



APPENDIX 5 - AIRSPACE DESIGN PRINCIPLES CONSULTATION: CONSULTATION DOCUMENT



**AIRSPACE
PRINCIPLES
CONSULTATION**

AIRSPACE PRINCIPLES CONSULTATION DOCUMENT

JANUARY 2018

Heathrow



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Foreword



Heathrow is a critical part of the UK economy, but its expansion is also vital to securing the country's economic future as an outward looking nation.

This consultation is a central part of delivering that plan. It is your first opportunity to share your views on the options for how we expand. Your feedback will inform two further consultations before we finalise our proposals.

Heathrow expansion is about more than just a runway. It is about opportunities for our local community, inside and outside the airport's boundary. It is about securing the country's economy and connecting the whole of the UK to global growth. And it is about legacy – building the infrastructure today that our children will need for tomorrow.

Today, businesses across the country, from Scotland to the South West depend on the global connections Heathrow creates. With 194 routes to over 80 countries, we connect the whole of Britain to the world and drive investment back into and across the country.

Expanding Heathrow is essential to ensure future generations can compete for global trade. It will create up to 180,000 new jobs and up to £187 billion in economic benefits across the country. We will double cargo capacity, boost British exporters and leave an infrastructure skills legacy.

But expanding in the national interest must not come at a cost to our local communities.

That's why we have already made a number of commitments on issues including noise, air quality and compensation. Together, they mean that expansion presents a once in a lifetime opportunity to reduce the impacts of the airport on our local communities, and ensure you share in the benefits of expansion.

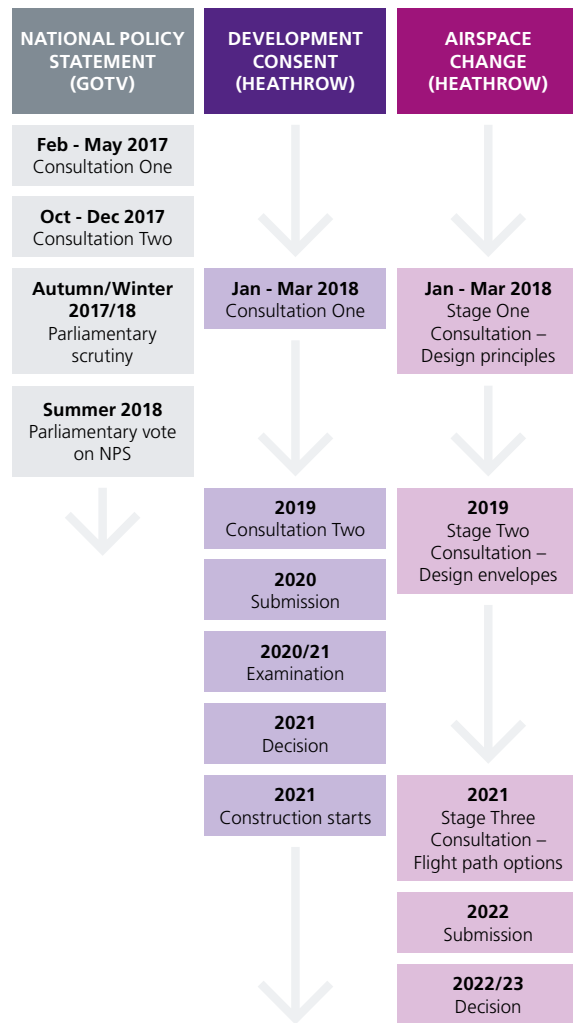
That is what this consultation is about. It is a critical step in modernising airspace, delivering expansion, unlocking these opportunities and delivering our commitments. We want to hear from you so that you can help us shape our plans.

We look forward to discussing our airspace design principles with you, hearing your views and working with you to deliver a modernised and improved airspace design at Heathrow.

John Holland Kaye
Chief Executive
Heathrow Airport Limited

Section 1 - Introduction

Indicative Timeline



In October 2016, the Government announced Heathrow¹ as their preferred option for the expansion of airport capacity in the South East. The Government published the Draft Airports National Policy Statement (ANPS) for consultation in 2017. When approved by Parliament, the ANPS will confirm the principle of the scheme and the factors against which the application for the expansion of Heathrow will be decided.

The expansion of the airport is not just about the physical changes required on the ground. Building a new runway will also lead to changes to where and how planes fly in the future. Changes to flight paths will be confirmed through the airspace change process which is determined by the Civil Aviation Authority (CAA).

The south east of England is already one of the busiest airspaces in the world with five major airports in close proximity: Heathrow, Gatwick, Stansted, London City and Luton. The airspace that these airports use was designed for an age when aircraft and navigation was much less sophisticated. A major airspace modernisation programme is already underway across all of these airports.

Undertaking expansion at Heathrow at the same time as this wider modernisation programme provides a once in a generation opportunity to modernise and improve the way our airspace is used.

There will be several stages of consultation before the final flight paths needed to operate a three runway Heathrow are decided (see page 8). This ensures the views of affected stakeholders are considered throughout the airspace design process.

The first stage – which is the focus of this consultation document – sets out some of the key design principles that could be used as the basis for developing Heathrow’s future airspace design, and asks for your views and preferences relating to them.

The design principles presented here are part of a wider set of design principles that we will use when comparing airspace design options. The wider set of design principles will include ensuring the design is safe and capable of accommodating the type of aircraft we expect to use the airport.

Heathrow is also running a separate consultation to seek your views on our emerging proposals on the ground and how we might mitigate the potential effects. You can find more details at www.heathrowconsultation.com

¹ Heathrow’s Northwest Runway scheme

In 2015 the independent Airports Commission recognised that an expanded Heathrow could be a better neighbour for local communities than it is today.

Reducing the noise impact of Heathrow is a key element of our approach to expanding the airport. And it's something that's been done before: since the 1970s, the number of flights at Heathrow has nearly doubled, yet the number of people within Heathrow's noise footprint has fallen by 90%².

In our proposal to the Airports Commission, we demonstrated that we could continue to reduce Heathrow's impacts by:

- Using quieter aircraft – by the time the third runway opens, 90% of aircraft at Heathrow are expected to be “next generation” aircraft like the Boeing 787 or Airbus A320-neo³;
- Increasing the time without scheduled night flights from 5.0 hours to 6.5 hours with expansion;
- Maintaining runway alternation for communities living under the final approach paths;
- Keeping planes coming into land higher for longer;
- Alternating arrival and departure flight paths so that residents experience periods of time without overflight, something that isn't done today; and
- Ending routine aircraft stacking⁴.

As part of the Airports Commission process we have also developed a noise insulation scheme that goes above and beyond statutory requirements and was regarded by the Government as “world class”. For more information please see our Airport Expansion Consultation Document.

We recognise that there will be some communities who will experience aircraft noise for the first time when the new runway becomes operational, and it is crucial that they, and communities who are currently overflown, get their say on the design of Heathrow's future flight paths.

This consultation is your opportunity to have your say on how we approach the redesign of Heathrow's airspace.

² In 1974, there were 2,000,000 people living in the 57dB Leq 16h noise contour around Heathrow. By 2012 this had fallen to 239,600 people

³ See Sustainable Aviation's website for more information on how the aviation industry is working together to develop a quieter, cleaner and smarter aviation industry www.sustainableaviation.co.uk

⁴ For more information on current operations at Heathrow see the Heathrow Operations Handbook on our website www.heathrow.com/noise

UK airspace change

Modernisation of the UK's airspace is required to accommodate growing demand for air travel, regardless of the expansion of Heathrow. The Government has embarked on their 'Future Airspace Strategy' (FAS), led by the CAA, to modernise the UK's airspace.

The aim of the strategy is to make the airspace more efficient; improve punctuality; cut CO₂ emissions; reduce noise from less aircraft-holding at low levels; and to ensure there is capacity to meet future demand. The FAS will require all UK airports to modernise, as well as the network that sits above these airports which is known as en-route airspace. FAS is also part of a Europe-wide modernisation project, called the Single European Sky, to make the skies above Europe more efficient⁵.

The Government's 'Strategic Rationale for Upgrading the UK Airspace' provides more information on the need for airspace modernisation in the UK and describes the upgrades planned⁶.

Changes that are made to accommodate a third runway at Heathrow will need to fit in with the changing airspace of the UK and Europe. Heathrow is working closely with the other airports in the south-east of England to develop an integrated approach to airspace modernisation.

Heathrow's review of its airspace will consider flights up to an altitude of approximately 9,000ft. This is where our routes connect to the wider airspace network above the UK. Changes to airspace above this is the responsibility of NATS (the national air traffic service providers) rather than Heathrow, and any changes to this upper airspace will be taken forward by NATS.

NATS has produced videos on how aircraft at different altitudes are seen from the ground. These can be found at www.nats.aero/environment/aircraft-noise



Image courtesy of NATS

⁵ For more information on the FAS you may be interested in the NATS film available at www.caa.co.uk/Commercial-industry/Airspace/Future-airspace-strategy/Future-airspace-strategy/

⁶ www.gov.uk/government/uploads/system/uploads/attachment_data/file/586871/upgrading-uk-airspace-strategic-rationale.pdf

Performance Based Navigation

The introduction of Performance Based Navigation (PBN) is key to achieving the aims of the FAS. PBN improves the accuracy of where aircraft fly by moving away from 'conventional' navigation using ground-based beacons, to satellite navigation.

As Heathrow's airspace and the routes aircraft fly are redesigned to accommodate the expansion of the airport and a new runway, we will move to using PBN.

PBN is being introduced across the world. This new technology allows more flexible positioning of routes and enables aircraft to fly them more accurately. This helps improve operational performance and reduce delays.

However, enabling aircraft to follow an allocated route more precisely will potentially lead to routes becoming narrower and more concentrated than today and we recognise that this concentration of aircraft is a concern to local communities.

Heathrow is committed to working with local communities and with the aviation industry to find ways to implement PBN without a significant increase in the noise impact for our surrounding communities. We have been discussing options with local stakeholders in Heathrow's regular community engagement forums over the last few years, including the Heathrow Community Noise Forum.

For more information on PBN you may like to read the CAA's document on "Airspace Design Guidance: Noise mitigation considerations when designing PBN departure and arrival routes" (also known as CAP1378).



Section 2 - Airspace change process

Changes to Heathrow's flight paths required for expansion are subject to a separate process to the expansion of the airport on the ground. These flight path changes are approved by the Civil Aviation Authority (CAA), following their airspace design guidance⁷. It requires Heathrow to carry out consultation on the airspace proposals with a wide range of stakeholders, including potentially affected communities.

Heathrow is responsible for developing proposals for any changes to flight paths into and out of the airport. To ensure that all stakeholders are engaged and can influence the design of future flight paths, we will be carrying out consultation over the next few years. This means we do not have any future flight path options to consult on at this early stage.

Airspace Regulation

Heathrow operates within a regulatory framework set by policy makers, including the UK Government through the Department for Transport (DfT). Any changes to Heathrow's airspace need to be consistent with Government policy and approved by the CAA. Key airspace regulation documents include:

- UK Airspace Policy (DfT)
- Air Navigation Guidance (DfT)
- Airspace Design Guidance (CAA)

For more information on the Government's role in Heathrow operations, please see the Heathrow website www.heathrow.com/noise/heathrow-operations

How do we get permission for expansion on the ground?



To get permission for the expansion of Heathrow we must apply for a Development Consent Order (DCO) under the Planning Act 2008.

As part of this process there will be opportunities for you to get involved and participate. Our DCO application will be subject to examination by the Planning Inspectorate and the Secretary of State for Transport will make the final decision on whether to grant or refuse permission for the scheme to go ahead.

Further information can be found in our **DCO Process Information Paper**.

For more information on the process for designing our airspace please see our **Airspace Change Process Information Paper**.



⁷ Referred to as CAP1616

Section 3 - Redesigning our airspace

Consultation approach

We will carry out three stages of consultation on the changes that we need to make to the airspace above London and the surrounding areas:

To be consistent with Government policy, we will assess each of the potential design options using an options appraisal model that will enable us to compare the relative benefits, both positive and negative, of each option.

After the final consultation, we will finalise our proposed new airspace design and submit it to the CAA who will decide whether to approve the changes. The CAA will consider a range of factors including safety, security, operational and environmental impacts. For certain types of airspace change, the Secretary of State may decide to intervene and to make a decision instead of the CAA. This is known as a “call in”.

We recognise that this is a lengthy process, which means there will be a period of uncertainty for communities living around Heathrow. However, the phased consultation approach will enable you to provide your views throughout the design process, and will allow us the opportunity to feedback on consultation responses and how they have influenced our emerging airspace design.



Consultation 1 **Design principles**

This consultation is the first stage and focuses on ‘design principles’. In this consultation we are seeking feedback on a key set of principles that could be used to guide the design and structure of Heathrow’s future airspace. These ‘design principles’ will be included in a set of rules we will use to help us to redesign our airspace.



Consultation 2 **Design envelopes**

In the second consultation, we will present the geographic areas within which flight paths could be positioned. We will ask what local factors should be taken into account when developing new flight paths within these geographically defined areas known as ‘design envelopes’.



Consultation 3 **Flight path options**

The feedback we receive will help to inform the design of ‘flight path options’ (i.e. the actual routes aircraft will fly), which will be presented in a third and final stage of consultation.

We have produced a number of other documents which help to explain and provide further information on our proposals:

Airspace Change
Information Paper

Airspace
Feedback Form

Heathrow
Operations Handbook

Technical overview on Network Air Traffic Management (ATM)
Issues and Constraints

These documents are available to view on our website, at consultation events or at document inspection locations.

Responding to the consultation

The deadline for responding to this consultation is 11.55pm on 28 March 2018.





Section 4 - Airspace design principles

Before we can begin to design our future airspace for an expanded Heathrow, we need to develop a set of principles or 'rules' to use when designing the new flight paths.

Our future airspace will need to accommodate the appropriate number of arriving and departing aircraft, safely and efficiently. We will also need to demonstrate that we have met all requirements set out in the Airports National Policy Statement (ANPS). The draft ANPS includes requirements such as:

- a) Avoid significant adverse impacts on health and quality of life from noise;
- b) Mitigate and minimise adverse impacts on health and quality of life from noise; and
- c) Where possible, contribute to improvements to health and quality of life.

However, beyond these core requirements, we expect to have a number of options and trade-offs to choose between when designing future flight paths.

This consultation is therefore seeking feedback on a set of key principles we have developed. We believe these principles address the issues highlighted most frequently by local communities and their representatives, and will enable us to develop airspace options that deliver an efficient and considerate expanded Heathrow.

The following pages set out six key principles that we could use to redesign our airspace. We have provided some examples of how different principles might affect the developing design and for some of these principles we are asking you to tell us your preferred option.

The prioritisation of one of these principles will compromise the ability to use another. For example, designing routes that reduce the total number of people overflown by aircraft might mean more concentrated flight paths over less populated areas, increasing the frequency of overflight for those affected but impacting fewer people.

On the other hand, if we adopt a principle to share routes over a wider area, this is likely to increase the total number of people overflown by aircraft, but reduce the number of people most affected as the noise will be shared more equally. These options are explored in Principle 1.

We are seeking your views on how the options put forward within these principles should be prioritised. In Principles 5 and 6 we propose one principle (rather than options) and we seek your feedback on these. We will use your feedback to help shape the design principles we use to guide our future airspace design.

Principle 1: Flight paths

There are three options for the design principle we could apply when deciding where we choose to put our flight paths in relation to where they are today. A trade-off exists between these three options so we want your views on which should be given priority.

Key

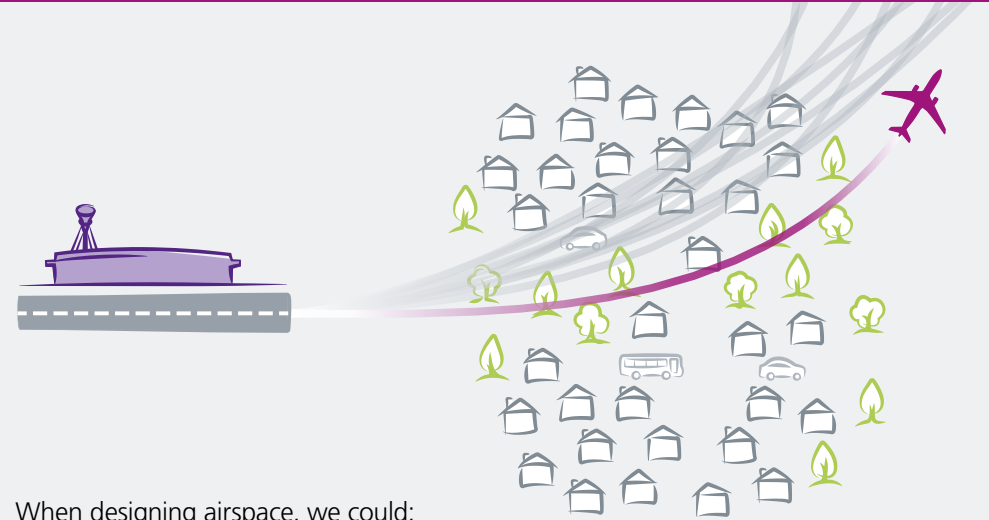


Existing aircraft tracks



Potential new route

Flight path option A



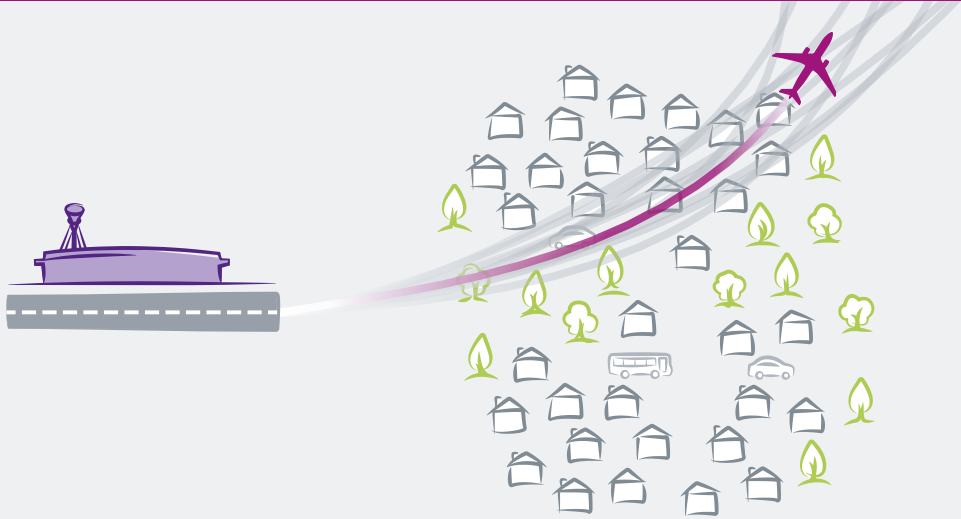
When designing airspace, we could:

A

Minimise the total number of people overflown, with routes designed to impact as few people as possible;

This option would minimise the total number of people overflown by directing flights over the areas of lowest population. This is likely to result in some routes over areas that don't currently experience overflight from aircraft using Heathrow. In addition, aircraft will be more concentrated on a route than they are today, meaning those affected people are likely to experience more aircraft overhead than those experienced by people overflown by aircraft today.

Flight path option B



B

Minimise the number of people newly overflown, keeping routes close to where they are today, where possible;

This option would minimise the number of people newly overflown by keeping routes as close to today's flight paths as possible. This is likely to result in a concentration of aircraft over the areas overflown by aircraft using Heathrow today, meaning that these areas are likely to experience more aircraft overhead than they do currently.

Flight path option C



C

Share routes over a wider area, which might increase the total number of people overflown but would reduce the total number of people most affected by the routes as the noise will be shared more equally.

This option would spread the routes over a wider area to share the impact of overflight. This would result in a larger number of people being overflown, but each route would be flown less frequently than under option (a) or (b).

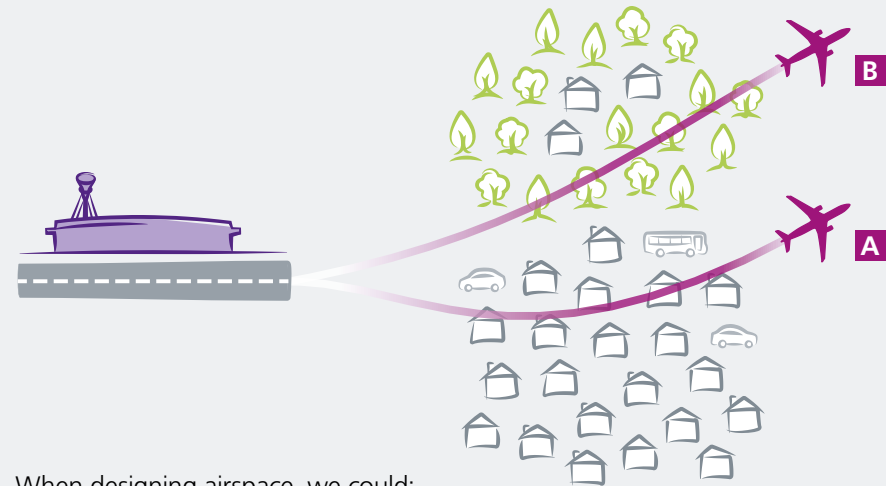
Principle 2: Urban and rural areas

We are seeking views about whether we should prioritise flights over urban or rural areas.

Urban areas are more populated than rural areas so airspace designs that seek to minimise the number of people overflown are likely to position routes over rural areas or less densely populated urban areas.

However, urban areas have higher general noise levels than rural areas and therefore the presence of aircraft noise might be less noticeable than in rural locations. We also recognise that rural locations are often valued for their tranquillity by both residents and visitors, who could include residents of neighbouring densely populated urban areas.

Urban and rural areas



When designing airspace, we could:

A

Prioritise routing aircraft over urban areas, recognising that urban areas have higher general noise levels; or

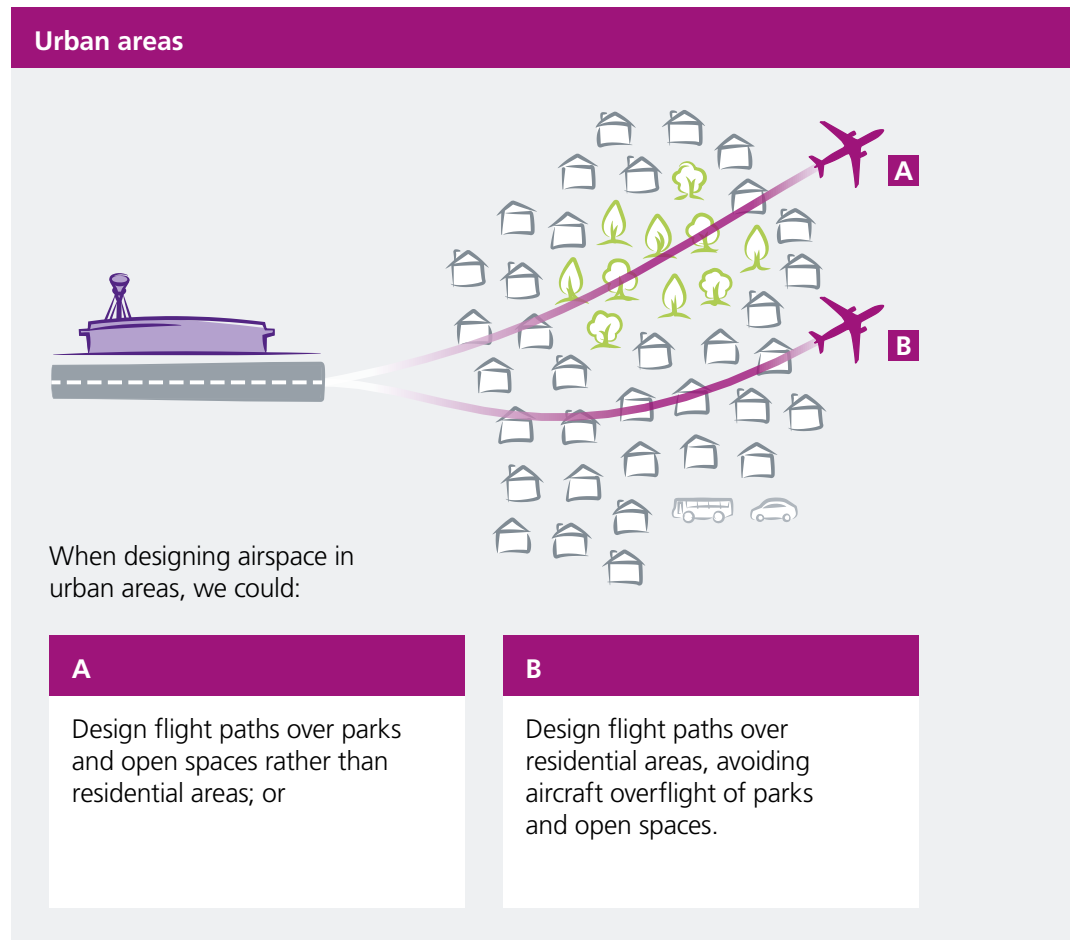
B

Prioritise routing aircraft over rural areas where fewer people live.

Principle 3: Urban areas

Not all urban areas have the same general noise level, and parks and open spaces within urban areas may be especially valued for their tranquillity.

When overflying urban areas, we could seek to avoid overflight of parks and open spaces by positioning routes over residential and commercial areas, or we could seek to reduce the number of people affected by overflight by positioning routes over parks and open spaces where possible.

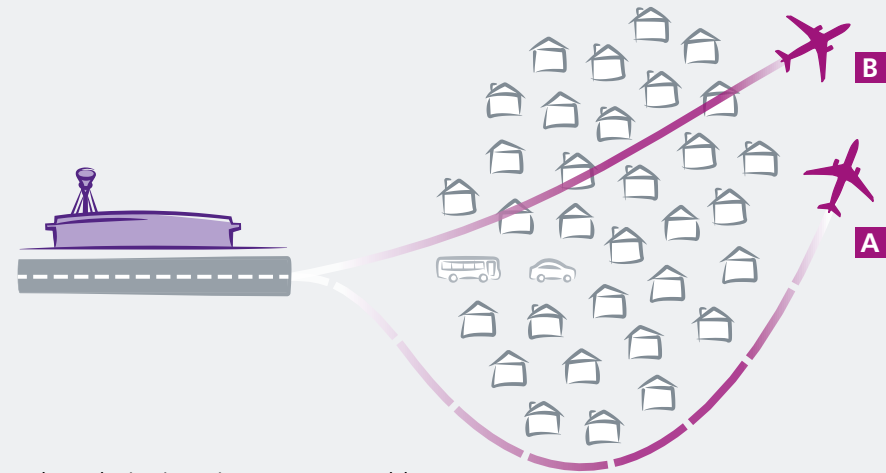


Principle 4: Noise and Emissions

Avoiding overflight of local communities could result in a longer route, with aircraft burning more fuel and producing more emissions⁸.

You can liken this to a road bypass of a town. Roads that go directly through the town centre are sometimes replaced with a bypass (avoiding the need to drive through the town) however this often results in a longer journey around the town. The congestion and negative effects on the town are reduced but the amount of fuel used and the emissions produced may increase.

Noise and Emissions



When designing airspace, we could:

A

Design flight paths that prioritise the reduction of aircraft noise for local communities over those that reduce fuel burn and emissions; or

B

Design flight paths that prioritise a reduction in fuel burn and emissions over those that reduce noise for local communities.

⁸ Note that emissions refer to those impacting climate change, not health

Principle 5: Technology and Innovation

This airspace redesign is a once in a generation opportunity to modernise the way our airspace is used. The airspace we design now needs to be efficient for the foreseeable future.

We are therefore proposing that one of our design principles is to base our airspace on the latest navigation technology, and we are working in partnership with our airlines to ensure they invest in some of the older aircraft at Heathrow to bring them up to these more modern capabilities.

This technology will also be an important factor in how well we can meet the design principles set out previously, because it will give us more flexibility to position routes than is possible with older navigation technologies. We are intending to design routes to a minimum Performance Based Navigation standard, and there may be parts of the design where aircraft with a higher specification of navigation technology have an advantage.

If this design principle is accepted it means that we will not design routes to accommodate aircraft with older navigation technologies.

We don't offer an alternative to this principle, but we do ask for you to comment on aircraft technology and airline investment as part of this consultation.

Principle 6: Night flights

Reducing the noise impacts of Heathrow, particularly at night, is a key focus for us – now and in the future. Heathrow has made good progress over the last few years in reducing the number of late running flights that operate from the airport and, with expansion we have committed to extend the ban on scheduled night flights from five hours today to six and a half hours (sometime between 11pm and 7am) with the exact timings to be decided by the Development Consent Order process.

Heathrow will encourage only the newest and quietest planes to fly in and out of the airport, particularly during the night period. The majority of Heathrow's flights in the future will be between the hours of 7am and 11pm, so the set of design principles we apply to flight paths in the future will mainly apply to flights during the day.

However, for the small number of flights that will operate late at night or early in the morning, we would like you to consider whether we should apply the same principles as we do during the rest of the day, or whether we should seek to apply them differently during these times.

You may like to review the previous questions and consider which of the proposed design principles would be appropriate for flights late at night or early in the morning, or you can propose another principle that hasn't been mentioned.

Airport Expansion Consultation



Within our separate but parallel consultation on the expansion of the airport, we are required to ask for your feedback on particular issues relating to night flights, noise and air quality.

For more information please see our **Airport Expansion Consultation Document** and to have your say on the emerging proposals for the airport please see www.heathrowconsultation.com



Section 5 - Have your say

We are seeking feedback on the key design principles that we have presented in this document. In providing your views it is important to understand that airspace design is a highly technical and complex process, particularly when seeking to introduce new routes into one of the busiest areas of airspace in the world. We might not be able to apply every preferred principle every time, but your feedback to this consultation will help us to understand what matters most to you.

Similarly, the consultation is not a referendum: we will not necessarily choose one design principle based on the largest number of "votes", to the exclusion of other principles. Instead, we will use postcode data to identify where particular principles are important to specific geographic areas and this might mean that the design principles are applied differently to areas closer to the airport than to areas further away.

An airspace design of this size and complexity has not been undertaken anywhere in the world before and this consultation gives you an opportunity to let us know what matters most to you regarding the airport's flight paths.

There are a number of ways you can find out more about our proposals and provide us with your comments.

Come to one of our consultation events

We're holding consultation events at venues throughout the consultation period. Details of these events can be found on our website: www.heathrowconsultation.com. Members of the project team will be on hand to answer your questions and provide advice on how you can respond to the consultation. You can also pick up copies of the project documents.

Visit our website

You can visit our website to find the information on our proposals and fill in our online consultation feedback form: www.heathrowconsultation.com

Registering your details on the website will enable you to submit your feedback to the consultation online.

Visit one of our document inspection locations

You can view copies of all the materials we've produced to inform this consultation at any of our unmanned document inspection locations. For more information please go to our website www.heathrowconsultation.com

Tell us what you think

Your feedback is a very important. The deadline for responding to this consultation is 11.55pm on 28 March 2018. You can provide us with your comments and views in a number of ways:



online via our project website www.heathrowconsultation.com



complete a **feedback form**, available on request or at our consultation events



write to us at:
Freepost LHR AIRSPACE CONSULTATION



send an **email** to us at
airspace.feedback@heathrowconsultation.com

All feedback received through these channels will be considered. While all the feedback we receive will be recorded, we will be unable to respond to you individually.

Get in touch

If you would like any help to provide your feedback, information about our proposals and how to take part, or to request copies of documents you can:



call our freephone number:

0800 307 7996

(open Monday to Friday, 9am-6pm)



send an **email** to us at

info@heathrowconsultation.com

Next Steps

After the consultation has closed, we will develop airspace design principles, based on your feedback, and we will produce a report of the consultation findings.

We will use these design principles to develop design envelopes and will carry out a further public consultation on these, expected to be in 2019.





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If you would like a large text or alternative format of this document, please contact us on 0800 307 7996 or send an email to us at: info@heathrowconsultation.com

There are lots of ways you can contact us or find out more



online via our project website
www.heathrowconsultation.com



send an **email** to us at
info@heathrowconsultation.com



call our freephone number
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