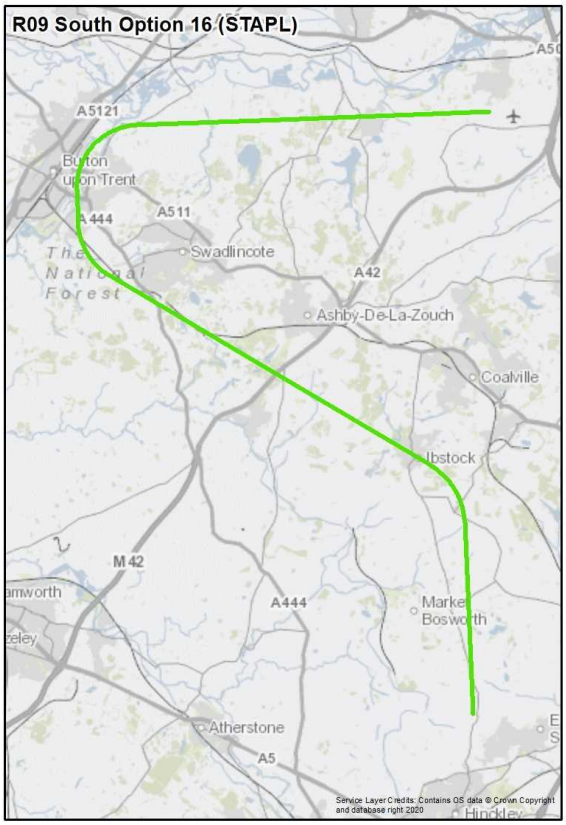
**Option Description:**

The IAF for this option is STAPL and the style of the route is 'direct' which means the distance to the final approach has been minimised. It follows an identical initial track as Option 15 but routes further west before joining the final approach.

The option starts at IAF STAPL at Stapleton north of Hinkley from where it tracks north, turning north west to over fly Ibstock but remaining south of Coalville. It continues on this track to fly south of Ashby-de-la-Zouch until west of Swadlincote where it turns north and overflies the edge of Burton upon Trent before turning right to join the extended runway centreline.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (5.1nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 2.18° which is close to the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 16 is 54km (29nm). When compared to the 'do nothing' baseline (57km (31nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

8.0% of the area of the Option 16 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 16 is estimated to overfly approximately 10,500 households with an approximate population of 18,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 20,400.

From 7,000ft, Option 16 is estimated to overfly approximately 19,650 households with an approximate population of 35,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 40,400.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 16 is estimated to overfly 100 noise sensitive areas.

From 7,000ft, Option 16 is estimated to overfly 140 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 20.24 Transition Runway 09 South Option 21

| Design Principle Evaluation | Option No. 21 |
|---|---|
| Option Name: Transition RW 09 South Option 21 | ACCEPT |

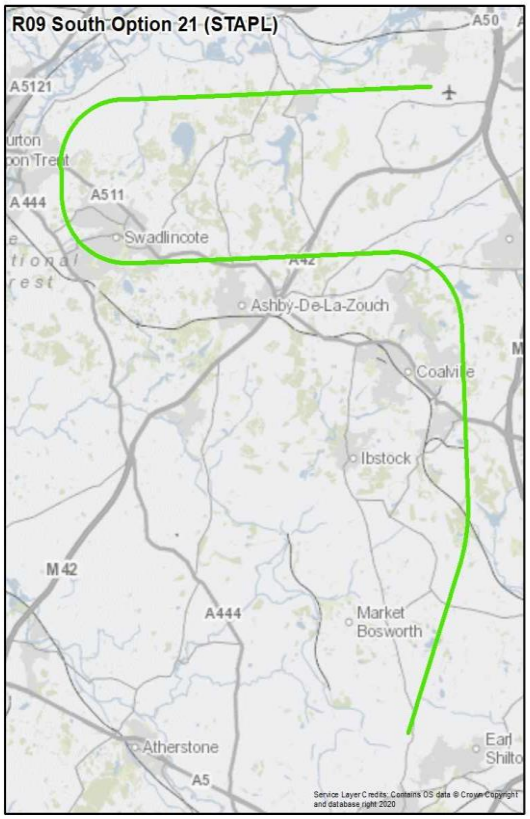
**Option Description:**

The IAF for this option is STAPL and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route.

The option starts at IAF STAPL at Stapleton north of Hinkley from where the route initially tracks north east until close to Thornton where the route turns north to pass east of Coalville. The route then turns west and passes to the north of Coalville and Ashby-de-la-Zouch and over the southern portion of Swadlincote, before turning right to join the extended runway centreline east of Burton upon Trent.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 1.95° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 21 is 59km (32nm). When compared to the 'do nothing' baseline (57km (31nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

16.3% of the area of the Option 21 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 21 is estimated to overfly approximately 11,200 households with an approximate population of 20,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 24,500.

From 7,000ft, Option 21 is estimated to overfly approximately 19,850 households with an approximate population of 36,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 43,400.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 21 is estimated to overfly 55 noise sensitive areas.

From 7,000ft, Option 21 is estimated to overfly 95 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 20.25 Transition Runway 09 South Option 22

| Design Principle Evaluation | Option No. 22 |
|---|---|
| Option Name: Transition RW 09 South Option 22 | ACCEPT |

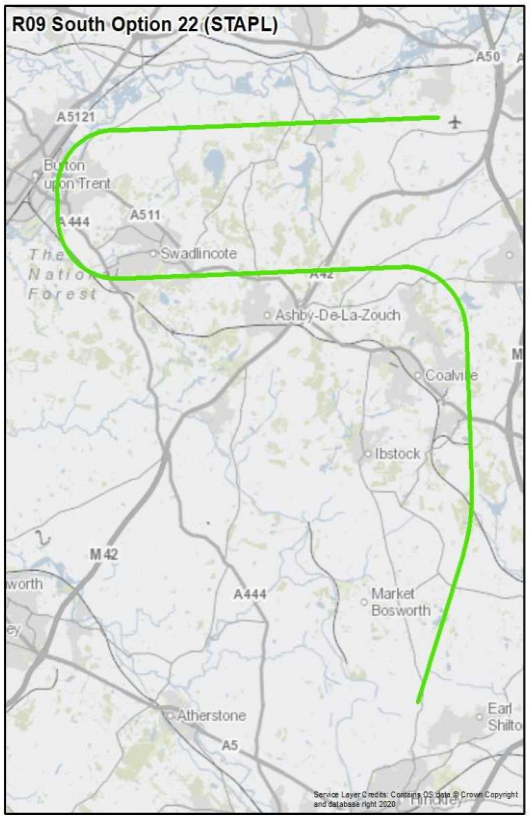
**Option Description:**

The IAF for this option is STAPL and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route. It follows the same route as Option 21 but routes further west before joining the final approach.

The option starts at IAF STAPL at Stapleton north of Hinkley from where the route initially tracks north east until close to Thornton where the route turns north to pass east of Coalville. The route then turns west and passes to the north of Coalville and Ashby-de-la-Zouch and over the southern portion of Swadlincote, before turning right over the eastern edge of Burton upon Trent to join the extended runway centreline.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (5.1nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 09 approaches.

The descent gradient to the FAF is 1.76° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 22 is 64km (35nm). When compared to the 'do nothing' baseline (57km (31nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

15.6% of the area of the Option 22 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 22 is estimated to overfly approximately 16,150 households with an approximate population of 28,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 33,300.

From 7,000ft, Option 22 is estimated to overfly approximately 24,900 households with an approximate population of 44,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 52,300.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 22 is estimated to overfly 120 noise sensitive areas.

From 7,000ft, Option 22 is estimated to overfly 160 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 20.26 Transition Runway 09 South STAPL Summary

| | Option 15 | Option 16 | Option 21 | Option 22 |
|---|---|---|---|---|
| **S - Safety** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **P - Programme** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **C - Continuity** | MET | MET | MET | MET |
| **E - Emissions** | MET | PARTIAL | PARTIAL | NOT MET |
| **N1 - Noise** | MET | MET | MET | MET |
| **N2 - Noise** | MET | MET | MET | MET |
| **N3 - Noise** | MET | MET | MET | MET |
| **N4 - Noise** | MET | MET | MET | MET |
| **A1 - Airspace** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **A2 - Airspace** | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET |
| | Best | Best | Best | Best |

## 20.27 Transition Runway 09 South Viable but Poor Fit Options

| Option | Safety | Programme | Continuity |
|---|---|---|---|
| A19 | S | P | C |

Description: This is a route that commences at an IAF located in the vicinity of Syston to the north of Leicester and routed north of Coalville and Ashby-de-la-Zouch to join the final approach for runway 09 at an IF at 3.85nm from the FAF. It was originally created in the comprehensive list of Arrivals as Option 19 but was changed to Viable Poor Fit following analysis on descent gradients.

Safety: As detailed at section 19.9f) in the DOR, it is a safety requirement for each IAF to have the ability to provide arrivals procedures to both runway 27 and runway 09. From the position of SYSTO to the north of Leicester this is not possible as the IAF is too close to the FAF for runway 27 and creates a CDA gradient that is above the range for CDAs defined within ICAO guidance.

Without the ability to provide viable options to runway 27, any arrivals options from this IAF to runway 09 are therefore also classified as Viable but Poor Fit. To create and operate these in isolation (without reciprocal procedures for runway 27) would create a potentially unsafe scenario within the network in operating the STAR, and during a runway change if RTF communications were lost.

| | | | |
|---|---|---|---|
| B20 | S | P | C |

Description: This is a route that commences at an IAF located in the vicinity of Syston to the north of Leicester and routed north of Coalville and Ashby-de-la-Zouch to join the final approach for runway 09 at an IF at 5.1nm from the FAF. It was originally created in the comprehensive list of Arrivals as Option 20 but was changed to Viable Poor Fit following analysis on descent gradients.

Safety: As detailed at section 19.9f) in the DOR, it is a safety requirement for each IAF to have the ability to provide arrivals procedures to both runway 27 and runway 09. From the position of SYSTO to the north of Leicester this is not possible as the IAF is too close to the FAF for runway 27 and creates a CDA gradient that is above the range for CDAs defined within ICAO guidance.

Without the ability to provide viable options to runway 27, any arrivals options from this IAF to runway 09 are therefore also classified as Viable but Poor Fit. To create and operate these in isolation (without reciprocal procedures for runway 27) would create a potentially unsafe scenario with within the network in operating the STAR, and during a runway change if RTF communications were lost.

# 21 Transitions Runway 27 North

## 21.1 Transition Runway 27 North Option 1

| Design Principle Evaluation | Option No. 1 |
|---|---|
| Option Name: Transition RW 27 North Option 1 | ACCEPT |

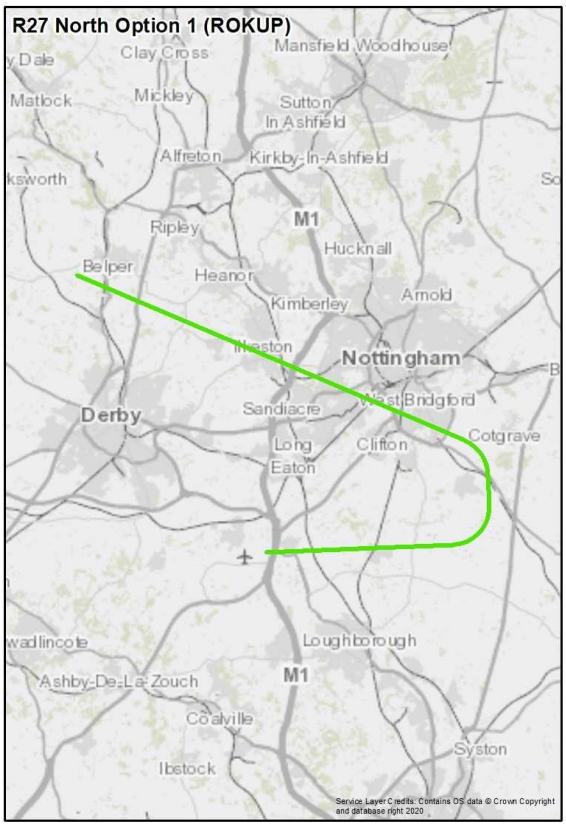
**Option Description:**

The IAF for this option is ROKUP and the style of the route is 'direct' which means the distance to the final approach has been minimised.

This option starts at IAF ROKUP west of Belper and initially tracks south east over southern Ilkeston and southern Nottingham. It continues on this track until south of Gamston where the route turns south and routes east of Keyworth before turning left to join the extended runway centreline.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 2.13° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.



| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 1 is 55km (30nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

24.8% of the area of the Option 1 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 1 is estimated to overfly approximately 10,500 households with an approximate population of 20,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 23,500.

From 7,000ft, Option 1 is estimated to overfly approximately 45,350 households with an approximate population of 90,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 99,400.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 1 is estimated to overfly 80 noise sensitive areas.

From 7,000ft, Option 1 is estimated to overfly 300 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.2 Transition Runway 27 North option 2

| Design Principle Evaluation | Option No. 2 |
|---|---|
| Option Name: Transition RW 27 North Option 2 | ACCEPT |

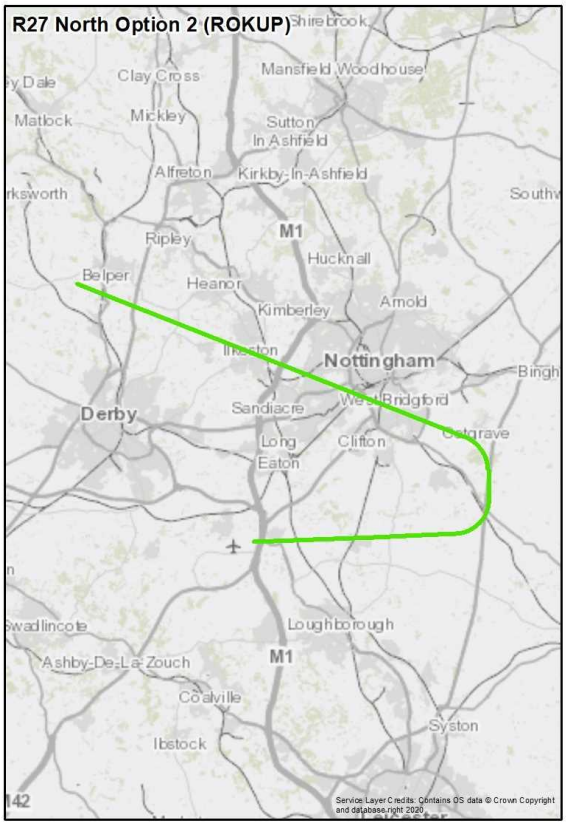
**Option Description:**

The IAF for this option is ROKUP and the style of the route is 'direct' which means the distance to the final approach has been minimised. It follows a similar route to Option 1 but routes further east before joining the final approach.

The option starts at IAF ROKUP west of Belper and initially tracks south east over southern Ilkeston and southern Nottingham. It continues on this track until Cotgrave to the south east of Nottingham where the route turns south and routes east of Keyworth briefly following the line of the A46, before turning left to join the extended runway centreline.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (5nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 1.93° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 2 is 59km (32nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

25.2% of the area of the Option 2 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 2 is estimated to overfly approximately 14,200 households with an approximate population of 26,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 31,800.

From 7,000ft, Option 2 is estimated to overfly approximately 48,200 households with an approximate population of 96,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 105,100.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 2 is estimated to overfly 105 noise sensitive areas.

From 7,000ft, Option 2 is estimated to overfly 405 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.3 Transition Runway 27 North Option 3

| Design Principle Evaluation | Option No. 3 |
|---|---|
| Option Name: Transition RW 27 North Option 3 | ACCEPT |

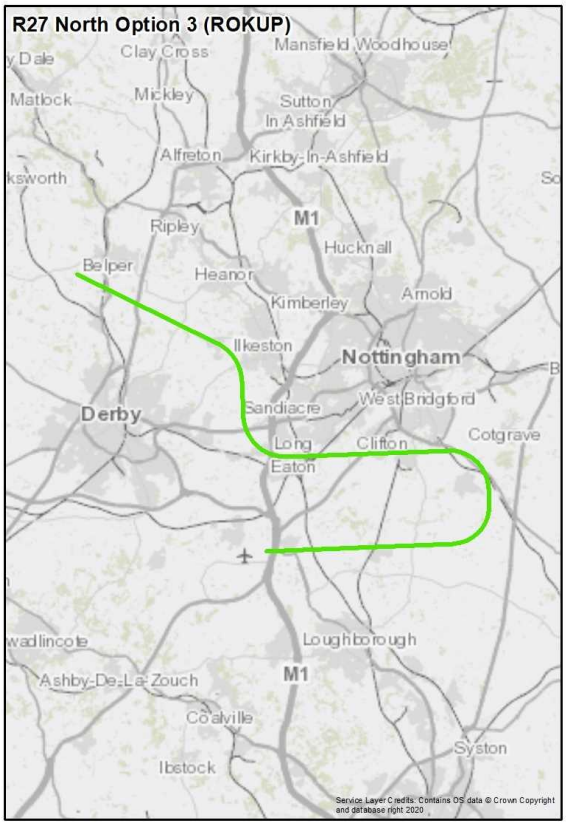
**Option Description:**

The IAF for this option is ROKUP and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route.

The option starts at IAF ROKUP west of Belper and initially tracks south east before turning south over West Hallam, just to the west of Ilkeston, then turning east to fly over Long Eaton and Clifton. To the south east of Nottingham, the route turns south and routes east of Keyworth before turning left to join the extended runway centreline.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 1.96° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 3 is 59km (32nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

23.8% of the area of the Option 3 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 3 is estimated to overfly approximately 10,050 households with an approximate population of 18,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 24,900.

From 7,000ft, Option 3 is estimated to overfly approximately 36,450 households with an approximate population of 66,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 75,500.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 3 is estimated to overfly 90 noise sensitive areas.

From 7,000ft, Option 3 is estimated to overfly 255 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.4 Transition Runway 27 North Option 4

| Design Principle Evaluation | Option No. 4 |
|---|---|
| Option Name: Transition RW 27 North Option 4 | ACCEPT |

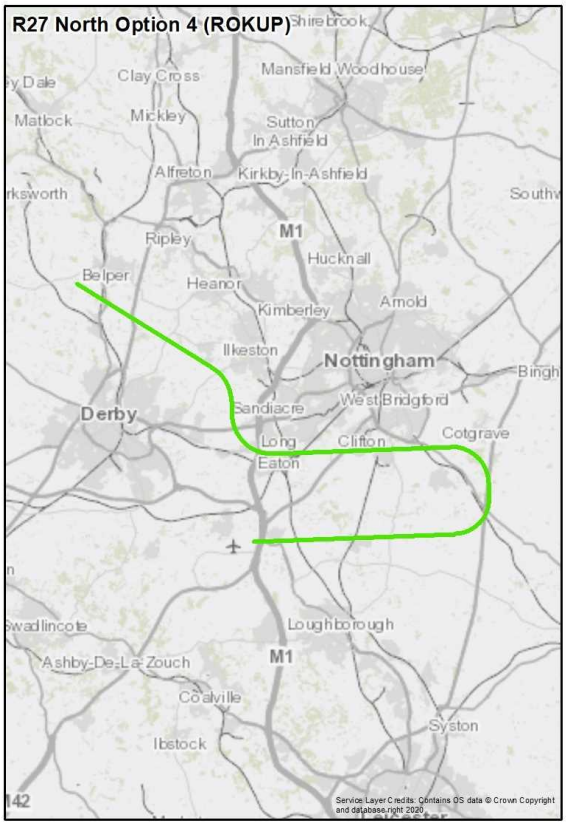
**Option Description:**

The IAF for this option is ROKUP and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route. It follows a similar route to Option 3 but routes further east before joining the final approach.

The option starts at IAF ROKUP west of Belper and initially tracks south east before turning south over West Hallam, just to the west of Ilkeston, then turning east to fly over Long Eaton and Clifton. It continues on this track until south west of Cotgrave to the south east of Nottingham where the route turns south and routes east of Keyworth briefly following the line of the A46, before turning left to join the extended runway centreline.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (5nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 1.81° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 4 is 63km (34nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

25.9% of the area of the Option 4 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 4 is estimated to overfly approximately 10,450 households with an approximate population of 19,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 29,400.

From 7,000ft, Option 4 is estimated to overfly approximately 34,000 households with an approximate population of 61,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 68,400.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 4 is estimated to overfly 90 noise sensitive areas.

From 7,000ft, Option 4 is estimated to overfly 230 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.5 Transition Runway 27 North ROKUP Summary

| | Option 1 | Option 2 | Option 3 | Option 4 |
|---|---|---|---|---|
| **S - Safety** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **P - Programme** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **C - Continuity** | MET | MET | MET | MET |
| **E - Emissions** | PARTIAL | PARTIAL | PARTIAL | NOT MET |
| **N1 - Noise** | MET | MET | MET | MET |
| **N2 - Noise** | MET | MET | MET | MET |
| **N3 - Noise** | MET | MET | MET | MET |
| **N4 - Noise** | MET | MET | MET | MET |
| **A1 - Airspace** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **A2 - Airspace** | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET |
| | Best | Best | Best | Best |

## 21.6 Transition Runway 27 North Option 5

| Design Principle Evaluation | Option No. 5 |
|---|---|
| Option Name: Transition RW 27 North Option 5 | ACCEPT |

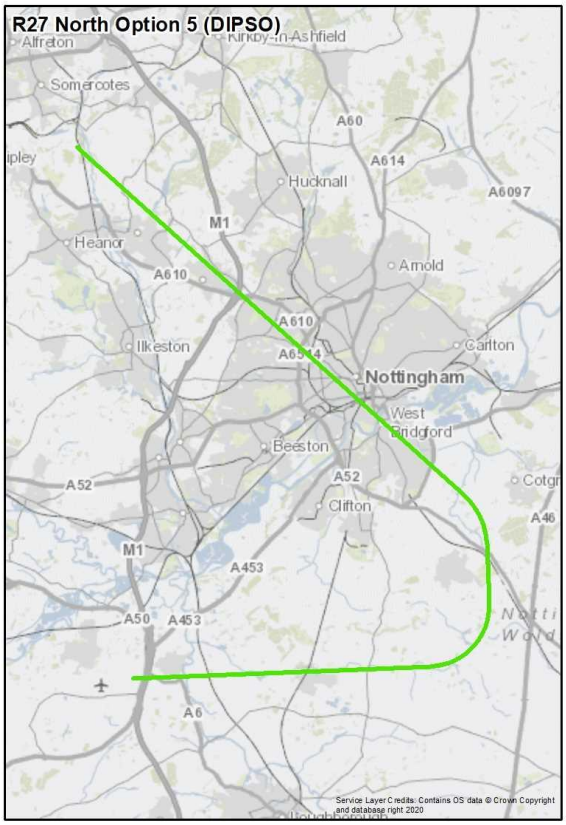
**Option Description:**

The IAF for this option is DIPSO and the style of the route is 'direct' which means the distance to the final approach has been minimised.

The option starts at IAF DIPSO, east of Ripley and initially tracks south east over Eastwood, Kimberley, and central Nottingham. It continues on this track until south of Gamston where the route turns south and routes east of Keyworth before turning left to join the extended runway centreline.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 2.59° which is within the optimum range for low noise approaches and is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be better than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 5 is 48km (26nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is shorter in length and it is therefore anticipated that emissions would be better.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

25.2% of the area of the Option 5 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 5 is estimated to overfly approximately 6,450 households with an approximate population of 12,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 17,400.

From 7,000ft, Option 5 is estimated to overfly approximately 78,650 households with an approximate population of 162,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 168,500.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 5 is estimated to overfly 45 noise sensitive areas.

From 7,000ft, Option 5 is estimated to overfly 950 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.7 Transition Runway 27 North Option 6

| Design Principle Evaluation | Option No. 6 |
|---|---|
| Option Name: Transition RW 27 North Option 6 | ACCEPT |

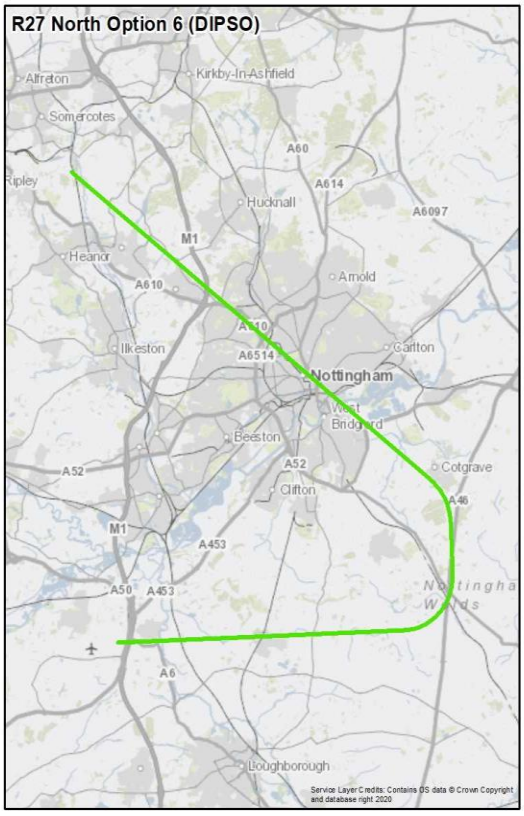
**Option Description:**

The IAF for this option is DIPSO and the style of the route is 'direct' which means the distance to the final approach has been minimised. It follows a similar route to Option 5 but routes further east before joining the final approach.

The option starts at IAF DIPSO, east of Ripley and initially tracks south east over Eastwood, Kimberley, and central Nottingham. It continues on this track until overhead Cotgrave to the south east of Nottingham where the route turns south and routes east of Keyworth briefly following the line of the A46, before turning left to join the extended runway centreline.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (5nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 2.33° which is within the optimum range for low noise approaches and is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 6 is 52km (28nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

28.6% of the area of the Option 6 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 6 is estimated to overfly approximately 3,750 households with an approximate population of 7,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 13,300.

From 7,000ft, Option 6 is estimated to overfly approximately 80,100 households with an approximate population of 158,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 165,700.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 6 is estimated to overfly 40 noise sensitive areas.

From 7,000ft, Option 6 is estimated to overfly 1,055 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.8 Transition Runway 27 North Option 7

| Design Principle Evaluation | Option No. 7 |
|---|---|
| Option Name: Transition RW 27 North Option 7 | ACCEPT |

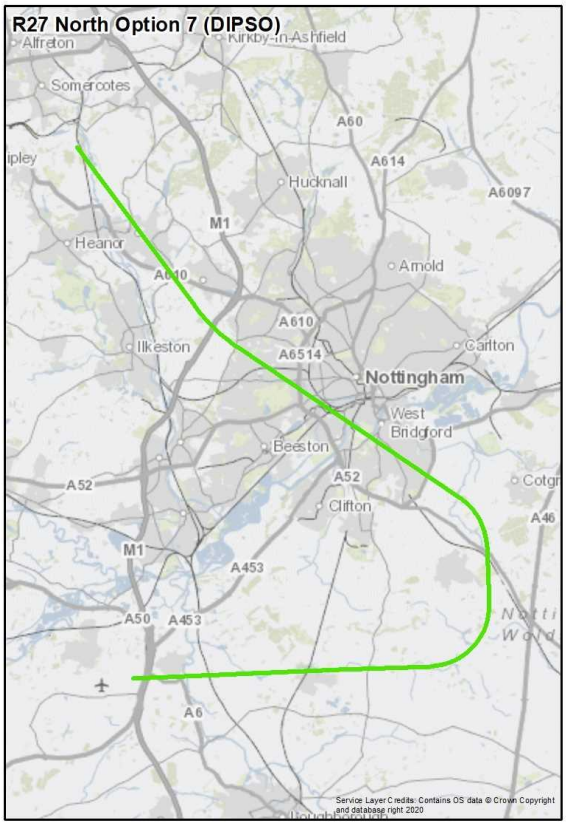
**Option Description:**

The IAF for this option is DIPSO and the style of the route is 'direct' which means the distance to the final approach has been minimised. It follows a similar track to Option 5 but routes slightly further south west over Nottingham.

The option starts at IAF DIPSO east of Ripley and initially tracks south east passing just south of Kimberley. Just west of Nottingham it makes a slight left turn and continues over central Nottingham until south of Gamston where the route turns south and routes east of Keyworth before turning left to join the extended runway centreline.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 2.57° which is within the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be better than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 7 is 48km (26nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is shorter in length and it is therefore anticipated that emissions would be better.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

25.0% of the area of the Option 7 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 7 is estimated to overfly approximately 7,350 households with an approximate population of 13,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 17,400.

From 7,000ft, Option 7 is estimated to overfly approximately 58,100 households with an approximate population of 120,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 126,300.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 7 is estimated to overfly 55 noise sensitive areas.

From 7,000ft, Option 7 is estimated to overfly 565 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.9 Transition Runway 27 North Option 8

| Design Principle Evaluation | Option No. 8 |
|---|---|
| Option Name: Transition RW 27 North Option 8 | ACCEPT |

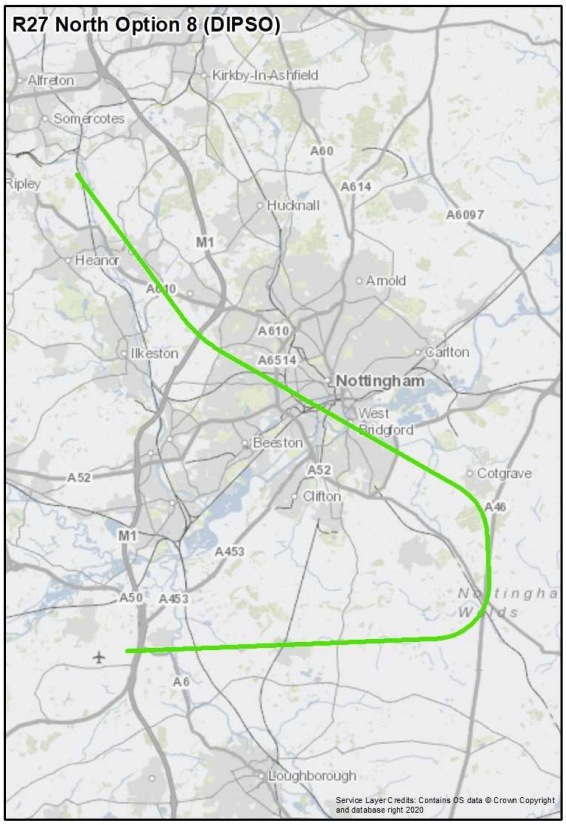
**Option Description:**

The IAF for this option is DIPSO and the style of the route is 'direct' which means the distance to the final approach has been minimised. It follows a similar route to Option 7 but routes further east before joining the final approach.

The option starts at IAF DIPSO east of Ripley and initially tracks south east passing just south of Kimberley. Just west of Nottingham it makes a slight left turn and continues over central Nottingham until overhead Cotgrave to the south east of Nottingham where the route turns south and routes east of Keyworth briefly following the line of the A46, before turning left to join the extended runway centreline.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (5nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 2.3° which is within the optimum range for low noise approaches and is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 8 is 52km (28nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

29.2% of the area of the Option 8 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 8 is estimated to overfly approximately 3,400 households with an approximate population of 6,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 14,700.

From 7,000ft, Option 8 is estimated to overfly approximately 67,550 households with an approximate population of 138,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 148,400.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 8 is estimated to overfly 40 noise sensitive areas.

From 7,000ft, Option 8 is estimated to overfly 735 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.10 Transition Runway 27 North Option 29

| Design Principle Evaluation | Option No. 29 |
|---|---|
| Option Name: Transition RW 27 North Option 29 | ACCEPT |

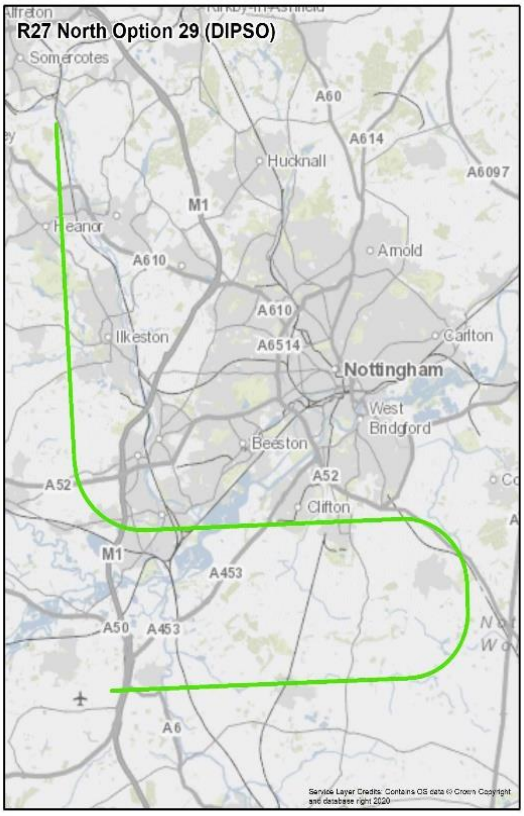
**Option Description:**

The IAF for this option is DIPSO and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route.

The option starts at IAF DIPSO, east of Ripley and tracks south between Heanor and Eastwood and west of Ilkeston and Nottingham. It then turns east to fly over Long Eaton and Clifton. To the south east of Nottingham the route turns south and routes east of Keyworth before turning left to join the extended runway centreline.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 2.1° which is close to the optimum range for low noise approaches and is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 29 is 56km (30nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

23.8% of the area of the Option 29 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 29 is estimated to overfly approximately 10,400 households with an approximate population of 19,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 25,900.

From 7,000ft, Option 29 is estimated to overfly approximately 44,400 households with an approximate population of 81,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 93,200.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 29 is estimated to overfly 100 noise sensitive areas.

From 7,000ft, Option 29 is estimated to overfly 290 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.11 Transition Runway 27 North Option 30

| Design Principle Evaluation | Option No. 30 |
|---|---|
| Option Name: Transition RW 27 North Option 30 | ACCEPT |

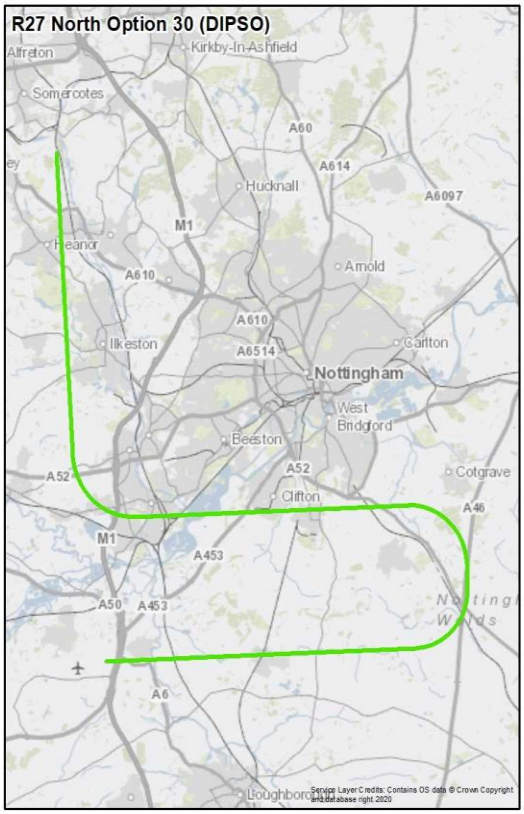
**Option Description:**

The IAF for this option is DIPSO and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route.

The option starts at IAF DIPSO, east of Ripley and tracks south between Heanor and Eastwood and west of Ilkeston and Nottingham. It then turns east to fly over Long Eaton and Clifton. It continues on this track until south west of Cotgrave to the south east of Nottingham where the route turns south and routes east of Keyworth briefly following the line of the A46, before turning left to join the extended runway centreline.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (5nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 1.9° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 30 is 60km (32nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

25.5% of the area of the Option 30 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 30 is estimated to overfly approximately 9,250 households with an approximate population of 17,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 20,100.

From 7,000ft, Option 30 is estimated to overfly approximately 45,600 households with an approximate population of 83,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 95,900.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 30 is estimated to overfly 90 noise sensitive areas.

From 7,000ft, Option 30 is estimated to overfly 285 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.12 Transition Runway 27 North DIPSO Summary

| | Option 5 | Option 6 | Option 7 | Option 8 | Option 29 | Option 30 |
|---|---|---|---|---|---|---|
| **S - Safety** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **P - Programme** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **C - Continuity** | MET | MET | MET | MET | MET | MET |
| **E - Emissions** | MET | PARTIAL | MET | PARTIAL | PARTIAL | PARTIAL |
| **N1 - Noise** | MET | MET | MET | MET | MET | MET |
| **N2 - Noise** | MET | NOT MET | NOT MET | MET | MET | MET |
| **N3 - Noise** | MET | MET | MET | MET | MET | MET |
| **N4 - Noise** | MET | MET | MET | MET | MET | MET |
| **A1 - Airspace** | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **A2 - Airspace** | MET | MET | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET | MET | MET |
| | Best | 4,000ft beneficial | 4,000ft beneficial | Best | Best | Best |

## 21.13 Transition Runway 27 North Option 9

| Design Principle Evaluation | Option No. 9 |
|---|---|
| Option Name: Transition RW 27 North Option 9 | ACCEPT |

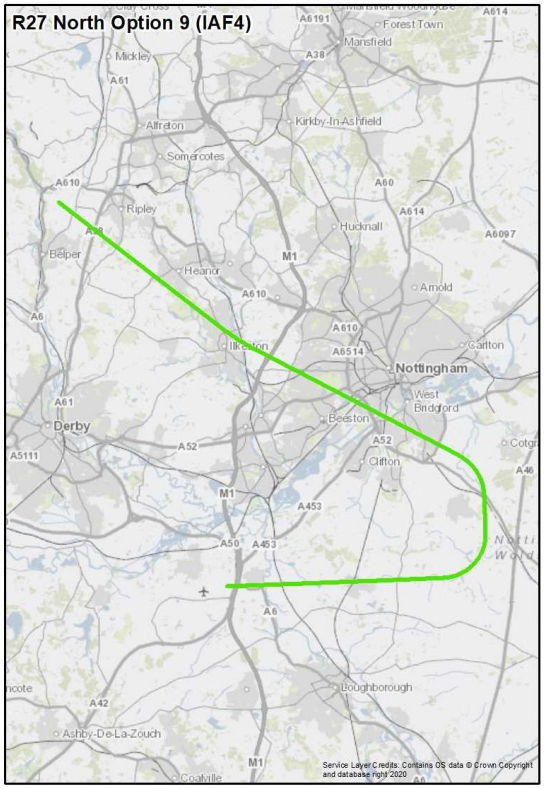
**Option Description:**

The IAF for this option is IAF4 and the style of the route is 'direct' which means the distance to the final approach has been minimised.

This option starts at IAF4 north of Belper from where it tracks south east passing between Belper and Ripley, turning slightly left over Ilkeston to over fly south west Nottingham. Once south east of Nottingham at a point south of Gamston the route turns south and routes east of Keyworth before turning left to join the extended runway centreline.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 2.17° which is close to the optimum range for low noise approaches and is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 9 is 54km (29nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

24.1% of the area of the Option 9 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 9 is estimated to overfly approximately 11,950 households with an approximate population of 22,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 25,700.

From 7,000ft, Option 9 is estimated to overfly approximately 48,150 households with an approximate population of 94,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 102,100.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 9 is estimated to overfly 100 noise sensitive areas.

From 7,000ft, Option 9 is estimated to overfly 395 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.14 Transition Runway 27 North Option 10

| Design Principle Evaluation | Option No. 10 |
|---|---|
| Option Name: Transition RW 27 North Option 10 | ACCEPT |

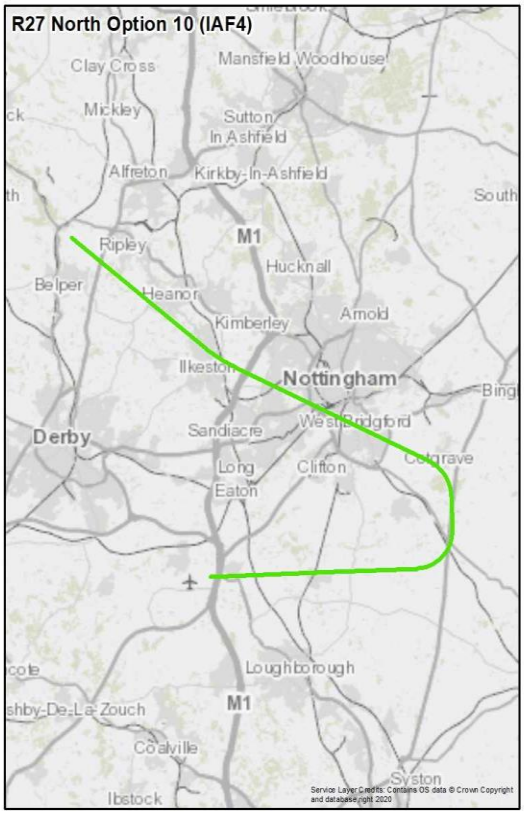
**Option Description:**

The IAF for this option is IAF4 and the style of the route is 'direct' which means the distance to the final approach has been minimised. It follows a similar route to Option 9 but routes further east before joining the final approach.

This option starts at IAF4 north of Belper from where it tracks south east passing between Belper and Ripley, turning slightly left over Ilkeston to over fly south west Nottingham. It continues on this track until overhead Cotgrave to the south east of Nottingham where the route turns south and routes east of Keyworth briefly following the line of the A46, before turning left to join the extended runway centreline.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (5nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 1.97° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 10 is 59km (32nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

25.7% of the area of the Option 10 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 10 is estimated to overfly approximately 14,200 households with an approximate population of 26,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 32,400.

From 7,000ft, Option 10 is estimated to overfly approximately 57,150 households with an approximate population of 114,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 123,600.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 10 is estimated to overfly 100 noise sensitive areas.

From 7,000ft, Option 10 is estimated to overfly 510 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.15 Transition Runway 27 North Option 25

| Design Principle Evaluation | Option No. 25 |
|---|---|
| Option Name: Transition RW 27 North Option 25 | ACCEPT |

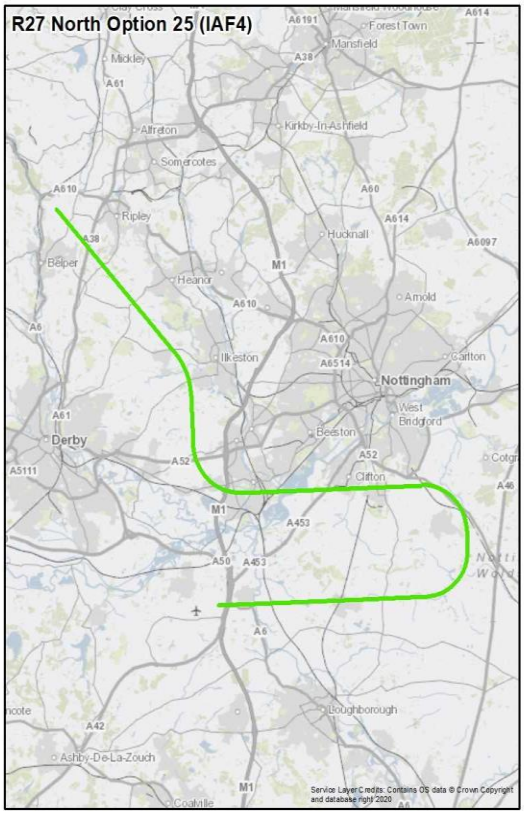
**Option Description:**

The IAF for this option is IAF4 and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route.

The option starts at IAF4 north of Belper and tracks south east between Belper and Ripley before turning south just west of Ilkeston and routing to the west of Nottingham. It then turns east to fly over Long Eaton and Clifton. To the south east of Nottingham the route turns south and routes east of Keyworth before turning left to join the extended runway centreline.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 1.95° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 25 is 59km (32nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

23.5% of the area of the Option 25 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 25 is estimated to overfly approximately 10,050 households with an approximate population of 18,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 24,800.

From 7,000ft, Option 25 is estimated to overfly approximately 38,600 households with an approximate population of 71,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 81,200.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 25 is estimated to overfly 90 noise sensitive areas.

From 7,000ft, Option 25 is estimated to overfly 225 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.16 Transition Runway 27 North Option 26

| Design Principle Evaluation | Option No. 26 |
|---|---|
| Option Name: Transition RW 27 North Option 26 | ACCEPT |

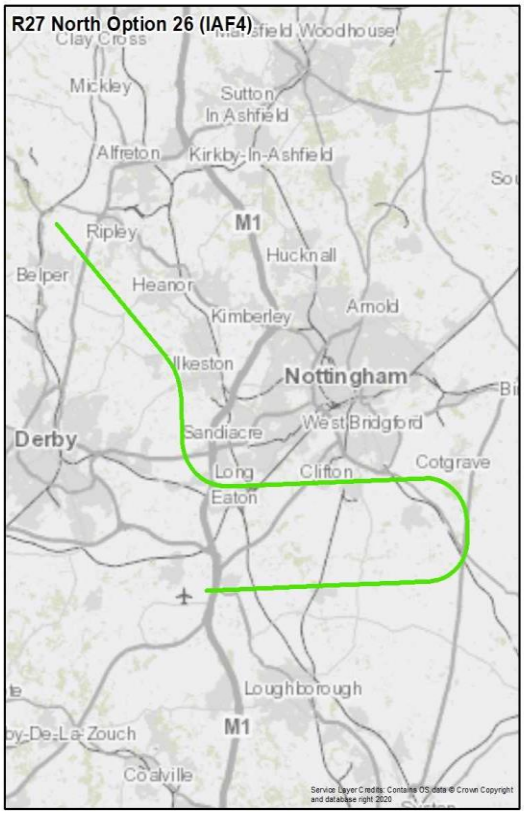
**Option Description:**

The IAF for this option is IAF4 and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route. It follows the same route as Option 25 but routes further east before joining the final approach.

The option starts at IAF4 north of Belper and tracks south east between Belper and Ripley before turning south just west of Ilkeston and routing to the west of Nottingham. It then turns east to fly over Long Eaton and Clifton. It continues on this track until south west of Cotgrave to the south east of Nottingham where the route turns south and routes east of Keyworth briefly following the line of the A46, before turning left to join the extended runway centreline.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (5nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 1.78° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 26 is 63km (34nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

25.3% of the area of the Option 26 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 26 is estimated to overfly approximately 10,350 households with an approximate population of 19,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 26,000.

From 7,000ft, Option 26 is estimated to overfly approximately 40,050 households with an approximate population of 73,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 84,400.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 26 is estimated to overfly 85 noise sensitive areas.

From 7,000ft, Option 26 is estimated to overfly 230 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.17 Transition Runway 27 North IAF4 Summary

| | Option 9 | Option 10 | Option 25 | Option 26 |
|---|---|---|---|---|
| **S - Safety** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **P - Programme** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **C - Continuity** | MET | MET | MET | MET |
| **E - Emissions** | PARTIAL | PARTIAL | PARTIAL | NOT MET |
| **N1 - Noise** | MET | MET | MET | MET |
| **N2 - Noise** | MET | MET | MET | MET |
| **N3 - Noise** | MET | MET | MET | MET |
| **N4 - Noise** | MET | MET | MET | MET |
| **A1 - Airspace** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **A2 - Airspace** | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET |
| | Best | Best | Best | Best |

## 21.18 Transition Runway 27 North Option 11

| Design Principle Evaluation | Option No. 11 |
|---|---|
| Option Name: Transition RW 27 North Option 11 | ACCEPT |

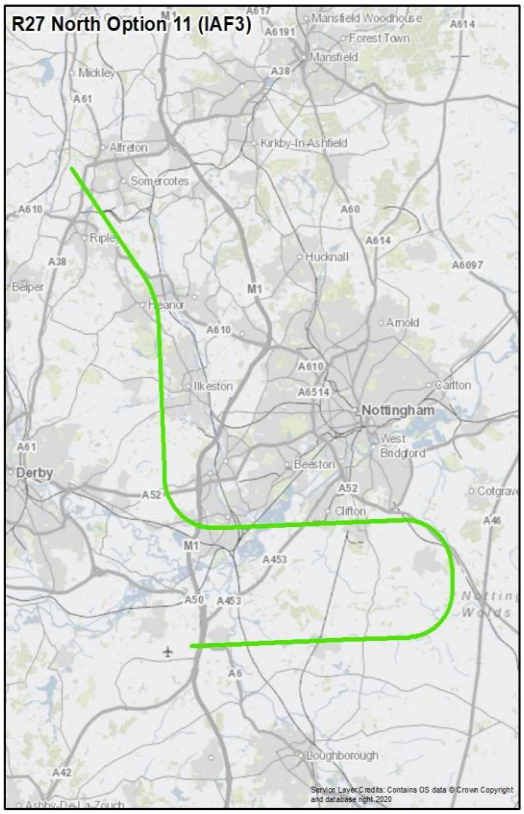
**Option Description:**

The IAF for this option is IAF3 and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route.

The option starts at IAF3 west of Alfreton from where it tracks south east turning south between Heanor and Eastwood and routing west of Ilkeston and Nottingham. It then turns east to fly over Long Eaton and Clifton. To the south east of Nottingham the route turns south and routes east of Keyworth before turning left to join the extended runway centreline.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 1.86° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 11 is 61km (33nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

26.8% of the area of the Option 11 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 11 is estimated to overfly approximately 11,100 households with an approximate population of 20,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 26,400.

From 7,000ft, Option 11 is estimated to overfly approximately 49,550 households with an approximate population of 90,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 104,700.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 11 is estimated to overfly 80 noise sensitive areas.

From 7,000ft, Option 11 is estimated to overfly 310 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.19 Transition Runway 27 North Option 12

| Design Principle Evaluation | Option No. 12 |
|---|---|
| Option Name: Transition RW 27 North Option 12 | ACCEPT |

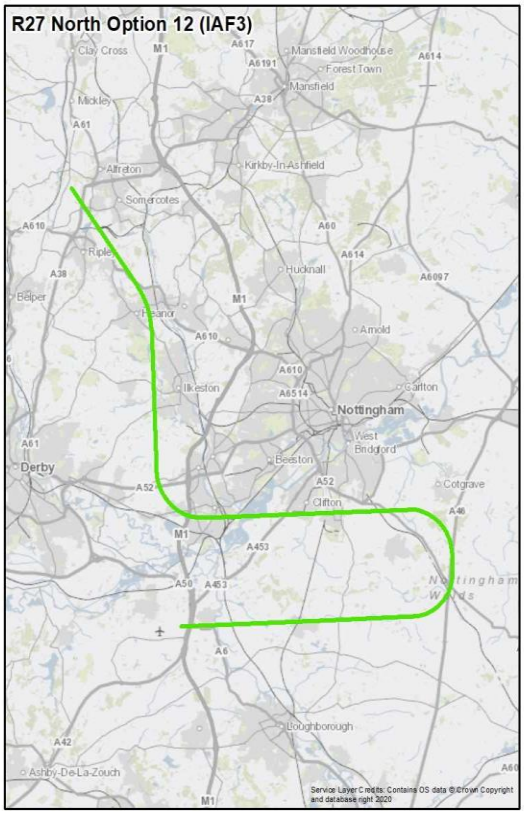
**Option Description:**

The IAF for this option is IAF3 and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route. It follows the same route as Option 11 but routes further east before joining the final approach.

The option starts at IAF3 west of Alfreton from where it tracks south east turning south between Heanor and Eastwood and routing west of Ilkeston and Nottingham. It then turns east to fly over Long Eaton and Clifton. It continues on this track until south west of Cotgrave to the south east of Nottingham where the route turns south and routes east of Keyworth briefly following the line of the A46, before turning left to join the extended runway centreline.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (5nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 1.71° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 12 is 65km (35nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

28.0% of the area of the Option 12 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 12 is estimated to overfly approximately 10,150 households with an approximate population of 18,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 25,400.

From 7,000ft, Option 12 is estimated to overfly approximately 51,250 households with an approximate population of 93,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 108,400.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 12 is estimated to overfly 85 noise sensitive areas.

From 7,000ft, Option 12 is estimated to overfly 320 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.20 Transition Runway 27 North Option 23

| Design Principle Evaluation | Option No. 23 |
|---|---|
| Option Name: Transition RW 27 North Option 23 | ACCEPT |

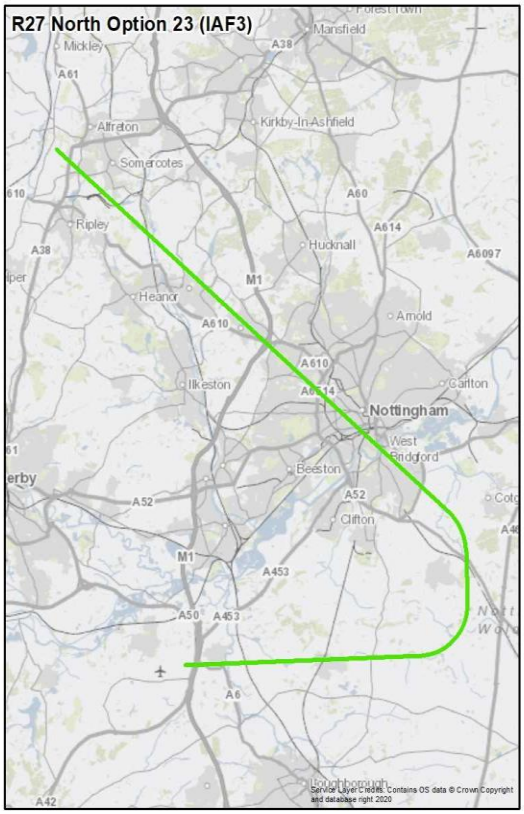
**Option Description:**

The IAF for this option is IAF3 and the style of the route is 'direct' which means the distance to the final approach has been minimised.

The option starts at IAF3 west of Alfreton and initially tracks south east over Eastwood, Kimberley, and central Nottingham. It continues on this track until south of Gamston where the route turns south and routes east of Keyworth before turning left to join the extended runway centreline.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 2.19° which is close to the optimum range for low noise approaches and is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 23 is 54km (29nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

26.4% of the area of the Option 23 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 23 is estimated to overfly approximately 20,100 households with an approximate population of 38,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 42,300.

From 7,000ft, Option 23 is estimated to overfly approximately 79,000 households with an approximate population of 160,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 167,700.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 23 is estimated to overfly 215 noise sensitive areas.

From 7,000ft, Option 23 is estimated to overfly 875 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.21 Transition Runway 27 North Option 24

| Design Principle Evaluation | Option No. 24 |
|---|---|
| Option Name: Transition RW 27 North Option 24 | ACCEPT |

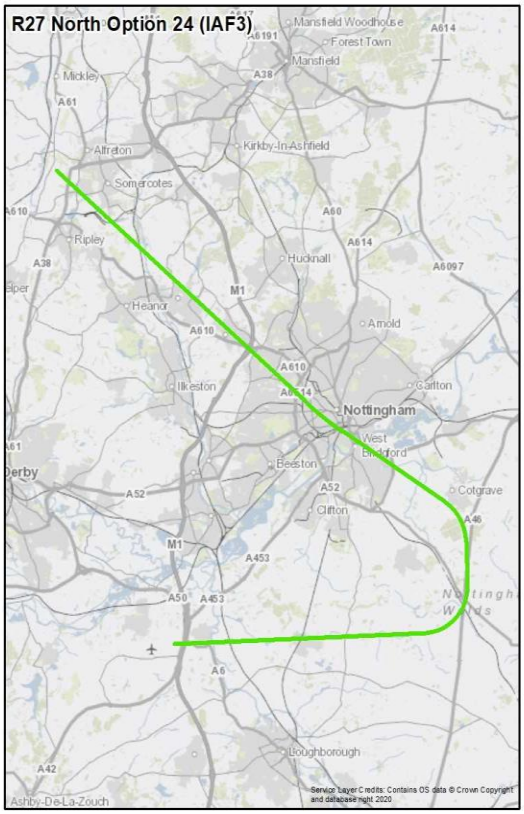
**Option Description:**

The IAF for this option is IAF3 and the style of the route is 'direct' which means the distance to the final approach has been minimised. It follows the same route as Option 23 but routes further east before joining the final approach.

The option starts at IAF3 west of Alfreton and initially tracks south east over Eastwood, Kimberley, and central Nottingham. It continues on this track until overhead Cotgrave to the south east of Nottingham where the route turns south and routes east of Keyworth briefly following the line of the A46, before turning left to join the extended runway centreline.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (5nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 2° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 24 is 58km (31nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

29.7% of the area of the Option 24 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 24 is estimated to overfly approximately 12,350 households with an approximate population of 23,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 31,200.

From 7,000ft, Option 24 is estimated to overfly approximately 82,150 households with an approximate population of 167,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 178,400.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 24 is estimated to overfly 100 noise sensitive areas.

From 7,000ft, Option 24 is estimated to overfly 915 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.22 Transition Runway 27 North IAF3 Summary

| | Option 11 | Option 12 | Option 23 | Option 24 |
|---|---|---|---|---|
| **S - Safety** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **P - Programme** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **C - Continuity** | MET | MET | MET | MET |
| **E - Emissions** | NOT MET | NOT MET | PARTIAL | PARTIAL |
| **N1 - Noise** | MET | MET | MET | MET |
| **N2 - Noise** | MET | MET | MET | MET |
| **N3 - Noise** | MET | MET | MET | MET |
| **N4 - Noise** | MET | MET | MET | MET |
| **A1 - Airspace** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **A2 - Airspace** | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET |
| | Best | Best | Best | Best |

## 21.23 Transition Runway 27 North Option 13

| Design Principle Evaluation | Option No. 13 |
|---|---|
| Option Name: Transition RW 27 North Option 13 | ACCEPT |

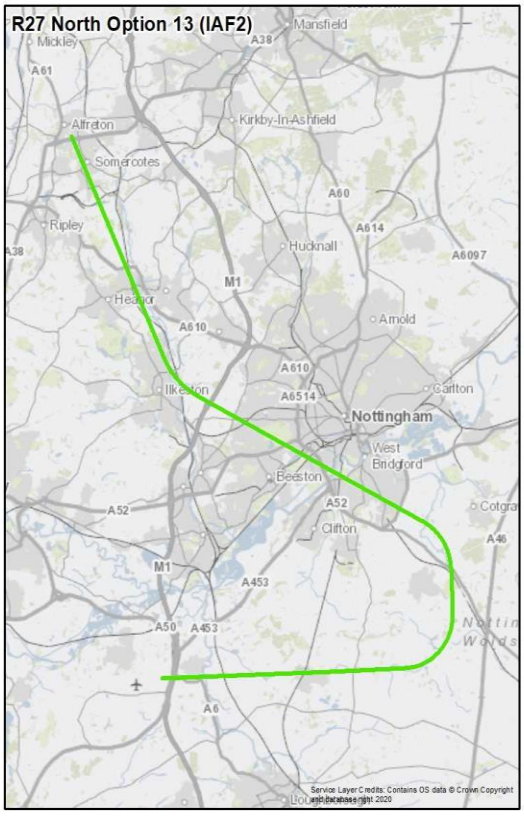
**Option Description:**

The IAF for this option is IAF2 and the style of the route is 'direct' which means the distance to the final approach has been minimised.

The option starts at IAF2 near Alfreton and tracks south east between Heanor and Eastwood and overflies the eastern side of Ilkeston where it turns slightly left. It then passes over south west Nottingham and continues on this track until south east of Nottingham to a point south of Gamston. At this point the route turns south and routes east of Keyworth before turning left to join the extended runway centreline.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 2.18° which is close to the optimum range for low noise approaches and is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 13 is 54km (29nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

27.0% of the area of the Option 13 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 13 is estimated to overfly approximately 12,000 households with an approximate population of 22,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 25,900.

From 7,000ft, Option 13 is estimated to overfly approximately 55,100 households with an approximate population of 106,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 117,300.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 13 is estimated to overfly 100 noise sensitive areas.

From 7,000ft, Option 13 is estimated to overfly 430 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.24 Transition Runway 27 North Option 14

| Design Principle Evaluation | Option No. 14 |
|---|---|
| Option Name: Transition RW 27 North Option 14 | ACCEPT |

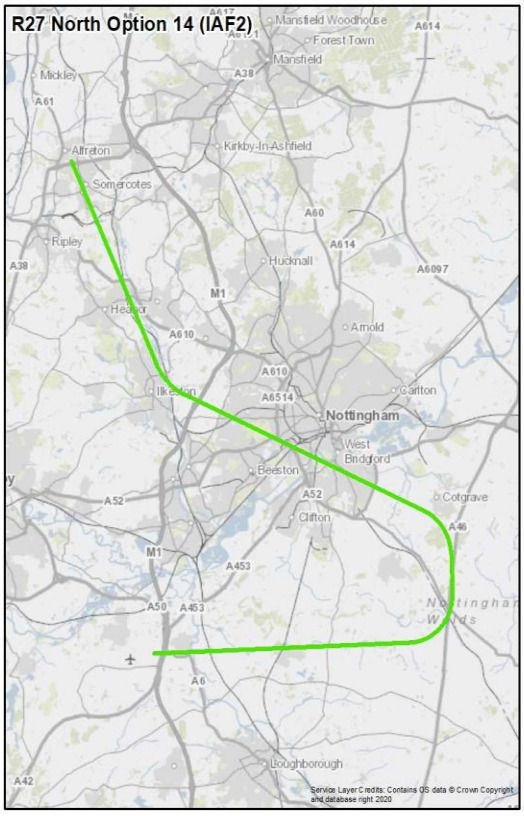
**Option Description:**

The IAF for this option is IAF2 and the style of the route is 'direct' which means the distance to the final approach has been minimised. It follows a similar route as Option 13 but routes further east before joining the final approach.

The option starts at IAF2 near Alfreton and tracks south east between Heanor and Eastwood and overflies the eastern side of Ilkeston where it turns slightly left. It then passes over south west Nottingham and continues on this track until overhead Cotgrave to the south east of Nottingham where the route turns south and routes east of Keyworth, briefly following the line of the A46, before turning left to join the extended runway centreline.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (5nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 1.99° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 14 is 58km (31nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

28.5% of the area of the Option 14 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 14 is estimated to overfly approximately 14,150 households with an approximate population of 26,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 32,300.

From 7,000ft, Option 14 is estimated to overfly approximately 64,000 households with an approximate population of 125,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 138,600.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 14 is estimated to overfly 105 noise sensitive areas.

From 7,000ft, Option 14 is estimated to overfly 545 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.25 Transition Runway 27 North Option 21

| Design Principle Evaluation | Option No. 21 |
|---|---|
| Option Name: Transition RW 27 North Option 21 | ACCEPT |

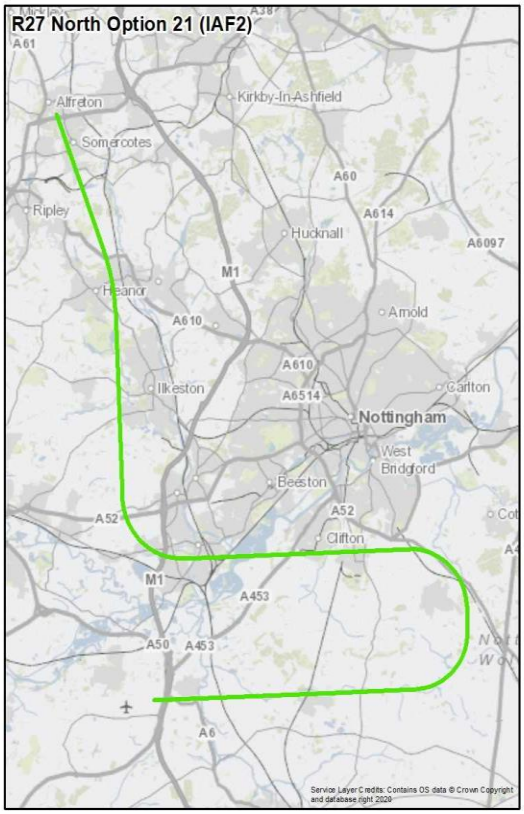
**Option Description:**

The IAF for this option is IAF2 and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route.

The option starts at IAF2 near Alfreton from where it tracks south east turning south between Heanor and Eastwood and routing west of Ilkeston and Nottingham. It then turns east to fly over Long Eaton and Clifton. To the south east of Nottingham the route turns south and routes east of Keyworth before turning left to join the extended runway centreline.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 1.89° which is within the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 21 is 61km (33nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

24.2% of the area of the Option 21 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 21 is estimated to overfly approximately 10,350 households with an approximate population of 19,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 25,100.

From 7,000ft, Option 21 is estimated to overfly approximately 51,250 households with an approximate population of 93,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 107,800.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 21 is estimated to overfly 80 noise sensitive areas.

From 7,000ft, Option 21 is estimated to overfly 335 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.26 Transition Runway 27 North Option 22

| Design Principle Evaluation | Option No. 22 |
|---|---|
| Option Name: Transition RW 27 North Option 22 | ACCEPT |

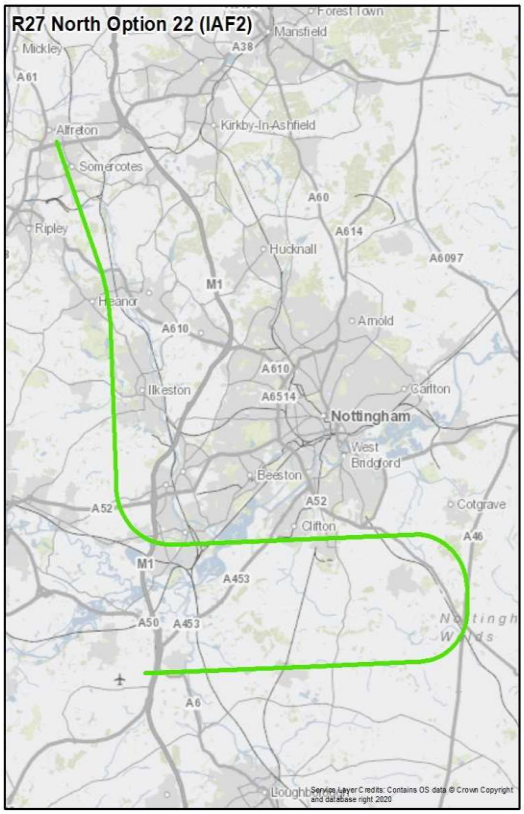
**Option Description:**

The IAF for this option is IAF2 and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route. It follows the same route as Option 21 but routes further east before joining the final approach.

The option starts at IAF2 near Alfreton from where it tracks south east turning south between Heanor and Eastwood and routing west of Ilkeston and Nottingham. It then turns east to fly over Long Eaton and Clifton. It continues on this track until south west of Cotgrave to the south east of Nottingham where the route turns south and routes east of Keyworth briefly following the line of the A46, before turning left to join the extended runway centreline.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (5nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 1.72° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 22 is 65km (35nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

25.7% of the area of the Option 22 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 22 is estimated to overfly approximately 10,250 households with an approximate population of 18,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 25,600.

From 7,000ft, Option 22 is estimated to overfly approximately 53,050 households with an approximate population of 96,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 111,700.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 22 is estimated to overfly 85 noise sensitive areas.

From 7,000ft, Option 22 is estimated to overfly 345 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.27 Transition Runway 27 North IAF2 Summary

| | Option 13 | Option 14 | Option 21 | Option 22 |
|---|---|---|---|---|
| **S - Safety** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **P - Programme** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **C - Continuity** | MET | MET | MET | MET |
| **E - Emissions** | PARTIAL | PARTIAL | PARTIAL | NOT MET |
| **N1 - Noise** | MET | MET | MET | MET |
| **N2 - Noise** | MET | MET | MET | MET |
| **N3 - Noise** | MET | MET | MET | MET |
| **N4 - Noise** | MET | MET | MET | MET |
| **A1 - Airspace** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **A2 - Airspace** | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET |
| | Best | Best | Best | Best |

## 21.28 Transition Runway 27 North Option 15

| Design Principle Evaluation | Option No. 15 |
|---|---|
| Option Name: Transition RW 27 North Option 15 | ACCEPT |

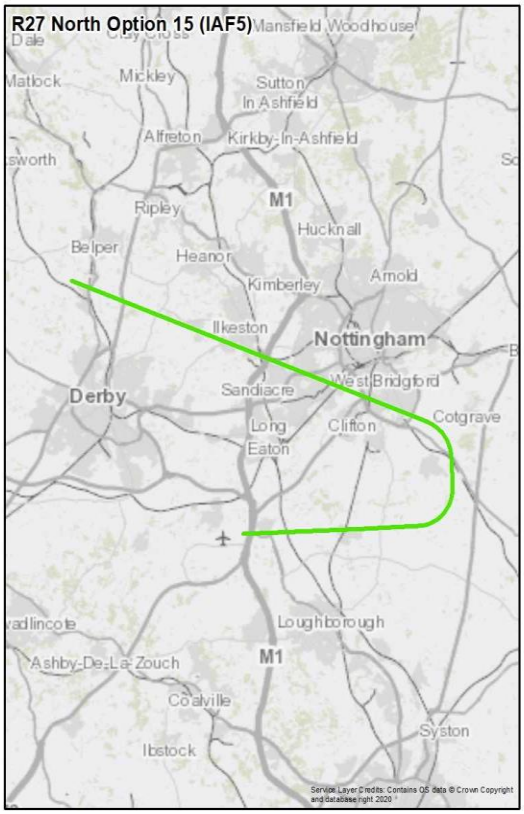
**Option Description:**

The IAF for this option is IAF5 and the style of the route is 'direct' which means the distance to the final approach has been minimised.

This option starts at IAF5 north of Duffield and initially tracks south east passing south of Ilkeston and routing over south west Nottingham. It continues on this track until south of Gamston where the route turns south and routes east of Keyworth before turning left to join the extended runway centreline.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 2.19° which is close to the optimum range for low noise approaches and is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 15 is 54km (29nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

27.6% of the area of the Option 15 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 15 is estimated to overfly approximately 10,500 households with an approximate population of 20,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 24,300.

From 7,000ft, Option 15 is estimated to overfly approximately 42,350 households with an approximate population of 83,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 99,700.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 15 is estimated to overfly 65 noise sensitive areas.

From 7,000ft, Option 15 is estimated to overfly 255 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.29 Transition Runway 27 North Option 16

| Design Principle Evaluation | Option No. 16 |
|---|---|
| Option Name: Transition RW 27 North Option 16 | ACCEPT |

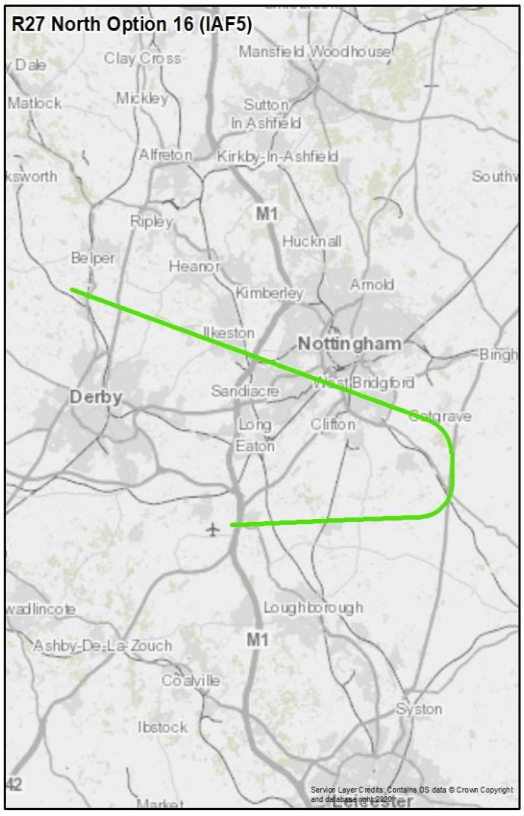
**Option Description:**

The IAF for this option is IAF5 and the style of the route is 'direct' which means the distance to the final approach has been minimised. It follows a similar route as Option 15 but routes further east before joining the final approach.

This option starts at IAF5 north of Duffield and initially tracks south east passing south of Ilkeston and routing over south west Nottingham. It continues on this track until Cotgrave to the south east of Nottingham where the route turns south and routes east of Keyworth briefly following the line of the A46, before turning left to join the extended runway centreline.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (5nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 1.98° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 16 is 58km (31nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

27.4% of the area of the Option 16 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 16 is estimated to overfly approximately 12,650 households with an approximate population of 24,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 29,300.

From 7,000ft, Option 16 is estimated to overfly approximately 45,700 households with an approximate population of 91,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 107,200.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 16 is estimated to overfly 80 noise sensitive areas.

From 7,000ft, Option 16 is estimated to overfly 305 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.30 Transition Runway 27 North Option 27

| Design Principle Evaluation | Option No. 27 |
|---|---|
| Option Name: Transition RW 27 North Option 27 | ACCEPT |

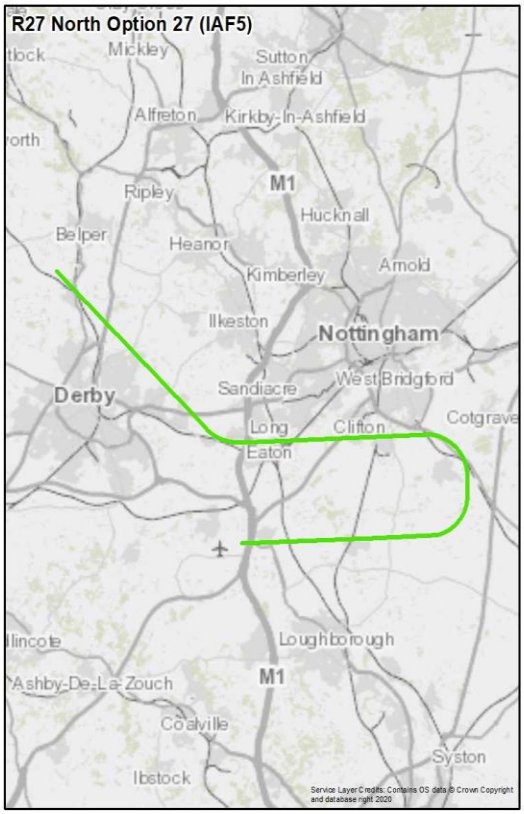
**Option Description:**

The IAF for this option is IAF5 and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route.

The option starts at IAF5 north of Duffield and initially tracks south east, just north of Derby. Close to Draycott the route turns left to head east passing over Long Eaton and Ruddington, and to the south east of Nottingham the route turns south and routes east of Keyworth before turning left to join the extended runway centreline.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 2.09° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 27 is 56km (30nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

27.1% of the area of the Option 27 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 27 is estimated to overfly approximately 10,350 households with an approximate population of 19,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 25,800.

From 7,000ft, Option 27 is estimated to overfly approximately 42,850 households with an approximate population of 78,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 87,800.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 27 is estimated to overfly 100 noise sensitive areas.

From 7,000ft, Option 27 is estimated to overfly 260 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.31 Transition Runway 27 North Option 28

| Design Principle Evaluation | Option No. 28 |
|---|---|
| Option Name: Transition RW 27 North Option 28 | ACCEPT |

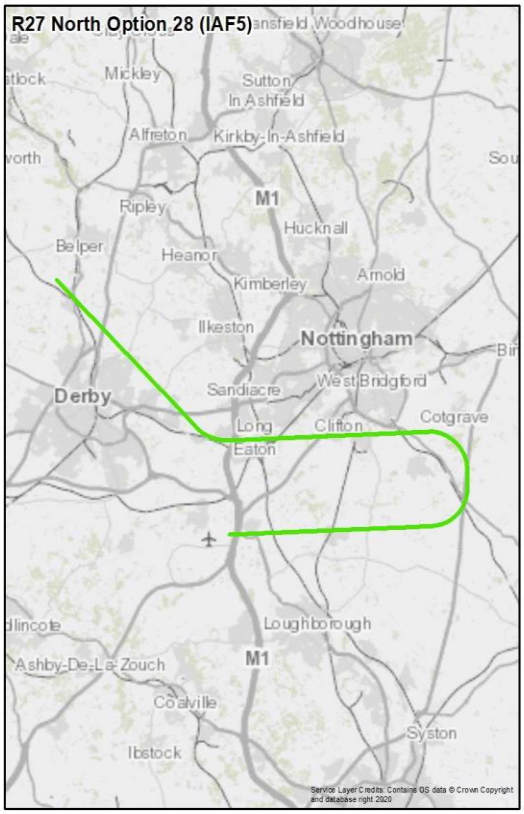
**Option Description:**

The IAF for this option is IAF5 and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route. It follows the same route as Option 27 but routes further east before joining the final approach.

This option starts at IAF5 north of Duffield and initially tracks south east, just north of Derby. Close to Draycott the route turns left to head east passing over Long Eaton and Ruddington. It continues on this track until south west of Cotgrave to the south east of Nottingham where the route turns south and routes east of Keyworth briefly following the line of the A46, before turning left to join the extended runway centreline.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (5nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 1.89° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 28 is 60km (32nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

28.6% of the area of the Option 28 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 28 is estimated to overfly approximately 9,550 households with an approximate population of 17,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 21,000.

From 7,000ft, Option 28 is estimated to overfly approximately 44,250 households with an approximate population of 81,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 90,900.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 28 is estimated to overfly 90 noise sensitive areas.

From 7,000ft, Option 28 is estimated to overfly 255 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.32 Transition Runway 27 North IAF5 Summary

| | Option 15 | Option 16 | Option 27 | Option 28 |
|---|---|---|---|---|
| **S - Safety** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **P - Programme** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **C - Continuity** | MET | MET | MET | MET |
| **E - Emissions** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **N1 - Noise** | MET | MET | MET | MET |
| **N2 - Noise** | MET | MET | MET | MET |
| **N3 - Noise** | MET | MET | MET | MET |
| **N4 - Noise** | MET | MET | MET | MET |
| **A1 - Airspace** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **A2 - Airspace** | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET |
| | Best | Best | Best | Best |

## 21.33 Transition Runway 27 North Option 17

| Design Principle Evaluation | Option No. 17 |
|---|---|
| Option Name: Transition RW 27 North Option 17 | ACCEPT |

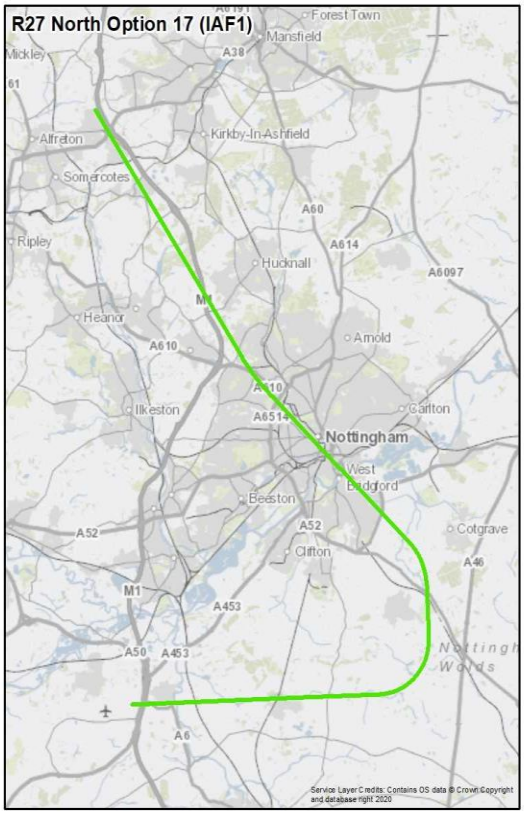
**Option Description:**

The IAF for this option is IAF1 and the style of the route is 'direct' which means the distance to the final approach has been minimised.

The option starts at IAF1 west of Sutton-in-Ashfield and tracks south east following the line of the M1 motorway, passing between Hucknall and Kimberley. It then makes a slight left turn passing over central Nottingham and continues on this track until south of Gamston where the route turns south and routes east of Keyworth before turning left to join the extended runway centreline.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 2.3° which is within the optimum range for low noise approaches and is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 17 is 52km (28nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

47.2% of the area of the Option 17 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 17 is estimated to overfly approximately 14,750 households with an approximate population of 28,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 33,500.

From 7,000ft, Option 17 is estimated to overfly approximately 78,200 households with an approximate population of 157,400. Taking account of planned property developments, this option is estimated to impact an approximate total population of 167,100.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 17 is estimated to overfly 125 noise sensitive areas.

From 7,000ft, Option 17 is estimated to overfly 955 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.34 Transition Runway 27 North Option 18

| Design Principle Evaluation | Option No. 18 |
|---|---|
| Option Name: Transition RW 27 North Option 18 | ACCEPT |

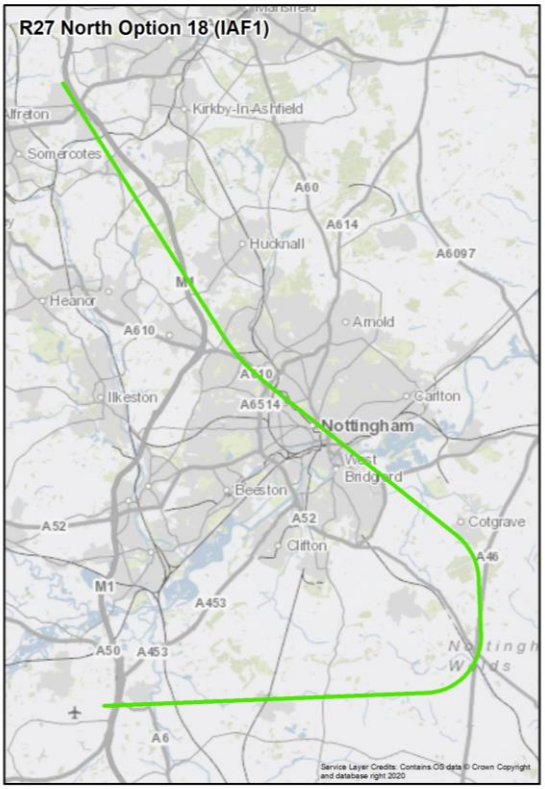
**Option Description:**

The IAF for this option is IAF1 and the style of the route is 'direct' which means the distance to the final approach has been minimised. It follows a similar route as Option 17 but routes further east before joining the final approach.

The option starts at IAF1 west of Sutton-in-Ashfield and tracks south east following the line of the M1 motorway, passing between Hucknall and Kimberley. It then makes a slight left turn passing over central Nottingham and continues on this track until overhead Cotgrave to the south east of Nottingham where the route turns south and routes east of Keyworth briefly following the line of the A46, before turning left to join the extended runway centreline.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (5nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 2.08° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be better than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 18 is 47km (25nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is shorter in length and it is therefore anticipated that emissions would be better.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

56.0% of the area of the Option 18 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 18 is estimated to overfly approximately 28,900 households with an approximate population of 60,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 66,000.

From 7,000ft, Option 18 is estimated to overfly approximately 69,550 households with an approximate population of 137,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 146,700.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 18 is estimated to overfly 510 noise sensitive areas.

From 7,000ft, Option 18 is estimated to overfly 900 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.35 Transition Runway 27 North Option 19

| Design Principle Evaluation | Option No. 19 |
|---|---|
| Option Name: Transition RW 27 North Option 19 | ACCEPT |

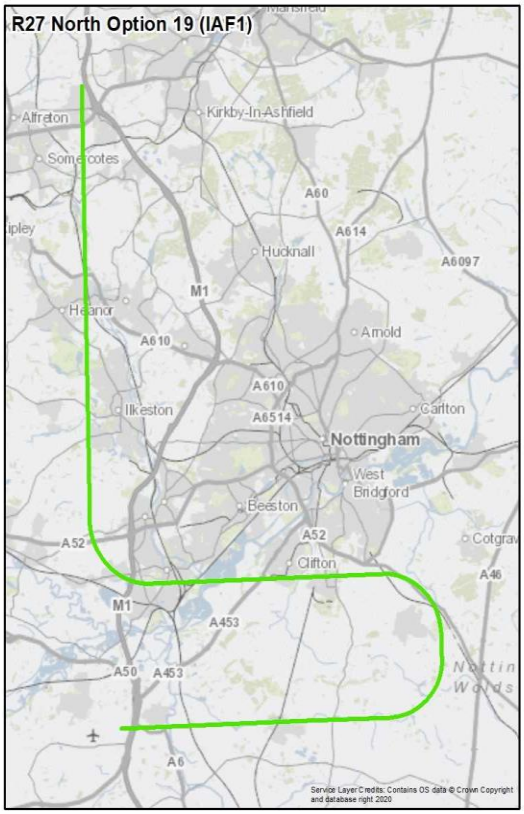
**Option Description:**

The IAF for this option is IAF1 and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route.

The option starts at IAF1 west of Sutton-in-Ashfield and tracks south passing over Heanor and routing west of Ilkeston and Nottingham. It then turns east to fly over Long Eaton and Clifton. To the south east of Nottingham the route turns south and routes east of Keyworth before turning left to join the extended runway centreline.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 1.82° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 19 is 62km (33nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

30.6% of the area of the Option 19 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 19 is estimated to overfly approximately 12,850 households with an approximate population of 23,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 28,900.

From 7,000ft, Option 19 is estimated to overfly approximately 50,650 households with an approximate population of 93,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 105,900.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 19 is estimated to overfly 90 noise sensitive areas.

From 7,000ft, Option 19 is estimated to overfly 300 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.36 Transition Runway 27 North Option 20

| Design Principle Evaluation | Option No. 20 |
|---|---|
| Option Name: Transition RW 27 North Option 20 | ACCEPT |

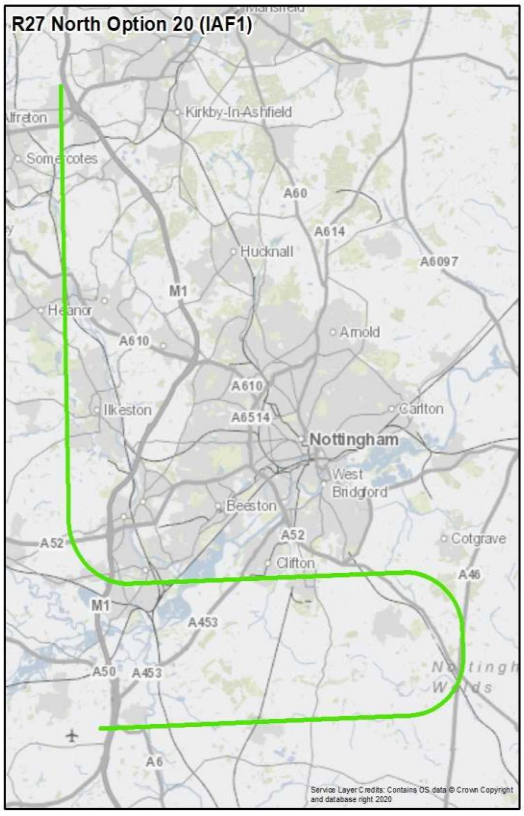
**Option Description:**

The IAF for this option is IAF1 and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route. It follows the same route as Option 19 but routes further east before joining the final approach.

The option starts at IAF1 west of Sutton-in-Ashfield and tracks south passing over Heanor and routing west of Ilkeston and Nottingham and then turns east to fly over Long Eaton and Clifton. It continues on this track until south west of Cotgrave to the south east of Nottingham where the route turns south and routes east of Keyworth briefly following the line of the A46, before turning left to join the extended runway centreline.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (5nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 1.67° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 20 is 66km (36nm). When compared to the 'do nothing' baseline (55km (30nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

31.5% of the area of the Option 20 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 20 is estimated to overfly approximately 10,100 households with an approximate population of 18,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 25,100.

From 7,000ft, Option 20 is estimated to overfly approximately 52,200 households with an approximate population of 95,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 109,500.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 20 is estimated to overfly 85 noise sensitive areas.

From 7,000ft, Option 20 is estimated to overfly 310 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 21.37 Transition Runway 27 North IAF1 Summary

| | Option 17 | Option 18 | Option 19 | Option 20 |
|---|---|---|---|---|
| **S - Safety** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **P - Programme** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **C - Continuity** | MET | MET | MET | MET |
| **E - Emissions** | PARTIAL | MET | NOT MET | NOT MET |
| **N1 - Noise** | MET | MET | MET | MET |
| **N2 - Noise** | MET | MET | MET | MET |
| **N3 - Noise** | MET | MET | MET | MET |
| **N4 - Noise** | MET | MET | MET | MET |
| **A1 - Airspace** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **A2 - Airspace** | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET |
| | Best | Best | Best | Best |

# 22 Transitions Runway 27 South

## 22.1 Transition Runway 27 South Option 1

| Design Principle Evaluation | Option No. 1 |
|---|---|
| Option Name: Transition RW 27 South Option 1 | ACCEPT |

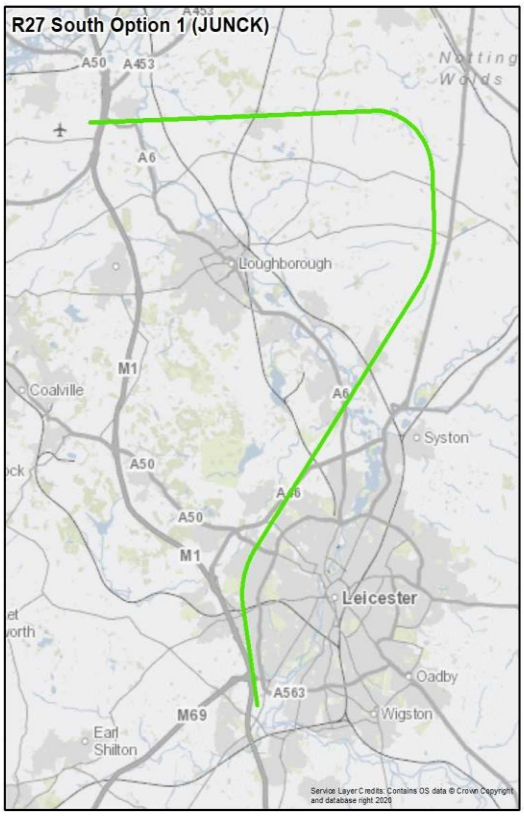
**Option Description:**

The IAF for this option is JUNCK and the style of the route is 'direct' which means the distance to the final approach has been minimised.

The option starts at IAF JUNCK, southwest of Leicester and initially tracks north following the M1 motorway over west Leicester before turning right to head north east over north west Leicester, Rothley and Sileby. It turns left to head north and parallel the A46 just north of Seagrave to the east of Loughborough, before turning left to join the extended runway centreline north east of the Wymeswold solar farm.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 2.77° which is close to the optimum range for low noise approaches and is within the acceptable range for CDAs defined within ICAO guidance.



| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be better than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 1 is 46km (25nm). When compared to the 'do nothing' baseline (53km (29nm)) this option is shorter in length and it is therefore anticipated that emissions would be better.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

43.5% of the area of the Option 1 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 1 is estimated to overfly approximately 1,650 households with an approximate population of 3,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 6,500.

From 7,000ft, Option 1 is estimated to overfly approximately 41,450 households with an approximate population of 78,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 100,300.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 1 is estimated to overfly 30 noise sensitive areas.

From 7,000ft, Option 1 is estimated to overfly 200 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 22.2 Transition Runway 27 South Option 2

| Design Principle Evaluation | Option No. 2 |
|---|---|
| Option Name: Transition RW 27 South Option 2 | ACCEPT |

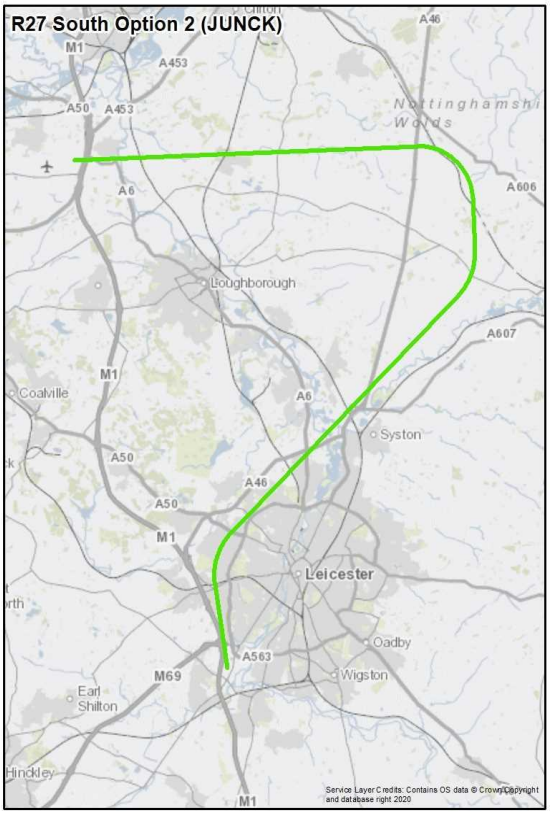
**Option Description:**

The IAF for this option is JUNCK and the style of the route is 'direct' which means the distance to the final approach has been minimised. It follows a similar route to Option 1 but routes further east before joining the final approach.

The option starts at IAF JUNCK, southwest of Leicester and initially tracks north following the M1 motorway over west Leicester before turning right to head north east over north west Leicester, and north west of Syston. To the west of Melton Mowbray the route turns north before turning left to join the extended runway centreline close to Upper Broughton.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (6.3nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 2.23° which is close to the optimum range for low noise approaches and is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 2 is 53km (29nm). When compared to the 'do nothing' baseline (53km (29nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

37.8% of the area of the Option 2 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 2 is estimated to overfly approximately 1,450 households with an approximate population of 2,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 2,900.

From 7,000ft, Option 2 is estimated to overfly approximately 42,250 households with an approximate population of 80,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 97,100.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 2 is estimated to overfly 25 noise sensitive areas.

From 7,000ft, Option 2 is estimated to overfly 205 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 22.3 Transition Runway 27 South Option 3

| Design Principle Evaluation | Option No. 3 |
|---|---|
| Option Name: Transition RW 27 South Option 3 | REJECT |

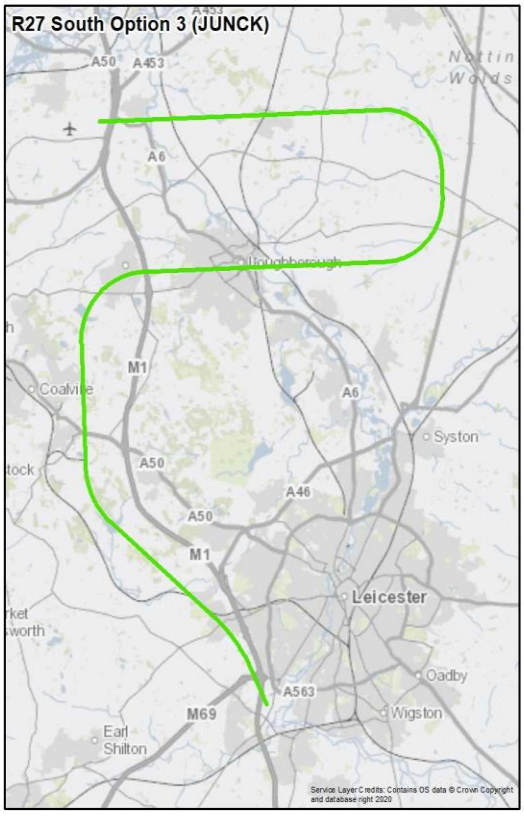
**Option Description:**

The IAF for this option is JUNCK and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route.

The option starts at IAF JUNCK, southwest of Leicester and initially follows the line of the M1 before turning north to pass the eastern edge of Coalville. To the south west of Shepshed the route turns east passing over Shepshed and central Loughborough and it continues on this track until just north of Seagrave to the east of Loughborough, where it turns left and then left again to join the extended runway centreline north east of the Wymeswold solar farm.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 1.86° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 3 is 61km (33nm). When compared to the 'do nothing' baseline (53km (29nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

40.9% of the area of the Option 3 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 3 is estimated to overfly approximately 15,550 households with an approximate population of 39,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 40,100.

From 7,000ft, Option 3 is estimated to overfly approximately 42,200 households with an approximate population of 88,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 108,600.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | PARTIAL |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 3 is estimated to overfly 155 noise sensitive areas.

From 7,000ft, Option 3 is estimated to overfly 270 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 22.4 Transition Runway 27 South Option 4

| Design Principle Evaluation | Option No. 4 |
|---|---|
| Option Name: Transition RW 27 South Option 4 | ACCEPT |

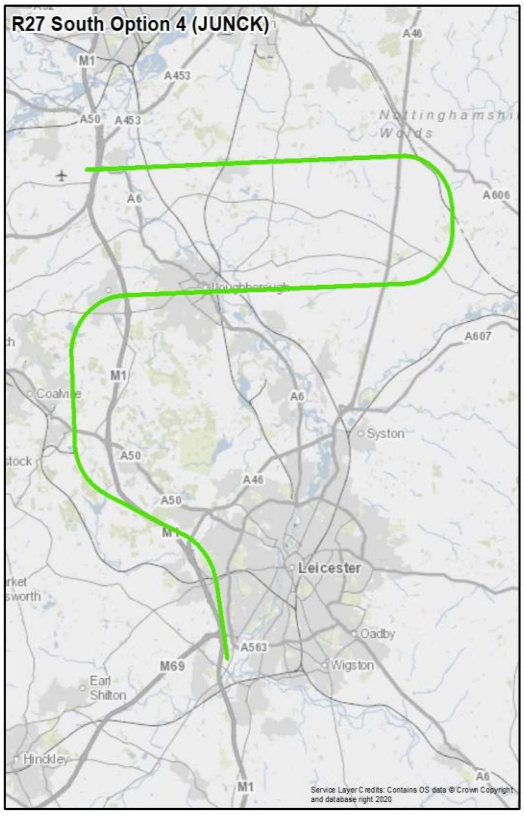
**Option Description:**

The IAF for this option is JUNCK and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route. It follows a similar profile to Option 3 but routes further east before joining the final approach.

The option starts at IAF JUNCK, southwest of Leicester and initially follows the line of the M1 over Leicester Forest East services before turning north to pass the eastern edge of Coalville. To the south west of Shepshed the route turns east passing over Shepshed and central Loughborough and it continues on this track until west of Melton Mowbray where it turns left and then left again to join the extended runway centreline close to Upper Broughton.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (6.3nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 1.53° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 4 is 71km (38nm). When compared to the 'do nothing' baseline (53km (29nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

40.9% of the area of the Option 4 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 4 is estimated to overfly approximately 4,550 households with an approximate population of 8,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 11,000.

From 7,000ft, Option 4 is estimated to overfly approximately 55,300 households with an approximate population of 113,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 134,300.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 4 is estimated to overfly 45 noise sensitive areas.

From 7,000ft, Option 4 is estimated to overfly 315 noise sensitive areas.

This is a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 22.5 Transition Runway 27 South Option 7

| Design Principle Evaluation | Option No. 7 |
|---|---|
| Option Name: Transition RW 27 South Option 7 | ACCEPT |

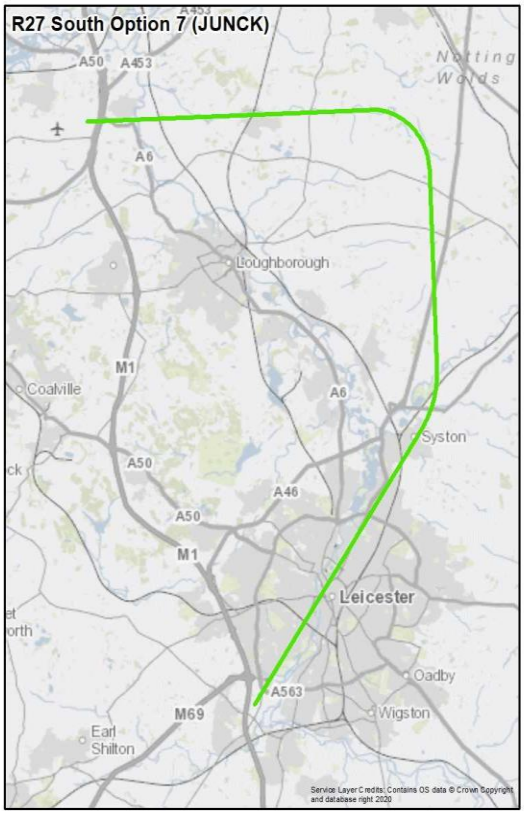
**Option Description:**

The IAF for this option is JUNCK and the style of the route is 'direct' which means the distance to the final approach has been minimised.

The option starts at IAF JUNCK, southwest of Leicester and initially tracks north east over central Leicester and Syston. Just north of Syston the route turns north and continues on this heading over the A46 before turning left to join the extended runway centreline north east of the Wymeswold solar farm.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 2.78° which is close to the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be better than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 7 is 46km (25nm). When compared to the 'do nothing' baseline (53km (29nm)) this option is shorter in length and it is therefore anticipated that emissions would be better.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

33.9% of the area of the Option 7 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 7 is estimated to overfly approximately 1,500 households with an approximate population of 3,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 6,200.

From 7,000ft, Option 7 is estimated to overfly approximately 78,350 households with an approximate population of 168,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 180,700.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 7 is estimated to overfly 25 noise sensitive areas.

From 7,000ft, Option 7 is estimated to overfly 610 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 22.6 Transition Runway 27 South Option 8

| Design Principle Evaluation | Option No. 8 |
|---|---|
| Option Name: Transition RW 27 South Option 8 | ACCEPT |

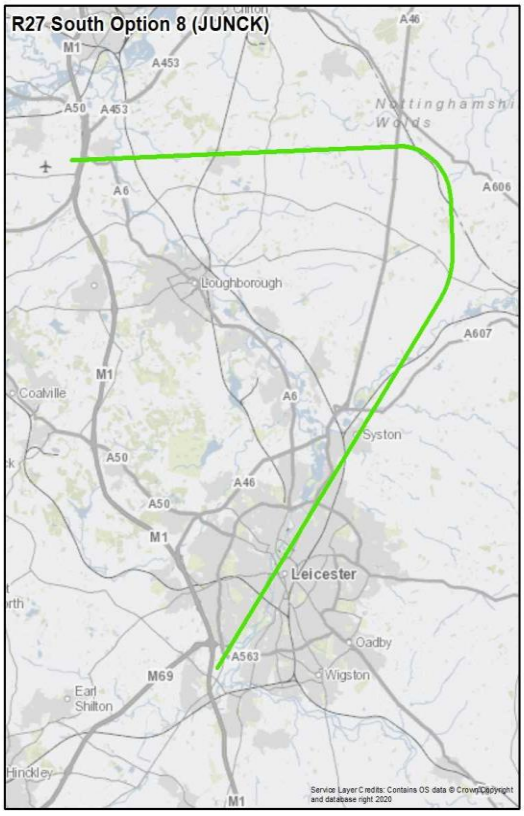
**Option Description:**

The IAF for this option is JUNCK and the style of the route is 'direct' which means the distance to the final approach has been minimised. It follows the same route as Option 7 but routes further east before joining the final approach.

The option starts at IAF JUNCK, southwest of Leicester and initially tracks north east over central Leicester and Syston. It continues on this heading until a point to the west of Melton Mowbray where the route turns north before turning left to join the extended runway centreline close to Upper Broughton.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (6.3nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 2.33° which is within the optimum range for low noise approaches and is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 8 is 52km (28nm). When compared to the 'do nothing' baseline (53km (29nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

24.0% of the area of the Option 8 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 8 is estimated to overfly approximately 1,450 households with an approximate population of 2,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 2,800.

From 7,000ft, Option 8 is estimated to overfly approximately 79,950 households with an approximate population of 171,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 181,300.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 8 is estimated to overfly 25 noise sensitive areas.

From 7,000ft, Option 8 is estimated to overfly 630 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 22.7 Transition Runway 27 South Option 9

| Design Principle Evaluation | Option No. 9 |
|---|---|
| Option Name: Transition RW 27 South Option 9 | ACCEPT |

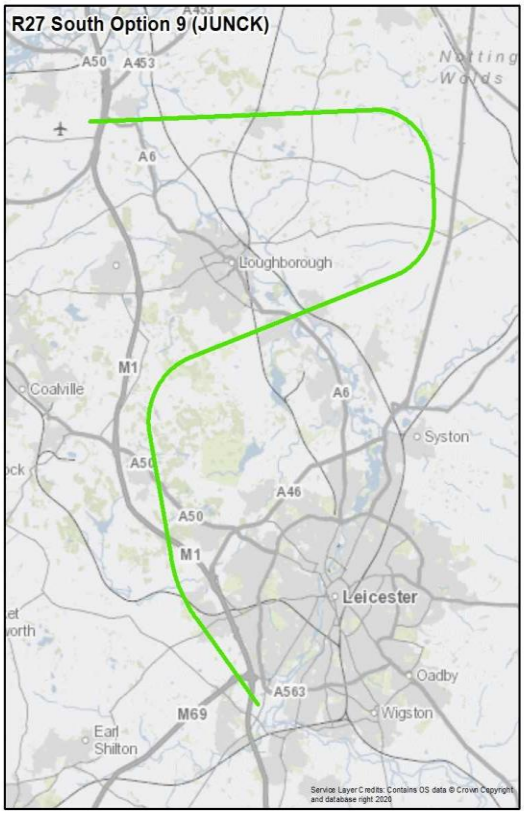
**Option Description:**

The IAF for this option is JUNCK and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route.

The option starts at IAF JUNCK, southwest of Leicester and follows the line of the M1 north, turning slightly right to the west of Ratby to remain east of Coalville. To the north east of the M1 Junction 22 the route turns north east, passing south of Loughborough and over Barrow upon Soar and continues on this track until just north of Seagrave to the east of Loughborough. Here it turns left and then left again to join the extended runway centreline north east of the Wymeswold solar farm.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 2.25° which is close to the optimum range for low noise approaches and is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 9 is 53km (29nm). When compared to the 'do nothing' baseline (53km (29nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

45.0% of the area of the Option 9 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 9 is estimated to overfly approximately 5,400 households with an approximate population of 10,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 13,000.

From 7,000ft, Option 9 is estimated to overfly approximately 25,750 households with an approximate population of 48,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 64,500.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 9 is estimated to overfly 45 noise sensitive areas.

From 7,000ft, Option 9 is estimated to overfly 130 noise sensitive areas.

This is a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 22.8 Transition Runway 27 South Option 10

| Design Principle Evaluation | Option No. 10 |
|---|---|
| Option Name: Transition RW 27 South Option 10 | REJECT |

**Option Description:**

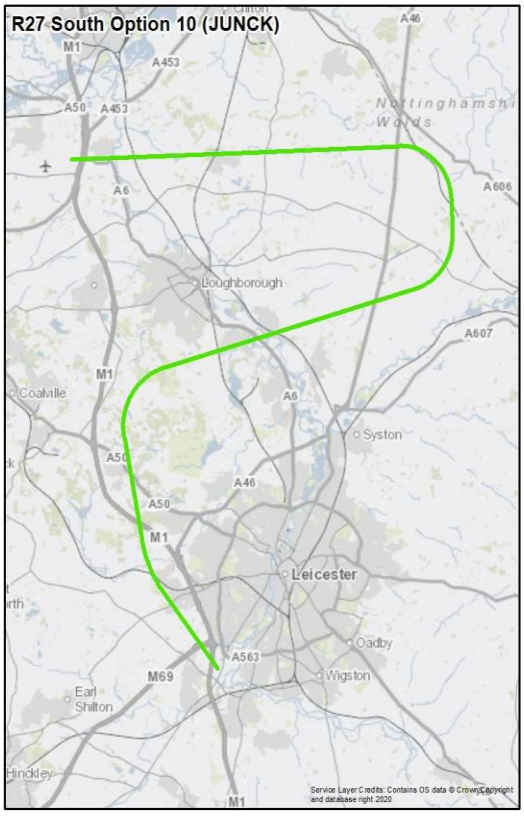
The IAF for this option is JUNCK and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route. It follows the same route as Option 9 initially but routes further east before joining the final approach.

The option starts at IAF JUNCK, southwest of Leicester and follows the line of the M1 north, turning slightly right to the west of Ratby to remain east of Coalville. To the north east of the M1 Junction 22 the route turns north east, passing south of Loughborough and over Barrow upon Soar. It continues on this heading until a point to the west of Melton Mowbray where the route turns north before turning left to join the extended runway centreline close to Upper Broughton.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (6.3nm) whilst keeping the route within existing controlled airspace.

The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 1.83° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 10 is 62km (33nm). When compared to the 'do nothing' baseline (53km (29nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

38.5% of the area of the Option 10 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 10 is estimated to overfly approximately 1,300 households with an approximate population of 2,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 17,100.

From 7,000ft, Option 10 is estimated to overfly approximately 25,300 households with an approximate population of 47,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 47,100.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 10 is estimated to overfly 20 noise sensitive areas.

From 7,000ft, Option 10 is estimated to overfly 130 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 22.9 Transition Runway 27 South JUNCK Summary

| | Option 1 | Option 2 | Option 3 | Option 4 | Option 7 | Option 8 | Option 9 | Option 10 |
|---|---|---|---|---|---|---|---|---|
| **S - Safety** | MET | PARTIAL | MET | PARTIAL | MET | PARTIAL | MET | PARTIAL |
| **P - Programme** | MET | PARTIAL | PARTIAL | PARTIAL | MET | PARTIAL | PARTIAL | PARTIAL |
| **C - Continuity** | MET | MET | MET | MET | MET | MET | MET | MET |
| **E - Emissions** | MET | PARTIAL | NOT MET | NOT MET | MET | PARTIAL | PARTIAL | NOT MET |
| **N1 - Noise** | MET | MET | MET | MET | MET | MET | MET | MET |
| **N2 - Noise** | MET | MET | NOT MET | MET | NOT MET | NOT MET | MET | NOT MET |
| **N3 - Noise** | MET | MET | PARTIAL | PARTIAL | MET | MET | PARTIAL | PARTIAL |
| **N4 - Noise** | MET | MET | PARTIAL | MET | MET | MET | MET | MET |
| **A1 - Airspace** | MET | PARTIAL | MET | PARTIAL | MET | PARTIAL | MET | PARTIAL |
| **A2 - Airspace** | MET | MET | MET | MET | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET | MET | MET | MET | MET |
| | Best | Best | Rejected | Best | 4,000ft beneficial | 4,000ft beneficial | Best | Rejected |

## 22.10 Transition Runway 27 South Option 5

| Design Principle Evaluation | Option No. 5 |
|---|---|
| Option Name: Transition RW 27 South Option 5 | ACCEPT |

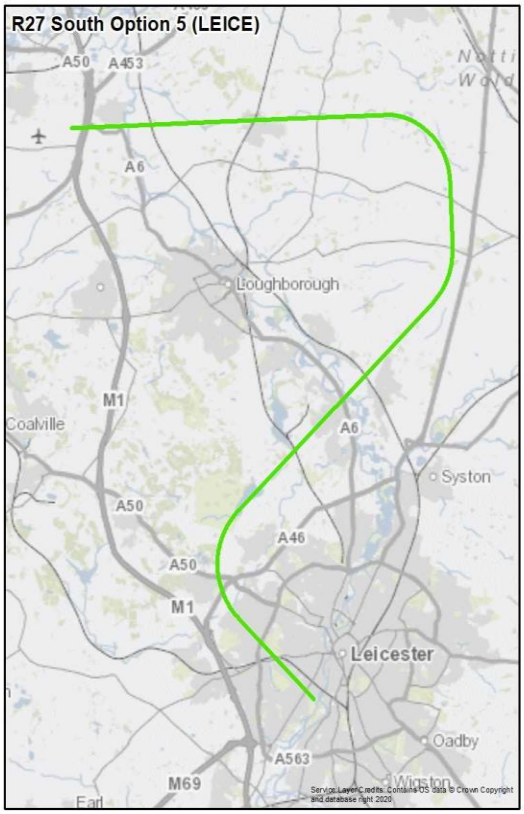
**Option Description:**

The IAF for this option is LEICE and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route.

This option starts at IAF LEICE, near the King Power Stadium from where it initially tracks north west to pass just east of Groby where it turns to a north east heading passing over Mountsorrel. It continues on this track until just north of Seagrave to the east of Loughborough, where it turns left and then left again to join the extended runway centreline north east of the Wymeswold solar farm.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 2.78° which is close to the optimum range for low noise approaches and is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be better than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 5 is 46km (25nm). When compared to the 'do nothing' baseline (53km (29nm)) this option is shorter in length and it is therefore anticipated that emissions would be better.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

26.2% of the area of the Option 5 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 5 is estimated to overfly approximately 1,650 households with an approximate population of 3,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 6,500.

From 7,000ft, Option 5 is estimated to overfly approximately 54,250 households with an approximate population of 110,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 117,700.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 5 is estimated to overfly 30 noise sensitive areas.

From 7,000ft, Option 5 is estimated to overfly 335 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 22.11 Transition Runway 27 South Option 6

| Design Principle Evaluation | Option No. 6 |
|---|---|
| Option Name: Transition RW 27 South Option 6 | ACCEPT |

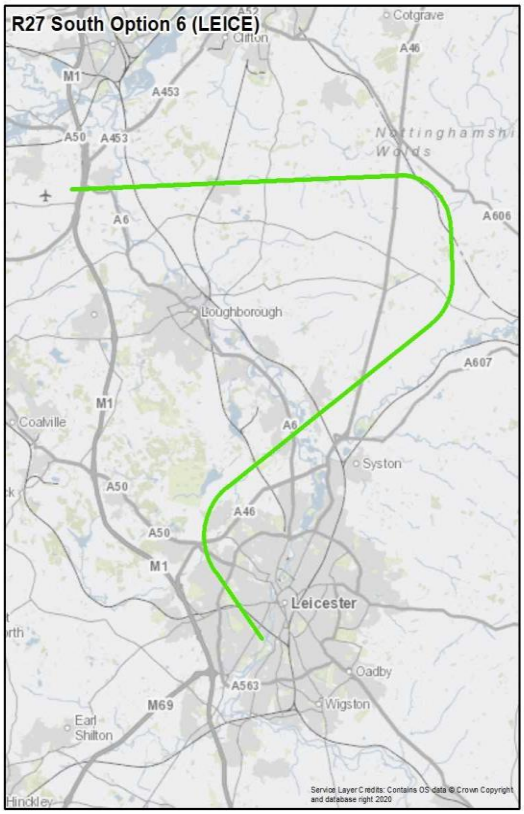
**Option Description:**

The IAF for this option is LEICE and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route. It follows a similar profile to Option 5 but routes further east before joining the final approach.

This option starts at IAF LEICE, near the King Power Stadium and initially tracks north west to pass over Anstey where it turns right to a north east heading and follows a line just north of the Leicester western bypass. It continues on this heading, passing between Syston and Mountsorrel and to the west of Melton Mowbray the route turns north before turning left to join the extended runway centreline close to Upper Broughton.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (6.3nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 2.29° which is within the optimum range for low noise approaches and is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 6 is 52km (28nm). When compared to the 'do nothing' baseline (53km (29nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | NOT MET |
|---|---|

*Summary of Assessment:*

23.5% of the area of the Option 6 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the lower-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 6 is estimated to overfly approximately 1,400 households with an approximate population of 2,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 2,800.

From 7,000ft, Option 6 is estimated to overfly approximately 54,600 households with an approximate population of 112,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 121,700.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 6 is estimated to overfly 25 noise sensitive areas.

From 7,000ft, Option 6 is estimated to overfly 345 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 22.12 Transition Runway 27 South Option 11

| Design Principle Evaluation | Option No. 11 |
|---|---|
| Option Name: Transition RW 27 South Option 11 | ACCEPT |

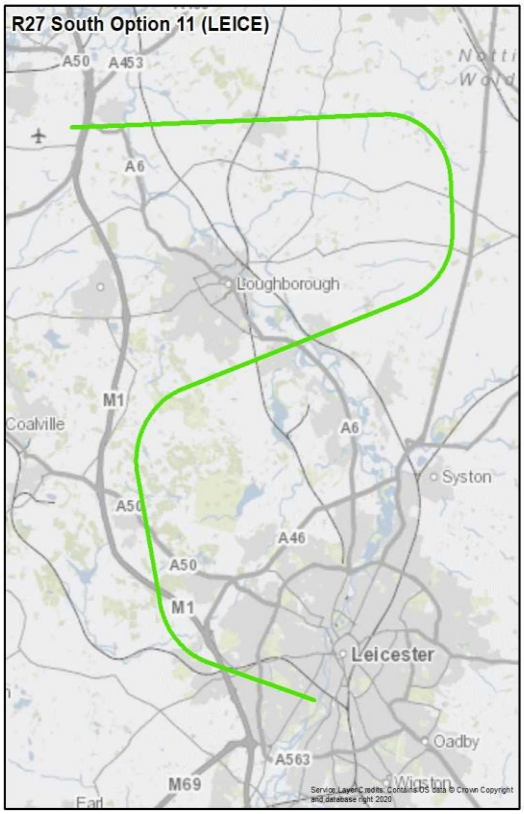
**Option Description:**

The IAF for this option is LEICE and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route.

The option starts at IAF LEICE, near the King Power Stadium and initially heads north west before turning slightly right to head north to remain east of Coalville. To the north east of the M1 Junction 22 the route turns north east, passing south of Loughborough and over Barrow upon Soar and continues on this track until just north of Seagrave to the east of Loughborough. Here it turns left and then left again to join the extended runway centreline north east of the Wymeswold solar farm.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 2.25° which is close to the optimum range for low noise approaches and is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 11 is 53km (29nm). When compared to the 'do nothing' baseline (53km (29nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

39.0% of the area of the Option 11 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 11 is estimated to overfly approximately 5,350 households with an approximate population of 10,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 12,900.

From 7,000ft, Option 11 is estimated to overfly approximately 50,300 households with an approximate population of 103,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 114,900.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 11 is estimated to overfly 45 noise sensitive areas.

From 7,000ft, Option 11 is estimated to overfly 295 noise sensitive areas.

This is a similar number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 22.13 Transition Runway 27 South Option 12

| Design Principle Evaluation | Option No. 12 |
|---|---|
| Option Name: Transition RW 27 South Option 12 | ACCEPT |

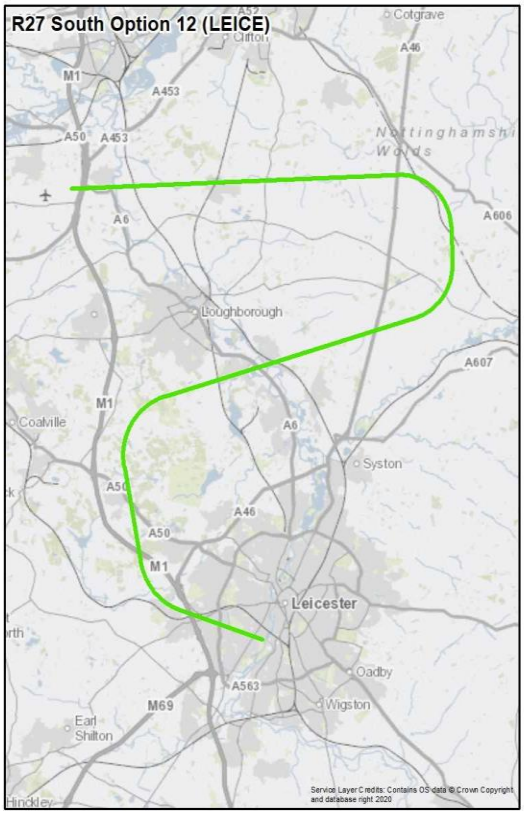
**Option Description:**

The IAF for this option is LEICE and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route. It follows the same route as Option 11 initially but routes further east before joining the final approach.

The option starts at IAF LEICE, near the King Power Stadium and initially heads north west before turning slightly right to head north to remain east of Coalville. To the north east of the M1 Junction 22 the route turns north east, passing south of Loughborough and over Barrow upon Soar. It continues on this heading until a point to the west of Melton Mowbray where the route turns north before turning left to join the extended runway centreline close to Upper Broughton.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (6.3nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 1.84° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 12 is 62km (33nm). When compared to the 'do nothing' baseline (53km (29nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

33.4% of the area of the Option 12 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 12 is estimated to overfly approximately 1,300 households with an approximate population of 2,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 2,600.

From 7,000ft, Option 12 is estimated to overfly approximately 49,800 households with an approximate population of 102,500. Taking account of planned property developments, this option is estimated to impact an approximate total population of 111,000.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 12 is estimated to overfly 20 noise sensitive areas.

From 7,000ft, Option 12 is estimated to overfly 300 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 22.14 Transition Runway 27 South Option 23

| Design Principle Evaluation | Option No. 23 |
|---|---|
| Option Name: Transition RW 27 South Option 23 | ACCEPT |

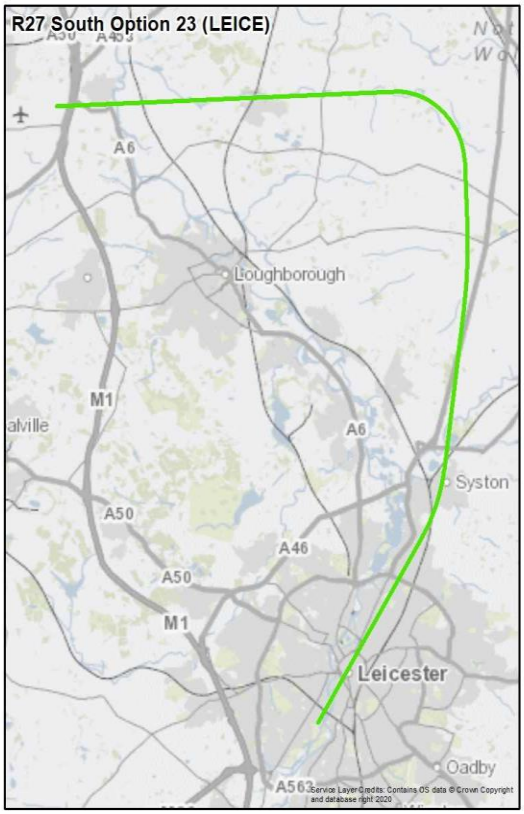
**Option Description:**

The IAF for this option is LEICE and the style of the route is 'direct' which means the distance to the final approach has been minimised.

This option starts at IAF LEICE, near the King Power Stadium from where the route heads north east over central Leicester. At Syston the route turns slightly left to head north and continues on this track until just north of Seagrave to the east of Loughborough where it turns slightly left and then left again to join the extended runway centreline north east of the Wymeswold solar farm.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 3.22° which is above the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS ends Simplification and Integration. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be better than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 23 is 41km (22nm). When compared to the 'do nothing' baseline (53km (29nm)) this option is shorter in length and it is therefore anticipated that emissions would be better.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

26.9% of the area of the Option 23 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 23 is estimated to overfly approximately 1,650 households with an approximate population of 3,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 6,500.

From 7,000ft, Option 23 is estimated to overfly approximately 75,750 households with an approximate population of 168,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 182,100.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 23 is estimated to overfly 35 noise sensitive areas.

From 7,000ft, Option 23 is estimated to overfly 680 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 22.15 Transition Runway 27 South Option 24

| Design Principle Evaluation | Option No. 24 |
|---|---|
| Option Name: Transition RW 27 South Option 24 | ACCEPT |

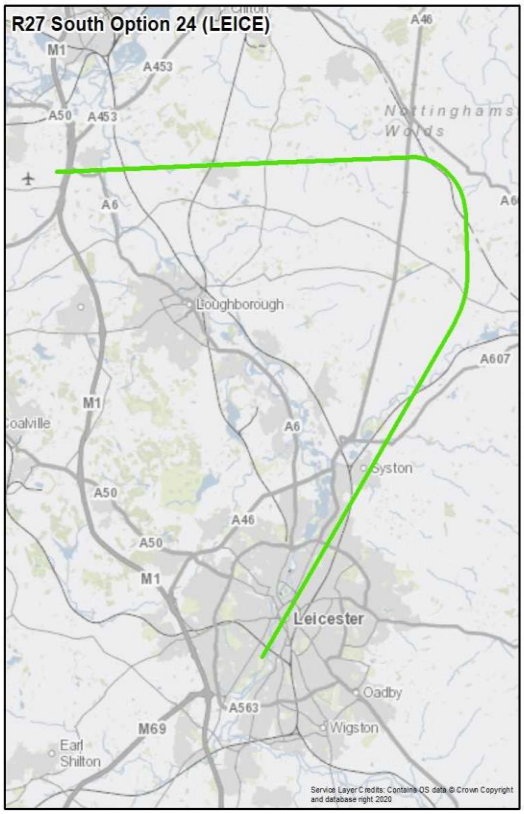
**Option Description:**

The IAF for this option is LEICE and the style of the route is 'direct' which means the distance to the final approach has been minimised.

This option starts at IAF LEICE, near the King Power Stadium from where the route heads north east over central Leicester. It continues on this track until a point to the west of Melton Mowbray where the route turns north. It turns left to join the extended runway centreline close to Upper Broughton.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (6.3nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 2.61° which is within the optimum range for low noise approaches and is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 24 is 48km (26nm). When compared to the 'do nothing' baseline (53km (29nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

16.0% of the area of the Option 24 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 24 is estimated to overfly approximately 1,600 households with an approximate population of 3,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 3,200.

From 7,000ft, Option 24 is estimated to overfly approximately 78,300 households with an approximate population of 174,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 185,100.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 24 is estimated to overfly 25 noise sensitive areas.

From 7,000ft, Option 24 is estimated to overfly 690 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 22.16 Transition Runway 27 South LEICE Summary

| | Option 5 | Option 6 | Option 11 | Option 12 | Option 23 | Option 24 |
|---|---|---|---|---|---|---|
| **S - Safety** | MET | PARTIAL | MET | PARTIAL | MET | PARTIAL |
| **P - Programme** | MET | PARTIAL | PARTIAL | PARTIAL | MET | PARTIAL |
| **C - Continuity** | MET | MET | MET | MET | MET | MET |
| **E - Emissions** | MET | PARTIAL | PARTIAL | NOT MET | MET | PARTIAL |
| **N1 - Noise** | MET | MET | MET | MET | MET | MET |
| **N2 - Noise** | NOT MET | NOT MET | MET | MET | MET | MET |
| **N3 - Noise** | MET | MET | PARTIAL | MET | MET | MET |
| **N4 - Noise** | MET | MET | MET | MET | MET | MET |
| **A1 - Airspace** | MET | PARTIAL | MET | PARTIAL | MET | PARTIAL |
| **A2 - Airspace** | MET | MET | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET | MET | MET |
| | 4,000ft beneficial | Best | Best | Best | Best | Best |

## 22.17 Transition Runway 27 South Option 13

| Design Principle Evaluation | Option No. 13 |
|---|---|
| Option Name: Transition RW 27 South Option 13 | ACCEPT |

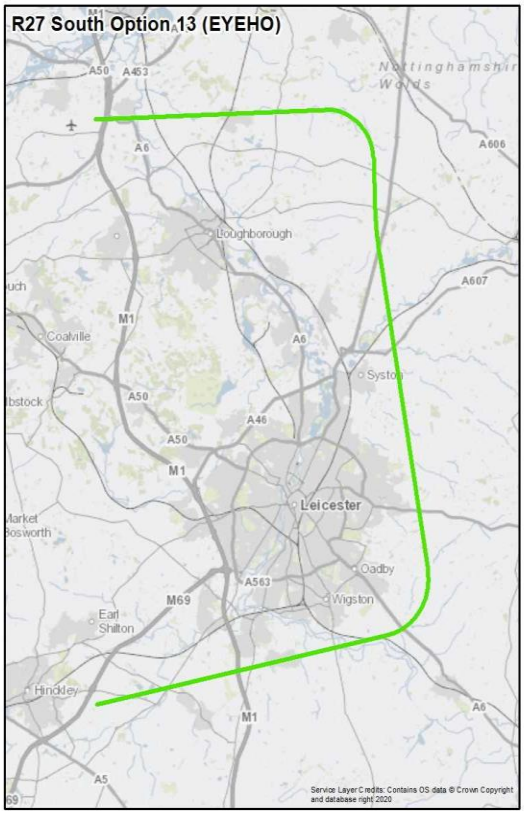
**Option Description:**

The IAF for this option is EYEHO and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route.

This option starts at IAF EYEHO, south east of Hinkley from where it routes east to remain south of Leicester. At a point south of Leicester Airport it turns left to head north to by-pass Leicester and Syston to the east. It continues on this heading over the A46 before turning left to join the extended runway centreline north east of the Wymeswold solar farm.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 1.72° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 13 is 65km (35nm). When compared to the 'do nothing' baseline (53km (29nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

22.2% of the area of the Option 13 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 13 is estimated to overfly approximately 3,500 households with an approximate population of 6,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 11,200.

From 7,000ft, Option 13 is estimated to overfly approximately 19,150 households with an approximate population of 36,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 44,900.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 13 is estimated to overfly 25 noise sensitive areas.

From 7,000ft, Option 13 is estimated to overfly 85 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 22.18 Transition Runway 27 South Option 14

| Design Principle Evaluation | Option No. 14 |
|---|---|
| Option Name: Transition RW 27 South Option 14 | ACCEPT |

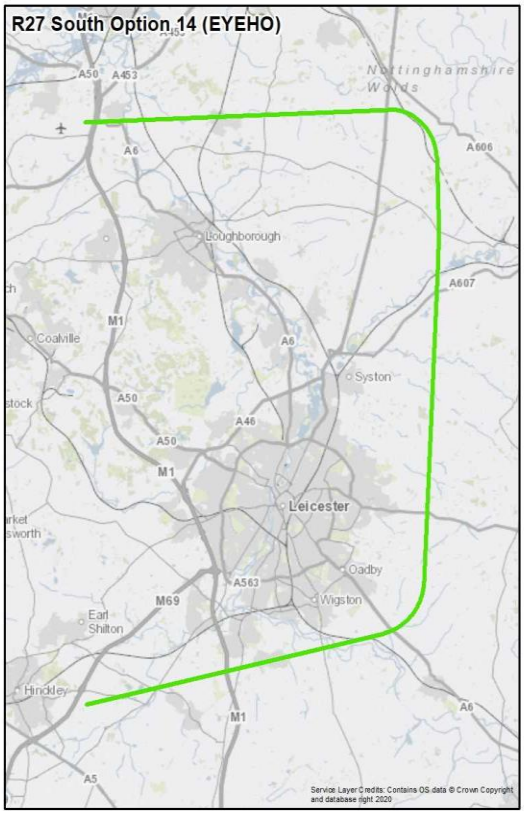
**Option Description:**

The IAF for this option is EYEHO and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route. It follows the same route as Option 13 initially but routes further east after the turn north at Leicester Airport.

This option starts at IAF EYEHO, south east of Hinkley from where it routes east to remain south of Leicester. At a point south of Leicester Airport it turns left to head north to by-pass Leicester and Syston to the east and passing close to Gaddesby and Hoby before turning left to join the extended runway centreline close to Upper Broughton.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (6.3nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 1.57° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 14 is 70km (38nm). When compared to the 'do nothing' baseline (53km (29nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

17.4% of the area of the Option 14 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 14 is estimated to overfly approximately 1,100 households with an approximate population of 2,200. Taking account of planned property developments, this option is estimated to impact an approximate total population of 2,200.

From 7,000ft, Option 14 is estimated to overfly approximately 17,100 households with an approximate population of 32,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 35,700.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 14 is estimated to overfly 15 noise sensitive areas.

From 7,000ft, Option 14 is estimated to overfly 75 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 22.19 Transition Runway 27 South Option 21

| Design Principle Evaluation | Option No. 21 |
|---|---|
| Option Name: Transition RW 27 South Option 21 | ACCEPT |

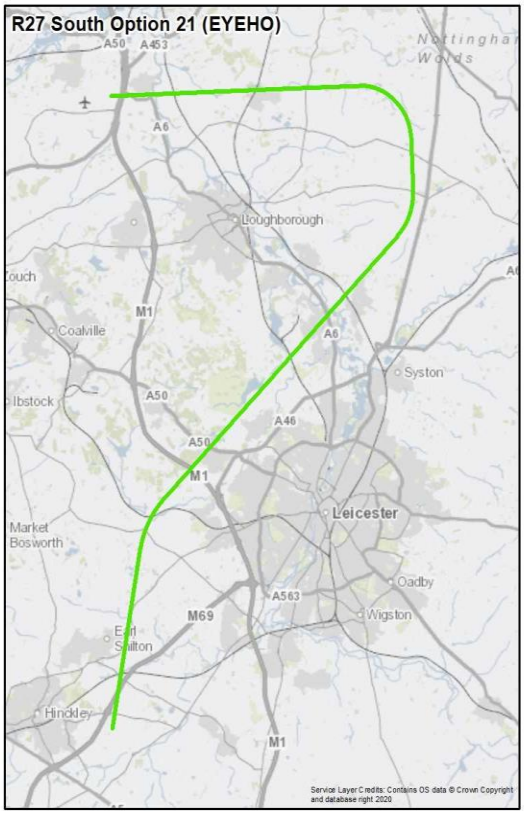
**Option Description:**

The IAF for this option is EYEHO and the style of the route is 'direct' which means the distance to the final approach has been minimised.

This option starts at IAF EYEHO, south east of Hinkley from where it heads north initially until Desford where the route turns right to head north east passing over the M1 at Groby and remaining north of Leicester and south of Loughborough. It continues on this track until just north of Seagrave to the east of Loughborough where it turns left and then left again to join the extended runway centreline north east of the Wymeswold solar farm.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 2.13° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 21 is 55km (30nm). When compared to the 'do nothing' baseline (53km (29nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

30.3% of the area of the Option 21 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 21 is estimated to overfly approximately 7,850 households with an approximate population of 14,800. Taking account of planned property developments, this option is estimated to impact an approximate total population of 18,500.

From 7,000ft, Option 21 is estimated to overfly approximately 23,250 households with an approximate population of 43,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 51,400.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | PARTIAL |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 21 is estimated to overfly 55 noise sensitive areas.

From 7,000ft, Option 21 is estimated to overfly 110 noise sensitive areas.

This is an increased number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 22.20 Transition Runway 27 South Option 22

| Design Principle Evaluation | Option No. 22 |
|---|---|
| Option Name: Transition RW 27 South Option 22 | ACCEPT |

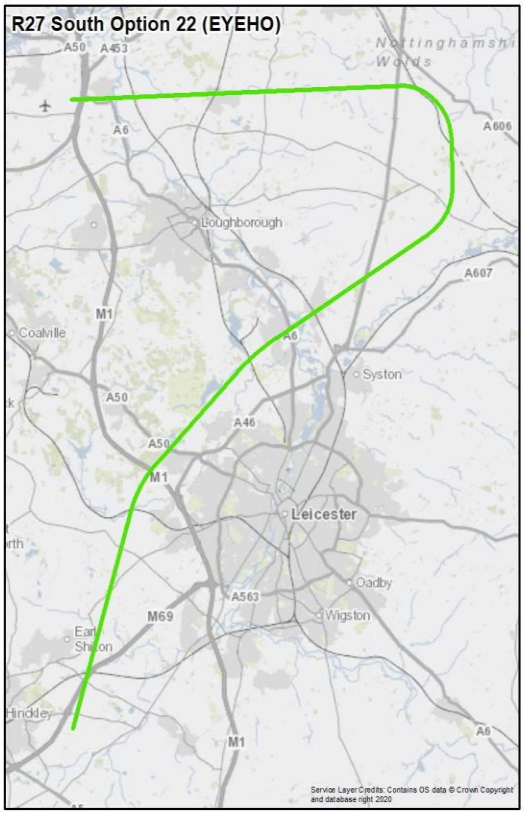
**Option Description:**

The IAF for this option is EYEHO and the style of the route is 'direct' which means the distance to the final approach has been minimised. It follows the same route as Option 21 initially but routes further east before joining the final approach.

This option starts at IAF EYEHO, south east of Hinkley from where it heads north initially until east of Desford where the route turns right to head north east passing over the M1 at Groby and remaining north of Leicester and south of Loughborough. It continues on this heading until Mountsorrel where it makes a slight right turn and heads to a point to the west of Melton Mowbray where the route turns north. It turns left to join the extended runway centreline close to Upper Broughton.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (6.3nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 1.79° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 22 is 63km (34nm). When compared to the 'do nothing' baseline (53km (29nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

28.5% of the area of the Option 22 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 22 is estimated to overfly approximately 2,450 households with an approximate population of 4,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 6,000.

From 7,000ft, Option 22 is estimated to overfly approximately 23,300 households with an approximate population of 43,700. Taking account of planned property developments, this option is estimated to impact an approximate total population of 49,900.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 22 is estimated to overfly 20 noise sensitive areas.

From 7,000ft, Option 22 is estimated to overfly 105 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 22.21 Transition Runway 27 South EYEHO Summary

| | Option 13 | Option 14 | Option 21 | Option 22 |
|---|---|---|---|---|
| **S - Safety** | MET | PARTIAL | MET | PARTIAL |
| **P - Programme** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **C - Continuity** | MET | MET | MET | MET |
| **E - Emissions** | NOT MET | NOT MET | PARTIAL | NOT MET |
| **N1 - Noise** | MET | MET | MET | MET |
| **N2 - Noise** | MET | MET | MET | MET |
| **N3 - Noise** | PARTIAL | MET | PARTIAL | MET |
| **N4 - Noise** | MET | MET | PARTIAL | MET |
| **A1 - Airspace** | MET | PARTIAL | MET | PARTIAL |
| **A2 - Airspace** | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET |
| | Best | Best | Best | Best |

## 22.22 Transition Runway 27 South Option 15

| Design Principle Evaluation | Option No. 15 |
|---|---|
| Option Name: Transition RW 27 South Option 15 | ACCEPT |

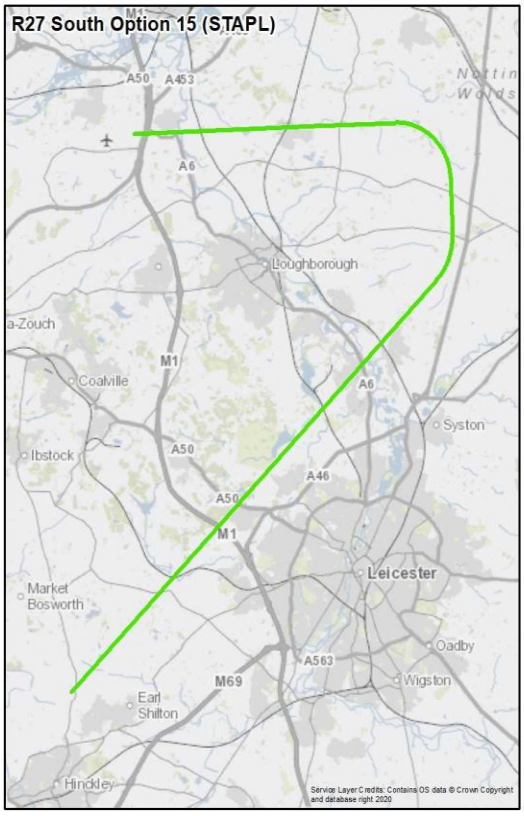
**Option Description:**

The IAF for this option is STAPL and the style of the route is 'direct' which means the distance to the final approach has been minimised.

This option starts at IAF STAPL at Stapleton north of Hinkley from where the route tracks north east passing over the M1 at Groby and remaining north of Leicester and south of Loughborough. It continues on this track until just north of Seagrave to the east of Loughborough where it turns left and then left again to join the extended runway centreline north east of the Wymeswold solar farm.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 2.32° which is within the optimum range for low noise approaches and is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be similar to the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | PARTIAL |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 15 is 52km (28nm). When compared to the 'do nothing' baseline (53km (29nm)) this option is similar in length and it is therefore anticipated that emissions would be similar.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

22.2% of the area of the Option 15 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 15 is estimated to overfly approximately 4,200 households with an approximate population of 7,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 11,300.

From 7,000ft, Option 15 is estimated to overfly approximately 20,400 households with an approximate population of 38,100. Taking account of planned property developments, this option is estimated to impact an approximate total population of 46,000.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 15 is estimated to overfly 40 noise sensitive areas.

From 7,000ft, Option 15 is estimated to overfly 100 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 22.23 Transition Runway 27 South Option 16

| Design Principle Evaluation | Option No. 16 |
|---|---|
| Option Name: Transition RW 27 South Option 16 | ACCEPT |

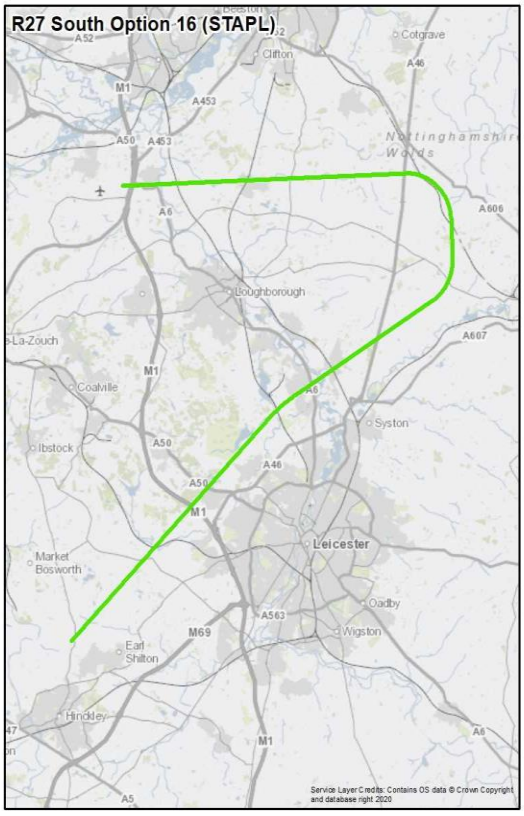
**Option Description:**

The IAF for this option is STAPL and the style of the route is 'direct' which means the distance to the final approach has been minimised. It follows the same route as Option 15 initially but routes further east after Mountsorrel before joining the final approach.

The option starts at IAF STAPL at Stapleton north of Hinkley from where the route tracks north east passing over the M1 at Groby and remaining north of Leicester and south of Loughborough. It continues on this heading until Mountsorrel where it makes a slight right turn and heads to a point to the west of Melton Mowbray where the route turns north. It turns left to join the extended runway centreline close to Upper Broughton.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (6.3nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 1.91° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 16 is 60km (32nm). When compared to the 'do nothing' baseline (53km (29nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

19.1% of the area of the Option 16 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 16 is estimated to overfly approximately 1,200 households with an approximate population of 2,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 2,300.

From 7,000ft, Option 16 is estimated to overfly approximately 22,000 households with an approximate population of 41,300. Taking account of planned property developments, this option is estimated to impact an approximate total population of 47,100.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 16 is estimated to overfly 15 noise sensitive areas.

From 7,000ft, Option 16 is estimated to overfly 100 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 22.24 Transition Runway 27 South Option 19

| Design Principle Evaluation | Option No. 19 |
|---|---|
| Option Name: Transition RW 27 South Option 19 | ACCEPT |

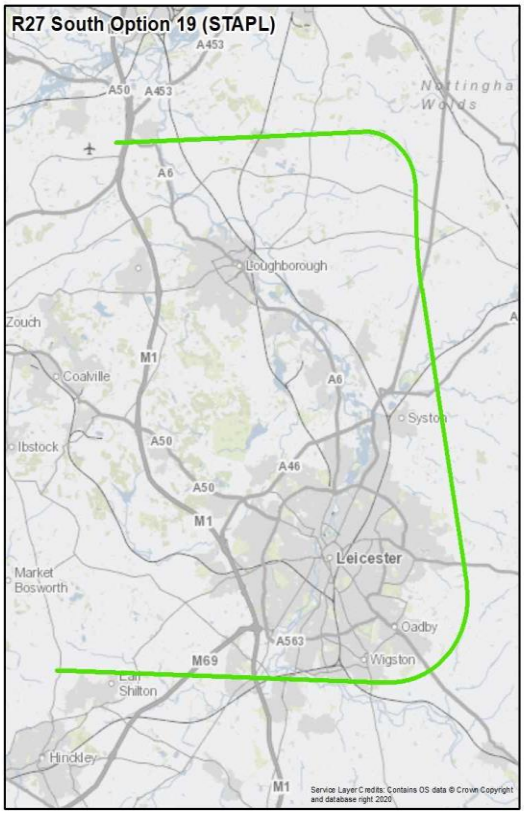
**Option Description:**

The IAF for this option is STAPL and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route.

The option starts at IAF STAPL at Stapleton north of Hinkley from where it routes east to pass over the southern edge of Leicester. At a point south of Leicester Airport it turns left to head north to by-pass Leicester and Syston to the east. It continues on this heading over the A46 before turning left to join the extended runway centreline north east of the Wymeswold solar farm.

This RNAV 1 route connects the IAF to the IF which is placed as close as possible to the FAF (3.85nm) when PANS OPS criteria and MSD for a 90° turn is taken into consideration. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 1.68° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground, is designable, remains wholly within CAS and meets with industry standards and regulations. At this stage, the change sponsor does not believe that additional protocols or safety mitigations or procedures are required to confirm safe operation.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS ends Simplification and Integration. When considering the Environmental end this option is expected to overfly an increased population below 4,000ft and a reduced population below 7,000ft when compared to the baseline. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 19 is 66km (36nm). When compared to the 'do nothing' baseline (53km (29nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

22.7% of the area of the Option 19 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | PARTIAL |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 19 is estimated to overfly approximately 3,550 households with an approximate population of 6,900. Taking account of planned property developments, this option is estimated to impact an approximate total population of 11,300.

From 7,000ft, Option 19 is estimated to overfly approximately 40,050 households with an approximate population of 75,600. Taking account of planned property developments, this option is estimated to impact an approximate total population of 87,600.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and an increased population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 19 is estimated to overfly 25 noise sensitive areas.

From 7,000ft, Option 19 is estimated to overfly 200 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | MET |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In common with all options at present, it cannot be determined whether it may be constrained by existing arrangements and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 22.25 Transition Runway 27 South Option 20

| Design Principle Evaluation | Option No. 20 |
|---|---|
| Option Name: Transition RW 27 South Option 20 | ACCEPT |

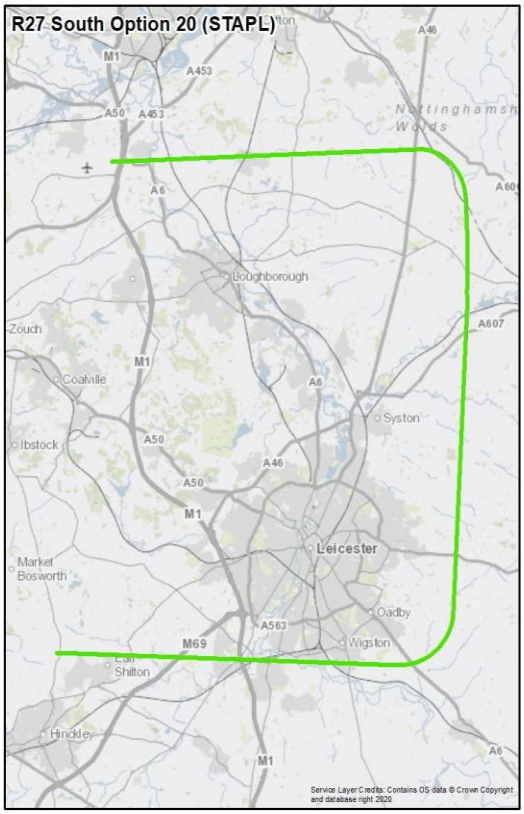
**Option Description:**

The IAF for this option is STAPL and the style of the route is 'indirect' which means the distance to the final approach has not been minimised but has been designed to provide an alternative respite option to a 'direct' route. It follows the same route as Option 19 initially but routes further east after the turn north at Leicester Airport.

The option starts at IAF STAPL at Stapleton north of Hinkley from where it routes east to pass over the southern edge of Leicester. At a point south of Leicester Airport it turns left to head north to by-pass Leicester and Syston to the east and passing close to Gaddesby and Hoby before turning left to join the extended runway centreline close to Upper Broughton.

This RNAV 1 arrival connects the IAF to the IF which is placed as far as possible from the FAF (6.3nm) whilst keeping the route within existing controlled airspace. The FAF is at 2,000ft, which is the platform altitude for the existing FAF for runway 27 approaches.

The descent gradient to the FAF is 1.51° which is below the optimum range for low noise approaches but is within the acceptable range for CDAs defined within ICAO guidance.




| Design Principle **Safety** | PARTIAL |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this option is deemed to be safe for airspace users, the airport and communities on the ground and is designable; however, additional CAS and/or changes to the procedure design parameters may be required in order to meet with industry standards and regulations including the UK CAA containment policy.

| Design Principle **Programme** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed as a RNAV1 route and aligns with the UK AMS end Simplification. For the AMS end Integration, it is anticipated more CAS will be required due to the UK Containment Policy. This route is deemed to be aligned with the Environmental end of the AMS. The size of the population overflown below 4,000ft and 7,000ft have been evaluated as being reduced, when compared to the baseline values. The emissions generated by the route are expected to be worse than the baseline. Assessed in isolation, this option is deemed to be able to deliver a CDA and is expected to be able to connect to the IAF for the EMA ATC arrival procedure at a point consistent with the anticipated planned national network operations of NERL. Based on current available information, there is no known confliction with adjacent airport programmes or design options; however, a full assessment against the FASI Masterplan will be conducted during Stage 3.

| Design Principle **Continuity** | MET |
|---|---|

*Summary of Assessment:*

When assessed in isolation, this design option is deemed to be capable of making best use of the existing runway capacity and based on current information, is not expected to adversely impact the ability to meet current, or future demand. This option considers interactions with adjacent airports and the ability to integrate with the future proposed revised NATS en route structure. Further assessments will be conducted at Stage 3 of the ACP process, and will consider whether, as part of a combination of routes, this design option continues to satisfy the Design Principle Continuity.

| Design Principle **Emissions** | NOT MET |
|---|---|

*Summary of Assessment:*

The estimated track length of Option 20 is 72km (39nm). When compared to the 'do nothing' baseline (53km (29nm)) this option is longer in length and it is therefore anticipated that emissions would be worse.

| Design Principle **Noise N1** | MET |
|---|---|

*Summary of Assessment:*

When evaluating this option in isolation, it is not possible to assess the ability to be able to distribute flight paths to avoid concentration of aircraft activity and provide an ability to deliver 'respite' or 'relief'. This assessment can only become possible when the design options have been grouped into dependent networks during Stage 3 activities of the ACP process. As a result, all options have been deemed to meet this design principle at this stage.

| Design Principle **Noise N2** | MET |
|---|---|

*Summary of Assessment:*

18.1% of the area of the Option 20 overflight corridor coincides with an area considered to have relatively high levels of background noise. This option falls within the upper-third of options within this peer group in terms of alignment with this design principle.

| Design Principle **Noise N3** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 20 is estimated to overfly approximately 1,050 households with an approximate population of 2,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 2,000.

From 7,000ft, Option 20 is estimated to overfly approximately 38,000 households with an approximate population of 71,000. Taking account of planned property developments, this option is estimated to impact an approximate total population of 78,200.

This is a reduced population compared to the 'do nothing' baseline up to 7,000ft, and a reduced population compared to the 'do nothing' baseline up to 4,000ft.

| Design Principle **Noise 4** | MET |
|---|---|

*Summary of Assessment:*

From 4,000ft, Option 20 is estimated to overfly 10 noise sensitive areas.

From 7,000ft, Option 20 is estimated to overfly 190 noise sensitive areas.

This is a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 4,000ft, and a reduced number of noise sensitive areas compared to the 'do nothing' baseline up to 7,000ft.

| Design Principle **Airspace 1** | PARTIAL |
|---|---|

*Summary of Assessment:*

This arrival option has been designed by a CAA Approved IFP designer in compliance with PANS-OPS 8168 as an RNAV 1 track that can be flown by all current and future aircraft operating into EMA (based on a fleet equipage and performance survey) and is considered to be futureproof. In isolation, the option is constrained by existing arrangements relating to CAS dimensions and the UK Containment Policy and further analysis will be required as part of Stage 3 activities.

| Design Principle **Airspace 2** | MET |
|---|---|

*Summary of Assessment:*

This option will enable ATC to allow priority to be given to EMA traffic whilst ensuring that accessibility to all authorised users remains, including emergency aircraft who will continue to be given the highest priority and be able to operate safely with minimum restriction.

| Design Principle **Technology** | MET |
|---|---|

*Summary of Assessment:*

This option has been designed in compliance with PANS OPS-8168 to utilise the latest widely available navigational procedures including PBN. The option has been created in a way that enables a CDA to be flown during the transition to EMA.

## 22.26 Transition Runway 27 South STAPL Summary

| | Option 15 | Option 16 | Option 19 | Option 20 |
|---|---|---|---|---|
| **S - Safety** | MET | PARTIAL | MET | PARTIAL |
| **P - Programme** | PARTIAL | PARTIAL | PARTIAL | PARTIAL |
| **C - Continuity** | MET | MET | MET | MET |
| **E - Emissions** | PARTIAL | NOT MET | NOT MET | NOT MET |
| **N1 - Noise** | MET | MET | MET | MET |
| **N2 - Noise** | MET | MET | MET | MET |
| **N3 - Noise** | PARTIAL | MET | PARTIAL | MET |
| **N4 - Noise** | MET | MET | MET | MET |
| **A1 - Airspace** | MET | PARTIAL | MET | PARTIAL |
| **A2 - Airspace** | MET | MET | MET | MET |
| **T - Technology** | MET | MET | MET | MET |
| | Best | Best | Best | Best |

## 22.27 Transition Runway 27 South Viable but Poor Fit Options

| Option | Safety | Programme | Continuity |
|---|---|---|---|
| A17 | S | P | C |

Description: This is a route that commences at an IAF located in the vicinity of Syston to the north of Leicester. From Syston the route heads north to join the extended runway centreline north east of the Wymeswold solar farm. It was originally created in the comprehensive list of Arrivals as Option 17 but was changed to Viable Poor Fit following analysis on descent gradients.

Programme: This option fails to align with the environmental ends of the AMS.

*Noise*: The IAF is located on the boundary of the area within which a CDA could be achieved to both runway ends. Further investigation showed that the IAF is too close to the FAF for runway 27 and created a CDA gradient of 5.02°. This is significantly above the optimum range for low noise approaches and above the ideal range for CDAs defined within ICAO guidance. A CDA is considered, to be lower in noise impact than a non-CDA, hence this option would not align with the ANG to minimise noise impacts below 7,000ft.

| | | | |
|---|---|---|---|
| B18 | S | P | C |

Description: This is a route that commences at an IAF located in the vicinity of Syston to the north of Leicester. From Syston the route heads north east to join the extended runway centreline close to Upper Broughton. It was originally created in the comprehensive list of Arrivals as Option 18 but was changed to Viable Poor Fit following analysis on descent gradients.

Programme: This option fails to align with the environmental ends of the AMS.

Noise: The IAF is located at the boundary of the area within which a CDA could be achieved to both runway ends. Further investigation showed that the IAF is too close to the FAF for runway 27 and created a CDA gradient of 3.7°. This is significantly above the optimum range for low noise approaches and above the ideal range for CDAs defined within ICAO guidance. A CDA is considered, to be lower in noise impact than a non-CDA, hence this option would not align with the ANG to minimise noise impacts below 7,000ft.

# 23 Next Steps

Consistent with the requirements of Step 2A of CAP1616, we have undertaken a design process to identify a comprehensive list of design options. In Step 2A, these design options have been evaluated against the design principles that we identified through stakeholder engagement in Stage 1. This work is reported separately in this document and the DOR. Those that best align with the design principles were carried forward in the process to Step 2B.

Design options carried forward to Step 2B have been subject to an initial appraisal. The findings of that appraisal are set out in the IOA and the accompanying assessment tables. The IOA has enabled us to identify a shortlist of design options.

The shortlist of design options has benefited from extensive engagement with stakeholders, including the general public. Among these stakeholders were other sponsors of airspace change including NATS as the en-route airspace provider, airlines and other airports with whom EMA may interact. Therefore, there is confidence that our shortlist and proposals are flexible enough to provide compatibility with proposals emerging from other change sponsors, in so far as they are known at this time.

We will continue to work with other change sponsors, including NATS, to ensure that, consistent with the UK's Future Airspace Strategy, we realise the benefits of modernising airspace arrangements. This will include:

- Further work to understand and resolve interdependencies and design conflicts with NATS and adjacent airports as part of the Cumulative Assessment Framework (CAF) process, particularly routes to the west, south west and south east.
- Supporting NATS in any work to create new CAS to the east of EMA.
- Detailed design work to combine individual EMA design options into networks of routes as part of the wider network system.
- Providing information to NATS to inform their development simulations for the MTMA, which will test these emerging system concepts.
- Working with NATS and other design teams involved with the FASI project to define EMA routes to and from the south.

This work will also allow us to combine our options into operating networks. Defining networks of routes that support operations to and from EMA will allow us to undertake the more detailed assessment at Stage 3 and allow us to understand the extent to which we are able to provide noise respite and relief to those that are most impacted. The introduction of PBN which, consistent with the requirements of the AMS, is integral to our proposals, will increase the accuracy with which aircraft fly and is likely therefore to lead to greater concentration on any single flight path. In exploring different combinations of routes and their role in a network, we will be guided by the Government's objective to minimise the total adverse effects on people on routes below 4,000ft.

The IOA that we have completed is the first of three appraisals required under CAP1616. The operating networks that result from the steps we have already undertaken will allow us to complete the more detailed Full Options Appraisal (FOA) required at Stage 3. This further assessment will make much greater use of quantitative data. As the FOA will consider fewer options, it will allow us to explore local factors including tranquillity and biodiversity in greater detail than has been possible to date, though this more detailed assessment will benefit from the data we have collated and reported at Stage 2.

Whilst the IOA considered the characteristics of each design option, the FOA will also consider operating networks. This assessment will require an estimate of the numbers and types of aircraft that will fly each route in a network. To facilitate this assessment, we will prepare detailed air traffic forecasts.

The assessment of operating networks will also allow greater consideration of some important factors, reflected in our design principles and for which the assessment in the IOA was limited due to routes not being developed as a system, or combined with the designs of the en-route network and adjacent airports. These include noise, emissions, capacity and safety. In defining the full range of criteria that we assess in the FOA we will be guided by CAP1616 and will take account of the information in Appendices B and E.

Our approach to the FOA and the way we will consider and collect the key information is set out in greater detail in the IOA at section 8.7.

On 12th October 2023, the CAA published an updated version of SARG Policy 126 (Policy for the Design of Controlled Airspace Structures), replacing the former policy statement dated 11 August 2022. This policy provides technical design criteria for controlled airspace structures and has been used to inform both the creation of the comprehensive design options, and to assess these options within the DPE and IOA process. The updated policy statement has a number of changes, including reductions to the design criteria and separation standards that ensure containment of instrument flight procedures, and which therefore may have a bearing on the design options created as part of this ACP.

The EMA Stage 2 submission including the DPE and the IOA assessed alignment of the design options with the August 2022 policy on the design of controlled airspace structures, which was in force at the time those assessments were carried out. As this policy was so recently superseded, the change sponsor has therefore undertaken a preliminary review of the updated October 2023 policy and the design options. It has concluded that, although the changes may impact a number of arrivals options and departure options, no design options would be prematurely discounted as a result of not having applied SARG Policy 126. It was concluded that the application of the up-to-date policy in substitution for the 2022 policy would not materially change any of the outcomes in the DPE and IOA. Consequently, it is unnecessary to revise the EMA Stage 2 submission.

This EMA Stage 2 Gateway submission is therefore based on the previous iteration of the SARG Policy 126, dated 11 August 2022. However, further work to confirm alignment with the new 12 October 2023 policy will be conducted within Stage 3A and beyond. Similarly, all future work will be conducted in line with this revised October 2023 policy – or any successor.

As there is the potential for routes to be refined or amended, as referred to above, it would be premature to define future Controlled Airspace (CAS) requirements at this stage. As such, we will identify CAS requirements for groups of options during Stage 3. All stakeholders will be provided with an indication of the CAS requirements within our Step 3C Consultation material, and the comments received will be taken into account and considered as part of the consultation analysis activities in Step 3D. More details of this approach are provided in the DOR at section 4.5.

The proposals being developed by MAG and other sponsors within the MTMA cluster are complex and will not be implemented for several years. Given the intention to rationalise the network of DVORs across the UK, it will be important that aircraft are able to continue to operate safely and efficiently in the intervening period between this rationalisation and the new arrangements being introduced. EMA intend to use the CAP1781 process provided by the CAA to provide a temporary solution using RNAV substitution, which will maintain the current network of routes with no change in aircraft behaviour, pending the full implementation of this airspace change. CAP1781 allows new technology - RNAV – to be used to maintain existing routeings (SIDs). To support this, we will work with airlines to ensure they implement any required technical changes to their systems. The CAP1781 process has begun and will run in parallel to this airspace change. We expect to conclude this separate change process in 2024.

The completion of the work required at Stage 2 has developed and refined the route options available at EMA, as well as expanding the understanding of stakeholders' views on those options. While it is not a requirement of the CAP1616 process, all stakeholders will be provided with the information submitted to the CAA at the conclusion of Stage 2 and given the opportunity to discuss the content and ask questions. This will include details of the feedback gathered at phase two of engagement, the revised route options and the assessments undertaken as part of Step 2B. This will ensure that they remain informed of the development of the Airspace Change Proposal at EMA ahead of the full public consultation exercise at Stage 3.

# 24 Glossary

| | |
|---|---|
| ACOG | Airspace Change Organisation Group formed in 2019 as a fully independent organisation within NATS under the direction of the UK Government Department for Transport and Civil Aviation Authority, who are the co-sponsors of the AMS. |
| ACP | Airspace Change Proposal. |
| ADWR | Airspace Development Workshop Record - the output from bilateral discussions with NERL to record and inform their comprehensive list of options for the network that interfaces with EMA traffic. |
| AgI | Above ground level. |
| AIAA | Area of Intense Aerial Activity – Airspace within which aircraft, singly or in combination with others, regularly participate in unusual manoeuvres, not constrained by a formal route network. |
| AIP | The UK Aeronautical Information Publication - a document published by the UK CAA which contains information essential to air navigation. (www.aurora.nats.co.uk/htmlAIP/Publications/2022-07-14-AIRAC/html/index-en-GB.html). |
| Altitude Based Priorities | The ANG sets out a framework of 'Altitude Based Priorities', to be taken into account when considering the potential environmental impact of airspace changes. |
| AMS | Airspace Modernisation Strategy (CAP1711) - this is the Government's strategy and plan for the use of UK airspace, including the modernisation of airspace (www.caa.co.uk/cap1711). The original AMS was published in December 2018 and a refreshed version in January 2023. All references to the AMS are to this January 2023 version. |
| AMSL | Above mean sea level. |
| ANCON | The UK civil Aircraft Noise Contour Model. A computer model developed and maintained by the Environmental Research and Consultancy Department (ERCD) of the Civil Aviation Authority which calculates contours of aircraft noise exposure levels around airports. |
| ANG | Air Navigation Guidance 2017 - Guidance to the CAA (from DfT) on its environmental objectives when carrying out its air navigation functions, and to the CAA and wider industry on airspace and noise management. (www.gov.uk/government/publications/uk-air-navigation-guidance-2017). |
| ANSP | Air Navigation Service Provider - an organisation which operates the technical system, infrastructure, procedures, and rules of an air navigation service system, which includes air traffic control. |
| AONB | Area of Outstanding Natural Beauty - an area of countryside which has been designated for conservation because of its significant landscape value, recognising its national importance. |
| AQMA | Air Quality Management Area - designated by a local authority and subject to a Local Air Quality Management Plan. |
| ATC | Air Traffic Control - service from an air navigation service provider providing guidance to aircraft through Controlled Airspace. |
| ATCC | Air Traffic Control Centre. There are two air traffic control centres in the UK both operated by NERL. The London ATCC deals with aircraft operating to the south of EMA and the Scottish ATCC deals with flights to the north of EMA. |
| ATCO | Air Traffic Control Officer – air traffic controllers who monitor the flow of aircraft into and out of the airport airspace by providing instructions and information to pilots, so that they fly safely and |

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| | efficiently. ATCOs manage flights at both airports and within the en-route (upper) airspace network. |
| ATM | Air Transport Movement - an aircraft operation for commercial purposes, as opposed to a flight for recreational or personal reasons. |
| ATS | Air Traffic Services. |
| ATZ | Aerodrome Traffic Zone – An airspace of defined dimensions established around an aerodrome for the protection of aerodrome traffic. |
| BKY | Abbreviation for the Barkway DVOR navigation beacon and routes that use that as a navigation point. |
| BHX | The three letter IATA code for Birmingham Airport. |
| Biodiversity | The variability among living things from all ecosystems (including terrestrial, marine, and aquatic amongst others) and the ecological complexes of which they are part, including diversity within species, between species and of ecosystems. |
| CAA | Civil Aviation Authority - the aviation industry's regulator. |
| CAP | Civil Aviation Publication - a document published by the UK CAA which can provide information, guidance or policy depending on the subject covered. The list of all CAPs is published on the CAA website (www.caa.co.uk/our-work/publications). |
| CAP1385 | The CAA's PBN enhanced route spacing guidance (www.caa.co.uk/cap1385). |
| CAP1498 | The CAA's Definition of Overflight - this defines overflight as it relates to airspace regulation and provides an overflight metric which may be used to quantitatively compare different airspace options (www.caa.co.uk/cap1498). |
| CAP1616 | The CAA's airspace change guidance document - it sets out the regulatory process which all airspace change proposals must follow (www.caa.co.uk/cap1616). |
| CAP1616a | A technical annex to CAP1616 - guidance on the regulatory process for changing airspace design including community engagement requirements. This annex outlines relevant methodologies for use in environmental assessments relating to airspace change (www.caa.co.uk/cap1616a). |
| CAP1711 | Airspace Modernisation Strategy - this is the Government's strategy and plan for the use of UK airspace, including the modernisation of airspace (www.caa.co.uk/cap1711). |
| CAP1781 | The CAA's DVOR/DME/NDB Rationalisation - guidance for the use of RNAV Substitution (www.caa.co.uk/cap1781). |
| CAP1926 | General Requirements and Guidance Material for the use of RNAV Substitution (www.caa.co.uk/cap1926) and which supports airlines in the implementation of RNAV substitution under CAP1781 |
| CAP1991 | Procedure for the CAA to review the classification of airspace (www.caa.co.uk/cap1991). |
| CAP2091 | CAA Policy on Minimum Standards for Noise Modelling -document defines categories of noise modelling sophistication and sets out requirements of the minimum category which different stakeholder or sponsor groups should use when providing noise calculations to the CAA. (www.caa.co.uk/cap2091). |
| CAP2156A | Airspace change Masterplan - CAA acceptance criteria: the criteria against which the CAA will make the decision whether to accept the airspace change Masterplan into the Airspace Modernisation Strategy (www.caa.co.uk/cap2156A). |
| CAP2302 | A Low Noise Arrival CAP2302 - a report that makes recommendations to implement low noise arrivals (www.caa.co.uk/cap2303). |
| CAP493 | Manual of Air Traffic Services - contains procedures, instructions and information which are intended to form the basis of air traffic services within the United Kingdom (www.caa.co.uk/cap493). |

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| CAP725 | The CAA's airspace change process guidance document that preceded CAP1616 (www.caa.co.uk/cap725). |
| CAP760 | CAA's Guidance on the Conduct of Hazard Identification, Risk Assessment, and the Production of Safety Cases (www.caa.co.uk/cap760). |
| CAP778 | The CAA's Policy and Guidance for the Design and Operation of Departure Procedures in UK Airspace (www.caa.co.uk/cap778). |
| CAA Controlled Airspace Containment Policy Statement | The CAA Controlled Airspace Containment Policy Statement (January 2014 superseded in August 2022) sets out the minimum criteria applicable to containment of instrument flight procedures for airports already within Controlled Airspace (CAS). Annex B provides the design criteria that have been applied to the arrival and departure routes in this ACP. (https://publicapps.caa.co.uk/docs/33/Policy%20for%20the%20Design%20of%20Controlled%20Airspace%20Structures%20110822.pdf). |
| CAS | Controlled Airspace is airspace within which air traffic services are provided. There are different classifications which define the air traffic control service provided and the requirements of aircraft flying within it. All commercial (passenger) flights fly within Controlled Airspace. |
| CATI & CATIIIB (approaches) | Categories of precision approach and landing (including Instrument Landing System (ILS) and Autoland) operations are defined according to the applicable Decision Altitude/Height and Runway Visual Range/visibility.<br>A category I (CATI) approach requires a higher decision height and better visibility than a category IIIB (CATIIIB) approach. The technical apparatus for CATIIIB approaches allow an airport to maintain operations in very poor visibility. |
| CCO | Continuous Climb Operations - allows departing aircraft to climb continuously, which reduces the level of noise heard on the ground, reduces fuel burn and emissions. |
| CDA | Continuous Descent Approach - allows arriving aircraft to descend continuously which reduces the level of noise heard on the ground, reducing fuel burn and emissions. |
| CF | Course to Fix - a path that terminates at a fix with a specified course at that fix. |
| Change sponsor | An organisation that proposes, or sponsors, a change to the airspace design in accordance with the CAA's airspace change process. |
| CHASE | The northerly of the two holds used for arrivals at Birmingham Airport. |
| Class G airspace | Class G airspace is also referred to as uncontrolled airspace and is airspace where an ATC service is not deemed necessary or cannot be provided for practical reasons. This means there are no restrictions on which aircraft can enter it, what equipment the aircraft must carry, or the routes taken by the aircraft. |
| Comprehensive list | The full list of design options that are viable designs as required by Stage 2 of the CAP1616 process and which are detailed in the Design Options Report. |
| CONOPS | Concept of Operations - a document that outlines how we want the airspace system to work in the future and the standards that we will use. |
| $CO_2$ | Carbon dioxide, one of the gases produced when burning aviation fuel. |
| COVID-19 | Coronavirus disease 19 is a contagious disease caused by a virus that was identified in 2019 and which resulted in a pandemic in the year 2020. |
| CP | Country Park - areas of land designated and protected by local authorities to provide access to the countryside. |
| Cumulative Impact | Where an environmental topic/receptor is affected by impacts from more than one source/project at the same time and the impacts act together. |
| CTA | Control Area - the controlled airspace that exists in the vicinity of an airport. |

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| dB | Decibels - a unit used to measure noise levels. |
| DEFRA | Department for the Environment, Food and Rural Affairs (UK Government). |
| DER | Departure End of Runway - a term that, when used in PANS-OPS 8168, determines the start point for the design of a departure procedure. |
| Design envelopes | Broad areas where it is possible to design routes and which are the areas where we have created design options for arriving and departing aircraft. |
| Design option | An output from the route design process that responds to the design principles and the Statement of Need (SoN). Design options are a requirement of the CAP1616 process. During the engagement carried out at Stage 2, design options were also referred to as route options. |
| Design principles | The principles encompassing the safety, environmental and operational criteria, and the strategic policy objectives that the change sponsor seeks to achieve in developing the airspace change proposal. They are an opportunity to combine local context with technical considerations and are therefore drawn up through discussion with affected stakeholders. The design principles at East Midlands Airport were established during Stage 1 of the CAP1616 process. |
| DF Coding | Direct to Fix coding - type of waypoint used in the design of PBN procedures. |
| DfT | Department for Transport. |
| DME | Distance Measuring Equipment - a ground-based beacon that allows aircraft to measure their precise distance from its location, often used to define a turn point. |
| DOE | Design Options Evolution - shows the evolution of the design options through Stages 2A and 2B of the CAP1616 process. Included as Appendix A to the Stage 2 Summary Document. |
| DOR | Design Options Report - this responds to the requirements of CAP1616 to develop a comprehensive list of options that address the SoN and that align with the design principles. It details the design process and the output of that process in the form of design options for both departures and arrivals. |
| DPE | Design Principle Evaluation - the document that undertakes an evaluation of the Viable and Good Fit options described in this report against the design principles. |
| DTY | Abbreviation for the Daventry DVOR navigation beacon and routes that use that as a navigation point. |
| DVOR | Doppler VHF Omni-directional Range - ground-based radio navigation beacon used by pilots to assist in aircraft navigation. |
| EASA | European Union Aviation Safety Agency. |
| Education (facilities) | For our analysis we have used the 'Ordnance Survey Address Base' count of educations facilities, details of which they receive from the local government contributing authority. These include all educational services including College, Further Education, Higher Education, Children's Nursery / Crèche, Preparatory / First / Primary / Infant / Junior / Middle School, Non State Primary / Preparatory School, Secondary / High School, Non State Secondary School, University, Special Needs Establishment and Other Educational Establishments. |
| EU | The European Union - an economic and political union of 27 countries. |
| EMA | The three letter IATA code for East Midlands Airport. |
| ERCD | The Environmental Research and Consultancy Department of the Civil Aviation Authority. |
| FAF | Final Approach Fix - The point at which the aircraft starts its final approach to land. |
| FASI-N | Future Airspace Strategy Implementation – North: The programme of airspace changes across the northern part of the UK, including East Midlands Airport, that is implementing the Governments Airspace Modernisation Strategy. |
| FASI-S | Future Airspace Strategy Implementation – South: The programme of airspace changes across the southern part of the UK including London that is implementing the Governments Airspace |

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| | Modernisation Strategy. Whilst the East Midlands Airport ACP will de deployed as part of FASI-N programme, the route structures to and from EMA to the south result in the need to align with the network being developed as part of FASI-S. |
| FIR | Flight Information Region - airspace delegated to a country by ICAO. In the UK there are two FIRs, London and Scottish. |
| FL | FL means 'Flight Level' and uses the standard international pressure (1013.2 hPa) to express altitude in hundreds of feet. For example, FL90 equates to 9,000ft calculated according to the 'constant' pressure altitude, rather than local pressure (QNH). |
| Flat segment | A defined period of level flight as required by a PANS-OPS PBN Approach procedure. |
| Flight path | The routes taken by aircraft within airspace. |
| Flight Level | A means to separate aircraft (above the transition altitude) by using a standard pressure setting for all aircraft. |
| FMS | Flight Management System - a specialised computer system that automates a wide variety of in-flight tasks, and which encompasses a data base to allow SID and arrivals routes to be pre-programmed and flown. |
| FOA | Full Options Appraisal - the options appraisal carried out at Stage 3 of the CAP1616 process. |
| Focus group | Group of representative stakeholders brought together to discuss proposals and offer feedback. |
| Ft | Feet. |
| GA | General Aviation - defined by ICAO as 'all civil aviation operations other than scheduled air services and non-scheduled air transport operations for remuneration or hire'. |
| GANP | The ICAO Global Air Navigation Plan provides a global strategy to modernise the air traffic management system. The GANP provides the foundation for the delivery of the UK AMS (CAP1711).<br>(https://www.icao.int/airnavigation/documents/ganp-2016-mobile.pdf). |
| GBAS | Ground Based Augmentation System - augments the existing GPS by providing corrections to aircraft in the vicinity of an airport to improve the accuracy of, and provide integrity for, the aircraft's GPS navigational position. |
| GDPR | The General Data Protection Regulations. |
| GIS | Geographic Information System. |
| GNSS | Global Navigation Satellite System - a term used to describe a system that uses satellites for position fixing. |
| GPS | Global Positioning System - a satellite-based radio navigation system owned by the United States government and operated by the United States Space Force. |
| HAZID Workshop | Hazard Identification workshop – the first part of the safety assurance process which identifies the safety requirements and potential interactions that may have a safety impact. It is held with air traffic control experts as well as airline representatives operating from East Midlands Airport. |
| IAF | Initial Approach Fix - the start of the approach phase of flight. For the East Midlands arrival design options, the IAF is at 7,000ft. |
| IF | Intermediate Fix – a defined point on an arrival procedure, where the aircraft speed and configuration are adjusted, shortly before the aircraft starts the final approach. |
| IATA | The International Air Transport Association - a trade association that supports aviation with global standards for airline safety, security, efficiency and sustainability. |
| ICAO | International Civil Aviation Organisation - an agency of the United Nations |
| IFP | Instrument Flight Procedure. |
| ILS | Instrument Landing System - a radio navigation system that provides vertical and horizontal guidance to arriving aircraft to help them land safely, especially in bad weather. |

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| Instrument Approach Procedures (IAPs) | A series of predetermined manoeuvres for the orderly transfer of an aircraft operating under instrument flight rules from the beginning of the initial approach to a landing, or to a point from which a landing may be made visually. |
| Intermediate segment | The element of the approach between the IF and FAF where the descent gradient is either minimised or where a portion of level flight is designed into the procedure to assist with aircraft stabilisation. |
| IOA | Initial Options Appraisal - the document that is the first iteration of the three option appraisals required by CAP1616 - the design options appraised within the IOA are the outputs from the DPE. |
| KIAS | Knots of indicated airspeed - the number shown on the airspeed indicator. |
| km | Kilometres. |
| KTS | Knots – nautical miles per hour. |
| LAeq | Equivalent continuous sound level, or Leq/LAeq, is the average sound level for a specific location, over a given period. |
| LBA | The three letter IATA code for Leeds Bradford Airport. |
| LDA | Localiser Directional Aid - an assisted approach not aligned with the landing runway, used in places where terrain or other factors prevent the localiser antenna from being aligned with the runway that it serves. |
| LOAEL | Lowest Observed Adverse Effect Level - below this level, there is no detectable effect on health and quality of life due to the noise. |
| LNAV | Lateral Navigation - a term for lateral (left/right) navigation used within Performance Based Navigation. |
| LPL | The three letter IATA code for Liverpool John Lennon Airport. |
| LTMA | London Terminal Manoeuvring Area – the designated area of Controlled Airspace that deals with air traffic in the London area. |
| m | Metres. |
| MAGIC map | Interactive map managed by DEFRA containing authoritative geographic information about the natural and built environment from across Government. |
| MAP | Missed Approach Procedure - on occasion, inbound aircraft are unable to land successfully on their first approach and perform an action known as a 'Go-Around'. The Missed Approach Procedure outlines a mechanism to route the aircraft, without conflict with departing or arriving aircraft, and re-establish it on to the arrivals path for another approach. |
| MAN | The three letter IATA code for Manchester Airport. |
| Masterplan | The strategic plan for the coordinated national programme of airspace change, created by the ACOG under the direction of the CAA and DfT. The criteria the CAA will apply to accept the Masterplan are contained in CAP2156a (www.caa.co.uk/cap2156A). |
| Medical (facilities) | For our analysis we have used the 'Ordnance Survey Address Base' count of 'Medical', details of which they receive from the local government contributing authority. These include Dentist, General Practice Surgery / Clinic, Health Centre, Health Care Services, Hospital, Hospice, Medical / Testing / Research Laboratory, Professional Medical Service, Assessment / Development Services. Not all of these are 'noise sensitive' receptors and in Stage 3 those which are not 'noise sensitive' will be removed from future analysis. |
| Mean track | For noise modelling purposes, an average track over the ground, derived from radar data samples. |
| Modal average path | The path over the ground most commonly flown, derived from radar data samples. |
| MSD | Minimum Stabilisation Distance - a design criteria within PANS-OPS 8168 that ensures aircraft stability when flying a procedure. |

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| MTMA | Manchester Terminal Manoeuvring Area - the designated area of Controlled Airspace that deals with traffic to the north of East Midlands Airport. |
| NATS | The air navigation service provider for the UK, formerly National Air Traffic Services. NATS 'En Route' manage the traffic in the upper airspace. |
| NDB | Non-Directional Beacon - a ground based radio beacon that emits a signal in every direction, used as an instrument approach aid for some airport procedures, including contingency procedures at EMA. |
| NERL | NATS En Route Ltd - the part of NATS that delivers en route air traffic control. |
| nm | Nautical miles. |
| NNR | National Nature Reserves - designated under the National Parks and Access to the Countryside Act 1949 and the Wildlife and Countryside Act 1981 to protect important habitats, species or geology. |
| Noise abatement | Activity to reduce the emission of noise from a given source (aircraft operations). |
| Noise-sensitive receptors | Specific locations or developments identified as likely to be adversely affected by noise from or due to aircraft operations. Individual locations will have varying degrees of sensitivity (measured noise exposure levels) depending upon their use. These provide a useful reference to the design principles N1, N2 and N3 where the number of people affected by noise, noise effects and noise sensitive areas are referenced. |
| NP | National Park - designated areas under the National Parks and Access to the Countryside Act 1949 to protect landscapes because of their special qualities. |
| NPR | Noise Preferential Route – initial flight path corridor around the SID that departing aircraft are required to remain within until they reach a minimum height of 5,000ft. Each NPR at EMA is 2.4km wide (1.2m either side of the SID). |
| NWMTA | North Wales Military Training Area: A designated area of airspace used extensively by the RAF for military training flights and which restricts use by civil air traffic. |
| Overflight | According to CAP1498, the definition of overflight is 'an aircraft in flight passing an observer at an elevation angle (approximately the angle between the horizon and the aircraft) that is greater than an agreed threshold, and at an altitude below 7,000ft.' |
| PANS-OPS | An ICAO document that stands for Procedures for Air Navigation Services Document 8168 that outlines the rules and criteria for designing aircraft flying procedures - commonly shortened to PANS-OPS. |
| PBN | Performance Based Navigation - a range of specifications that requires aircraft to navigate to specific accuracy standards, mainly by using satellite-based navigation systems. It is designed to improve track-keeping accuracy for departing and arriving aircraft. The transition to PBN is a UK and international policy requirement and a foundation of the AMS and this ACP. |
| PBN IR | The PBN IR introduces the gradual implementation of PBN flight procedures to support safer, greener, and more efficient aircraft operations. The regulation is binding in its entirety and directly applicable in all EU Member States. |
| Peak District | The Peak District - an upland area in England at the southern end of the Pennines. Mostly in Derbyshire, it extends into Cheshire, Greater Manchester, Staffordshire, West Yorkshire and South Yorkshire. |
| PDG | Procedure Design Gradient. |
| PIGOT | The southerly of the two existing holding stacks used for arriving aircraft at EMA. It is situated south east of Leicester. |
| Places of Worship | For our analysis we have used the 'Ordnance Survey Address Base' count of 'Places of Worship', details of which they receive from the local government contributing authority. These |

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| | include any Abbey, Baptistry, Cathedral, Church, Chapel, Citadel, Gurdwara, Kingdom Hall, Methodist, Mosque, Minster, Stupa, Succah, Synagogue, Tabernacle or Temple. |
| Planned Property Developments | Property developments with a reasonable prospect of being developed based on Local Plan allocations and Local Authority five-year Housing Land Supply Assessment data. During engagement we have used the term 'Future Housing Sites' to represent the broader phrase of planned property development as we are not aware of other future noise sensitive developments that would sit within this category. Data was collated by CBRE and supplied to East Midlands Airport in December 2022. |
| Point Merge | Is based on a specific precision-area navigation (P-RNAV) route structure, consisting of a point (the merge point) and pre-defined legs (the sequencing legs) equidistant from this point. The sequencing is achieved with a 'direct-to' instruction to the merge point at the appropriate time. |
| Q&A | Question and Answer - a list of questions (and their answers) that help the reader understand the subject material. |
| RAG | Red, amber, green - a means of assessing a project's status using the traffic light colours. |
| RF | Radius to Fix (RF) is a constant radius PBN turn around a defined turn centre which produces a highly accurate track over the ground. |
| RNAV1 | Area Navigation 1 is one of the specifications within PBN. Aircraft must maintain specific navigational accuracy within the flight. The '1' suffix refers to the accuracy requirement in the procedure, in this case aircraft must fly within +/-1 nautical mile of the centreline of the designed route. |
| RNP APCH | Required Navigation Performance Approach - a type of RNP procedure used in the descent phase of flight. |
| RNP-AR | Required Navigation Performance-Authorisation Required – a specialist type of PBN arrivals procedure, which requires suitably equipped aircraft, and crews to be trained in its use. |
| RNP1 | Required Navigation Performance - one of the specifications under PBN. Aircraft must maintain specific navigation accuracy, and in RNP are aided by on-board performance monitoring and alerting. It provides slightly more predictable track-keeping when compared to RNAV1. The '1' suffix refers to the accuracy requirement in the procedure, in this case aircraft must fly within +/-1 nautical mile of the centreline of the designed route. |
| RNP1+RF | Required Navigation Performance with Radius to Fix turns. |
| ROKUP | The northerly of the two existing holding stacks used for arriving aircraft at EMA. It is situated close to Belper. |
| Route option | A term used in engagement to describe the design options that have been created in this step of the Airspace Change Process. |
| SAC | Special Area of Conservation - Designated under the Conservation of Habitats and Species Regulations 2017 as making a significant contribution to the conserving of the habitats of protected species. |
| Safety Case | A written demonstration of evidence and due diligence provided by a corporation to demonstrate the ability to operate safely and effectively control hazards. |
| SARG | Safety and Airspace Regulation Group which drives UK Civil Aviation Authority (CAA) safety standards including overseeing aircraft, airlines and air traffic controllers. They are also responsible for the planning and regulation of UK airspace. |
| Secretary of State | The title typically held by Cabinet Ministers in charge of Government Departments. |
| SESAR | The Europe-wide Single European Sky Air Traffic Management Research programme - a joint undertaking is an institutionalised European partnership between private and public sector partners set up to accelerate through research and innovation the delivery of the Digital European Sky (www.sesarju.eu). |

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| SID | Standard Instrument Departure - pre-determined flight path set by Air Traffic Control that aircraft follow when departing an airport. |
| SME | Subject Matter Expert(s) is a person (are people) who has (have) accumulated great knowledge in a particular field or topic. |
| SoN | Statement of Need - the means by which the change sponsor sets out what airspace issue or opportunity it is seeking to address and what outcome it wishes to achieve, without specifying solutions, technical or otherwise. East Midlands Airport's SoN can be found online (https://airspacechange.caa.co.uk/documents/download/773). |
| SPA | Special Protection Area - protected areas for birds classified under the Wildlife and Countryside Act 1981 and protected under the Conservation of Habitats and Species Regulations 2017. |
| SSSI | Sites of Special Scientific Interest - areas of importance designated and protected by Natural England under the Wildlife and Countryside Act 1981 to recognise the land's wildlife, geology or landform is of special interest. |
| STAR | Standard Terminal Arrival Route - a pre-determined flight path set by Air Traffic Control that aircraft follow when arriving at an airport. |
| Step 1B Design Principles Report | A document that formed part of East Midlands Airport's Stage 1 submission to the CAA (https://airspacechange.caa.co.uk/documents/download/5447). |
| T-Bar | A name given to a type of RNAV final approach procedure. There is a final approach based on an extended centreline from the runway and then perpendicular to that, two Initial Approach Segments are connected to form a 'T' shape. |
| Technical Coordination Group | Created by ACOG the Group regularly meet to discuss and resolve policy and technical issues affecting airspace design across all airports. |
| TNT | Abbreviation for the Trent DVOR navigation beacon and routes that use that as a navigation point. |
| TODA | Take off Distance Available - the length of the paved surface of the take-off runway plus the length of the clearway. |
| TOS | Traffic Orientation Structure ensures smooth traffic flows and decrease the safety risks associated with crossing traffic. |
| Track to fix | A Track to Fix (TF) leg is used in PBN procedures to create a line between two waypoints. It is defined by the flight track to the following waypoint and Track to a Fix leg are sometimes called point-to-point legs for this reason. |
| Tranquillity | There is no universally accepted definition of tranquillity and therefore no accepted metric by which it can be measured. In general terms it can be defined as a state of calm. The consideration of impacts upon tranquillity for airspace change is with specific reference to National Parks and Areas of Outstanding Natural Beauty (AONB), plus any locally identified 'tranquil' areas that are identified through community engagement and are subsequently reflected within an airspace change proposal's design principles. |
| Transition | The part of the arrival route from the IAF at 7,000ft where aircraft are descending prior to joining the final approach at the FAF. |
| Transition Altitude | The altitude at or below which the vertical position of an aircraft is controlled by reference to altitudes. Above this, the reference is to a Flight Level. |
| Transport Act 2000 | The Transport Act 2000 is an Act of the Parliament of the United Kingdom. The Act provided for a number of measures across the transport industry. In the aviation sector, the Act set a framework for creation of a public-private partnership of National Air Traffic Services. |
| Uncontrolled airspace | Uncontrolled airspace is airspace where an ATC service is not deemed necessary or cannot be provided for practical reasons. This means there are no restrictions on which aircraft can enter it, |

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| | what equipment the aircraft must carry, or the routes taken by the aircraft. In airspace classification terms this is also referred to as Class G airspace. |
| Unviable | Options which would not comply with the rules or for flight procedure design, specifically the requirements of ICAO PANS-OPS 8168, or if they are not compliant with these rules, did not have a supporting safety justification. |
| VHF | Very High Frequency. |
| Viable and Good Fit | Options that are viable to design and which would be expected to meet the three design principles with which all design options 'must' comply (design principles Safety, Programme, and Continuity). |
| Viable but Poor Fit | Options that are viable to design, but which would not be expected to meet the requirements of the design principles Safety, Programme and Continuity. |
| VNAV | Vertical Navigation - a term for vertical (up/down) navigation used within Performance Based Navigation. |
| VRP | Visual reference point. |

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