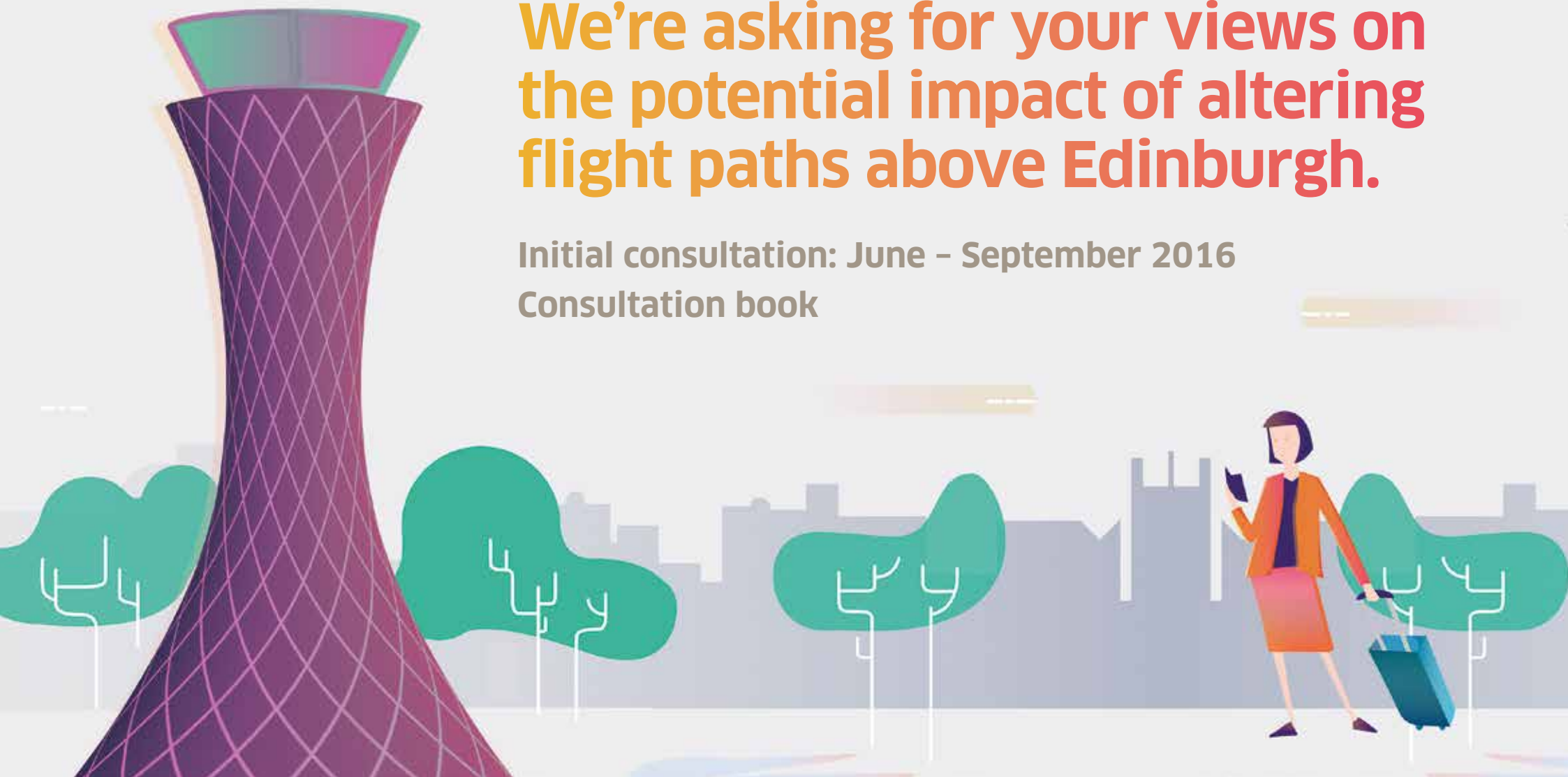


We're asking for your views on the potential impact of altering flight paths above Edinburgh.

Initial consultation: June - September 2016
Consultation book







WE'RE ASKING FOR YOUR VIEWS ON THE POTENTIAL IMPACT OF ALTERING FLIGHT PATHS ABOVE EDINBURGH.

What is this document about?

This document has been designed to provide you with the information you need to understand our initial consultation and explains the process involved in giving your views.

In addition to this document, our website has an interactive tool that allows you to input your postcode to see how it may affect you. Visit letsgofurther.com for more information.



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Glossary of terms

This glossary lists key acronyms within the document and their meaning as well as defining some industry terms and what they mean in this context. The glossary will be updated online during the consultation period. Visit letsgofurther.com for more information.

Notes

ACP	Airspace change proposal	NATMAC	National Air Traffic Management Committee
AGL	Above ground level	NATS	National Air Traffic Service
AMSL	Above mean sea level	NDB	Non directional beacon (conventional radio navigation beacon)
ATC	Air traffic control	NM	Nautical mile
ATM	Air traffic management	PBN	Performance Based Navigation
CAA	Civil Aviation Authority	RNAV	aRea NAVigation
CAP	Civil Aviation Publication	RNP	Required navigation performance (a navigation specification which includes RNAV)
CAS	Controlled airspace	SARG	Safety and Airspace Regulation Group (CAA responsible for regulation of airspace)
CDA	Continuous descent approach	SESAR	Single European Sky ATM Research
EACC	Edinburgh Airport Consultative Committee	SID	Standard instrument departure
EAL	Edinburgh Airport Limited	STAR	Standard terminal arrival route
Eurocontrol	The European Organisation for the Safety of Air Navigation	VHF	Very high frequency
Design envelope	The area within which each flight path may be positioned	VOR	VHF Omni directional range (conventional radio navigation beacon)
FAS	Future Airspace Strategy		
ICAO	International Civil Aviation Organisation		
Knots	Nautical miles (nm) per hour (1nm = 1.15 statute miles, therefore 220Knots = 253 miles per hour)		

Welcome

We're asking for your views on the potential impact of altering flight paths above Edinburgh that maximise operational benefits and minimise community impact.

This is the first time in 40 years we've consulted on altering flight paths to and from Edinburgh Airport. Why are we doing this now? Recent years have seen Edinburgh Airport change immeasurably based on passenger demand plus advances in technology, security and safety.

Our international route network has grown to become the envy of many similar sized European airports and we offer more choice than any airport in Scotland, with daily direct flights to the Middle East, North America and many cities across Europe, including London, which is served by more than 50 flights a day.

Notes

The benefits of this network to Scotland's position in world markets and therefore to our economy are substantial. The contribution to the Scottish economy of the activity generated by the airport is worth almost £1 billion every year and provides 23,000 jobs across the country.

Edinburgh Airport's sharp growth since 2013 means that it now handles 11.1 million passengers per year. That growth is itself reflective of Scotland's economic performance and our attractiveness as a destination for visitors from the four corners of the world.

And it is because of this attractiveness and our global reputation that we believe that this growth will continue.

We believe that Scotland should go further and we want to hear your views on this.

The growth, in the main, is driven by visitors to Scotland. The appetite for people from across the globe to visit our country remains undiminished.

This growth, assisted by progressive Scottish Government policies including the halving of Air Passenger Duty, will mean that Edinburgh Airport will continue to be one of the main drivers of the Scottish economy.

The effectiveness of our runway and the departure and arrival routes that efficiently guide aircraft to and from the airport are at the heart of this consultation.

Constant growth in passenger numbers presents us with challenges. We need to ensure that we can handle growth efficiently whilst maintaining service levels. We operate without a penny of public subsidy so we need to ensure that our business is sustainable.

We're confident that we can do both within our current boundaries in terms of physical building, but in order to handle Scotland's growth, we need to look at the airspace above Edinburgh.

Our airspace was designed in the 1970s when our airport had around 1 million passengers per year. In order to make our runway as effective as it can be to accommodate growth, we must modernise our airspace.

This is not an easy process nor is it one to take lightly. We know that some people will have concerns and we will need to ensure that any change minimises noise and disruption whilst delivering a safe, effective and sustainable solution.

This is why we are consulting on plans to change Edinburgh's flight paths for the first time in 40 years.

Now we want your views.

In the first consultation of its kind in Scotland, we want to gather as many opinions as possible.

Please give us your views at letsgofurther.com so that we can develop the best solution for flight paths that

we can and allow our airport to continue to make a significant contribution to the economic, cultural and social future of Scotland. This Airspace Change Programme involves a two stage consultation process. Firstly, between June and September 2016, we want to gather your views on the potential impact of altering flight paths above Edinburgh.

The results of this initial consultation will guide the development of future flight path options. Then a further consultation will take place between December 2016 and March 2017 to help us develop proposed flight paths for an airspace change proposal to the Civil Aviation Authority for implementation in 2018.

To give you confidence that our consultation process is robust and meaningful, we have commissioned an independent Quality Assurance by the Consultation Institute (consultationinstitute.org).

See section 4 for further information about how you can participate.



Regards,

A handwritten signature in blue ink, appearing to read 'Gordon Dewar', followed by a horizontal line.

Gordon Dewar
Chief Executive
6 June 2016

What is this Airspace Change Programme about?

This Airspace Change Programme is about the way in which Edinburgh Airport intends to grow, ensuring that it continues to be able to support Scotland's aspirations in a safe and effective way.

A cornerstone of this is the modernisation of the airport's existing aircraft arrival and departure routes.

We know that air travel plays a crucial role in supporting economic growth and prosperity, particularly for Scotland – a country at the north of an island in the north west of Europe.

The airport makes a £1 billion contribution to our economy and supports over 23,000 jobs across the country.

Aviation is a part of modern life that we all take for granted; for business, international trade and leisure or for visiting our friends and family. It is central to today's fast-moving lifestyle.

Airlines and airports require the support of efficient airspace, the invisible infrastructure in the skies above us. Today's airspace structure above Edinburgh was established over 40 years ago when there were fewer aircraft in the skies and they used basic navigation technology.

We need to enable growth and we must update the technology we use to navigate.

We now have the opportunity to modernise the old airspace structures currently flown to improve efficiency now that our skies are so much busier, and to reduce the environmental impact of air traffic.

The existing routes used by aircraft (termed 'conventional' routes) rely on the 1950s technology of ground based radio beacons¹. A well established and much more accurate form of navigation is area navigation (RNAV) which uses a combination of satellite and ground-based navigation technology to permit aircraft to follow a precisely defined path

Notes

over the ground with far greater accuracy than is possible with conventional routes. This in turn enables pilots to fly pre-determined, predictable arrival and departure profiles.

Aircraft today already use RNAV extensively to fly in our airspace, even though the existing conventional routes have not been specifically designed for its use. Processes are under way at a European level which require modernisation of the route system for the UK and other European countries². If the UK is to keep pace with the changes in the surrounding countries we need to upgrade our routes to RNAV standards.

It is important that as we seek to modernise our airspace to accommodate growth that we update all of our routes to RNAV standards.

We are committed to modernising and improving Edinburgh Airport in a way that maximises the benefits across Scotland and minimises the impact on local communities. This consultation on flight path changes is an important element of future development.

Edinburgh Airport is committed to undertaking a robust and meaningful consultation process and to give stakeholders confidence, we have commissioned the Consultation Institute to provide Quality Assurance of our consultation process.

For background information on how today's ATC system operates please refer to Ref. 9, on page 84: the CAA's Description of Today's ATC Route Structure and Operational Techniques.

¹ These ground-based radio beacons are technically referred to as VORs and NDBs. VOR stands for VHF omni directional radio range beacon, (Very High Frequency) and NDB stands for Non directional radio beacon.

² Details of the European requirement and legislated timescales for modernisation can be found here: www.eurocontrol.int/articles/performance-based-navigation-pbn-mandate

02

What is this Airspace Change Programme about?

2.1 Airspace Change Programme 2016 – 2018

Edinburgh Airport has commissioned a Quality Assurance of our consultation process by the Consultation Institute (consultationinstitute.org). As part of our commitment to you, we are publishing our programme mandate, as well as the mandate of our initial and further consultations.

Programme mandate

We, Edinburgh Airport, need to understand the views of stakeholders concerning the presentation of an airspace change proposal to the CAA that complies with the relevant regulatory requirements so that Edinburgh Airport can operate flight paths that maximise operational benefits and minimise community impact by 2018 so as to improve Edinburgh Airport's national transportation infrastructure to enable the economic, social and cultural growth of Scotland.

Notes

Mandate 1: Initial consultation

We, Edinburgh Airport, need to understand the views of stakeholders concerning issues that may arise from altering arrival and departure flight paths so that we can analyse concerns gathered during the initial consultation (June – September 2016) and develop viable options by December 2016 so as to develop a flight path change consultation on options to effectively maximise operational benefits and minimise community impacts.

Mandate 2: Further consultation

We, Edinburgh Airport, need to understand the views of stakeholders concerning viable options for arrival and departure flight paths so we can alter flight paths to maximise operational benefits and minimise community impacts by Summer 2017 so as to produce an airspace change proposal to the CAA which complies with relevant regulatory requirements and responds to consultee concerns.

02

What is this Airspace Change Programme about?

2.2 Modernising for the future

We seek to upgrade our aircraft departure and arrival routes³ to take advantage of the improved navigational capabilities of RNAV and improve the efficiency and capacity of the airspace around Edinburgh Airport.

This consultation focuses on arrival and departure routes to Edinburgh Airport below 7,000ft above ground level (AGL).

We are keen to modernise our airspace as this will allow us to:

- ensure our airport can meet existing and future demand by increasing the capacity of its runway
- make improvements to routes to allow flights to depart more frequently with fewer delays
- make efficiency improvements to the arrival routes based on a newly-positioned hold pattern
- position aircraft more accurately allowing arrival and departure routes to be flown more accurately
- help minimise the impact to fewer people on the ground
- meet legal obligations to keep pace with changes across Europe.

Our aim is to meet these requirements, maximising benefits to Edinburgh and Scotland whilst minimising any negative impacts. Where we are seeking to change a flight path, we will be seeking to minimise the population impacted under the route.

When following RNAV routes, aircraft will follow the routes more consistently than they do today. This is due to the improved track-keeping ability of RNAV. Improved track keeping means that there will be less dispersion of aircraft either side of each of the routes; this would mean a reduction in the overall area regularly overflowed, but an increase in the concentration of over-flights in some areas.

While RNAV routes are flown more accurately, they also open up the possibility of designing route configurations to specifically address local environmental issues, such as the provision of respite routes to share noise impacts more equitably (see Ref. 8, on page 84, for more detail about providing feedback on local environmental issues to be considered). This consultation seeks local information that will help us determine how to balance all benefits and impacts to provide the best solution for the region as a whole.

Many airlines are already equipped with RNAV technology and prefer to use it where they can

Notes

(because it is more accurate). As a result many aircraft currently flying from Edinburgh already use RNAV versions of conventional arrival and departure routes, so called 'RNAV overlays'. This proposal seeks to formalise the use of RNAV by superseding these overlays with officially certified RNAV routes, and in some cases introducing new RNAV routes.

The new RNAV routes would represent a change to the published routes. For this reason Edinburgh Airport has a duty, as prescribed by the Civil Aviation Authority, Safety and Airspace Regulation Group⁴ (CAA, SARG), to consult on any proposals for new routes.

³ Note that the flight paths followed by aircraft are defined by formal routes listed in the UK Aeronautical Information Publication (AIP section AD 2-EGPH lists Edinburgh arrival departure routes; ENR 3.1 details low level routes) and in local air traffic control routes and practices.

⁴ The CAA is the UK's independent airspace regulator.

“What local factors should be taken into account when determining the position of the route within the design envelope given the potential impacts, and why?”

02

What is this Airspace Change Programme about?

2.3 The initial consultation

In this initial consultation we are showing the design envelope (areas within which each flight path may be positioned). However, we do not yet know where within the design envelope the RNAV routes will specifically be placed. Following this consultation and taking into account your views, we will develop flight path options, which will then be the subject of further consultation. This means we are not consulting on specific flight paths at this stage.

Notes

Our objective of doing a two-phase consultation is to capture the feedback from stakeholders and consider the impacts before developing viable route options.

Ultimately the objective of these proposals is to have less noise impact across the region as a whole. Where possible, routes will be positioned to minimise the number of people overflown. In some areas flight paths will change – and this may mean some areas will be overflown more than today, others less, and some will not notice any significant change.

If these changes might affect you, we would like to hear your views. You can use our postcode search facility on our website, letsstofurther.com, which makes it easy to see how the proposed changes may affect you.

The principal question we're asking is:

“What local factors should be taken into account when determining the position of the route within the design envelope given the potential impacts, and why?”

The focus of this consultation is to ask for your feedback on the design envelopes to inform the design for all Edinburgh Airport departure and arrival routes up to 7,000ft.



THE CONSULTATION BEGINS ON 6 JUNE AND ENDS ON 12 SEPTEMBER 2016, A PERIOD OF 14 WEEKS.

Airspace change proposals must follow CAA and government guidance (Ref. 1, 3 and 4, on page 84). This involves liaison with the CAA to determine the appropriate level and form of consultation.

Airspace design has an effect on where aircraft fly and can be a highly complex subject area. Matters relating to navigation and airspace arrangements are inevitably technical in nature. For those stakeholders who want a deeper knowledge of ATC, we have provided more in-depth background information on the consultation website. Also Ref. 9 (CAP1379, on page 84) is a document produced by the CAA to specifically help stakeholders in airspace consultations, such as this, understand today's ATC route structure and operational techniques.

The consultation begins at midday on 6 June 2016 and ends at 23:59 on 12 September 2016, a period of 14 weeks.

Airspace Change Programme process





The initial consultation: What is it about, why is it needed and what will it consist of?

We're asking for your views on the potential impact of altering flight paths above Edinburgh that maximise operational benefits and minimise community impact.

This is the first time in 40 years we've consulted on altering flight paths to and from Edinburgh Airport. Why are we doing this now? Recent years have seen Edinburgh Airport change immeasurably based on passenger demand plus advances in technology, security and safety.

3.1 What is this consultation about?

This consultation concerns aircraft arriving to and departing from Edinburgh Airport.

Notes

Existing routes (termed 'conventional' routes) rely on the 1950s technology of VOR and NDB radio beacons. More modern navigation systems can now provide RNAV which uses a combination of satellite and ground-based navigation technology to permit aircraft to follow a precisely defined path over the ground with far greater accuracy than is possible with conventional routes.

The benefits of RNAV are well documented (Ref. 6 and 7, on page 84), and the replacement of conventional routes with equivalent RNAV routes is in accordance with government and international (ICAO/Eurocontrol) guidelines (Ref. 6).

This proposal seeks to replace the existing conventional routes with RNAV routes.

The positions of the new routes have not yet been determined. We seek to inform the decisions regarding where best to position these routes by consulting with those impacted or who have an interest.

We ask for your feedback regarding **“what local factors should be taken into account when determining the position of the route within the design envelope given the potential impacts, and why?”**

Government guidance provides generic objectives for airspace changes, such as the need to overfly the fewest people below 7,000ft above ground level (AGL) and to be as efficient as possible (i.e. minimising or not increasing CO₂ emissions) above 7,000ft. However, while the governmental guidance provides a starting point, we recognise that there may be specific local factors which could also have an influence on the optimum position of the routes. It is these local factors that this consultation seeks to identify, record and understand.

This consultation concerns changes which affect the profiles of aircraft arriving and departing from Edinburgh Airport below 7,000ft above ground level (AGL). See Appendix B for the legal requirements and how difference altitude cut-offs apply to this consultation.

These changes are fundamental to Edinburgh Airport's continued development.

Feedback from this consultation will inform the detailed design process and will influence the design options.

Once draft routes have been designed, a further consultation will take place where we will give you the opportunity to comment on the detailed design options that we have developed taking account of your feedback.

After the second consultation, Edinburgh Airport will submit an airspace change proposal to the CAA in which we must demonstrate that the proposed design achieves the best balance possible for all.

3.2 What is this consultation not about?

This consultation is not related to air traffic growth or the airport's growth in general.

Government policy regarding the change to Performance Based Navigation (PBN) is outside the scope of this consultation.

This consultation is not about: RNAV as a future tool; any other or future development; any aspect of government airport or airspace policy; or the establishment of controlled airspace.

Comments in responses not directly related to this initial consultation will be discounted from the analysis.

03

The initial consultation: What is it about, why is it needed and what will it consist of?

Notes

3.3 Implementation date

If the proposal is approved by the CAA, implementation of the proposal will occur at an appropriate opportunity but, in any event not before 7 December 2017.

3.4 With whom are we consulting?

The consultation is open to everyone who wants to participate and provide their views. The stakeholder groups include:

- i. Residents and the general public within the considered route design envelopes.
- ii. The Edinburgh Airport Consultative Committee (EACC) which includes representatives of Local Authorities, community representatives and other organisations that have expressed an interest in the activities of the airport.
- iii. All community councils under the considered route design envelopes.
- iv. All councils and unitary authorities under the considered design envelopes.
- v. All Members of the Scottish Parliament with constituencies under the considered route design envelopes.
- vi. All Members of UK Parliament with constituencies under the considered route design envelopes.

- vii. Members of the National Air Traffic Management Committee (NATMAC) which includes representatives of all types of airspace users.
- viii. Airlines that operate from Edinburgh Airport, and all users of the airspace around Edinburgh Airport.
- ix. Environmental representative bodies (e.g. National Trust, SEPA, Countryside Agency).
- x. Passengers who use the airport.
- xi. The consultation is also open to any other interested party to respond.

3.5 How long will the consultation period last?

The consultation will begin on 6 June 2016 and end on 12 September 2016, a period of 14 weeks. It would be appreciated if stakeholders could provide comments as early in the process as possible.



How do I participate?

Public consultations are only as effective as the input from those who participate. We invite you to participate in this initial consultation process. A period of 14 weeks is open for this initial consultation.

The closing date for replies associated with consultation issues is at **23:59** on **12 September 2016**.

Notes

You may wish to consider the following questions:

Are there any local factors or characteristics that mean that your area should have special consideration?

If you are an aircraft operator: Do you operate within the area in question? If yes, would the proposals benefit your operation now or in the future?

There are a number of ways to participate in this initial consultation.

4.1 Via website

A dedicated website has been developed to capture your feedback. All respondents need to provide their name and postcode. We have a Privacy Policy that meets data protection requirements.

Visit letsgofurther.com to provide your feedback and view our Privacy Policy.

4.2 Via postal system

Please compose your response in the format shown below, and send it to:

Consultation Coordinator
Edinburgh Airport
PO Box 17473
EDINBURGH
EH12 1ND

Ref: Airspace Consultation

First name:

Last name:

Postcode:

First line of text:

“I am responding on behalf of
[name of organisation/local council]”
or “I am responding as a member of the public”

Please ensure you have completed and enclosed with your response, our Privacy Form. If you do not have a copy of this form, visit letsstofurther.com to download or write to us to request one.

4.3 Via community events

We want to ensure there are a number of ways to gather views from a wide range of stakeholders, including, for example, young people.

4.4 Via stakeholders

We want to hear the views of stakeholders, for example, community groups, community councils, individuals, tourism organisations, business organisations, environmental organisations, statutory bodies, local government and national government. This list is not exhaustive, and we are keen to be advised of any other groups who may have an interest in this issue.

4.5 Other ways

We would welcome your views on other ways to consult. Contact us via the website or by writing to us (see 4.2 Via postal system).

04

How do I participate?

Notes

4.6 If I have no comment to make on the initial consultation, do I need to do anything?

If you have no comment to make on the proposal, as a representative of an organisation we would still like to know. Please tick the no comment box on the website or reference this in your postal response, again stating your name (and/or the organisation you represent), postcode and provide your completed Privacy Form.

4.7 What happens to the responses to the consultation?

Following consultation, Edinburgh Airport will analyse all responses and use this information to develop viable route options.

Responses to the consultation will be analysed to identify the concerns and comments of respondents and how these may be addressed. The final designs will look to address issues raised during this consultation where this is possible.

A further consultation will be undertaken on the route options.

4.8 Can I have a copy of the consultation results?

A report including feedback of this initial consultation will be available on the website once the analysis is complete.

4.9 Who monitors the consultation and where can I go if I have concerns regarding how the consultation is being carried out?

This consultation is being conducted by Edinburgh Airport. The CAA SARG will oversee the consultation, to ensure that it adheres to the process laid down in CAP 725 (Ref. 1, on page 84) and government guidelines (Ref. 3, on page 84). If you have any complaints about how this consultation has been conducted, these should be referred to:

Airspace Business Coordinator
Airspace, ATM and Aerodromes
Safety and Airspace Regulation Group
CAA House
45-59 Kingsway
London
WC2B 6TE
E-mail: airspace.policy@caa.co.uk

Please note that this address is for concerns and complaints regarding non-adherence to the defined consultation process. The SARG will not engage with consultees on details of this consultation. Response to the nature of this specific consultation should be addressed to Edinburgh Airport. The SARG will receive details of your response as part of the formal ACP submission.

Edinburgh Airport has also commissioned a Quality Assurance of our consultation process by the Consultation Institute (consultationinstitute.org).

4.10 Will my query/response be treated as confidential?

The CAA requires all consultation material, which includes copies of responses from all key stakeholders, to be included in any formal submission.

Edinburgh Airport undertakes that personal details or content of responses and submissions will be treated in line with our Privacy Policy.

Context and background to the proposal

This section describes the strategy and legislation driving the proposed changes, the legal framework that determines how changes should be made, and how these relate to potential benefits and impacts.

5.1 Benefits and impacts

Meeting the UK's Future Airspace Strategy (FAS) European legislative requirements will inevitably result in change. Converting a conventional route to a PBN route will, at the very least, mean that aircraft will fly more accurately along the centre of a route. This will give air traffic control and airline operators more certainty in planning and managing operations, where previously aircraft would have been dispersed over a much wider area.

Given that change to the routes, and consequently their impacts, is inevitable due to future requirements, we are seeking to ensure the change achieves the optimal outcome for Edinburgh and Scotland. We are seeking to redesign the route system and apply new methods of operation that are only possible in a PBN system, for example routes that avoid areas with specific noise sensitivity and/or multiple RNAV routes which are designed to share the noise over a wider area (see Ref. 8, on page 84).

There will always be factors that constrain what we can achieve, for example, the proximity of Edinburgh and Glasgow's holding patterns and routes and the limitations of aircraft climb, descent and turn performance. Over conventional routes, PBN still offers a much greater amount of flexibility in terms of how we design routes and, more importantly, how we position them.

It is important for us to understand stakeholder requirements to allow us to strike an optimal balance of benefits and impacts. We need to know relevant information to understand the local situation, therefore the main focus of this consultation (both the impacts of current routes and potential new routes/repositioning of existing routes) is asking for your feedback on the local issues.

Notes



**WE ARE SEEKING TO ENSURE
THE CHANGE ACHIEVES THE
OPTIMAL OUTCOME FOR
EDINBURGH AND SCOTLAND.**

Overview of current operations at Edinburgh Airport

Edinburgh Airport is serviced by two physical runways, and each can be used in either direction. The main and most frequently used runway is named runway 24/06 as per convention corresponding to the magnetic direction of the runway ends (242° for runway 24 and 062° for runway 06). This runway is used by preference. The direction for take off and landing on any particular day is dictated by the wind conditions⁵.

Notes

There is another runway (30/12) which is shorter but this is only used if the main runway is undergoing maintenance or if a strong north-westerly or south-easterly wind dictates that it is preferable to use the secondary runway. In 2015 runway 30/12 was only used on 30 occasions, mostly between the hours of midnight and 6am (less than 0.1% of the time).

⁵ It is safest for aircraft to take off and land into a head wind. There are strict limits regarding the strength of crosswinds and tail winds above which aircraft are not permitted to operate for take off and landing.

06

Overview of current operations at Edinburgh Airport

Figure 1: Airport runway layout



Notes:

This section details the routes and levels which departing and arriving aircraft would take when landing and taking off in each direction.

The main routes which aircraft take, to and from each runway, can be seen as red in the flight path density plots of Figures 2 to 4 as discussed in the following section.

06

Overview of current operations at Edinburgh Airport

6.1 Current aircraft flight paths

Figures 2 to 4 illustrate the arrival and departure routes to/from runway 24 and 06. These plots are generated from radar data and show the density of flight paths. Red areas indicate the highest concentration of flight paths, with yellow/green less so and grey areas show where there are only occasional flights.

The pattern of traffic on any particular day depends on the direction of the wind, since this determines which runway is used (aircraft always take off and land into the wind). The prevailing wind is from the south west, hence on average runway 24 is used, 79% of the time and runway 06, is used 21% of the time. In 2015 runway 30/12 was only used on 30 occasions, (less than 0.1% of the time).

Figure 2 shows traffic patterns over a two-week period including periods when both runway 24 and runway 06 were in use.

Figure 3 shows traffic patterns on days when the wind is predominantly from the west, which results in runway 24 being used.

Figure 4 shows traffic patterns on days when the wind is predominantly from the east, which results in runway 06 being used.

Arrivals to Edinburgh Airport from the south are routed to the TWEED hold⁶ (see Figure 3) (a point 17nm south of the airport) via the TALLA radio beacon (27nm south of the airport). Currently aircraft are then given instructions by Air Traffic Control (ATC) to join the final approach (known as vectoring). Even though there is no formal route it can be seen from Figure 3 and Figure 4 that there is a degree of consistency in the instructions given.

⁶ For background information on ATC operations including holding see Ref. 9, on page 84.

Notes



06

Overview of current operations at Edinburgh Airport

6.2 Current aircraft altitudes

The typical altitudes at points on the current flight paths are indicated on Figure 3 and Figure 4. Air Traffic Control (ATC) will always seek to climb departures to higher altitudes early and not to descend arrivals prematurely; this is better for noise levels, emissions reduction and CO₂ levels. However, ATC has to keep flights safely separated, which sometimes constrains the altitudes they can achieve.

6.3 Existing track concentrations

Figure 2 to 4 are intended to help you understand the current spread of flight paths.

These figures show the density of flight paths⁷ so that the current number of flights over any given location in a typical day can be gauged. These give a good indication of where the main concentrations of flights currently occur.

Where there is a spread of flight paths, this is a result of many factors including:

- the different speeds and performance of the various aircraft types. (In general, slower aircraft [e.g. turbo props and smaller aircraft] will turn with tighter radii, while larger jet aircraft fly faster and turn with wider radii);
- 'vectoring' by Air Traffic Control (i.e. ATC giving instructions to aircraft to fly a certain flight path, in order to maintain safe separation, for sequencing etc);
- variation due to wind.

For reference the current conventional Standard Instrument Departure (SID) route definitions and Standard Terminal Arrivals (STAR) routes are included in the appendices.

⁷These are derived from radar data taken from June 2015.

Notes

Figure 2: Current flight paths (2-week period, including use of runways 06 and 24)

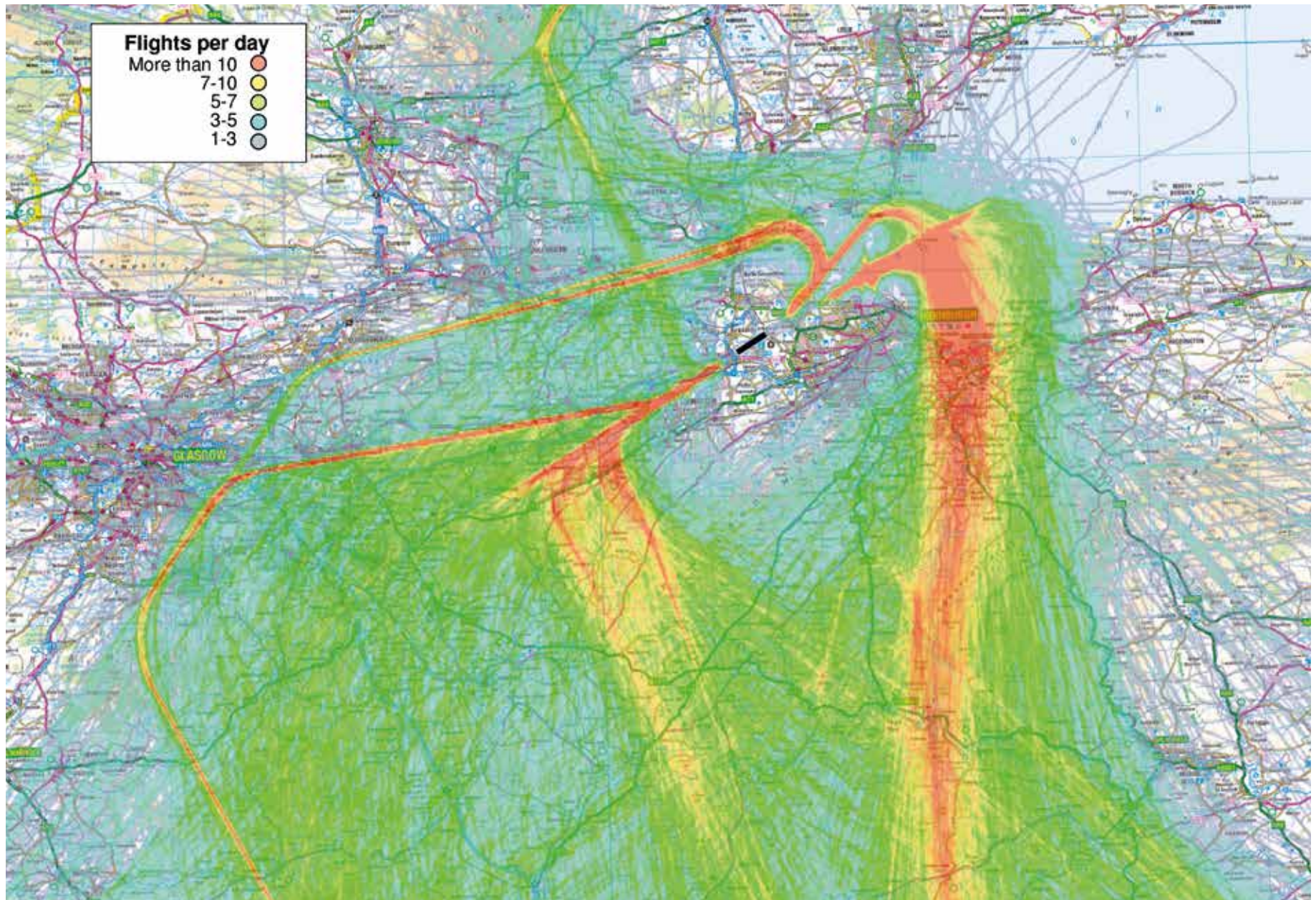


Figure 3: Current flight paths with typical altitudes, runway 24 westerly operations

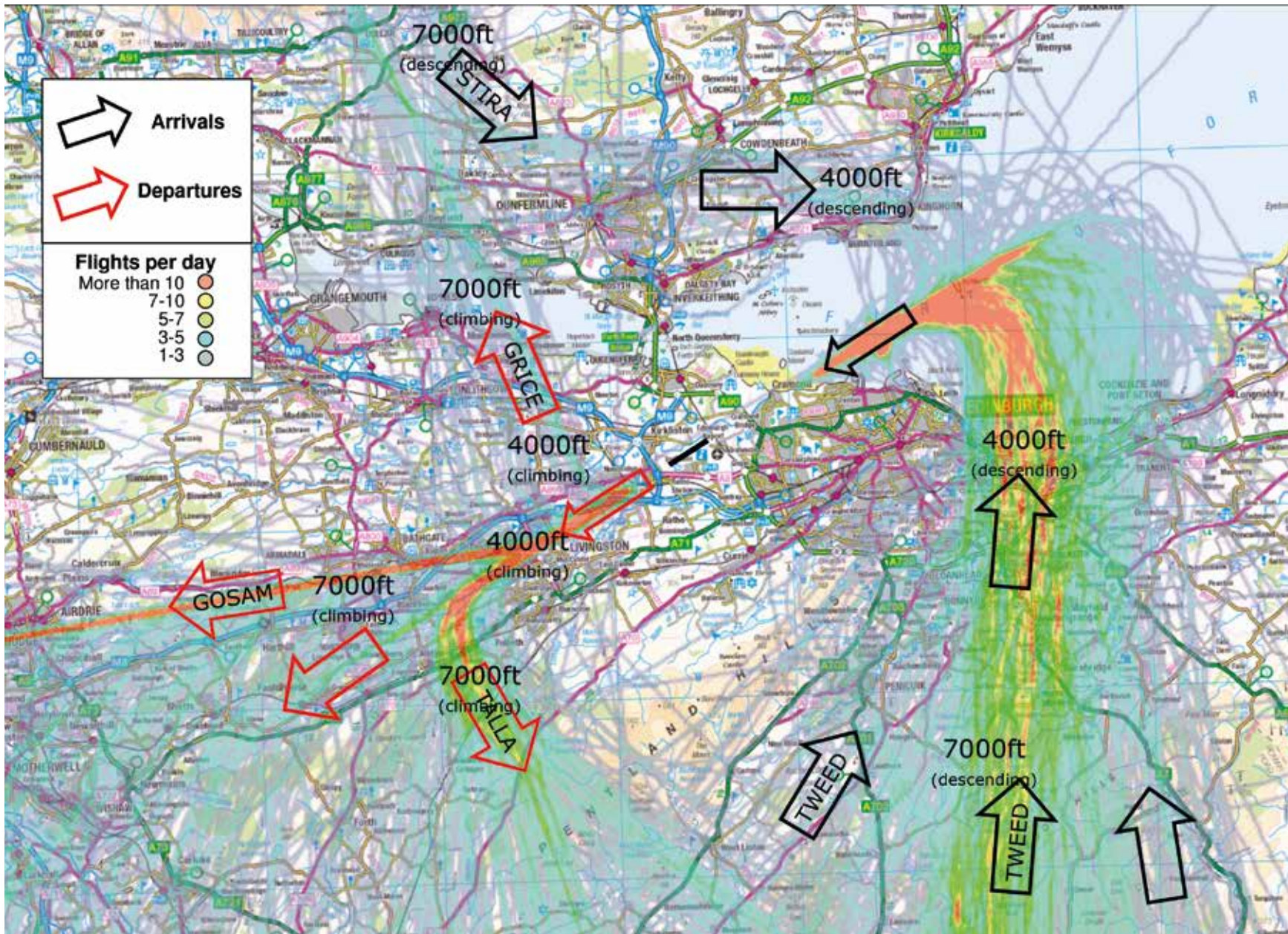


Figure 4: Current flight paths with typical altitudes, runway 06 easterly operations



06

Overview of current operations at Edinburgh Airport

Notes

Table 1: Average daily route usage

Route	Percentage of those using a SID/STAR	Average flights per day 2015*
Departures		
GOSAM	58%	81
TALLA	38%	53
GRICE	4%	5
Arrivals		
STIRA	8%	13
TWEED	92%	141

*Runway 24 is used 79% of the time, and runway 06, 21% of the time. This means that for each route shown in Table 1 the average flights per day would apply to runway 24 routes for 289 days per year and runway 06 for the remaining 76 days per year. The number of arrivals and departures does not have to be equal.



Design envelopes for possible route positioning

The following pages present design envelopes within which routes may be positioned.

The purpose of this consultation is to hear the views from all stakeholders in order to ensure that no potential issues are overlooked in the subsequent design of detailed options.

Notes

A design envelope does not indicate that air traffic will be spread across the extent of the envelope. Rather it shows the extent of the area, within which a route may be positioned. Once the position of the route is determined, traffic will tend to be more concentrated in that area. For this reason we seek to position the routes where they will have the least impact to those on the ground.

When responding to the consultation we ask that stakeholders consider what local factors should be taken into account when determining the position of the route within the design envelope, given the potential impacts, and give reasons why.

The final designs can be influenced by issues which are brought to light during this consultation.

7.1 Notes for design envelope diagrams

Figures 5 to 15 show maps with coloured areas to denote the consultation design envelopes for positioning the proposed Edinburgh Airport departures and arrivals below 7,000ft.

The final positions of the routes within these areas will be determined after consultation feedback has been analysed. The position of the routes will determine how areas within the coloured regions are impacted. Areas beneath the final routes would expect more overflights than today, and areas away from the routes would expect fewer.

Tables 2 and 3 provide L_{max} noise information for the typical and noisiest aircraft regularly flying to/from Edinburgh. L_{max} is the maximum noise experienced at ground level from an aircraft flying directly overhead. The L_{max} values may be compared to those in Table 4 for everyday equivalents. Also videos of aircraft flying overhead are provided at edinburghairport.com/noise to help stakeholders understand what aircraft at various altitudes may look and sound like.

Noise may still be experienced by residents beyond the boundary of the design envelope.

07

Design envelopes for possible route positioning

Table 2: Typical noise (L_{max}) (Arrivals) at various heights¹⁰

Aircraft type	% of flights	1,000ft	2,000ft	3,000ft	4,000ft	5,000ft	6,000ft	7,000ft
Typical A320/B737⁸	52.8%	77 dBA	69 dBA	64 dBA	61 dBA	59 dBA	57 dBA	56 dBA
Noisiest A330/ B767⁹	1.8%	84 dBA	74 dBA	68 dBA	64 dBA	60 dBA	58 dBA	56 dBA

Table 3: Typical noise (L_{max}) (Departures) at various heights

Aircraft type	% of flights	1,000ft	2,000ft	3,000ft	4,000ft	5,000ft	6,000ft	7,000ft
Typical A320/B737	52.8%	85 dBA	75 dBA	70 dBA	66 dBA	63 dBA	60 dBA	59 dBA
Noisiest A330/ B767	1.8%	92 dBA	83 dBA	77 dBA	73 dBA	69 dBA	66 dBA	64 dBA

Notes

⁸ Includes the following aircraft types: Airbus A318/319/320/321, Boeing 737-600/700/800/900 (Ancon category, 125-180 seat single-aisle 2-eng jet).

⁹ Includes the following aircraft types: Airbus A330, Boeing 767-300/400(Ancon category, 250 seat twin-aisle 2-eng jet).

¹⁰ This table shows L_{max} at heights above ground level. Local elevation should be taken into account. Data provided by the CAA UK aircraft noise contour model (ANCON).

Table 4: Examples of L_{max} equivalents in decibels (dBA)



110
dBA

Chainsaw, 1m distance



100
dBA

Disco, 1m from speaker



90
dBA

Diesel truck pass-by, 10m away



80
dBA

Kerbside of busy road, 5m away



70
dBA

Vacuum cleaner, distance 1m



60
dBA

Conversational speech, 1m



50
dBA

Quiet office



40
dBA

Room in quiet, suburban area



30
dBA

Quiet library

Source: Airports Commission, based substantially on www.sengpielaudio.com/TableOfSoundPressureLevels.htm

07

Design envelopes for possible route positioning

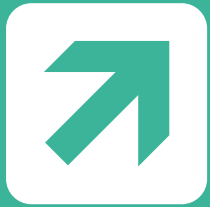
Table 5: Aircraft type (by number of departures during 2015)

Aircraft type	Number	Percentage
A319	9360	16.48%
DH8D	8561	15.07%
B738	8395	14.78%
A320	7948	13.99%
E190	4128	7.27%
B733	2801	4.93%
SF34	2280	4.02%
AT76	1748	3.08%
D328	1540	2.71%
E170	1415	2.49%
B752	1230	2.17%
A321	1095	1.93%
B763	814	1.43%
RJ1H	635	1.12%
B737	379	0.67%
B788	344	0.61%
Others (each <0.5%)	4120	7.25%

Notes:



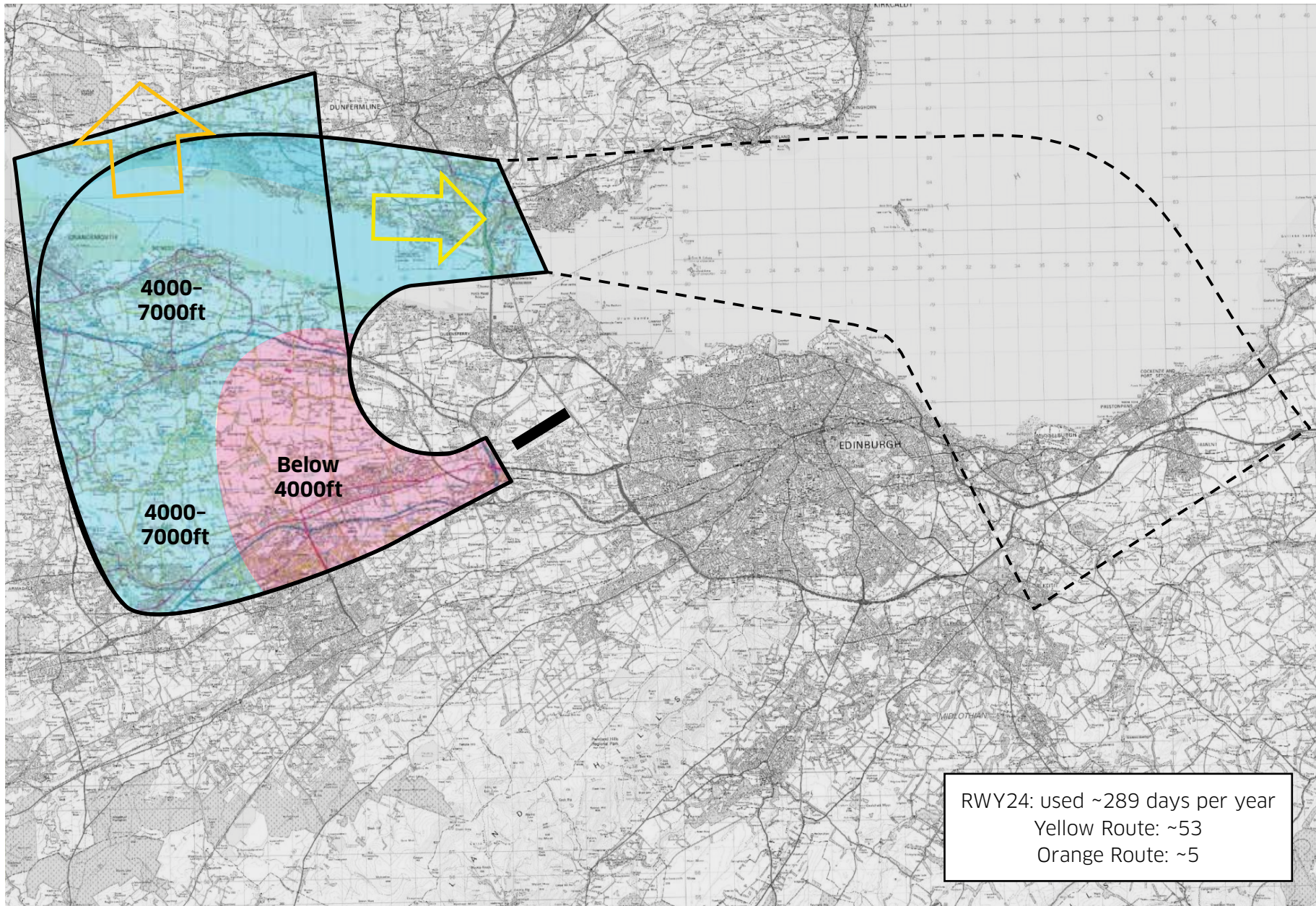




DEPARTURE DESIGN ENVELOPES

Figure 5: Runway 24 departures, right turnout design envelope

To find out more about design envelopes in your area, you can use the postcode search tool at letssofarther.com



Close up of design envelope in Figure 5.

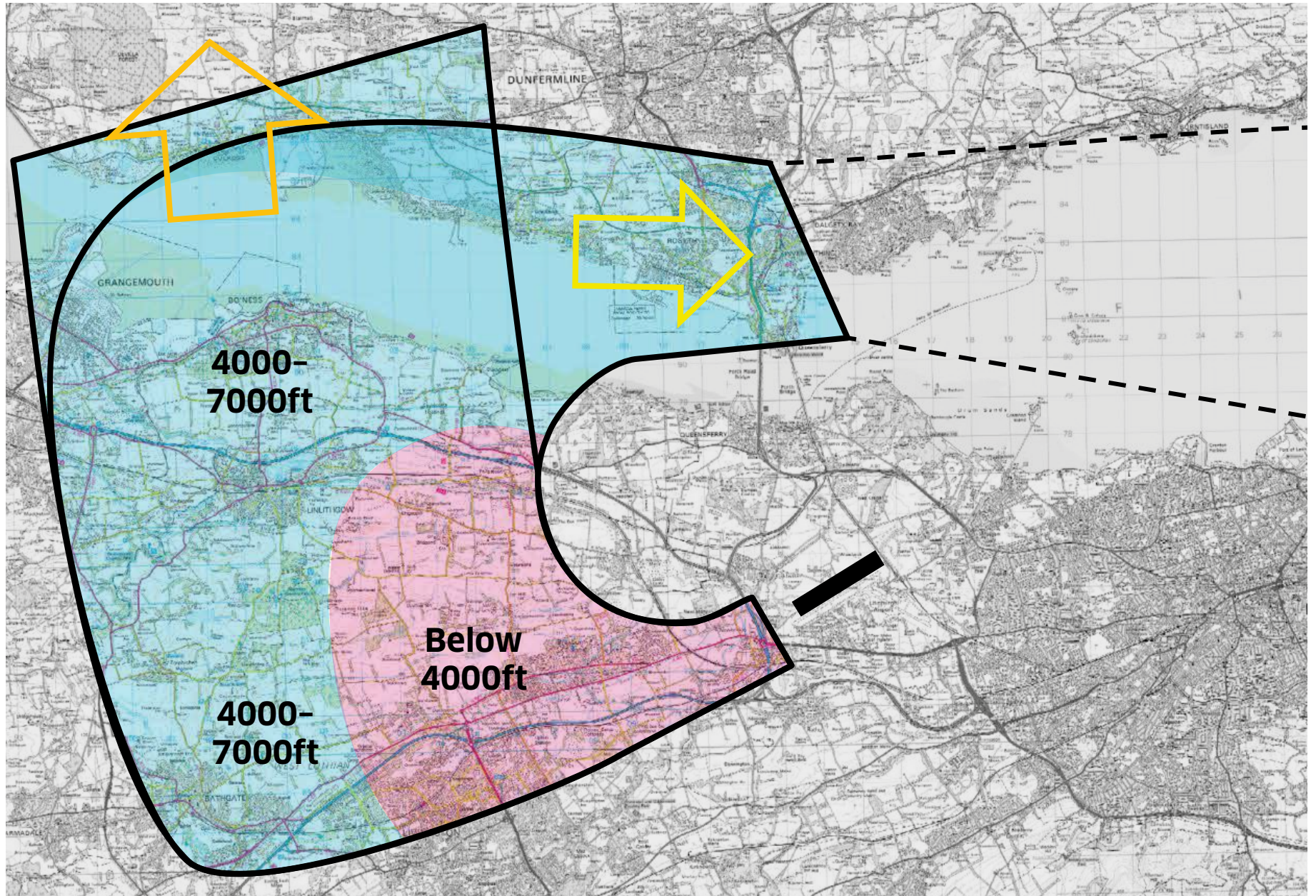
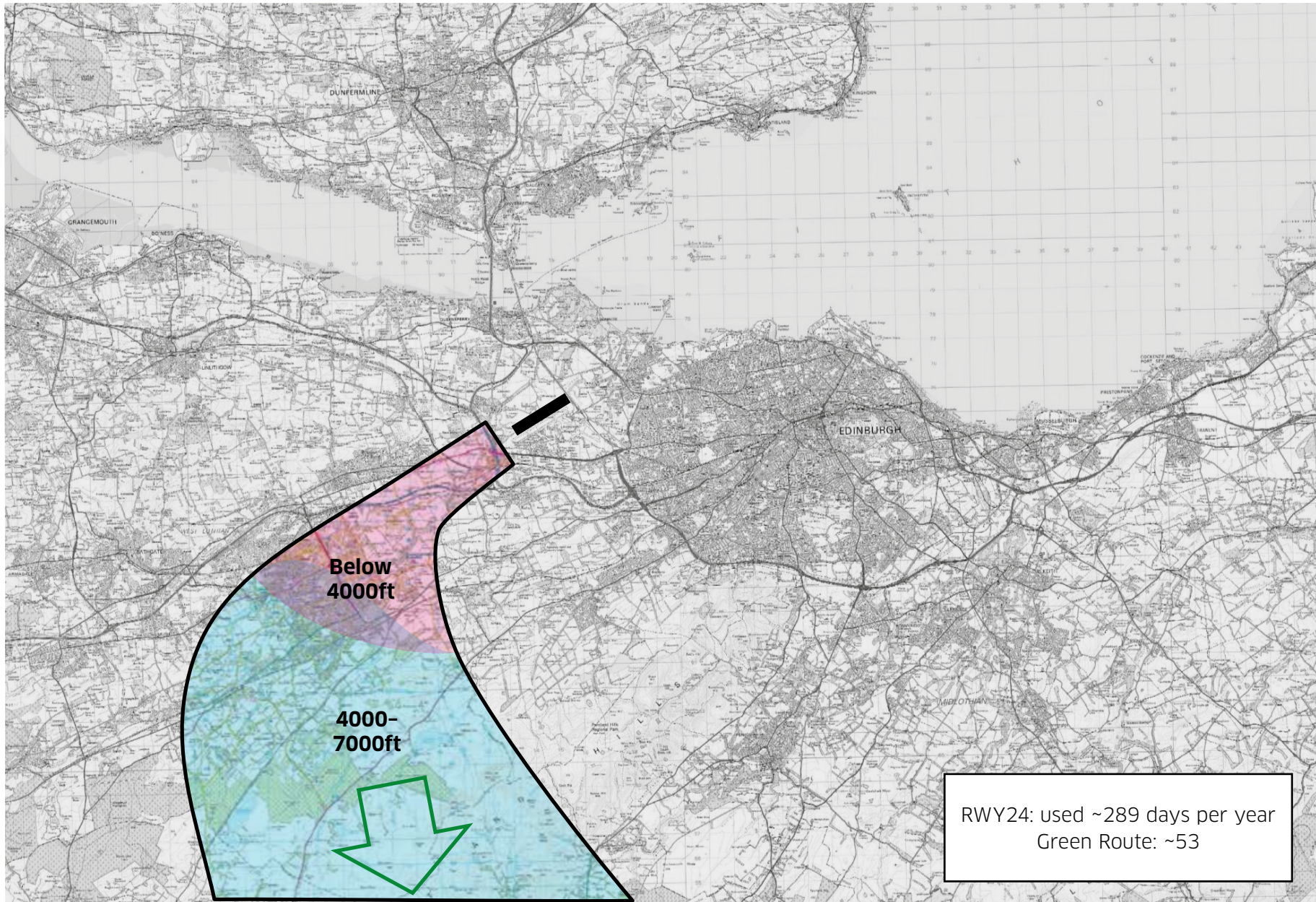


Figure 6: Runway 24 departures, left turnout design envelope

To find out more about design envelopes in your area, you can use the postcode search tool at letsgetfurther.com



Close up of design envelope in Figure 6.



Figure 7: Runway 24 departures, straight out design envelope

To find out more about design envelopes in your area, you can use the postcode search tool at letssofarther.com

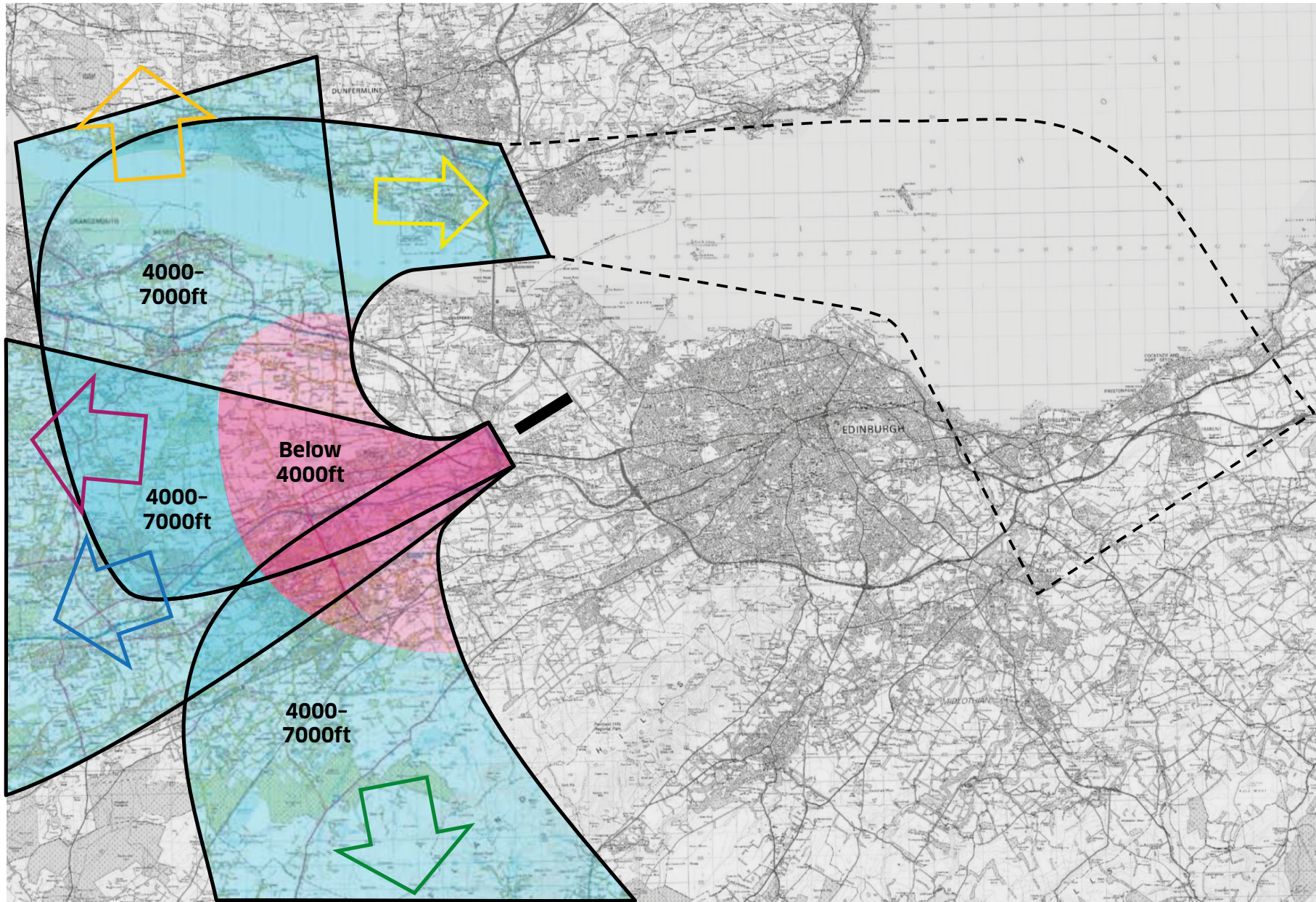


Close up of design envelope in Figure 7.



Figure 8: Runway 24 departures, combined design envelopes

To find out more about design envelopes in your area, you can use the postcode search tool at letssofarther.com



Close up of design envelope in Figure 8.

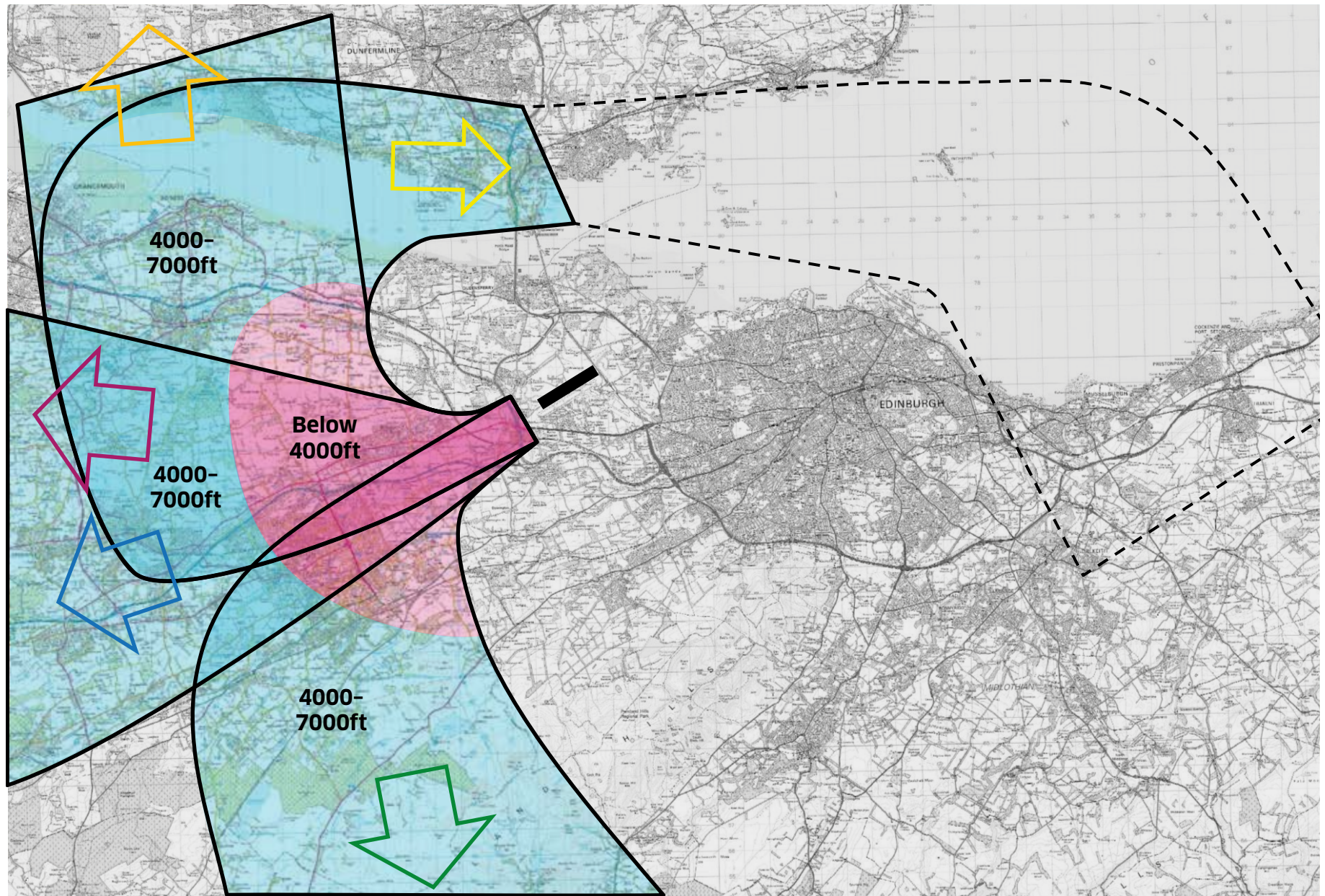


Figure 9: Runway 06 departures, right turnout design envelope

To find out more about design envelopes in your area, you can use the postcode search tool at letssofarther.com



Close up of design envelope in Figure 9.

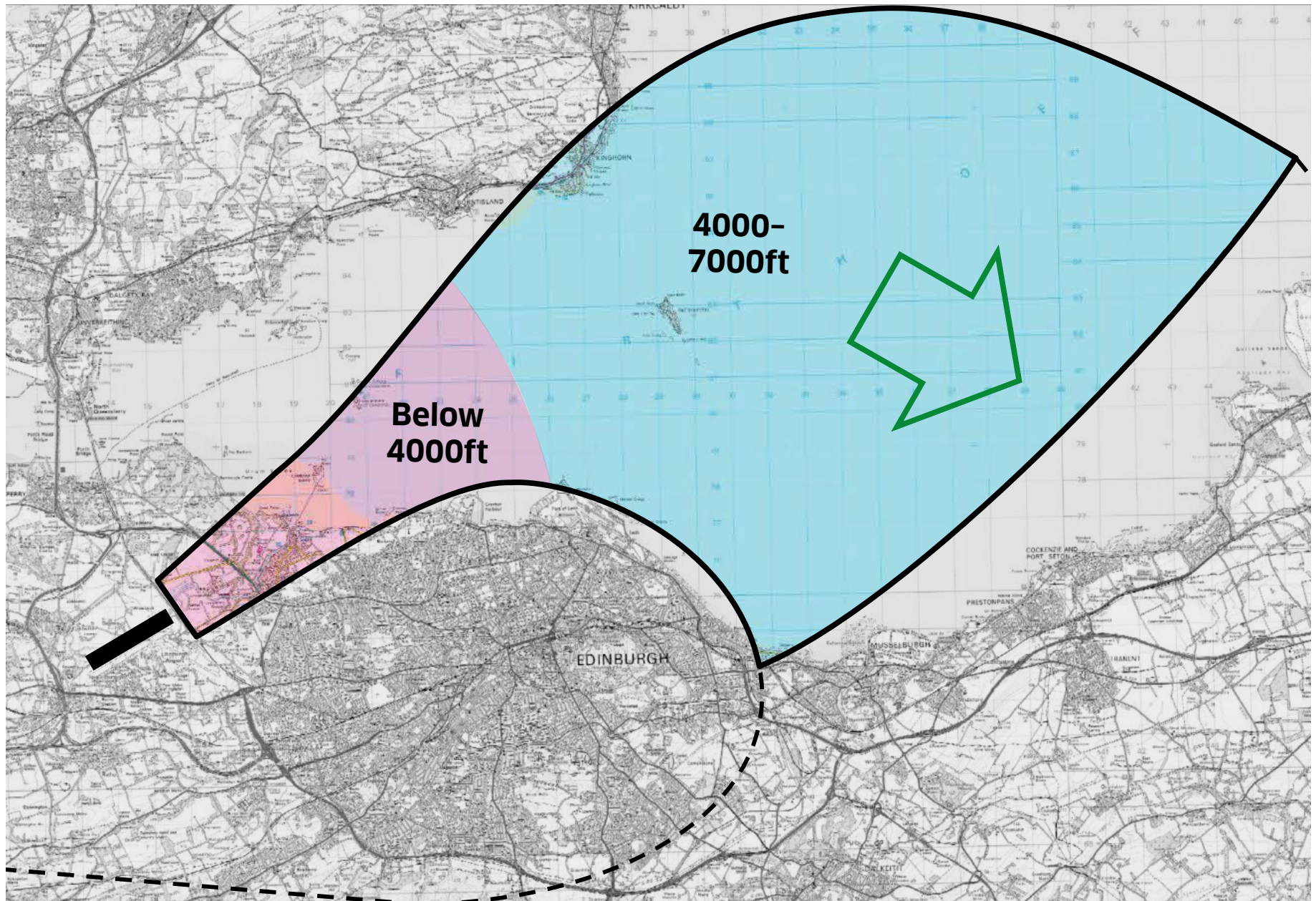
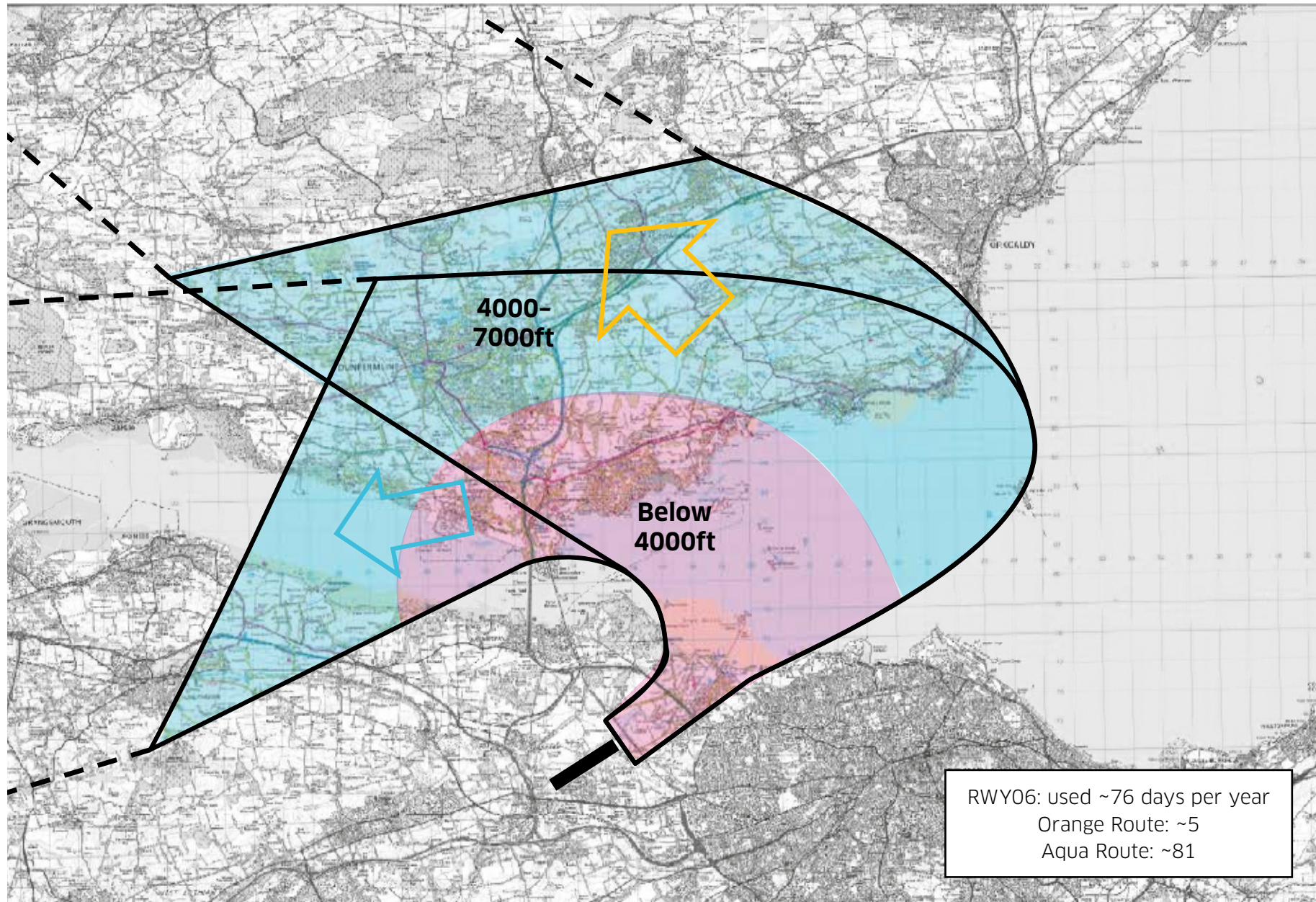


Figure 10: Runway 06 departures, left turnout design envelope

To find out more about design envelopes in your area, you can use the postcode search tool at letsgefurther.com



Close up of design envelope in Figure 10.

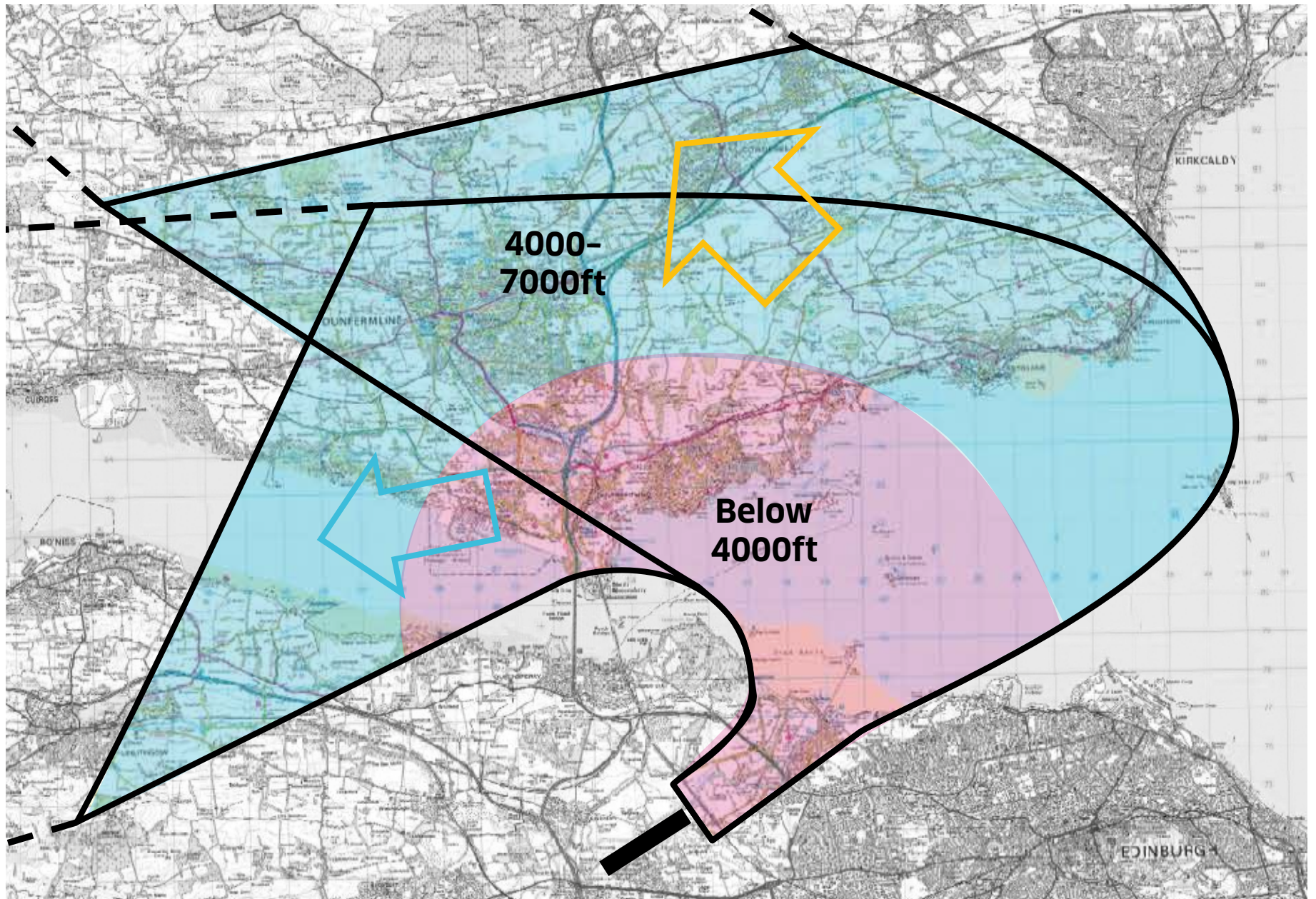


Figure 11: Runway 06 departures, combined design envelope

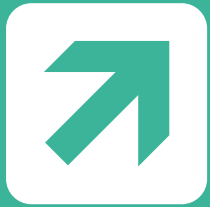
To find out more about design envelopes in your area, you can use the postcode search tool at letssofarther.com



Close up of design envelope in Figure 11.



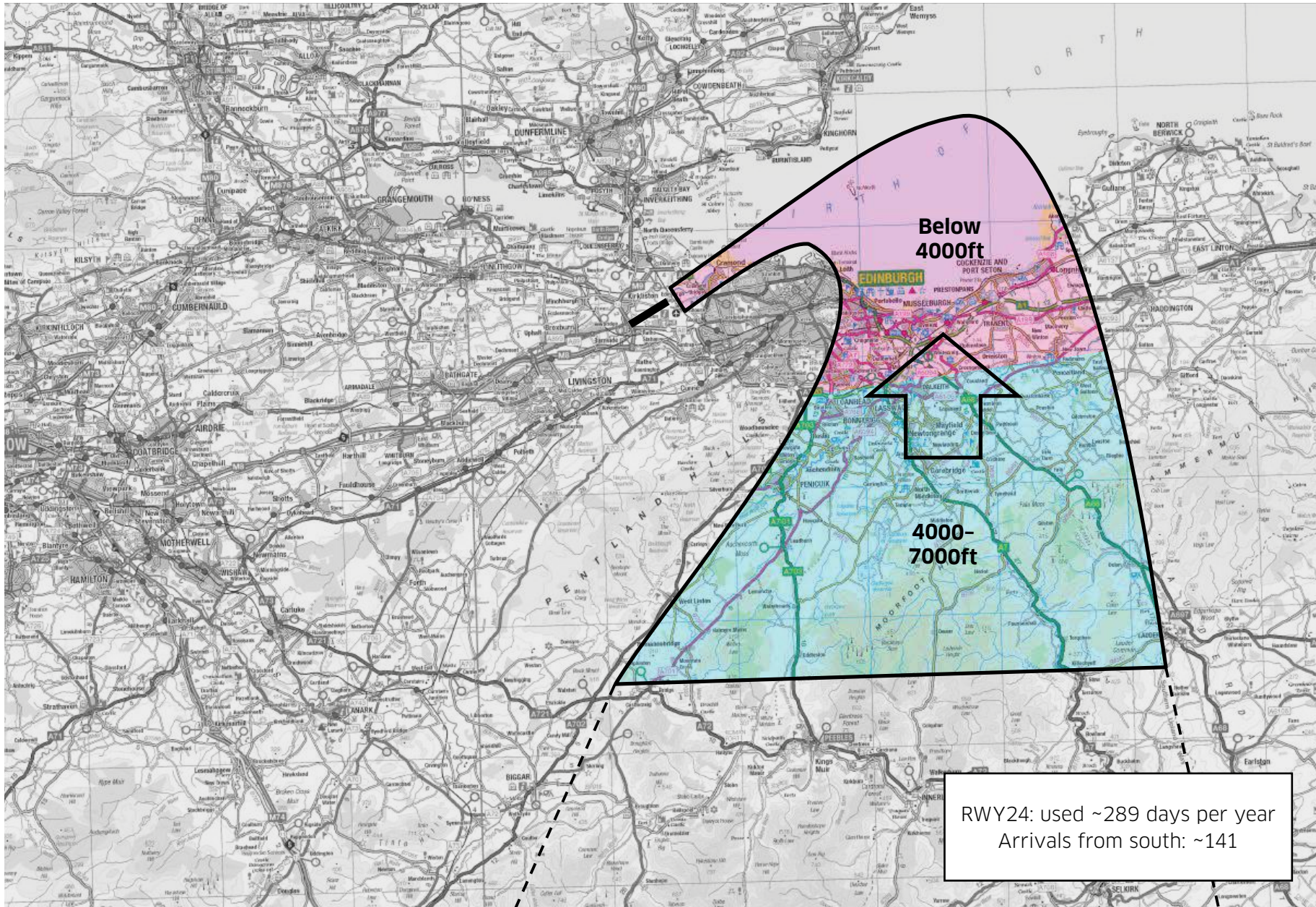




ARRIVAL DESIGN ENVELOPES

Figure 12: Runway 24 arrivals from south design envelope

To find out more about design envelopes in your area, you can use the postcode search tool at letsgofurther.com



Close up of design envelope in Figure 12.

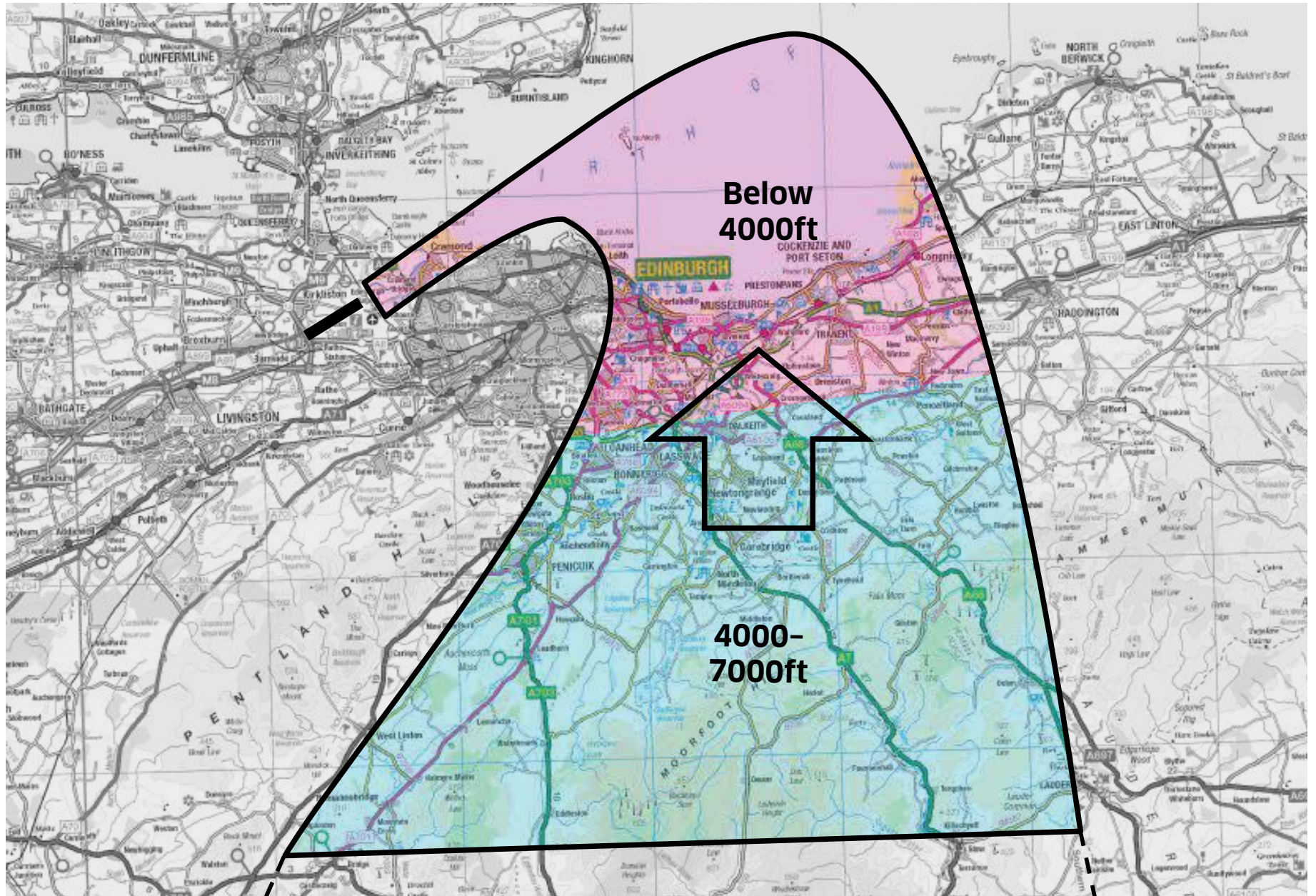
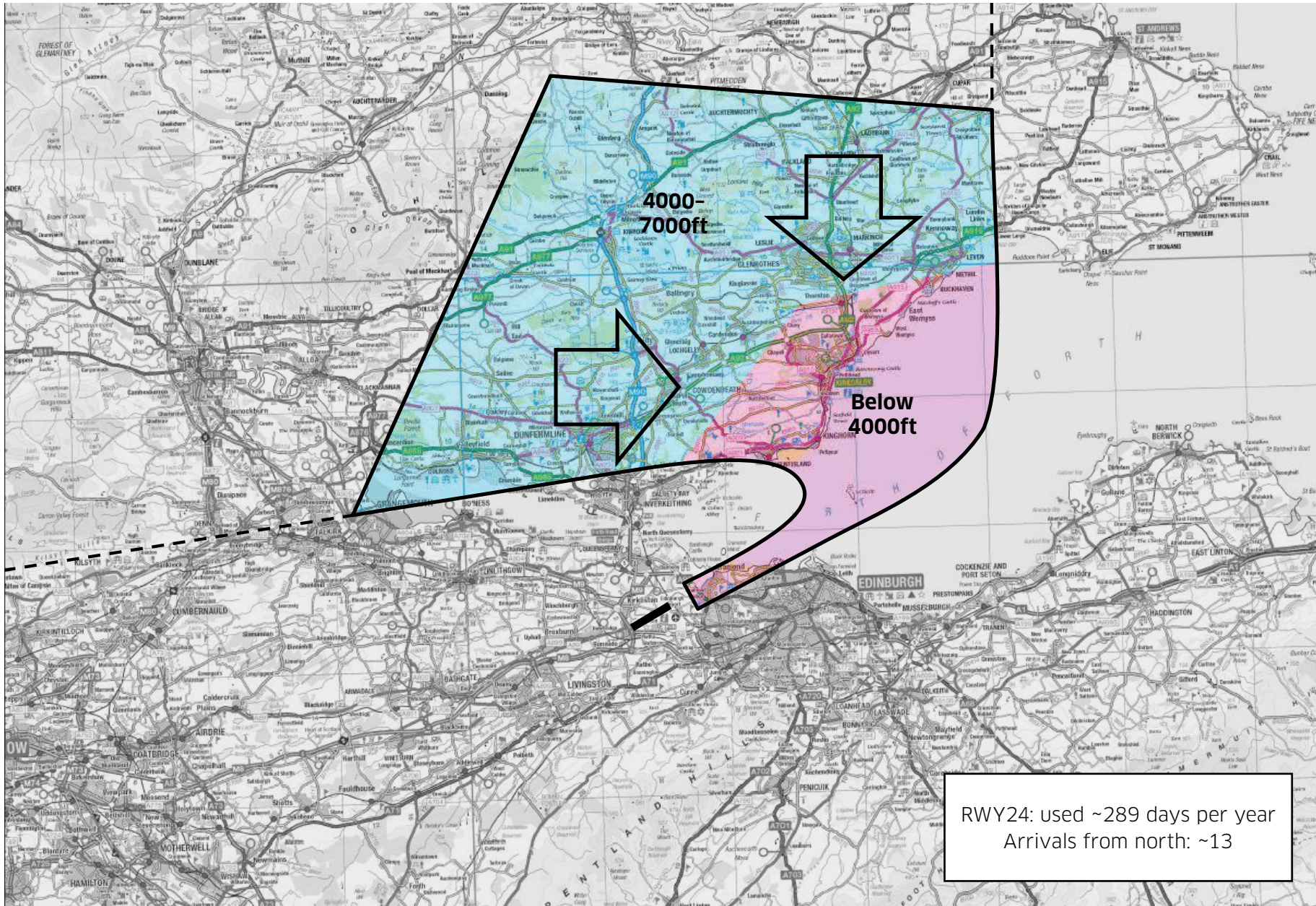


Figure 13: Runway 24 arrivals from north design envelope

To find out more about design envelopes in your area, you can use the postcode search tool at letsgofurther.com



Close up of design envelope in Figure 13.

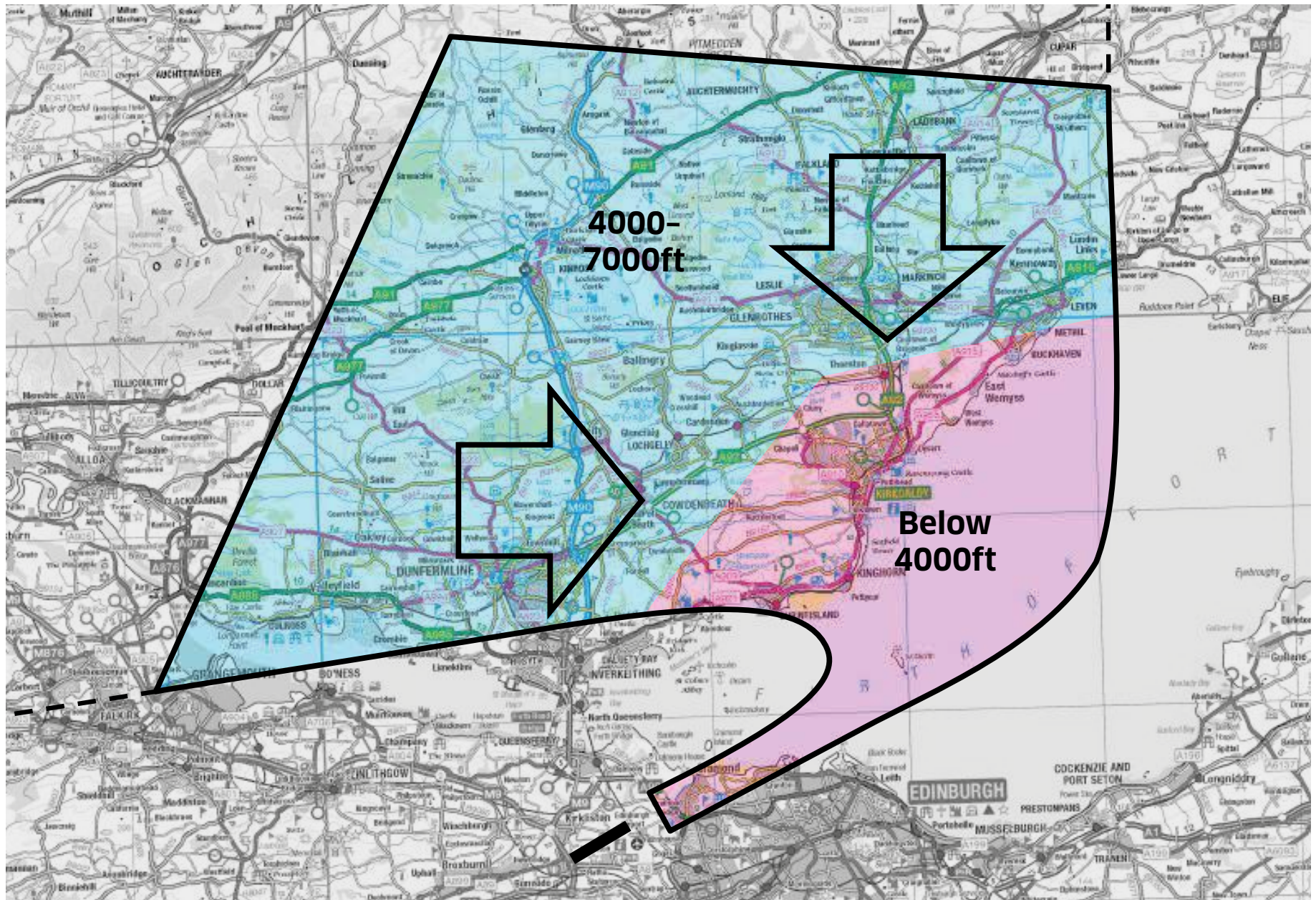
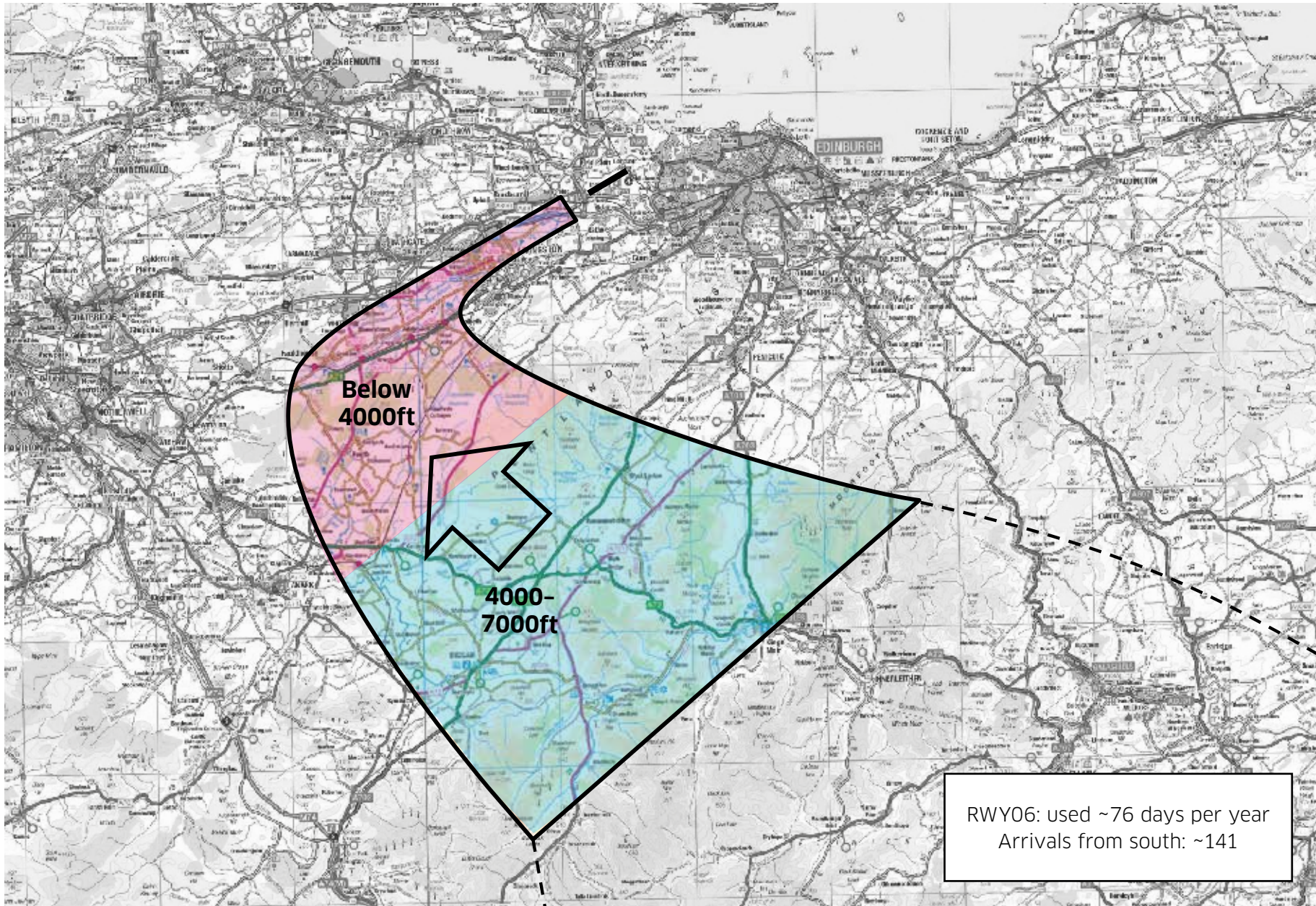


Figure 14: Runway 06 arrivals from south design envelope

To find out more about design envelopes in your area, you can use the postcode search tool at letssofarther.com



Close up of design envelope in Figure 14.

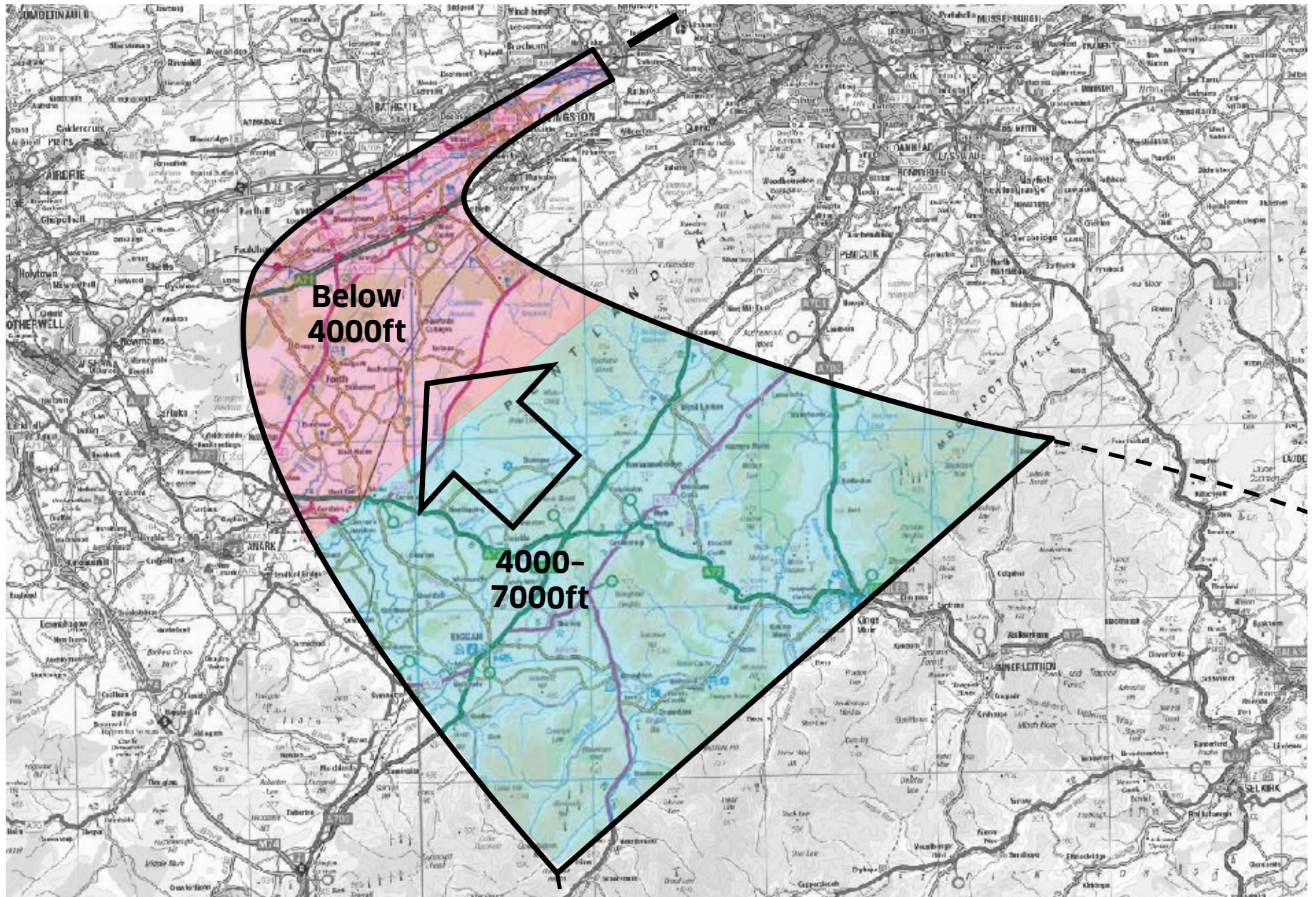
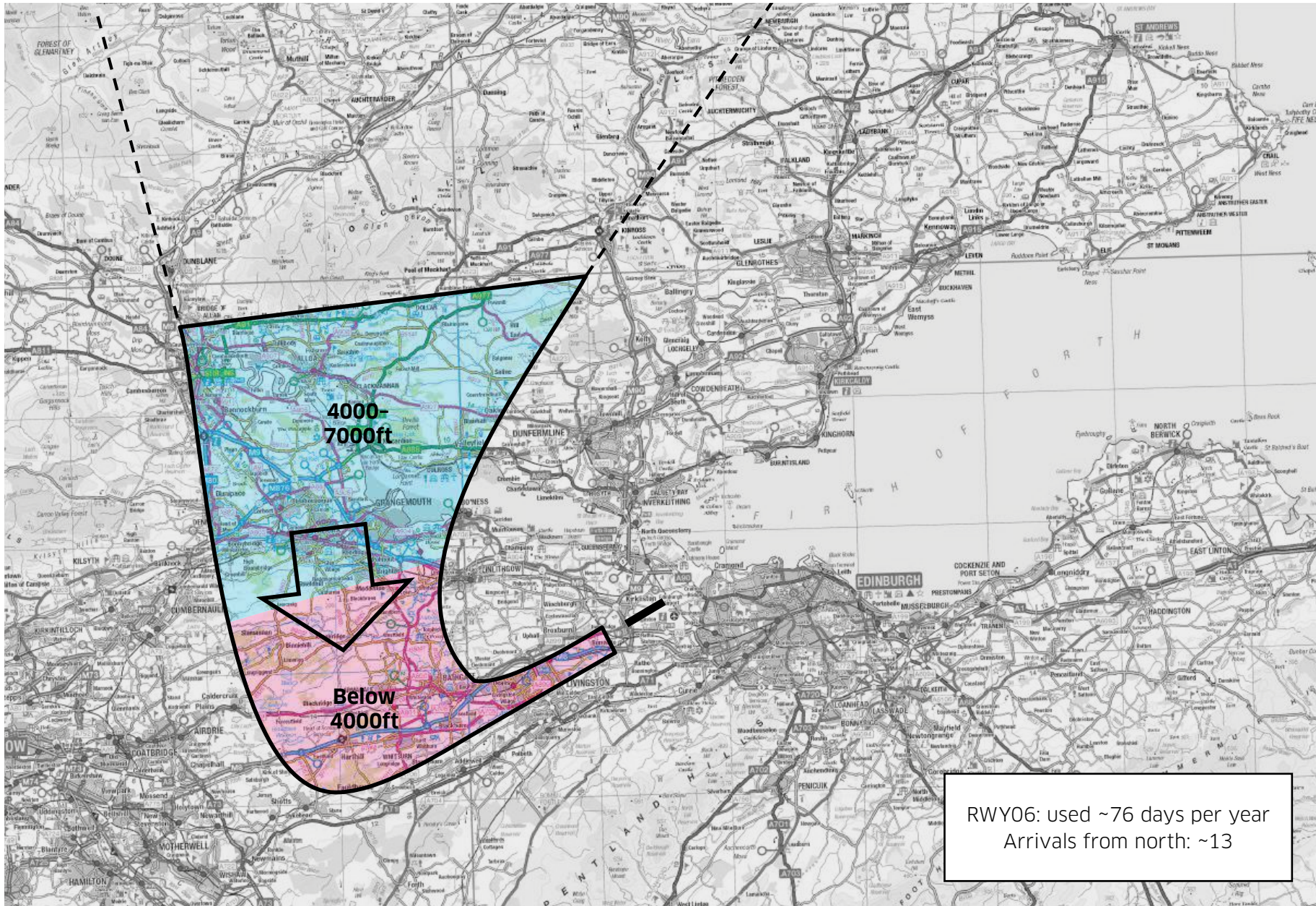


Figure 15: Runway 06 arrivals from north design envelope

To find out more about design envelopes in your area, you can use the postcode search tool at letsgofurther.com



Close up of design envelope in Figure 15.



7.2 Design considerations

The factors which must be considered when deciding where a route will be positioned are numerous. Justifications related to these are required to be presented to the CAA when requesting an airspace change. They include:

Safety

Safety is always the number one priority

Many of the factors below are motivated by ensuring the utmost safety. A change to airspace will only be approved by the CAA if it is as least as safe as current operations. Where possible we will always strive to improve safety.

Environmental

Noise impact to those on the ground

In low altitude airspace below 4,000ft, the priority should be to minimise aviation noise impact and the number of people on the ground significantly affected by it. In intermediate airspace from 4,000ft to 7,000ft the focus should continue to be on minimising the impact of aviation noise, but this should be balanced with the need for an efficient flow of traffic that minimises emissions.

Visual impact

Usually considered only with respect to designated areas such as National Parks.

CO₂ emissions

This is prioritised where aircraft will be above 7,000ft agl. For emissions at altitude government guidelines dictate that the emphasis is on CO₂ rather than NO_x and particulates.

Between 4,000ft and 7,000ft, CO₂ emissions remain a priority, to be considered in conjunction with noise impacts at these altitudes.

Local air quality

All emissions are considered, but are only applicable where changes are made to flight paths which are below 1,000ft agl.

Physical

Procedure design limitations

Internationally agreed parameters for design of flight procedures are governed by the International Civil Aviation Organisation (ICAO), and adopted by the UK CAA. These are limits for parameters such as terrain/obstacle clearance, maximum climb and descent angles, minimum distances between waypoints, stabilisation distances etc.

Avoidance of other airspace

For example, restricted areas, military danger areas.

Minimum turn radii

Determined by aircraft speed and maximum bank angle.

Speed

Maximum speed e.g. 220 knots can be specified for procedures. Below 10,000ft the maximum speed for aircraft is 250 knots unless otherwise notified.

Efficiency**Air traffic controller workload**

Each air traffic controller is responsible for a specific sector of airspace. For safety, limits are set on the number of aircraft that can enter each sector thus ensuring that the controller can safely manage the workload. Hence workload can be a limiting factor for how many aircraft can be handled.

Pilot workload

For safety, pilot workload must be kept to a manageable level. For example, complex routings can cause an unacceptable increase in pilot workload.

Airspace capacity

Systemisation can result in efficiencies such that the number of aircraft able to be handled in a sector can be increased.

Runway capacity

Runway capacity is often a limiting factor determining how many aircraft can use each route in a given time.

Environmental considerations

The full environmental considerations required when undertaking airspace changes are described in detail in references 1, 4 and 8, on page 84. The purpose of this consultation is to gather information which will help decide the proposed route positions. Since at this stage the detailed route design has not been done, it is not yet possible to undertake full environmental analysis in terms of noise contours and CO₂ production (although indicative L_{max} noise information has been provided). The results of this consultation will help inform the design of route options and detailed environmental analysis will be performed on these. A further consultation will then be undertaken on the proposed detailed design options and the environmental impacts of the final proposed routes.

8.1 Accurate track keeping

Aircraft using RNAV are often said to be on 'rails in the sky', i.e. they can follow a defined route accurately and repeatedly.

The use of RNAV technology enabling aircraft to fly routes more accurately does mean that there will be an increased concentration of aircraft over core tracks, replacing the spread that is seen today.

This increased track conformity is in line with Department for Transport guidance on environmental objectives. (Ref. 5: Aviation Policy Framework, Section 3.31, on page 84) which embodies the government guidance that it is desirable to concentrate aircraft along the fewest possible number of specified routes

in the vicinity of airports. This may present a change in noise and visual intrusion impact. Typically locations either side of the routes will be overflowed less and will be exposed to less aircraft noise, while locations close to the route centreline will be overflowed more, and may be exposed to more aircraft noise.

Notes

8.2 Improved descent planning

When flying RNAV approaches, pilots have more certainty regarding the distance left to run before reaching key points in the approach. This enables them to plan their descent such that they are able to stay higher longer and to execute smooth continuous descents. This can save fuel, reduce CO₂ emissions, and reduce noise impact¹¹.

8.3 Noise

Indicative figures for maximum noise exposure per flight are given in section 7.1. At this early stage in the design process it is not possible to undertake a detailed noise analysis. Once the routes have been designed it will be possible to produce noise contour maps which will illustrate the change in noise exposure. These will be central to the subsequent second consultation.

¹¹ Aircraft flying higher are quieter. Aircraft descending smoothly with reduced power settings are quieter than those having to descend then level off, which requires changes to the power settings which produce tonal changes in engine noise which are particularly noticeable to stakeholders on the ground. Smooth descents at reduced power settings requires less fuel and reduces CO₂ emissions.

What happens next?

This initial consultation has been circulated to stakeholder organisations who it is envisaged may have an interest in the proposed change.

Following best practice guidelines on consultation (Ref. 3, on page 84), consultees will be provided with 14 weeks to consider and respond to the proposal.

Notes

A feedback report will be published on the Edinburgh Airport website (letssofarther.com) once both consultation responses have been analysed. This will include details of the main issues that have been raised by stakeholders during both consultation periods.

Feedback from this initial consultation will inform the detailed design process and will influence the design options for the arrivals and departure routes.

Once detailed route options have been developed, a further consultation exercise will take place where we will seek views on the viable route options.

After the further consultation, Edinburgh Airport will develop an airspace change proposal for submission

to the CAA in which we must demonstrate that the proposed design achieves the best balance possible.

It is a requirement of the airspace change process that Edinburgh Airport provide the CAA with full details of the consultation (including copies of responses and correspondence) together with all documentation necessary for the promulgation of the proposed RNAV routes.

The CAA will then review the proposal (which can take up to 17 weeks) and reach a Regulatory Decision. If the proposal is approved, the implementation process could take a further twelve weeks. The target date for the RNAV routes to come into operation is Summer 2018.

The target date
for the RNAV
routes to come
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is **Summer 2018.**

Appendix B: Technical supporting information

What is RNAV?

RNAV is a highly accurate method of aircraft navigation. RNAV is not new, it has been in use since the 1970s, however the accuracy achievable has improved over the years and as a result there are several different specifications which determine the accuracy that can be achieved. For example RNAV5 has accuracy to $\pm 5\text{nm}$, RNAV1 has accuracy to $\pm 1\text{nm}$ (note: these are minimum standards, in practice the performance is typically much better, i.e. most aircraft are able to follow the defined centreline of a straight segment to within $\pm 0.1\text{nm}$ although more variation is seen around turns). RNAV1 utilises existing ground based infrastructure and satellite navigation to enable aircraft to navigate from point to point with a high degree of accuracy. The routes proposed herein are all designed to the RNAV1 specification.

When RNAV equipped aircraft fly known routes, the on-board flight management computers can assist the pilots by predicting accurate arrival times, and create optimised descent profiles from the top of the descent to the runway.

Predictable aircraft behaviour benefits both pilots and air traffic control, and helps deliver improved operational and environmental efficiency, safety, and resilience through the systemisation of operations.

The proposal to improve Edinburgh Airport's routes is a small part of the change to RNAV across the whole country and internationally. For the most efficient air transport network all routes need to be modernised to the same RNAV1 standard. This interdependency

is the reason behind the international legislation that requires modernisation throughout the system, as the full benefit can only be realised by ensuring that all key parts of the system are modernised.

What does an RNAV route design consist of?

RNAV routes are made up of waypoints which are precisely defined points in space. These waypoints are given certain attributes which determine how the aircraft interpret the route. Different aircraft will fly routes in different ways; along a straight segment all aircraft will follow the same 'centreline' closely (the centreline is a term describing the track that the route follows). However where routes turn, there is greater variation. For instance, slower aircraft tend to turn in a tighter radius than faster ones; hence they will follow different flight paths around the turn.

The RNAV-routes have an associated 'nominal track'. This is the track flown by the least manoeuvrable aircraft likely to fly the route, leading to the widest turns. It is necessary to calculate this as it is the performance of the least manoeuvrable aircraft that tend to limit what can be achieved in the design of a route, for example waypoints around a turn must be positioned such that the least manoeuvrable aircraft can fly between them, which may not be possible if they are too close together.

Waypoints are defined as either 'fly-over' whereby the aircraft flies directly over the top of the point and then turns to intercept a new course, or they are 'fly-by' waypoints in which case the aircraft anticipates the turn and the flight management system calculates the turn, (inside of the waypoint) to smoothly intercept the outbound course.

The aim of RNAV is to give consistency and commonality to the routes. This allows pilots to plan their descent profiles to best effect by knowing, ahead of schedule, the distance to touchdown and any level or speed restrictions that are in place.

CAA Future Airspace Strategy and legislation

Achieving operational and environmental efficiency means, importantly, taking advantage of the very latest technology. To ensure the UK takes full advantage of this, the CAA has been working with the aviation industry to develop the Future Airspace Strategy (FAS¹²), a blueprint for modernising the UK's airspace.

Modernisation of the airspace system is essential for the UK and continental Europe to remain competitive in the global market. For this reason processes are underway at a European level to make modernisation a legal requirement for the UK and other European states¹³. Doing nothing is therefore not an option.

The UK's airspace infrastructure is currently predicated on 'conventional' navigation, using ground based beacons. This system has been in place for many decades and does not exploit the modern navigational capabilities with which most commercial aircraft are already equipped (e.g. satellite technology). It is therefore relatively inefficient, both operationally and environmentally.

Modernisation will enable UK aviation to reap the benefits of the latest technologies such as Performance Based Navigation (PBN)¹⁴. A route system using PBN standards allows more flexible positioning of routes and enables aircraft to fly them more accurately. This helps improve operational performance in terms of safety and capacity, and also offers environmental benefits.

The environmental benefits of route flexibility include noise management by positioning some routes away from population centres or other sensitive areas, and more scope to minimise fuel burn and CO₂ emissions¹⁵ by shortening and/or raising flight paths.

Modernising the system can also help improve resilience by enabling a quicker recovery from events that close runways and generate delay (such as emergencies and bad weather).

Given FAS and the upcoming European legislation, the change to a PBN environment is inevitable and beyond the scope of this consultation; our focus is instead on how best to apply the change. Stakeholders wishing to discuss the overall PBN strategy should contact the CAA.

Our focus is therefore to meet medium to long term demands by providing an airspace system to help the UK meet the FAS and European requirements.

This consultation is not on growth in air traffic demand itself. Regulation of the UK aviation sector is the responsibility of the CAA.

¹² The CAA explains the background to FAS here: www.caa.co.uk/default.aspx?catid=2408

¹³ Eurocontrol explains the requirement and planned timescales for modernisation here: www.eurocontrol.int/articles/performance-based-navigation-pbn-mandate

¹⁴ PBN is a generic term for modern navigation standards.

¹⁵ Burning fossil fuel means that CO₂ is produced; for aviation fuel, 1kg of fuel burnt means 3.18kg of CO₂ is emitted.

Legal framework

Once airspace change sponsors have submitted their airspace change proposal, the CAA decides whether the proposal should be approved. To do this, they are required to consider a framework of legislation and guidance which set out the CAA's obligations, and the factors that it must take into account in assessing the merits of an airspace change proposal.

The CAA's primary obligation is to exercise its air navigation functions so as to maintain a high standard of safety in the provision of air traffic service. This duty, which is imposed on the CAA by the Transport Act 2000 (the 'Transport Act'), takes priority over all of the CAA's other duties.

The Transport Act also directs the CAA to exercise its air navigation functions in the manner it thinks best calculated to:

- secure the most efficient use of airspace consistent with the safe operation of aircraft and the expeditious flow of air traffic
- satisfy the requirements of all airspace users
- take account of government guidance on environmental objectives.

In addition to the duties imposed by the Transport Act, the CAA is obliged, by the Civil Aviation Authority (Air Navigation) Directions 2001, to take into account the need to reduce, control and mitigate as far as possible the environmental impacts of civil aircraft operations, and the need for environmental impacts to be considered at the earliest possible stages of planning, designing, and revising, airspace procedures and arrangements.

Edinburgh Airport has sought to reflect these duties and objectives, and the framework as a whole, in our development of these airspace change proposals and the consultation on them. We also take into account government guidance on environmental objectives set out in the Department for Transport's document 'Guidance to the Civil Aviation Authority on Environmental Objectives Relating to the Exercise of its Air Navigation Functions' (Ref. 4, on page 84). This sets out a number of environmental objectives, in relation to:

- greenhouse gas emissions and ozone depleting substances
- local air pollution
- noise (in particular in relation to aircraft below 7,000ft)
- tranquillity.

In our judgement, the way in which these objectives are best balanced is heavily dependent on the local area. For example, in some places, it may be better to fly aircraft along a longer route (using more fuel, causing an increase in CO₂ emissions) in order to avoid increasing noise in a sensitive area. In other cases, the opposite may be true. However, in general, our view is that:

- a. in low altitude airspace below 4,000ft, the priority should be to minimise aviation noise impact, and the number of people on the ground significantly affected by it
- b. in intermediate airspace from 4,000ft to 7,000ft, the focus should continue to be minimising the impact of aviation noise, but this should be balanced with the need for an efficient flow of traffic that minimises emissions

- c. in network airspace above 7,000ft, the priority is efficiency, and to minimise the global environmental impact of aviation (i.e. CO₂ emissions)
- d. where practicable, and without a significant detrimental effect on efficiency or noise impact on populated areas, air routes below 7,000ft should be avoided over National Parks
- e. where two options are similar in terms of their effect on densely populated areas, the value of maintaining legacy arrangements should be taken into consideration.

Airspace change sponsors must also take into account the guidance published by the CAA entitled 'CAP725 CAA Guidance on the Application of the Airspace Change Process' (Ref. 1, on page 84). This guidance states that the environmental impact of an airspace change must be considered from the outset, which we have done and continue to do.

In considering the design of airspace we take account of the environmental effects in the current system, and the effects we would expect after implementation, should our proposal be accepted. These are represented in the consultation document by the density plots showing the location of current traffic, and the consultation design envelopes showing where routes may be positioned in the future. We consider these effects for populated areas, National Parks and any other area in which there is potential impact that may be highlighted to us through the consultation process.

We seek to mitigate the local environmental impact on these areas as best we can, referring to the legal framework set out above. This consultation forms part of that mitigation strategy as it will collect information on local significance for route positioning. We will use the feedback from consultation to inform flight path design alongside guidance from the Government and CAA.

Referenced documents

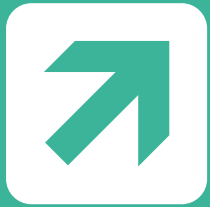
List of documents referenced in this publication:

- (1) CAP 725, CAA Guidance On The Application Of The Airspace Change Process¹⁶, Fourth Edition March 2016, CAA Safety and Airspace Regulation Group.
- (2) CAP 724, CAA Airspace Charter which defines the authorities, responsibilities and principles by which the CAA Director of Airspace policy conducts the planning or airspace and related arrangements in the UK.
- (3) Cabinet Office Code of Practice on Consultation.
- (4) Guidance to the Civil Aviation Authority on Environmental Objectives Relating to the Exercise of its Air Navigation Functions¹⁷, January 2014.
- (5) HM Government - Aviation Policy Framework, 2013.
- (6) Civil Aviation Authority, Future Airspace Strategy for the United Kingdom 2011 to 2030.
- (7) Policy for the Application of Performance Based Navigation in UK/Irish Airspace 2011.
- (8) CAP1378 Airspace Design Guidance: Noise mitigation considerations when designing PBN departure and arrival procedures, March 2016.
- (9) CAP1379 Description of Today's ATC Route Structure and Operational Techniques, March 2016.

¹⁶ At the time of writing a new version of CAP725 is being consulted on by the Civil Aviation Authority; however any resultant change to the guidance is not expected to be published until 2017; therefore in our consultation we refer to the extant guidance dated March 2016.

¹⁷ At the time of writing a new version of this guidance is being considered by the Department for Transport; however any resultant change to the guidance is not expected to be published until 2017; therefore in our consultation we refer to the extant guidance dated Jan 2014.

Notes



THANK YOU



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