Phase Two Engagement Materials - Departures

Stage 2 Develop and Assess

MAG East Midlands Airport

Appendix 4 outlines the departures materials shared during phase two stakeholder engagement.

Contents

EAST MIDLANDS AIRPORT FUTURE AIRSPACE

Stage 2 – Develop and Assess
Phase two engagement – departure route options

November 2022

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Contents

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East Midlands Airport – airspace change timeline

We are here

2019/2020	2022/2023	2023/2024	2024	2025	2026	2027 onwards
Stage 1 Define	Stage 2 Develop and assess	Stage 3 Full public consultation	Stage 4 Update and submit proposals	Stage 5 Decision	Stage 6 Implementation	Stage 7 Post-implementation review
Step 1A In May 2019 we sent the CAA our Statement of Need, which was approved and provisionally classed as a Level 1 change. **Step 1B** We gathered views on Design Principles during 2019. Our Stage 1 work was approved by the CAA in January 2020.	Using the Design Principles produced during Stage 1 as a framework to evaluate different design options, we will develop and assess options for any airspace change. We will send details of those design options to the CAA for approval in Spring 2023.	We will prepare to consult the public on these options. Once we have approval from the CAA to proceed, a formal consultation will take place in late 2023/2024.	We will update our airspace change proposal, taking stakeholders' feedback into account, before sending it to the CAA in 2024.	We expect the CAA's decision on whether to approve any airspace change in 2025.	If approved, any airspace changes could be put in place in 2026.	The CAP1616 process gives the CAA and airports 12 months to review any change that has been made to airspace.

[1] Level 1 changes are high impact changes to notified airspace design which have the potential to alter traffic patterns below 7,000ft

All future dates are provisional pending CAA approval and alignment with the wider Airspace Modernisation Strategy

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Stage 2 process – gathering views

We are here

Step 2A

Engagement phase one – sharing the design envelopes

June/July

We shared the design envelopes together with details of how these have been developed, for feedback and input.

Feedback considered, routes developed

August - October

Taking account of feedback, design envelopes were further enhanced and specific route options developed.

Engagement phase two – sharing route designs

November

In discussion sessions like this one, we will be sharing the route options that have been developed, together with our rationale to explain how we believe they align with our design principles, for feedback and input.

Feedback considered, options further developed. Design Principles Evaluation (DPE)

December

Taking account of feedback, options will be refined further. Route options will then be evaluated against the design principles to see which merit further assessment.

Step 2B

Initial Options Appraisal (IOA)

January - February

The route options taken forward from the DPE will be subject to an Initial Options Appraisal to determine the likely impact of each. Once complete, full details of all the work undertaken at Stage 2 will be submitted to the CAA for assessment.

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PHASE ONE RECAP

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Departures – phase one design process recap

1 Design Boundary

Determine where we could fly between the ground and 7,000ft. This creates a ‘design boundary’.

2 Constraints

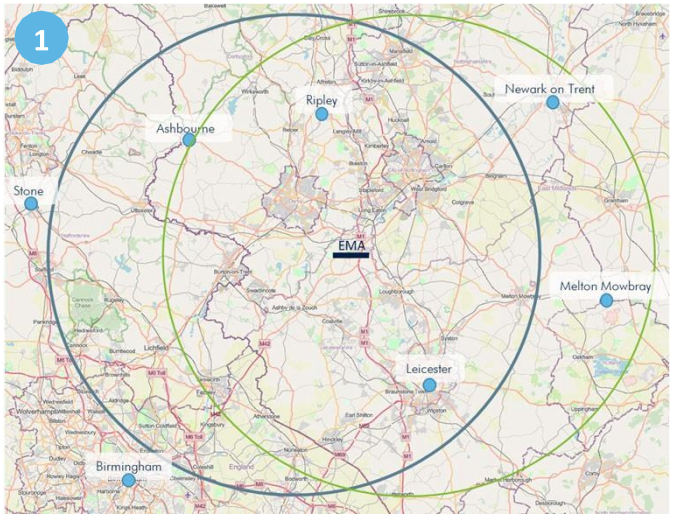
Consider the airspace around us to identify constraints within the design boundary.

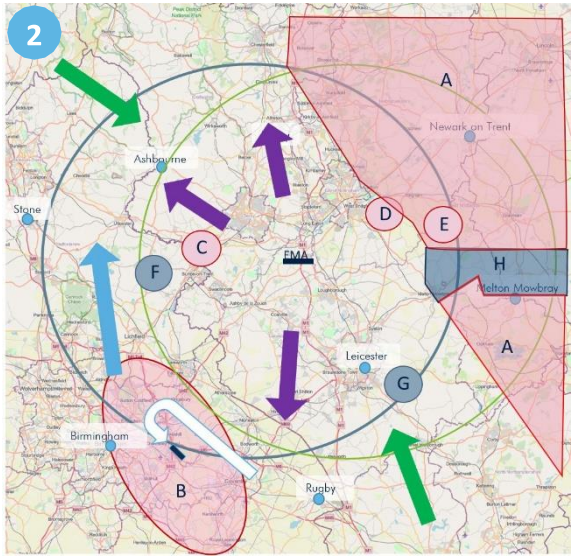
3 Design principles

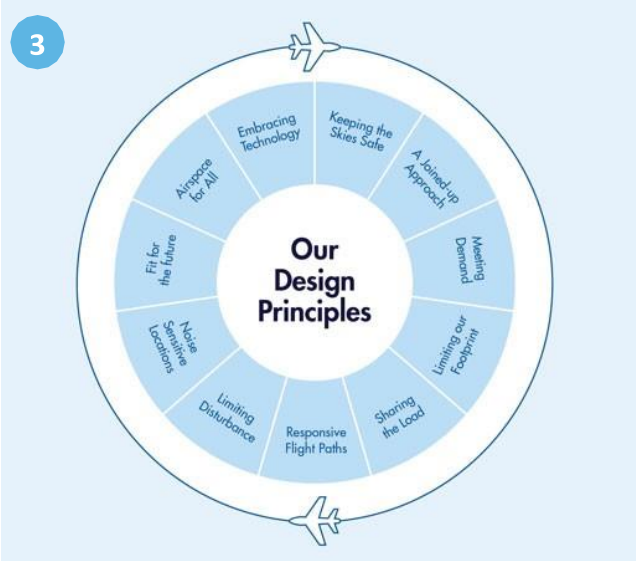
Using our design principles and supporting Concept of Operations (CONOPS), consider what we want to achieve.

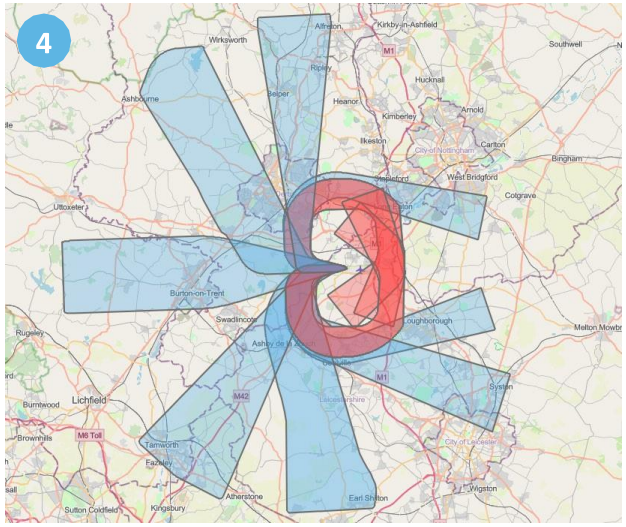
4 Design envelopes

This process created a set of design envelopes – broad areas where we could place routes for departures and arrivals.





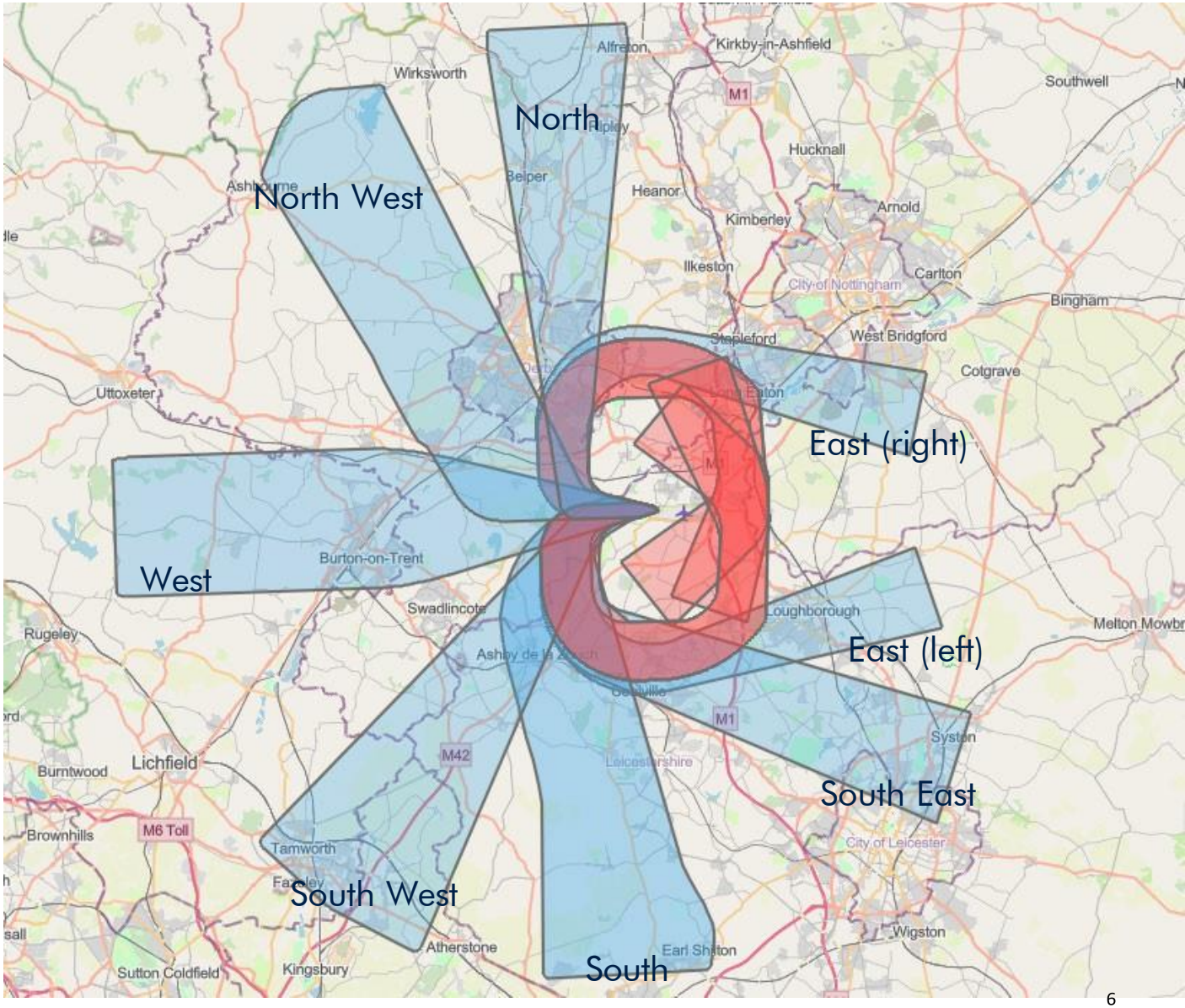




Runway 27 departure envelopes

Based around existing departure routes or areas we believe could improve the way we operate.

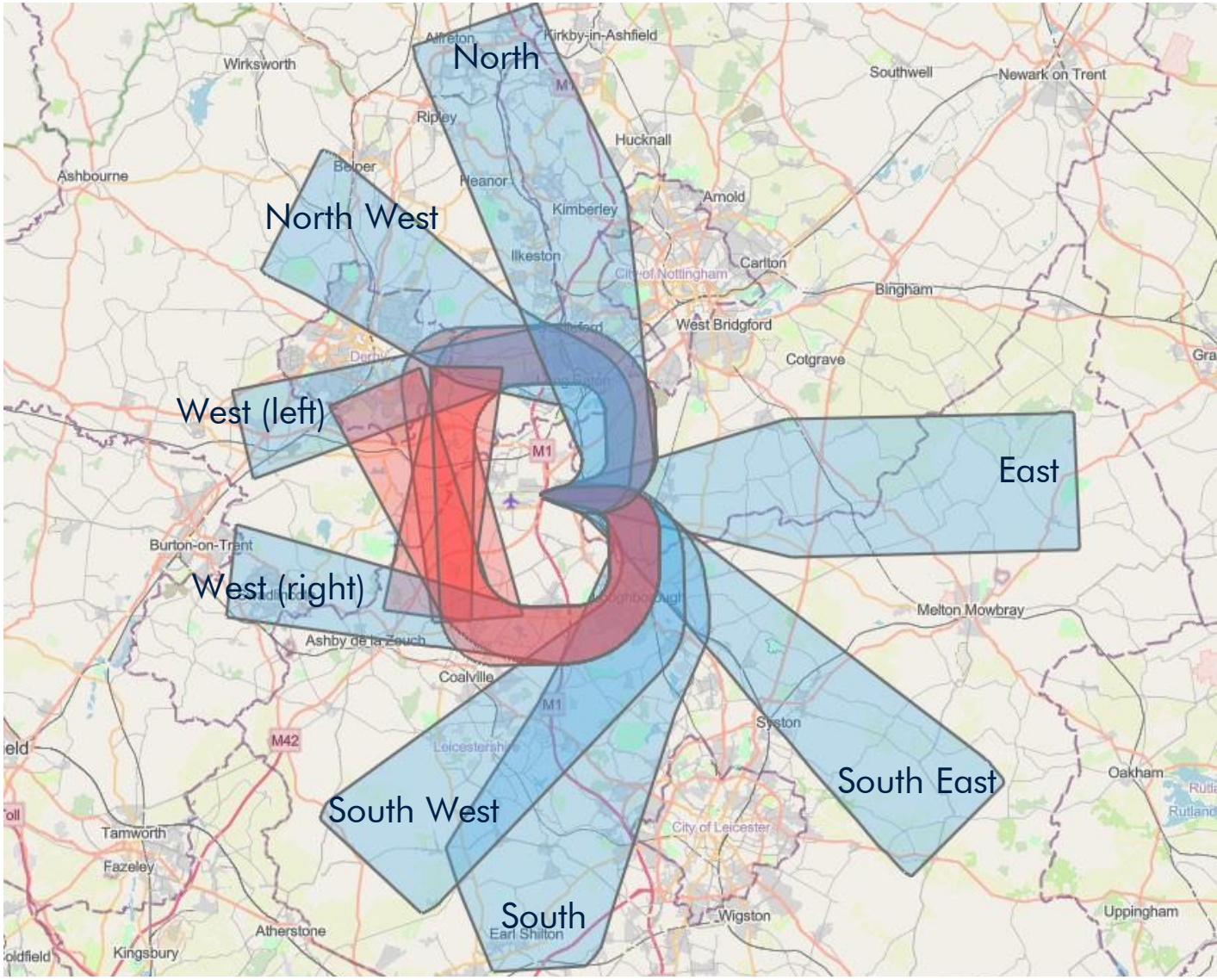
Included wrap around alternative envelopes (shown here in red) to potentially create predictable respite.



Runway 09 departure envelopes

Based around existing departure routes or areas we believe could improve the way we operate.

Included wrap around alternative envelopes (shown here in red) to potentially create predictable respite.



PHASE ONE ENGAGEMENT FEEDBACK

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Phase one feedback – general themes

	Feedback	Response
Respite	The alternative departure envelopes do not appear to present the most efficient means of delivering respite.	The alternative departure envelopes have been removed. New envelopes have been created and some envelopes have been extended to create further opportunities to create respite. Design principle link, Sharing the Load.
Community noise impacts	Managing noise impacts on communities close to the airport is a key concern. Many stakeholders asked us to avoid overflying specific villages, towns and cities.	Options have been included in each envelope that avoid direct overflight of specific areas of population, including those specifically mentioned, wherever possible. Design principle link, Limiting Disturbance.
Community noise impacts	Routes should be placed in areas where they cause the minimum noise disturbance to communities	Options have been included that aim to follow non residential areas, for example by following the path of major road networks, where possible. Design principle link, Responsive Flight Paths.
Community noise impacts	Consideration should be given to varying the initial departure to minimise noise impact on communities that are particularly close to the airport e.g. through tighter turns.	Opportunities to create respite are featured in various ways through the design, for example, by creating as many design envelopes as possible with varied options within them. In addition, some options have been developed that depart with an offset to potentially provide respite to communities that are particularly close to the runway centreline. Design principle link, Limiting Disturbance.
Community noise impacts	Consider steeper climb gradients	We know from engagement with our airlines that a 6% climb gradient is suitable for the fleet of aircraft in operation at EMA, which is consistent with our technology design principle which outlines our commitment to support technology that is widely available. However, 6% will be a minimum and it is likely that our designs will allow those aircraft that can climb more quickly to do so. Design principle link, Limiting Disturbance, Embracing Technology.

Phase one feedback – general themes

	Feedback	Response
Housing development	Consideration should be given to new/ proposed housing development within Local Plans.	The CAP1616 process requires us to consider local plans. All known committed local plan allocations and large sites with planning consent will be included as part of the overflight analysis that will form part of the Initial Options Appraisal (IOA). Design principle link, Limiting Disturbance.
Sensitive areas	Green spaces and other cultural sites are important. The location of SSSIs and other sensitive sites should be considered.	The location of sensitive sites as defined in the CAP1616 guidance has been included in our route options maps to provide clarity for stakeholders, options that take account of these have been provided. Sites that fall within the definition of tranquil areas will be identified; and considered as part of the environmental appraisal of the route options. This will be extended to heritage sites and parks as well as sites with ecological designation such as Ramsar sites and SSSIs. Design principle link, Noise Sensitive Locations.
Night operations	Operations at night are of particular concern.	At this stage of the process we are required to look at the location of route options only, not how each route might be used as part of the system of routes. This will come later in the process after the completion of Stage 2. However, the Sharing the Load design principle leads us to consider how we can create predictable respite or relief, either through the design (where the routes are) or how they are operated and that would include night operations which we understand is particularly sensitive. Design principle link, Sharing the Load.
Training flights	Training flights are most disruptive, these should be considered as part of airspace change.	Our airspace change relates to routes used by aircraft that join the NATS national route network at 7,000 feet. Training flights do not join this network and therefore do not form part of the airspace change process. Training flights are however considered as part of the Noise Action Plan, more detail on how these are being addressed and the progress that has been made can be found in the pre-read material.
Environment	Consideration should be given to environmental impacts of any changes.	As part of our design principles evaluation, in line with our Limiting our Footprint principle, each route option will be assessed to estimate the fuel burned and emissions generated. This will enable a comparison to be made between each option to provide a picture of the comparative environmental impact of each. Design principle link, Limiting our Footprint.

QUESTIONS

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DEVELOPING A COMPREHENSIVE LIST OF ROUTE OPTIONS

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WHAT WILL WE BE ASKING?

- Is the process we have followed to identify departure route options clear and logical?
- Is it clear how feedback from our earlier stakeholder discussion sessions in June have influenced the development of the route options?
- The extent to which the route options align with the design principles?
- Are there any further options or improvements that could deliver additional benefits that you feel we haven't included? If so, please explain.
- Aside from those already mentioned, are there any additional local factors we should be aware of when evaluating these route options?

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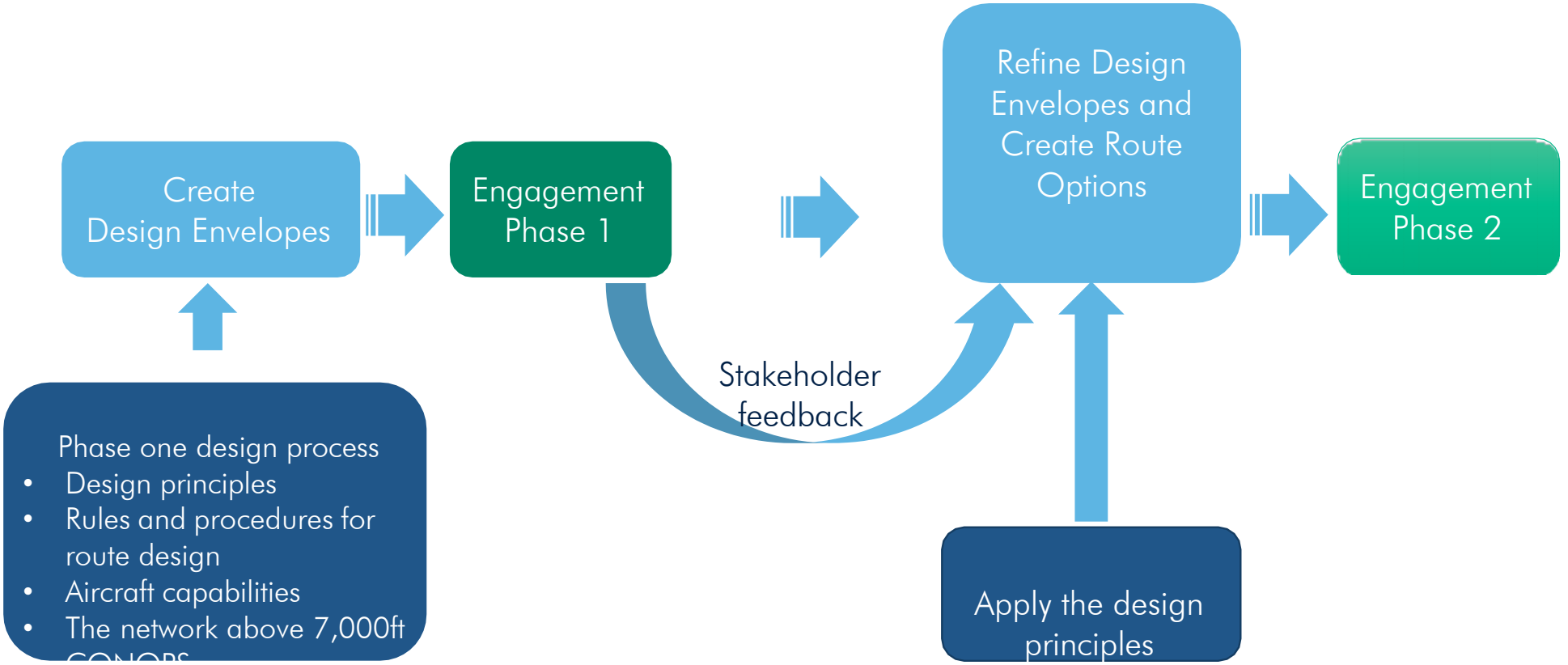
The phase 2 design process



The route options development process – applying the design principles

Keeping the Skies Safe
Safety must take precedence over all other factors. Flight paths must be safe for airspace users, the airport and communities on the ground.

Sharing the Load
Flight paths should, where practical, be spread out to avoid concentration of aircraft activity to share any noise impacts.

Fit for the Future
Flight paths should be designed to futureproof our airspace and cannot be constrained by existing arrangements.

A Joined-up Approach
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.

Responsive Flight Paths
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.

Airspace for All
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.

Meeting Demand
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.

Limiting Disturbance
Flight paths should seek to limit and, where possible, reduce noise disturbance to communities – especially at night.

Embracing Technology
Flight paths should be designed using the latest, widely available navigational technology and flying techniques.

Limiting our Footprint
Flight paths that limit and, where possible, reduce emissions should be implemented.

Noise Sensitive Locations
Flight paths should, where practical, avoid locations that are especially sensitive to noise.

To create departure options we looked at ways to route aircraft from the runway, through the design envelope to 7,000ft.

This created a comprehensive list of options.

Not all of the options which we considered are viable when assessed against our design principles, specifically the three design principles that we determined all of our options *must* meet. So we have therefore adopted a staged approach to refine these.

The result is a range of viable departure route options which we are presenting to you today.

The staged approach to refining our options

UNVIABLE

Options that do not meet PANS OPS 8168 (the rules for designing instrument approach and departure procedures) or have a justifiable safety case.

For example, this could be due to:

- The position of the first turn or the turn radius
- Not meeting obstacle clearance requirements
- Descending at a gradient above the recommended maximum

Unviable options will be outlined in our Design Options Report (DOR) but will not be developed in detail or analysed in the Design Principles Evaluation.

VIABLE BUT POOR FIT

Options that would not meet one or more of the three design principles with which routes 'must' comply (Keeping the Skies Safe, A Joined-up Approach, Meeting Demand)

- This will exclude any options that conflict with our identified safety constraints, or complex airspace.
- Alternatively it may exclude options that do not comply with policies such as the UK Government Airspace Modernisation Strategy.

The concept design for Viable but Poor Fit options is described in our Design Options Report (DOR), as is the reason for failing to meet the design principle. However, they will not be designed or taken forward for analysis.

VIABLE AND GOOD FIT

Options that would be expected to meet the three design principles with which routes 'must' comply (Keeping the Skies Safe, A Joined-up Approach, Meeting Demand)

- These are the subject of our discussion today

Viable and Good Fit options will be fully designed and evaluated against all of the design principles.

Creating departure options

The foundation for the options is the design envelope we shared with you at phase one.

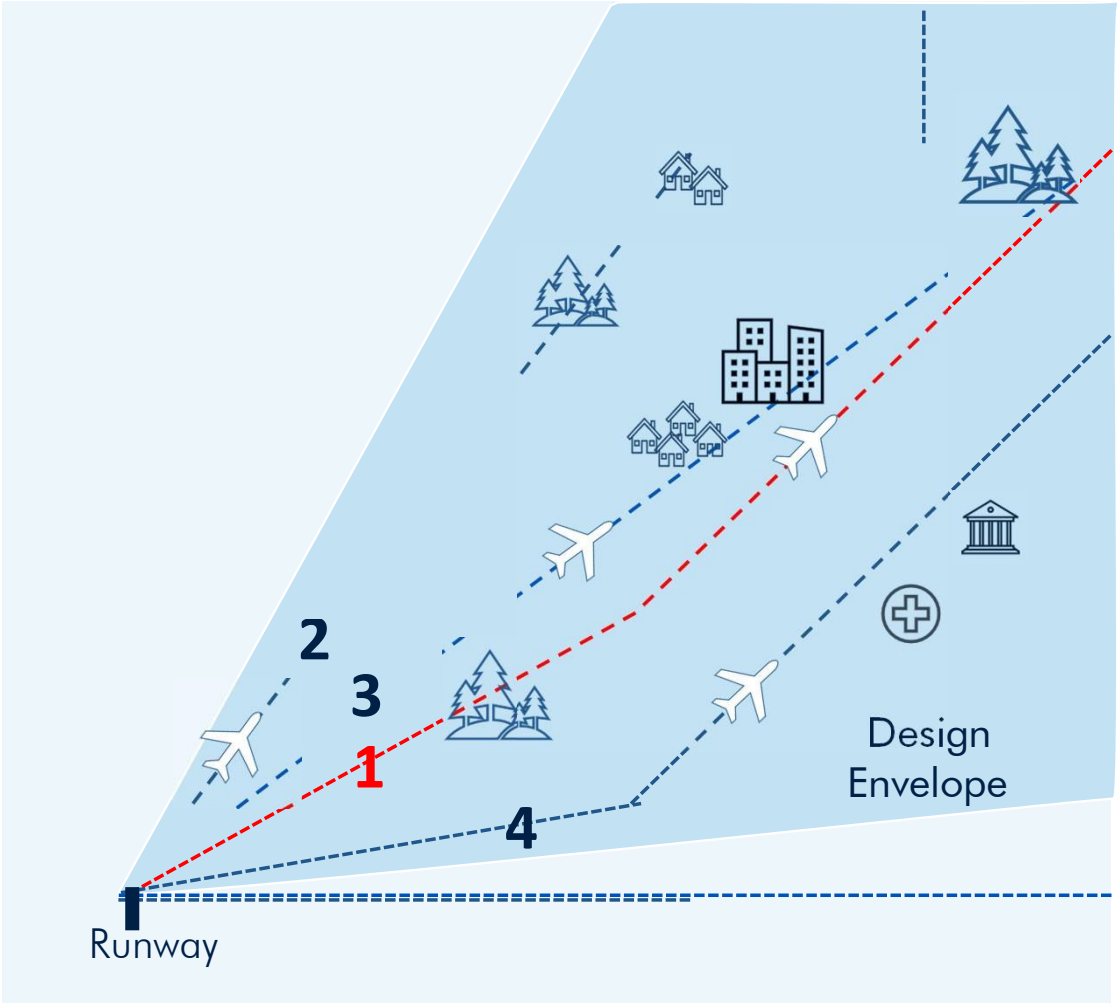
Where the envelope contains an existing route, this has been replicated as far as possible to Performance Based Navigation (PBN) standards. This is our 'do minimum' option. Shown on our illustration here in red.

Additional options have been created that could provide a benefit which aligns with one or more of the design principles.

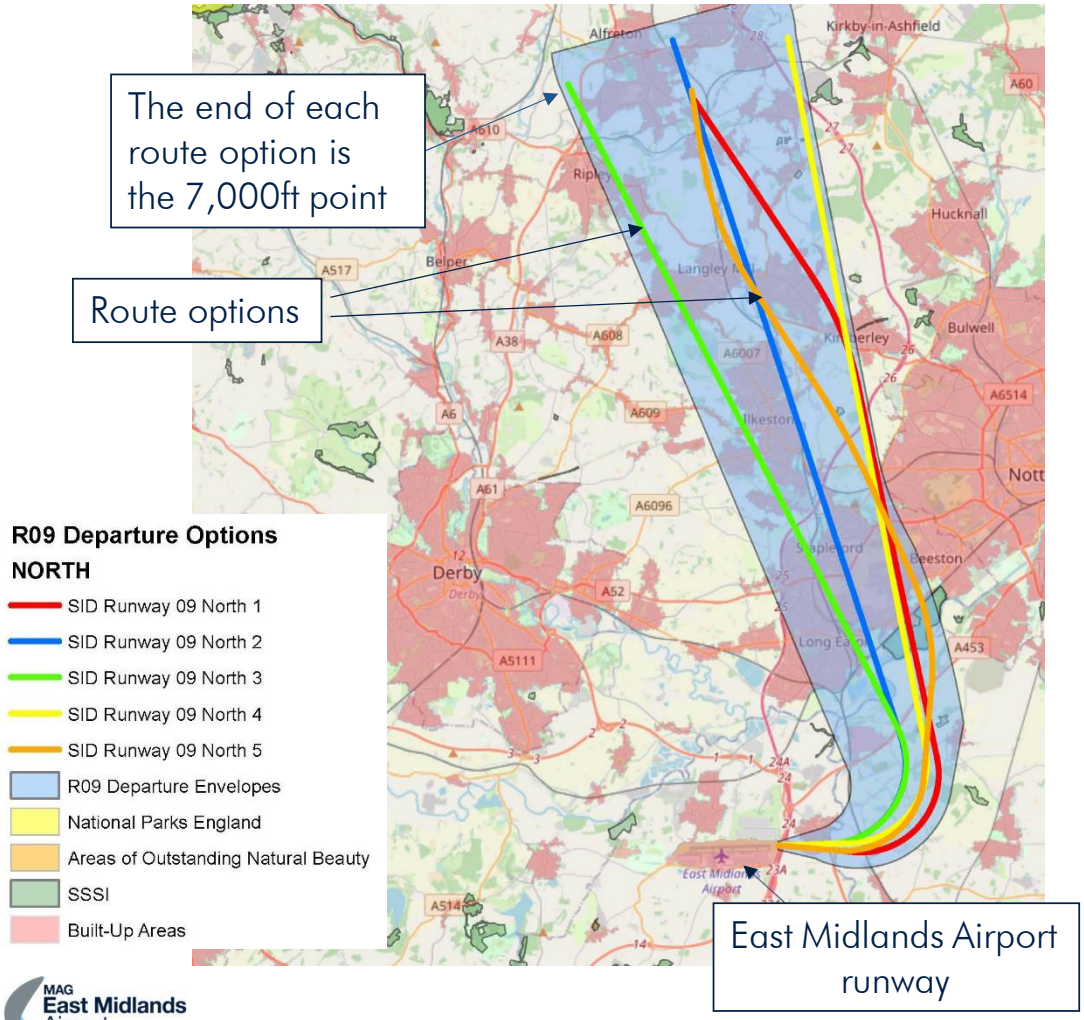
The examples show options that:

1. Do minimum
2. Route to reduce the number of people overflown (Limiting Disturbance), or
3. Provide a more direct routing to reduce fuel burn (Limiting our Footprint), or
4. Reduce the number of noise sensitive sites overflown (Noise Sensitive Locations).

Where a design envelope did not contain an existing route, a new set of route options were developed using the same concept.



How we are going to describe our options – an example



All routes are based on a 6% climb gradient and are illustrated from ground to 7,000ft.

Red routes are the replications of the current route (where applicable) this represents our 'do minimum' option.

All other coloured routes are intended to respond to one or more of the design principles, for example;

- Deviations to avoid populated areas - Limiting Disturbance
- Tighter turns from departure to achieve onward heading sooner – Limiting our Footprint
- Routes that would reduce delays for following aircraft – Meeting Demand
- Options to provide respite – Sharing the Load.

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RUNWAY 27

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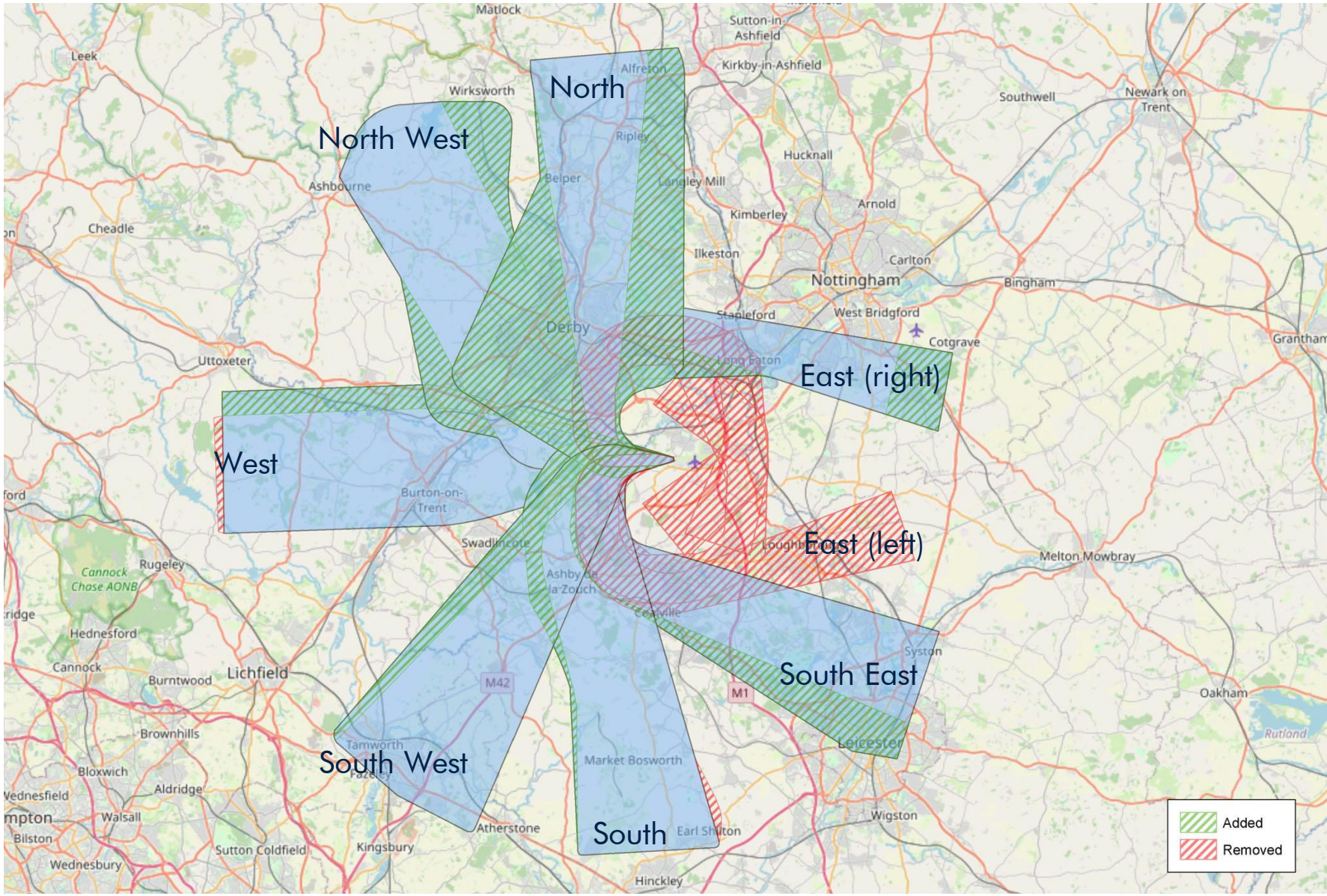
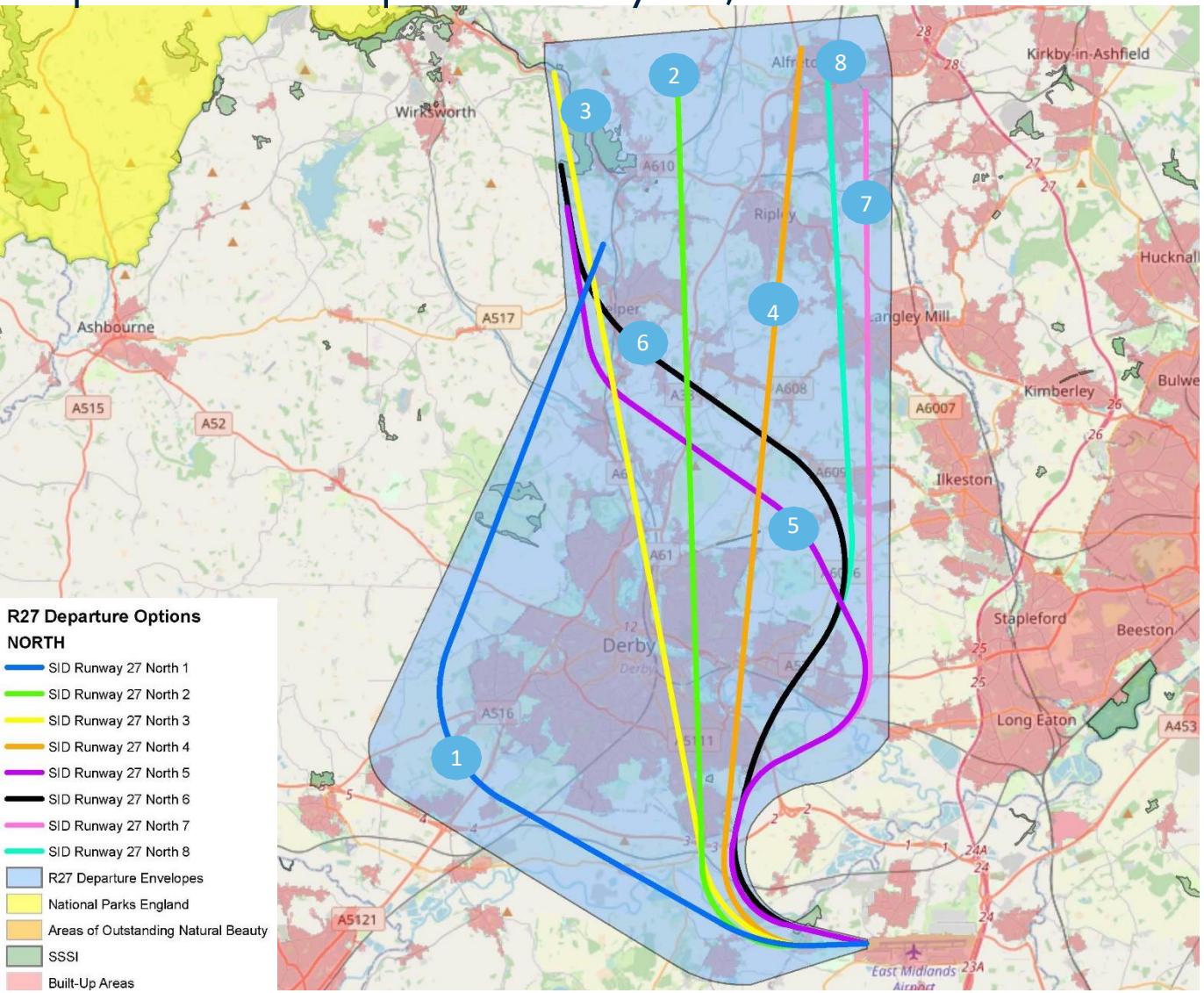
Revised design envelopes
Runway 27



Options shown are for illustration only and are subject to change as we progress through the CAP1616 process.

Departure envelope – Runway 27, North



Routes in this envelope have been designed for flights routing to both the north and the east. It has been extended to the east and west compared to the first engagement.
As it is a new envelope, there is no replicated route.

Option 1 provides connectivity to the upper airspace network and avoids direct overflight of Derby.
Design principle link – A Joined-up Approach and Limiting Disturbance.

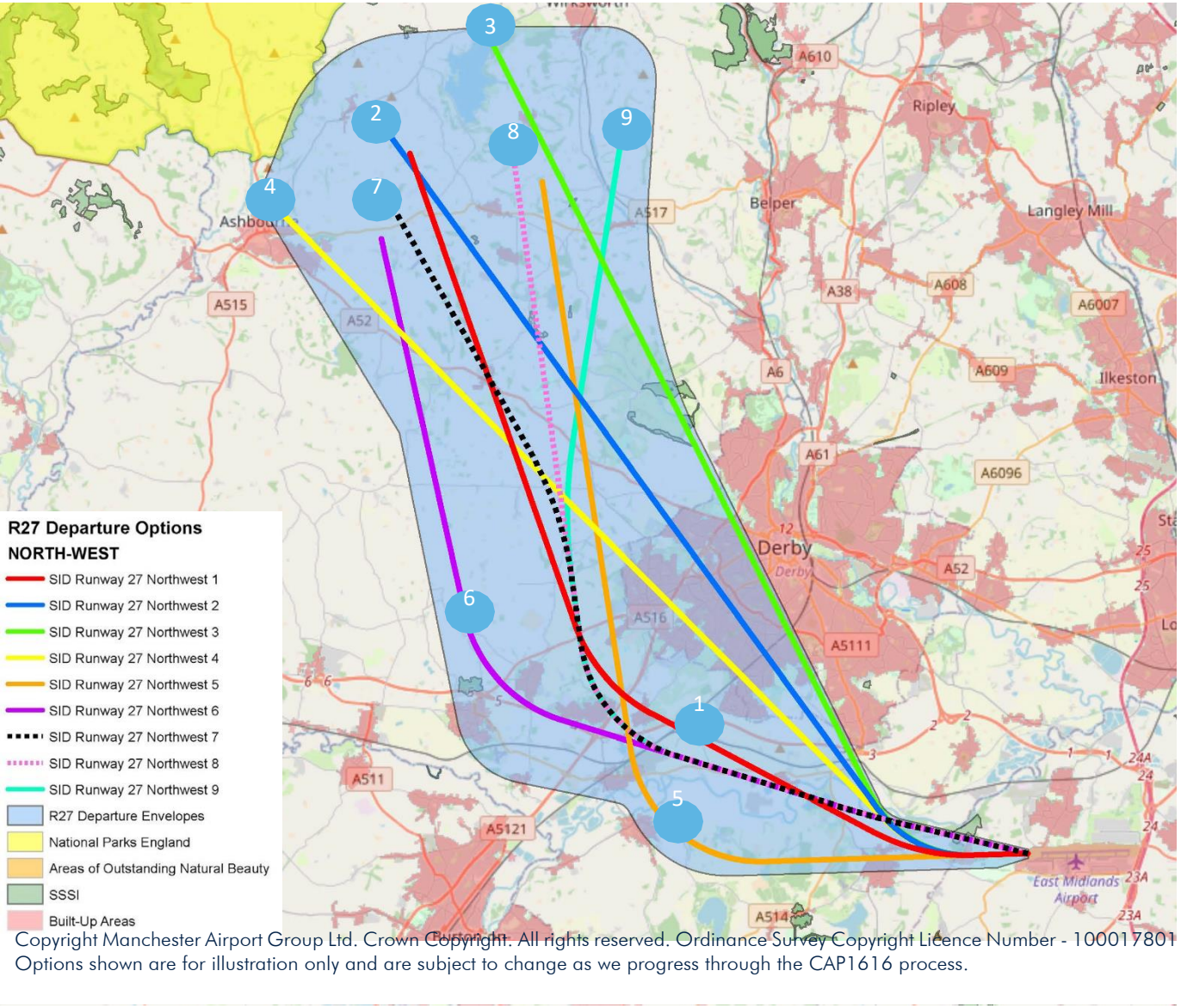
Option 2 is designed for fuel efficiency as it is the most direct.
Design principle link - Limiting our Footprint

Options 3 and 4 provide alternatives to connect to the upper airspace network.
Design principle link – A Joined-up Approach

Options 5, 6, 7 and 8 provide network connectivity but avoid direct overflight of specific communities. (Derby, Belper and Ripley).
Design principle link - Limiting Disturbance

Options shown are for illustration only and are subject to change as we progress through the CAP1616 process.

Departure options – Runway 27, North West



Options shown are for illustration only and are subject to change as we progress through the CAP1616 process.

Routes in this envelope have been designed for flights routing to the north and the north west. It is based on the current Trent departure and has been extended to the east and west.

Option 1 is a PBN replication of the current Trent route and represents the 'do minimum' option.
Design principle link – A Joined up Approach

Option 2 is the most direct route heading north west and is designed for fuel efficiency.
Design principle link – Limiting our Footprint

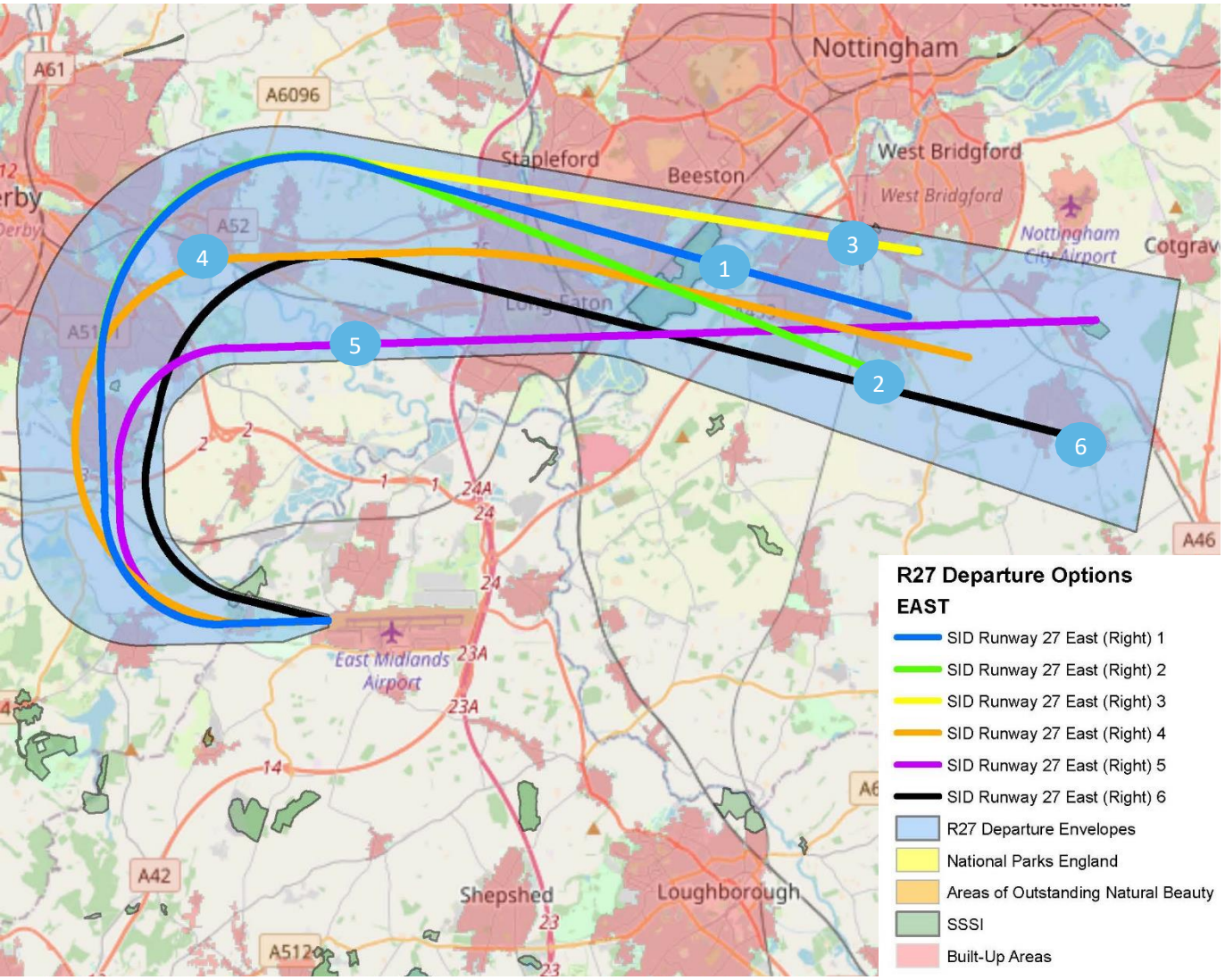
Options 3 & 4 provide alternative connectivity to the upper airspace network.
Design principle link – A Joined-up Approach, Limiting our Footprint

Options 5 provides alternative network connectivity and avoids direct overflight of Derby
Design principle link –Limiting Disturbance.

Option 6 is designed with an offset to avoid communities close to the runway centreline and follows the A50 before heading north.
Design principle link –Limiting Disturbance, Responsive Flight Paths,

Options 7, 8 and 9 all depart at an offset to avoid communities close to the runway centreline and have a spread of network joining points.
Design principle link –Limiting Disturbance.

Departure options – Runway 27, East



Options shown are for illustration only and are subject to change as we progress through the CAP1616 process.

Routes in this envelope have been designed for flights routing to the east. It has been extended to the south. This is a new envelope which is dependent on NATS creating controlled airspace and a suitable network joining point in this direction.
As this is a new envelope, there is no replicated route.

Option 1 was designed for fuel efficiency and follows the centreline of the original envelope.
Design principle link – Limiting our Footprint, A Joined-up Approach

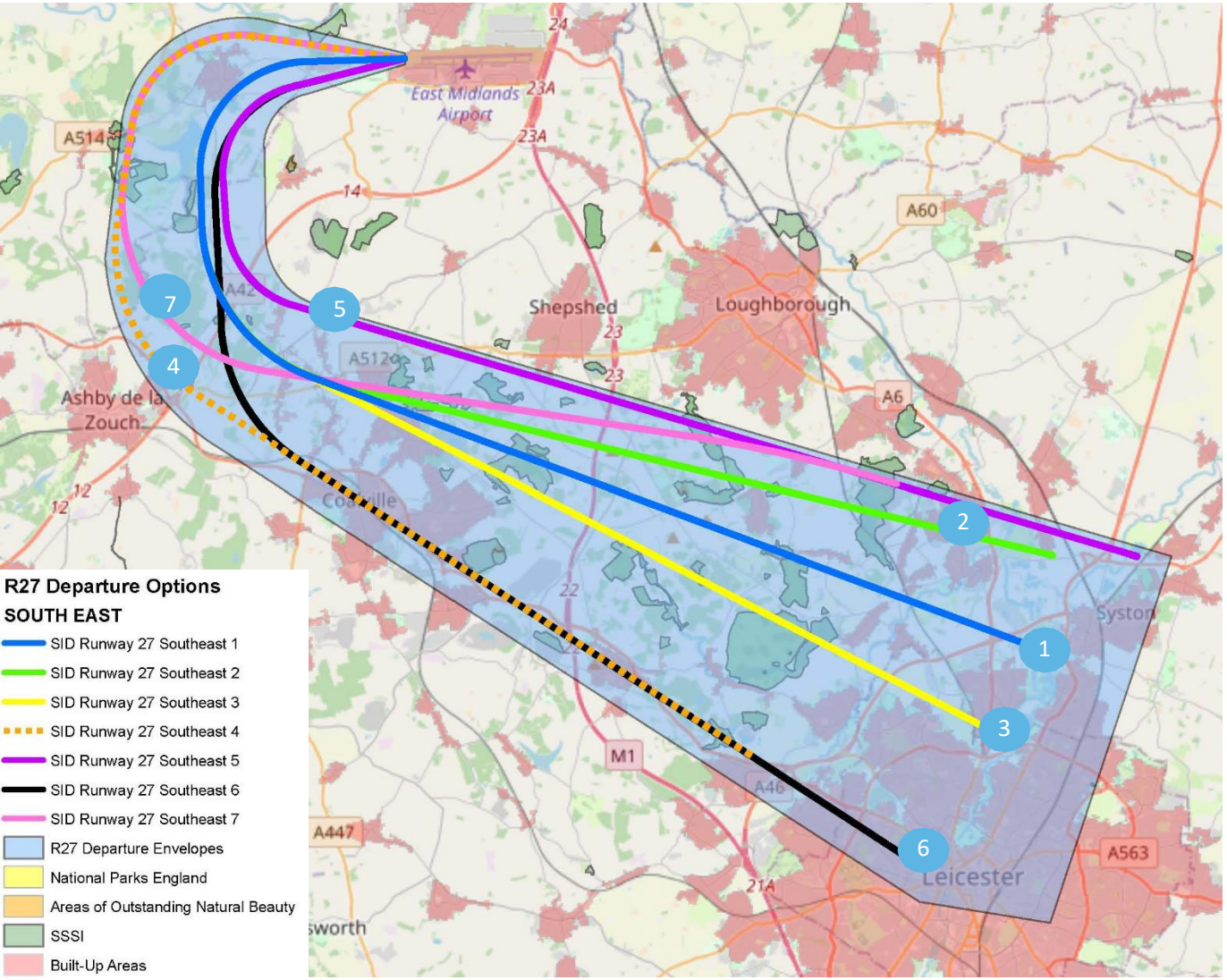
Options 2 and 3 follow the same initial route as option 1 but provide alternative connectivity to the upper airspace network.
Design principle link – A Joined-up Approach

Option 4 makes a single turn to avoid the south east of Derby.
Design principle link – Limiting Disturbance.

Option 5 takes a tight turn to avoid Derby and routes directly to the east.
Design principle link – Limiting our Footprint, Limiting Disturbance.

Option 6 has a north offset to avoid communities close to the extended runway centreline and then takes a right turn to avoid Derby and central Nottingham.
Design principle link – Limiting Disturbance.

Departure options – Runway 27, South East



Options shown are for illustration only and are subject to change as we progress through the CAP1616 process.

Routes in this envelope have been designed as a more efficient route for flights to the south east. This envelope has been extended to the south.
As this is a new envelope, there is no replicated route.

Option 1 was designed for fuel efficiency and follows the centreline of the original envelope.
Design principle link – Limiting our Footprint

Options 2 and 3 follow the same initial route as option 1 but provide alternative connectivity to the upper airspace network. Option 2 avoids the direct overflight of Leicester and Option 3 provides a direct route south east for fuel efficiency.
Design principle link – Limiting Disturbance, Limiting our Footprint

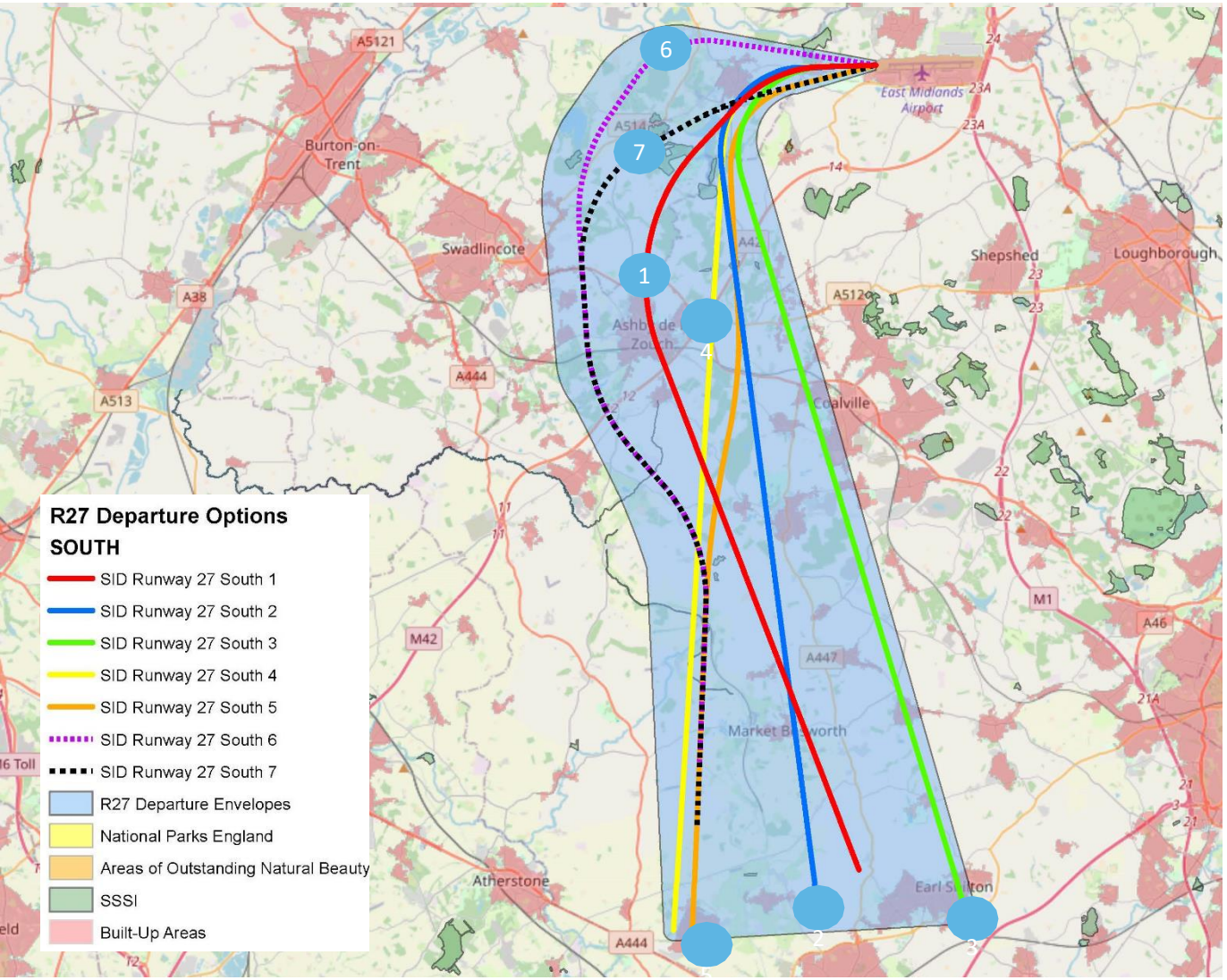
Option 4 has a north offset to avoid communities close to the extended runway centreline. It then aims to follow the A511/A50.
Design principle link – Limiting Disturbance, Responsive Flight Paths

Option 5 has a south offset to avoid communities close to the extended runway centreline and then takes a turn to avoid direct overflight of Leicester.
Design principle link – Limiting Disturbance

Option 6 has a south offset identical to option 5 but routes further south to follow the A511/A50.
Design principle link – Limiting Disturbance, Responsive Flight Paths

Option 7 has a north offset identical to option 4 but then routes to the northern edge of the envelope to avoid Coalville and Leicester.
Design principle link – Limiting Disturbance.

Departure options – Runway 27, South



Routes in this envelope have been designed for flights routing to the south. It has been extended to the north and is based on the current Daventry departure route.

Option 1 is a PBN replication of the current Daventry route and represents our 'do minimum' option.
Design principle link – A Joined up Approach

Option 2 is the most direct route heading south and is designed for fuel efficiency.
Design principle link – Limiting our Footprint

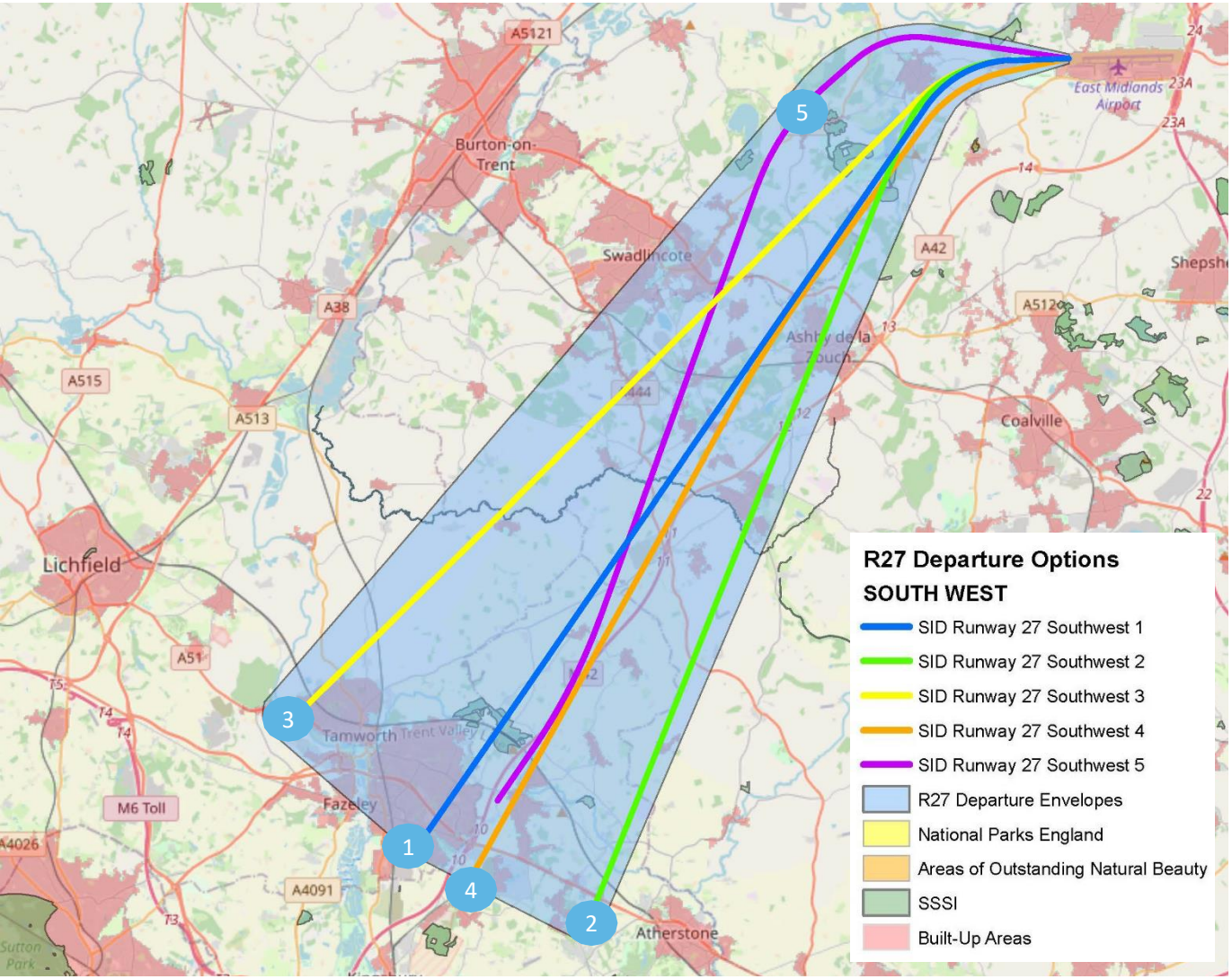
Options 3 and 4 provide alternative connectivity to the upper airspace network.
Design principle link – Limiting our Footprint, A Joined-up Approach

Option 5 has a south offset to avoid communities close to the extended runway centreline.
Design principle link – Limiting Disturbance

Options 6 has a north offset and Option 7 has a south offset to avoid communities close to the runway centreline. Both route between Swadlincote and Ashby-de-la Zouch.
Design principle link – Limiting Disturbance

Options shown are for illustration only and are subject to change as we progress through the CAP1616 process.

Departure options – Runway 27, South West



Routes in this envelope have been designed as a more efficient route for flights to the south west. This envelope has been extended to the west.
As this is a new envelope, there is no replicated route.

Option 1 is the most direct route heading south west and is designed for fuel efficiency.
Design principle link – Limiting our Footprint

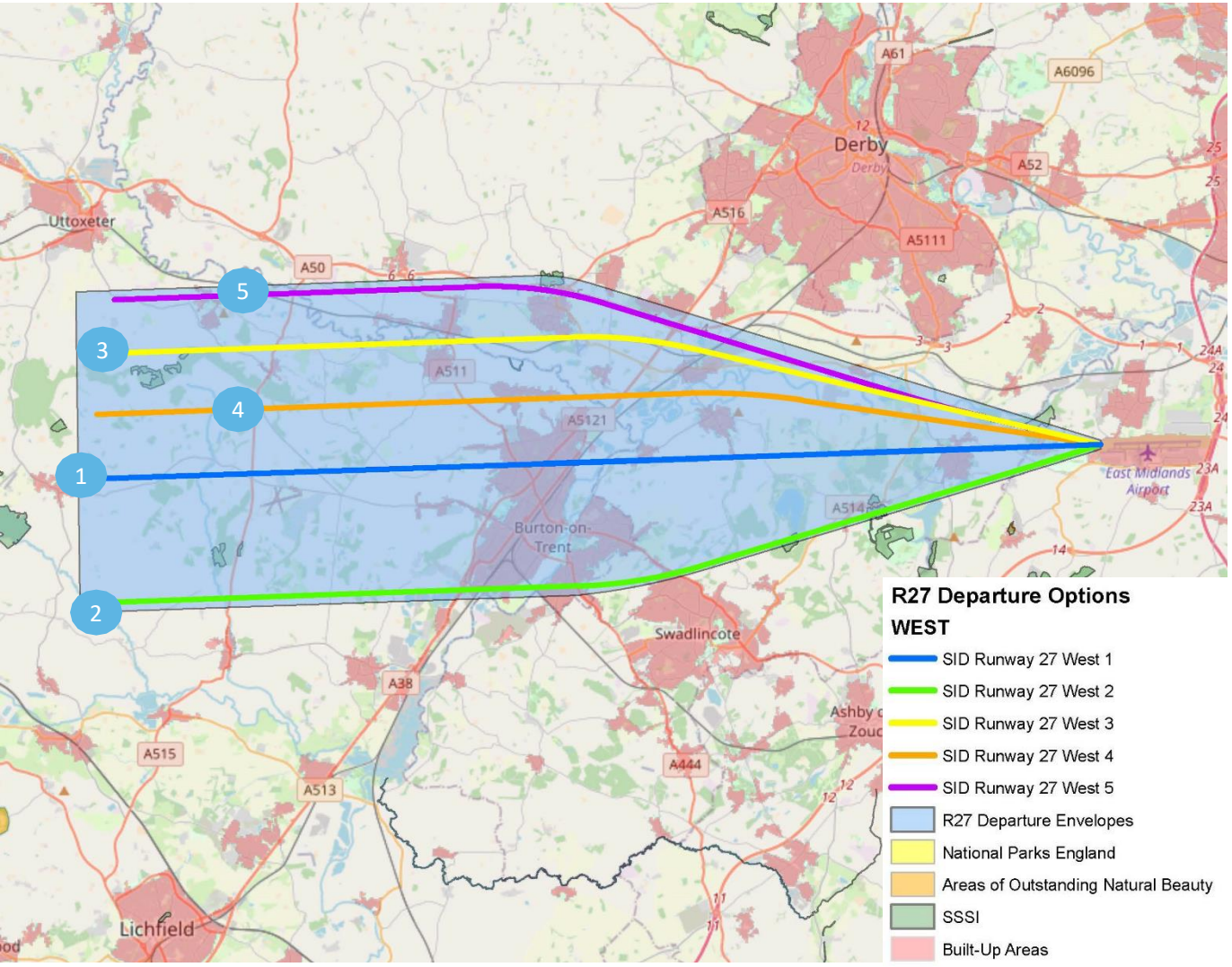
Options 2 and 3 provide alternative connectivity to the upper airspace network.
Design principle link – A Joined-up Approach

Option 4 has a south offset to avoid communities close to the runway centreline. It then routes close to the centre of the envelope for fuel efficiency.
Design principle link – Limiting Disturbance, Limiting our Footprint

Option 5 has a north offset to avoid communities close to the runway centreline. It then routes south west avoiding other communities and close to the centre of the envelope for fuel efficiency.
Design principle link – Limiting Disturbance, Sharing the Load, Limiting our Footprint

Options shown are for illustration only and are subject to change as we progress through the CAP1616 process.

Departure options – Runway 27, West



Options shown are for illustration only and are subject to change as we progress through the CAP1616 process.

Routes in this envelope have been designed as a more efficient route for flights to the west. This envelope has been extended to the north. As this is a new envelope, there is no replicated route.

Option 1 is the most direct route heading west and is designed for fuel efficiency.
*Design principle link – **Limiting our Footprint***

Option 2 has an offset to the south and Option 3 an offset to the north. Both provide alternative connectivity to the upper airspace network.
Design principle link – Limiting Disturbance, A Joined-up Approach

Option 4 has a slightly reduced offset to the north to avoid communities close to the runway centreline and remains north to avoid Burton on Trent.
Design principle link – Limiting Disturbance

Option 5 has the maximum offset to the north to avoid communities close to the runway centreline. It then aims to follow the A50 before heading west.
Design principle link – Responsive Flight Paths, Limiting Disturbance.

QUESTIONS & FEEDBACK – RUNWAY 27

- Is the process we have followed to identify route options for runway 27 clear and logical?
- Is it clear how feedback from our earlier stakeholder discussion sessions in June have influenced the development of the route options?
- The extent to which the route options align with the design principles?
- Are there any further options or improvements that could deliver additional benefits that you feel we haven't included? If so, please explain.
- Aside from those already mentioned, are there any additional local factors we should be aware of when evaluating these route options?

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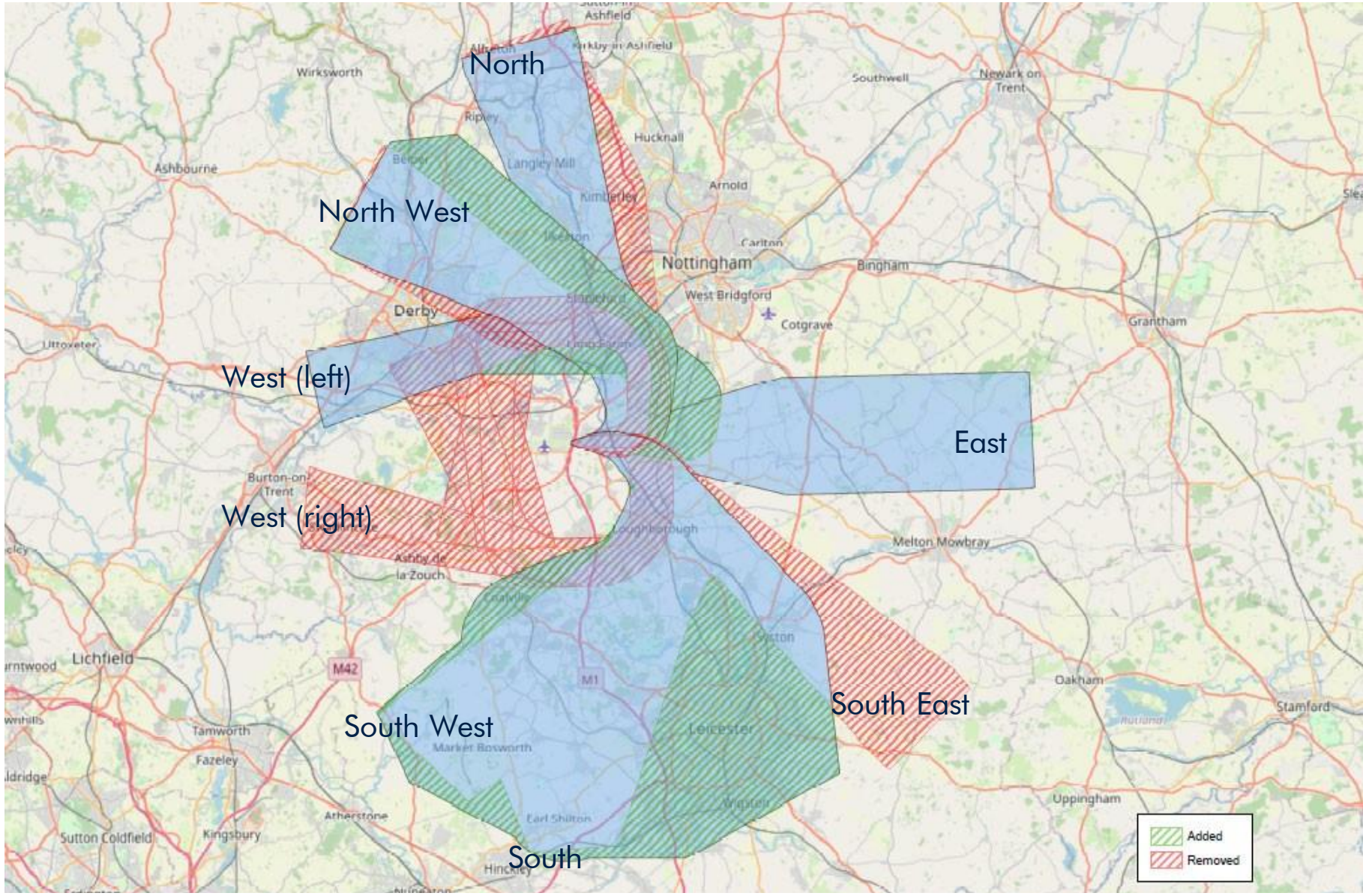
RUNWAY 09

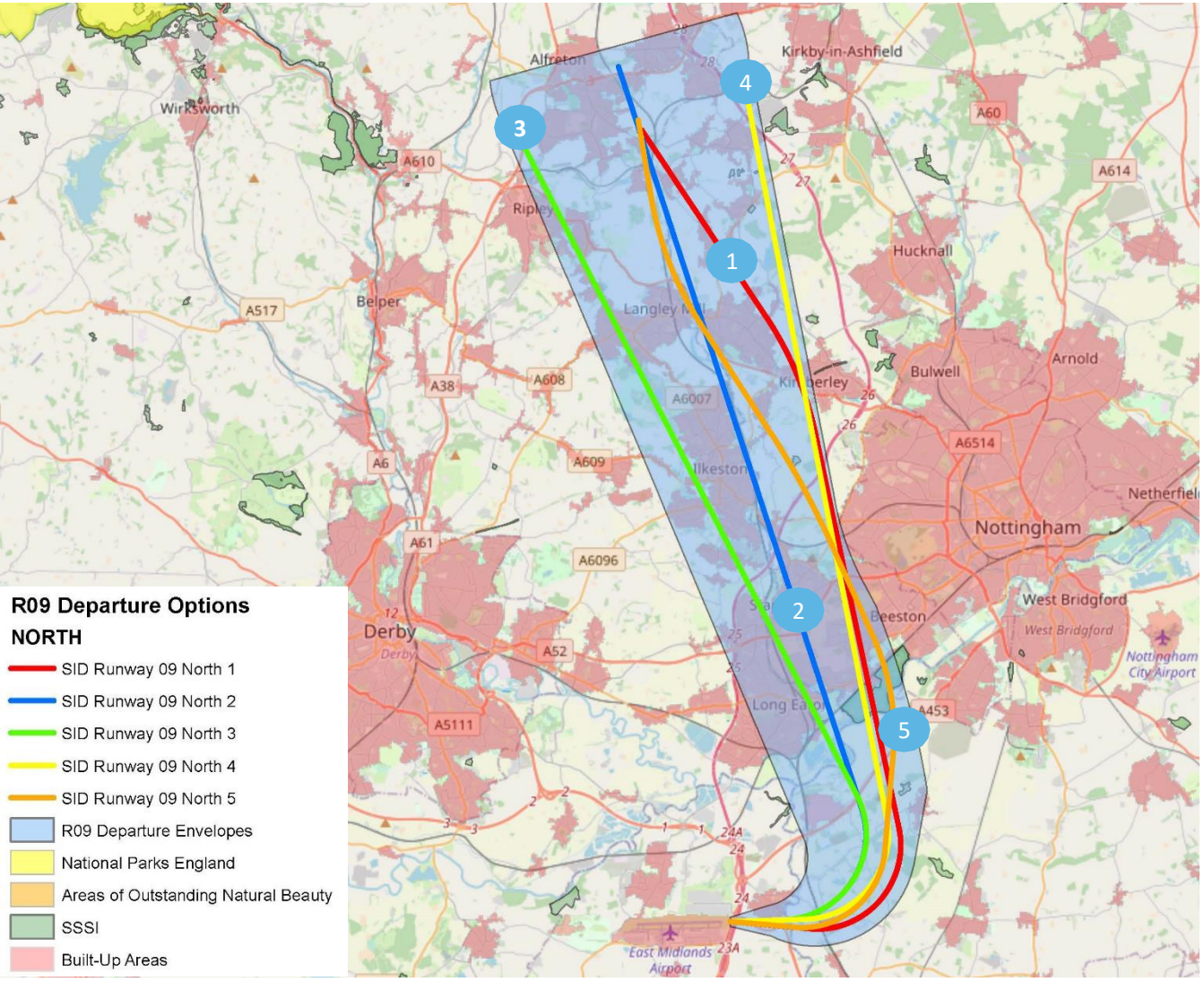
MAG East Midlands Airport

Revised design envelopes
Runway 09



Options shown are for illustration only and are subject to change as we progress through the CAP1616 process.

Departure options – Runway 09, North



Options shown are for illustration only and are subject to change as we progress through the CAP1616 process.

Routes in this envelope have been designed for flights routing to both the north and the east. It is based on the current Pole Hill departure.

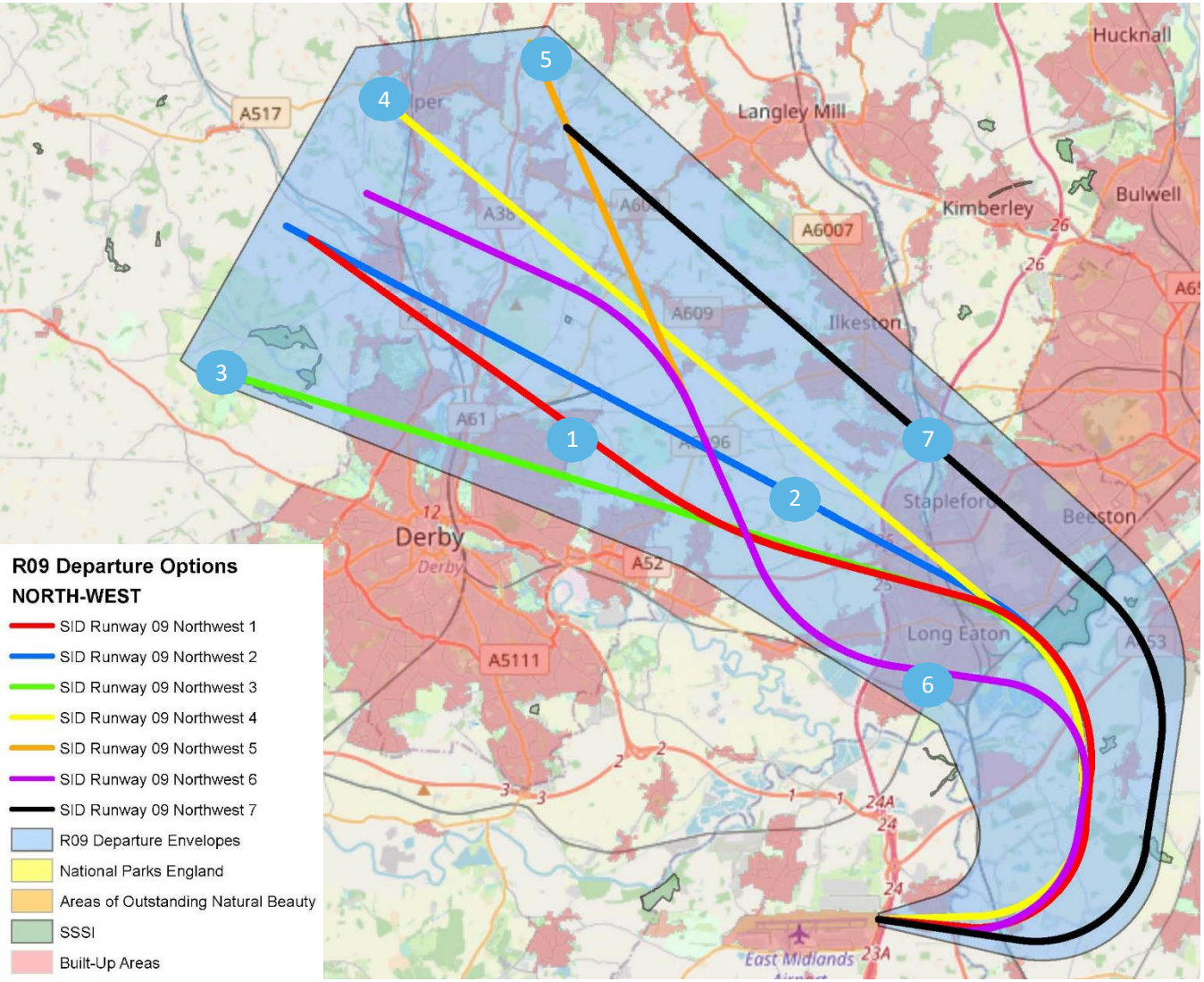
Option 1 is a PBN replication of the current Pole Hill route and represents our 'do minimum' option. It has current connectivity to the NATS network.
Design principle link – A Joined-up Approach

Option 2 is the most direct route heading north and is designed for fuel efficiency.
Design principles link – A Joined-up Approach and Limiting Our Footprint

Options 3 and 4 follow the outer edges of the envelope and provide alternative connectivity to the upper airspace network.
Design principles link – Joined-up Approach and Limiting Our Footprint

Option 5 has a south offset to avoid communities close to the runway centreline.
Design principle link – Limiting Disturbance

Departure options – Runway 09, North West



Routes in this envelope have been designed for flights routing to the north west. It is based on the current Trent departure.
The envelope has been extended to create respite options.

Option 1 is a PBN replication of the current Trent route and represents our 'do minimum' option.
Design principle link – Joined-Up Approach

Option 2 aims to copy the direct track of the current Trent SID. This results in a slightly wider initial turn than option 1 but provides the most direct route heading north west for fuel efficiency.

Design principles link – Joined-up Approach and Limiting Our Footprint

Options 3 and 4 follow the outer edges of the envelope and provide alternative and connectivity to the upper airspace network for fuel efficiency.
Design principle link – Joined-up Approach and Limiting Our Footprint

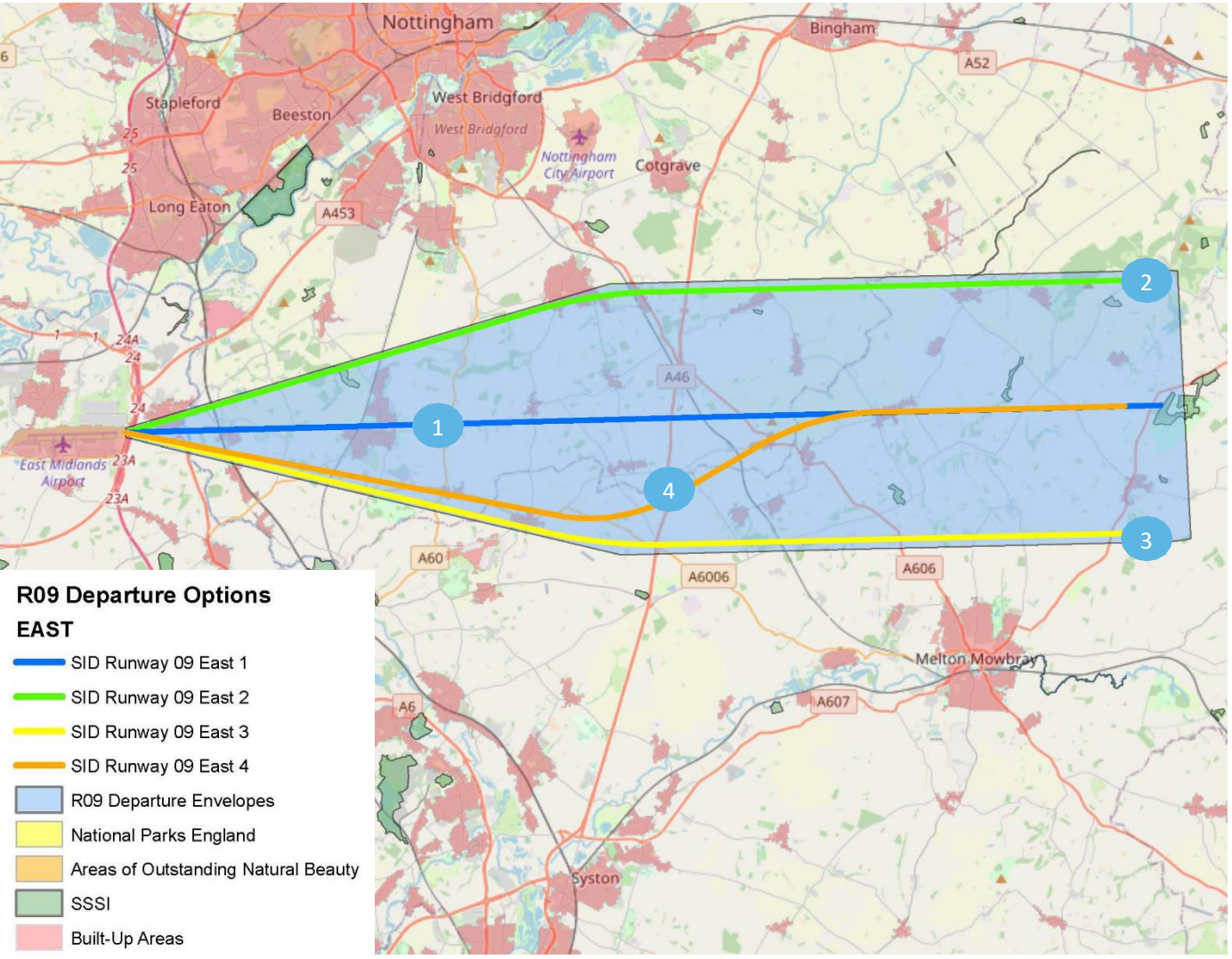
Option 5 has a south offset avoiding Kegworth and takes a tighter turn to route south of Long Eaton before heading to the north of the envelope.
Design principle link – Limiting Disturbance

Option 6 also has a south offset and follows option 5 initially but turns to the west to finish at the centre of the envelope close to the current network joining point.
Design principle link – Limiting Disturbance and Joined-Up Approach

Option 7 has a south offset to avoid Kegworth and Thrumpton with a wider turn in response to feedback to reduce noise impact to Long Eaton. It then follows the north edge of the new envelope.
Design principle link – Limiting Disturbance, and Sharing the Load

Options shown are for illustration only and are subject to change as we progress through the CAP1616 process.

Departure options – Runway 09, East



Options shown are for illustration only and are subject to change as we progress through the CAP1616 process.

Routes in this envelope have been designed for flights routing to the east. This is a new envelope which is dependant on NATS creating controlled airspace and a suitable network joining point in this direction.
As this is a new envelope, there is no replicated route.

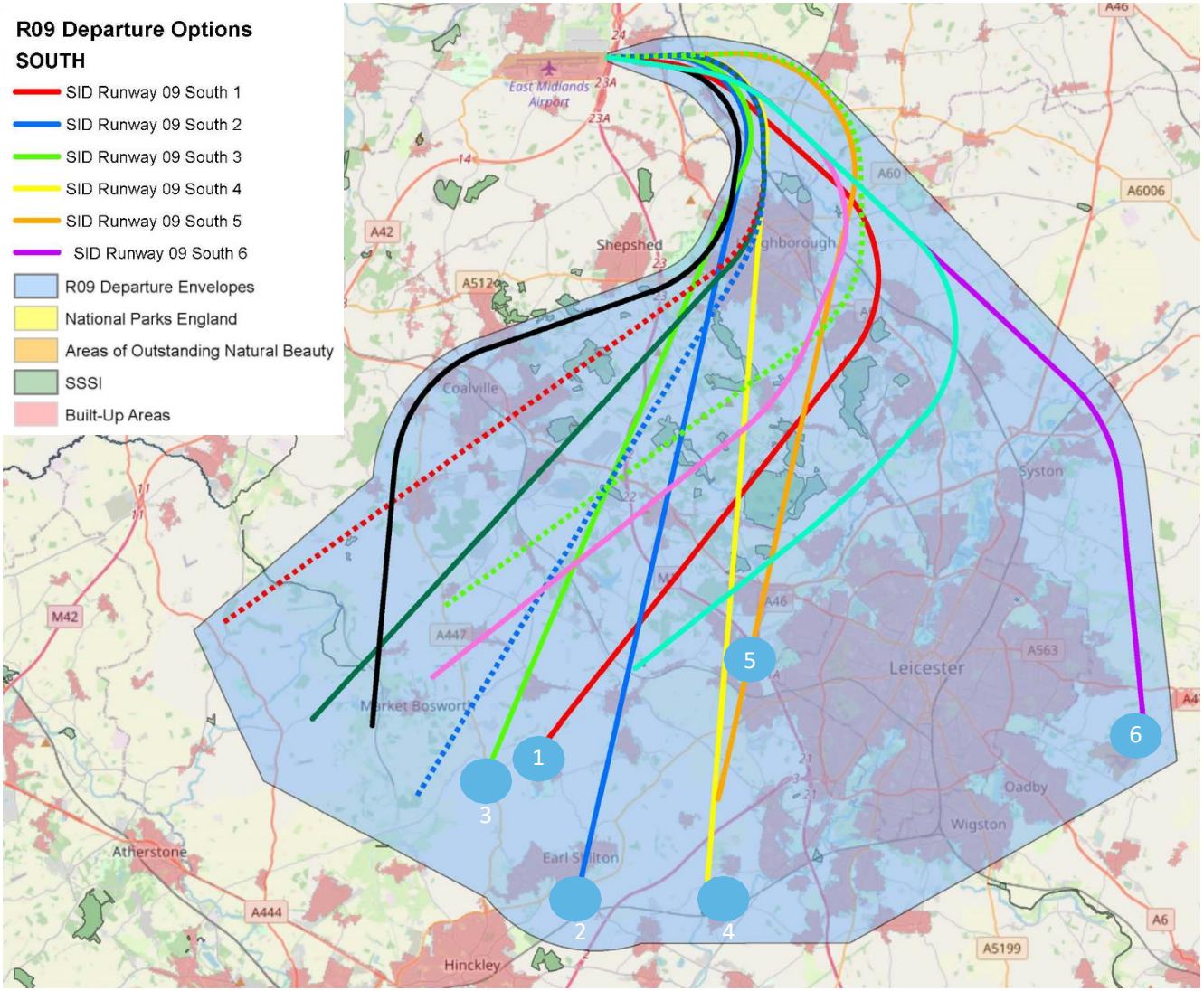
Option 1 is the most direct route heading east and is designed for fuel efficiency.
Design principles link – Limiting our Footprint and Joined-up Approach

Option 2 has a north offset and provides alternative network connectivity by following the northern edge of the envelope whilst also avoiding East Leake.
Design principle link – Joined-up Approach and Limiting Disturbance.

Options 3 has a south offset and provides alternative network connectivity by following the southern edge of the envelope whilst also avoiding Kegworth.
Design principle link – Joined-up Approach and Limiting Disturbance.

Option 4 follows a similar track to Option 3 by avoiding Kegworth and East Leake. It turns back to the centreline to follow the end of Option 1 for a direct routing east.
Design principle link – Limiting Disturbance, Limiting Our Footprint and Joined-Up Approach

Departure options – Runway 09, South



The South and Southwest envelopes are merged together to increase connectivity and provide direct routing to the South and South West. The envelopes and options are based on the current Daventry and Brookmans Park departure.

Option 1 is a PBN replication of the current Daventry route and represents the 'do minimum' option.
Design principle link – A Joined up Approach

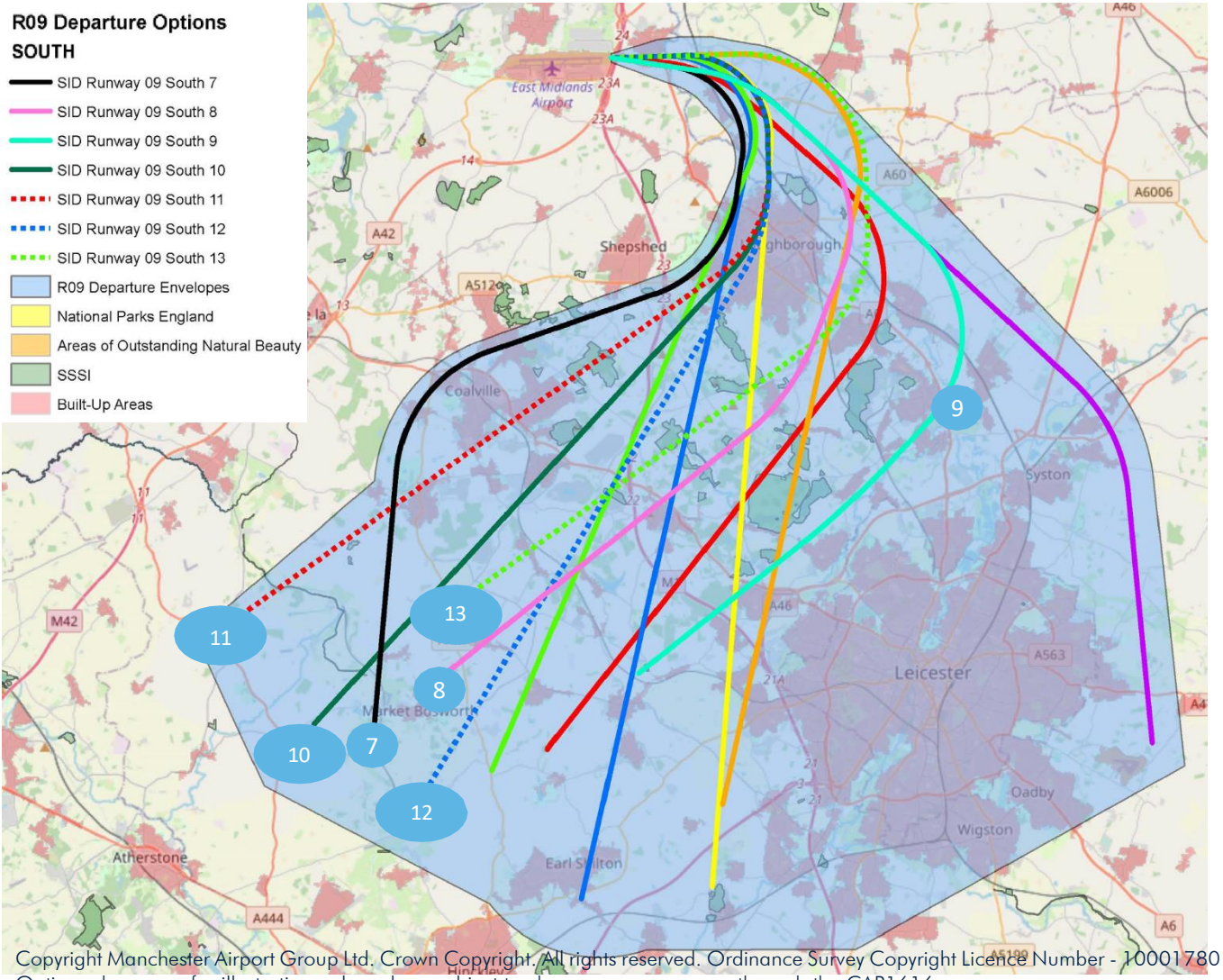
Option 2, 3 and 4 have a tighter turn to provide a more direct and fuel efficient route towards Earl Shilton, and provide alternative connectivity to the upper airspace network.
Design principle link – Limiting our Footprint & Joined-up Approach

Option 5 follows the extended centreline then turns south avoiding Loughborough and Leicester. It provides alternative connectivity to the upper airspace network.
Design principle link – Limiting Disturbance and Joined-up Approach

Option 6 is a PBN replication of the current Brookmans Park route. The route turns south following the edge of the amended envelope and avoids Loughborough and Leicester.
Design principle link – A Joined up Approach

Options shown are for illustration only and are subject to change as we progress through the CAP1616 process.

Departure options – Runway 09, South continued



Options shown are for illustration only and are subject to change as we progress through the CAP1616 process.

Option 7 has a south offset and then turns West to reduce interaction with arrivals. It then routes south towards Nuneaton.
Design principle link – Demand , Limiting Disturbance

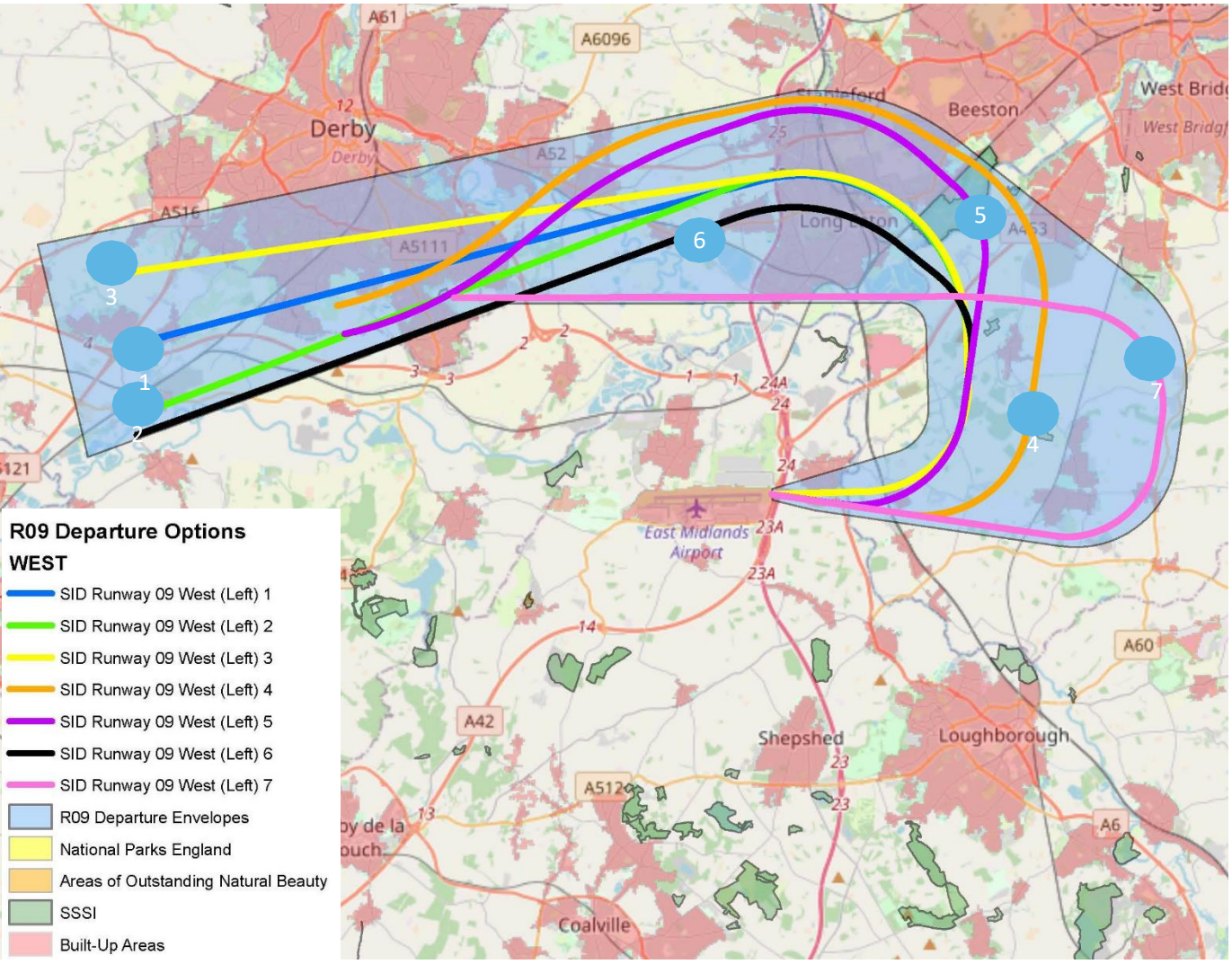
Option 8 has a south offset similar to the current Daventry route, but turns south west slightly earlier to provide alternative connectivity to the upper airspace network.
Design principle link – Limiting Disturbance, Limiting our Footprint

Option 9 has a south offset and follows the Brookmans Park route before turning south west to route between Loughborough and Leicester.
Design principle link – Limiting Disturbance

Options 10, 11 and 12 provide options to connect to the upper network airspace in a more south westerly position. After a turn to the south they overfly Loughborough and route towards Birmingham.
Design principle link – Limiting our Footprint

Option 13 is designed to follow the extended centreline and turns south west to avoid Loughborough and Leicester.
Design principle link – Limiting Disturbance and Joined-up Approach

Departure options – Runway 09, West



Options shown are for illustration only and are subject to change as we progress through the CAP1616 process.

Routes in this envelope have been designed as an alternative route for flights to the west and south west as part of the Sharing the Load design principle.
As this is a new envelope, there is no replicated route.

Options 1, 2 and 3 follow the same westerly turn to the end of the envelope. They provide alternative connectivity to the upper airspace network.
Design principle link – Joined-Up Approach

Option 4 has a south offset to avoid communities close to the airport. It then makes a wide turns to the north of the envelope before routing back towards the centreline.
Design principle link – Limiting Disturbance .

Option 5 is similar to Option 4 but turns to the north sooner to reduce track mileage and avoid southern Derby.
Design principle link – Limiting Disturbance and Limiting Our Footprint

Option 6 follows the initial turn of Option 1 but turns sooner to follow the southern edge of the amended envelope to avoid southern Derby.
Design principle link – Meeting Demand and Limiting Our Footprint

Option 7 has a south offset to avoid overflying communities close to the airport and continues to the east to gain altitude before turning back west to avoid Nottingham and Derby.
Design principle link – Limiting Disturbance.

QUESTIONS & FEEDBACK – RUNWAY 09

- Is the process we have followed to identify route options for runway 09 clear and logical?
- Is it clear how feedback from our earlier stakeholder discussion sessions in June have influenced the development of the route options?
- The extent to which the route options align with the design principles?
- Are there any further options or improvements that could deliver additional benefits that you feel we haven't included? If so, please explain.
- Aside from those already mentioned, are there any additional local factors we should be aware of when evaluating these route options?

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NEXT STEPS

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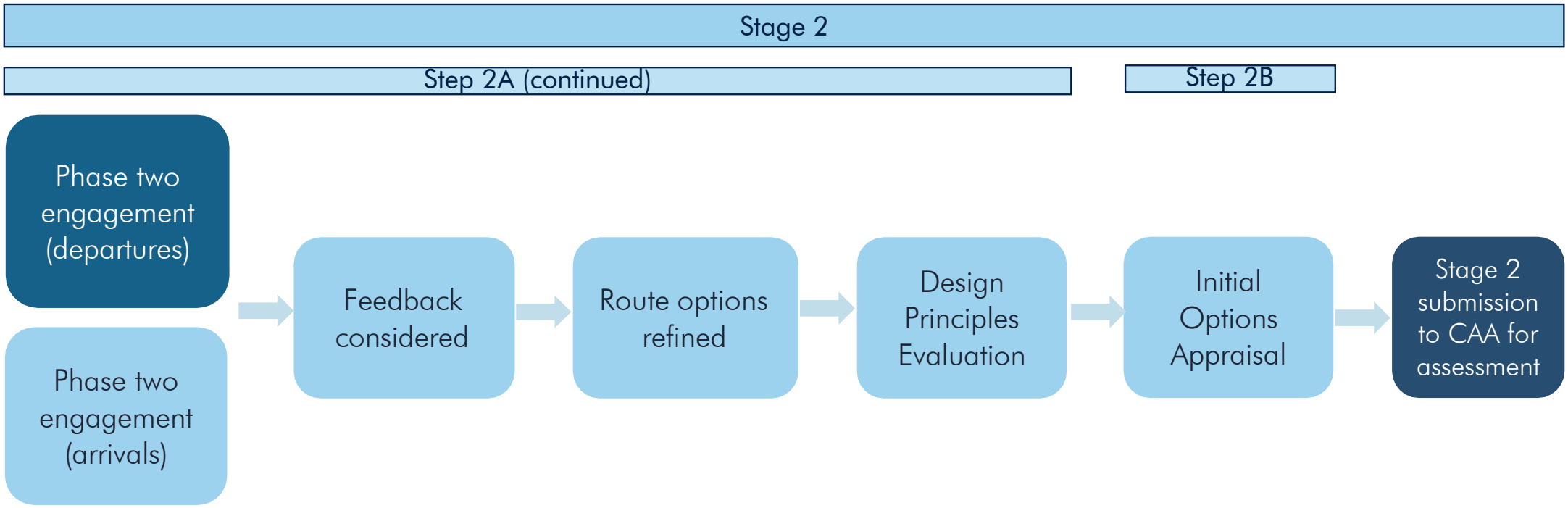
Next steps


Stage 2
Step 2A (continued)
Step 2B
Phase two engagement (departures)
Phase two engagement (arrivals)
Feedback considered
Route options refined
Design Principles Evaluation
Initial Options Appraisal
Stage 2 submission to CAA for assessment

Design Principles Evaluation (DPE) - Process

- Assessment criteria will be developed for each principle
- Performance against these criteria will be used to establish the extent to which each option meets each principle.
- Each option will be determined to have met, partially met or not met each design principle.
- A matrix will then be produced to determine overall alignment to the design principles and allow comparison between all route options.
- Options which merit further analysis will be taken forward to the Initial Options Appraisal (IOA).

Design Principle	**Keeping the Skies Safe** Safety must take precedence over all other factors. Flight paths must be safe for airspace users, the airport and communities on the ground.		
Keeping the Skies Safe	**Not met**	**Partial**	**Met**

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Step 2B - Initial Options Appraisal (IOA)

- The purpose of the IOA is to provide an assessment of each design option carried forward from the DPE to understand its likely benefits compared to the baseline (current operations).
- Each route option is assessed against the impacts defined within CAP1616 (shown in the table on the right).
- Options shortlisted based on performance against each criteria and then categorised giving us preferred options, favoured options, acceptable options and rejected options as well as the do minimum options.
- The IOA is the first of three options appraisals in the CAP1616 process and provides the foundation for the quantitative assessments that follow at Stages 3 and 4.

Step 2B

'Initial' Options Appraisal

CAA review of Stage 2 'Develop and Assess' gateway

Step 3A

'Full' Options Appraisal

CAA review of Step 3B and the subsequent Stage 3 'Consult' Gateway

Step 4A

'Final' Options Appraisal

CAA review after the formal submission of the airspace change proposal at the end of Stage 4

Affected Group	Impact
Communities	• Noise impact on Health and quality of life • Air Quality
Wider Society	• Greenhouse Gas Impact • Capacity and resilience
General Aviation	• Access
General Aviation/commercial airlines	• Economic impact from increased effective capacity • Fuel burn
Commercial airlines	• Training costs • Other costs
Airport/Air Navigation Service Provider	• Infrastructure costs • Operational costs • Deployment costs
Safety Assessment	• Safety Assessment
Wider Society	• Tranquillity • Biodiversity

QUESTIONS

MAG East Midlands Airport

Presentation, Q&A and feedback survey circulated

Feedback deadline – 5pm, Friday 9th December 2022

futureairspace@eastmidlandsairport.com

MAG East Midlands Airport

East Midlands Airport Future Airspace

Stage 2, Develop and Assess

Phase two discussion sessions – pre-read material

November 2022

MAG East Midlands Airport

East Midlands Airport Future Airspace

Thank you for taking part in our discussions about the future of airspace at East Midlands Airport (EMA). As we develop our plans, the feedback we receive from stakeholders (the people and organisations who can affect, or be affected by, any changes to airspace) will influence the decisions we make.

This document provides useful background information for the upcoming discussion session(s) which follow on from the sessions we held in the summer. Sources of further information are provided in this document and there will also be the opportunity to ask any questions on the information provided here at our discussion sessions.

STAGE 2 – DEVELOP AND ASSESS

This stage focuses on developing route options that address our statement of need and align with our design principles created through stakeholder engagement in Stage 1. There are two steps within Stage 2. At Step 2A, a comprehensive list of route options is developed, refined and assessed against the design principles. In Step 2B, the options are more closely assessed to understand their likely effects, both positive and negative.

Once we have completed this further evaluation, details of the work carried out at Stage 2 will then be submitted to the CAA for assessment at the end of February 2023. Subject to the CAA's approval, the airport will then proceed to Stage 3 of the airspace change process where the refined options will be subject to full public consultation.

GATHERING VIEWS AT STAGE 2

At Step 2A we are undertaking two phases of stakeholder engagement. The first phase took place in June/July 2022 and in these sessions, we explained the process our route designers followed to identify the broad areas where it would be possible to place departure and arrival routes that align with our statement of need and the design principles developed through stakeholder engagement at Step 1B. We then sought stakeholders' views on this work and the broad areas identified. Taking those views on board, a second stage of design work has now been completed to identify potential routes. In our forthcoming engagement sessions, we will explain the changes we made as a result of stakeholder feedback, and present specific route options that align with the design principles and take account of stakeholder views.

Following feedback from these sessions, the specific route options will be further refined and will then be fully assessed to see how well they meet the design principles. This will complete the requirements of Step 2A.

In Step 2B, the refined options will be subject to an initial assessment to understand their likely effects, both positive and negative

DESIGN PRINCIPLES

The design principles established at Step 1B continue to guide the development of our route options. After this next phase of engagement, each of the refined options will be formally assessed against each of these design principles.

Keeping the Skies Safe
Safety must take precedence over all other factors. Flight paths must be safe for airspace users, the airport and communities on the ground.

Sharing the Load
Flight paths should, where practical, be spread out to avoid concentration of aircraft activity to share any noise impacts.

Fit for the Future
Flight paths should be designed to futureproof our airspace and cannot be constrained by existing arrangements.

A Joined-up Approach
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.

Responsive Flight Paths
Where flight paths have 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.

Airspace for All
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.

Meeting Demand
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.

Limiting Disturbances
Flight paths should seek to limit and, where possible, reduce noise disturbance to communities – especially at night.

Embracing Technology
Flight paths should be designed using the latest, widely available navigational technology and flying techniques.

Limiting our Footprint
Flight paths that limit and, where possible, reduce emissions should be implemented.

Noise Sensitive Locations
Flight paths should, where practical, avoid locations that are especially sensitive to noise.

WHAT TO EXPECT FROM THE DISCUSSION SESSION?

If you are attending the online discussion session, this will be held on Microsoft Teams and is expected to run for one and a half hours. You will be sent a link to the session in advance.

If you are attending one of our in person discussion sessions, venue details and timings will have been provided to you with your invite.

Each session will consist of a presentation from the airport team and a Q&A session. There will be opportunity to ask questions and offer comments on the information shown throughout. Copies of the materials presented will be provided to you after the session with a feedback survey to enable you to consider the content before sharing your views.

Please note that the sessions will be recorded so feedback can be analysed.

If you have any questions or concerns before the session, or if there is anything we can do to help you take part, please let us know by contacting futureairspace@eastmidlandsairport.com

FURTHER INFORMATION

The links below provide more information on the topics covered in this document.

Full details on the Airspace Modernisation Strategy (AMS)

The CAA's CAP1616 guidance on the regulatory process for airspace change

Further details on the work East Midlands Airport completed at Stage 1

Additional information – training flights

GLOSSARY

Term	Definition
Airspace Modernisation Strategy (AMS)	The CAA's strategy and plan for the use of UK airspace, including the modernisation of airspace.
Air Traffic Control (ATC)	Air traffic control make sure aircraft fly safely within airspace, often issuing commands to aircraft to climb, descend or turn.
CAA	Civil Aviation Authority, the industry's regulator.
CAP1616	The CAA's guidance document which sets out the regulatory process which all airspace change proposals must follow.
Continuous Descent Approach (CDA)	Method by which arriving aircraft descend on a smooth continuous glide path, therefore staying higher above the ground for longer and reducing the level of arrival noise heard on the ground.
Future Airspace Implementation (FASI)	Group accountable for delivering airspace changes (includes airports and NERL (NATS En Route) in the UK.
Instrument Landing System (ILS)	A precision runway approach aid based on two signals which provide vertical and horizontal guidance to aircraft on approach to land.
NATS	The UK's air traffic navigation service provider, formerly known as National Air Traffic Services.
Noise Preferential Route (NPR)	Locally agreed defined initial flight paths that departing aircraft must remain within until they have reached a set minimum height.
Performance Based Navigation (PBN)	Satellite based navigation system designed to improved track keeping accuracy for aircraft.

East Midlands Airport Phase Two Departures Feedback

Departures route options survey

* Required

Welcome

We are very grateful to you for completing this feedback survey!

1 What is your name? *

2 What organisation are you representing? *
Please add N/A if this is not applicable.

3 What type of session did you attend? *

- ○ East Midlands Airport Stakeholder Briefing Session
- ○ YouGov Focus Groups
- ○ N/A

Stage 2 process

4 Based on the information we shared at the workshop and the materials we have provided, is the process we have followed to identify route options clear and logical? *

- ○ Yes
- ○ No

5 Please explain your answer *

6 Is it clear how feedback from our earlier stakeholder discussion sessions in June have influenced the development of the route options? *

- ○ Yes
- ○ No
- ○ Don't know

7 Please explain your answer *

Route options envelope for Runway 27

8 Have we clearly explained how the route options for Runway 27 have been developed? *

- ○ Yes
- ○ No

9 Please explain your answer *

10 Are there any improvements you think we should consider to the route options shown? *

- ○ Yes
- ○ No

11 Please explain your answer *

12 What extent do the route options align with the design principles? *

13 Are there any further options that could deliver additional benefits that you feel we haven't included? *

- ○ Yes
- ○ No

14 Please explain your answer *

15 Aside from those already mentioned, are there any additional local factors we should be aware of when evaluating these route options? *

- ○ Yes
- ○ No

16 Please explain your answer *

17 Do you have any further feedback on the initial route options presented? *

Route options envelope for Runway 09

18 Have we clearly explained how the route options for Runway 09 have been developed? *

- ○ Yes
- ○ No

19 Please explain your answer *

20 Are there any improvements you think we should consider to the route options shown? *

- ○ Yes
- ○ No

21 Please explain your answer *

22 What extent do the route options align with the design principles? *

23 Are there any further options that could deliver additional benefits that you feel we haven't included? *

- ○ Yes
- ○ No

24 Please explain your answer *

25 Aside from those already mentioned, are there any additional local factors we should be aware of when evaluating these route options? *

- ○ Yes
- ○ No

26 Please explain your answer *

27 Do you have any further feedback on the initial route options presented? *

Thank you!