



AIRSPACE &
FUTURE OPERATIONS
CONSULTATION

Departures

Time	Destination	Airline	Status
12:20	Manchester	DU429	Flight closing
12:25	Dublin	EI150	Flight closing
12:30	Frankfurt	LH895	Flight closing
12:30	Munich	LH909	Go to Gate
12:35	Newark	UA16	Flight closing
12:40	Düsseldorf	LH333	Go to Gate
13:00	Ottawa	SK317	Boarding
13:05	Singapore	3Q305	Boarding
13:20	Munich	LH475	Gate opens
13:30	Montreal	AC885	Gate opens
13:30	Lisbon	TP358	Gate opens
13:30	San Francisco	UA801	Gate opens
13:38	Houston	UA871	Go to Gate
13:45	Frankfurt	LH907	Gate opens
13:45	Zurich	LX338	Gate opens
13:50	Stockholm	SK532	Gate opens
13:55	Birmingham	4U2461	Gate opens
14:45	Hamburg	LH3393	Gate
15:00	Toronto	TP8272	Gate
15:10	Belfast City	BA5035	Gate
15:10	Frankfurt	LH909	Gate
15:10	Edinburgh	DL4435	Gate
15:20	Shannon	BA5943	Gate
15:25	Munich	LH377	Gate
15:25	Chicago	LH9356	Gate
15:25	Aberdeen	DL4425	Gate
15:35	Auckland	NZ901	Gate
via Los Angeles			
15:35	Oslo	SK606	Gate
15:50	Cologne	4U485	Gate
16:10	Newark	UA941	Gate
16:10	Istanbul	TK1986	Gate
16:20	Dublin	EI189	Gate
16:20	Washington	LH2266	Gate
16:25	Edinburgh	DL4437	Gate



AIRSPACE AND
FUTURE OPERATIONS
CONSULTATION
DOCUMENT

JANUARY 2019



Heathrow



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Guide to the consultation document

We recommend that you read and consider all the parts of the consultation document, however we know that some people might be more interested in some aspects of it than others. Below is a summary of each of the sections to help you navigate this document so you can go straight to those that are most relevant to you:

Section	What it's about	How it could affect you
2	Managing noise at an expanded Heathrow	We appreciate that local communities are concerned about the proposed expansion of Heathrow and its potential noise effects. This section will be of interest to anyone who would like to know more about how we propose to manage noise at an expanded Heathrow.
3.1	Respite – through runway and airspace alternation	We know that local communities value the breaks or reductions in noise from planes that they get when we alternate the use of our two runways today. Our proposed approach to runway alternation will be of interest to local communities who live closer to the airport and our proposed approach to airspace alternation will be of interest to communities further away from the airport – who might not currently benefit from breaks.
3.2	Directional preference	We are exploring options to offer communities relief from planes when we have been operating in the same direction for a long time or when communities have been experiencing planes from both Heathrow and other airports. This section describes our proposals for a new approach to balancing operations between the east and west of the airport.
3.3	Night flights	We are proposing to introduce a scheduled night flight ban at an expanded Heathrow. This section describes how we plan to manage noise over the sensitive night period.
4	Airspace change	This section of the consultation is about Heathrow's airspace and the areas where flight paths could be positioned in the future. This section will be of interest to most consultees.
5	Making better use of our existing runways	Heathrow needs to make changes to the way aircraft arrive at the airport before expansion and the construction of a new runway. This section describes the changes we need to make and the areas where flight paths could be positioned.
6	Have your say	This section of the consultation document tells you how to give us your feedback.
7	Next steps	This section of the consultation document tells you what we will do with your feedback and sets out future opportunities for you to provide feedback on our emerging plans.

Our consultation website:

You can also find all the consultation materials on our website along with a **postcode checker** so that you can quickly find out how you might be affected by the changes that we need to make to Heathrow's airspace.

There are also videos to explain each of the topics and an online feedback form for you to give us your comments on our proposals.

Please go to www.heathrowconsultation.com to find out more.

Foreword



John Holland-Kaye
Chief Executive
Heathrow

Since our airport began operations over 70 years ago, Heathrow has played a unique role in the development of the surrounding area, and we are proud of the partnerships we share with local communities. Today, we are committed to working closely with our neighbours to develop plans for the airport's future, and ensure that we deliver a fairer Heathrow for the next generation.

Last summer, Parliament voted to approve the Airports National Policy Statement for Heathrow expansion by an overwhelming majority, giving us a confident platform to continue through the planning process.

Since our planning consultation in early 2018, we have been using your feedback to develop our plans for our future airspace and expanded airport.

Now, we want to share our latest thinking and hear your views on a number of proposals to make Heathrow fit for the future.

What is this consultation about?

A key part of planning our future airport is redesigning the airspace around Heathrow, and looking at how a three-runway airport could operate in the future.

The UK's airspace was designed in the 1950s. Demand for air travel has grown strongly since then, and the Government expects this to continue. To keep up with this demand, nationwide airspace modernisation is being taken forward by Government.

As the UK's only hub airport, Heathrow has a key part to play. We are promoting plans to modernise our airspace at the same time as we design our expanded airport. In this consultation, we want local communities to tell us what we should take into account when designing new flight paths – both for expansion, and to make better use of our existing runways.

Operating a three runway airport will be different to how we operate a two runway airport today, and provides greater flexibility so we have opportunities to minimise impacts for local communities. Therefore, we are also asking your views on how an expanded airport could operate.

Our commitments to you

Over the last few decades, Heathrow has made great strides in reducing our noise footprint – Heathrow is quieter now than it was in the 1970s, even with double the number of aircraft. But from our conversations with local communities, we know that noise remains a key issue which we need to focus on.

Modernising the airspace around Heathrow while at the same time developing our plans for expansion, gives us the best opportunity to minimise the impacts of noise for communities. As well as making

our airspace more efficient, we will deliver on key commitments we have made for expansion, including guaranteeing predictable periods of respite and introducing a scheduled night flight ban.

A local legacy for the future

Expansion is not just about minimising impacts, but about maximising opportunities; the project will create thousands of new jobs and double the number of apprenticeships by 2030, giving local young people a launchpad as they set out on their careers. Expansion will connect the whole of the UK to global growth by opening up new trading routes, so that businesses of all sizes can connect to markets across the world.

Collaboration is key to making the most of these opportunities, to delivering the project in a way which is fair to local communities, and to helping us create a local legacy for the next generation.

This consultation is another chance for you to have your say and help shape our plans for our future airport and operations. I urge everyone to get involved, learn about our proposals, and let us know what you think.

We are truly grateful for your time, and I thank you in advance for your feedback.

Section 1 – Introduction

Heathrow is one of the world's busiest airports, serving over 200,000 passengers a day, flying to over 200 destinations and home to more than 80 airlines. As the UK's only hub airport it plays a vital economic role for both the UK and the local community. The airport provides jobs for almost one in four local households and is responsible for over 30% of the UK's non-EU exports.

On 25 June 2018, Parliament formally backed Heathrow expansion, with MPs voting in support of the Government's Airports National Policy Statement (Airports NPS).

The Airports NPS sets out Government policy for the expansion of Heathrow and the construction of a new north-west runway. This will increase the number of runways at Heathrow from two to three.

It also sets out the tests that Heathrow must meet, for example on air quality and noise, in order to get permission to expand.


Heathrow is undertaking several stages of consultation on both the physical and operational changes needed to build and operate the expanded airport and on the new flight paths that are needed. This is so that the views of local communities, local authorities, airlines, and all other interested parties can be considered throughout the design and development process.

Last year we consulted on the expansion of Heathrow and options for the physical infrastructure changes that will be required, as well as on the key design principles we could use as the basis for developing Heathrow's future airspace.

This consultation will help us to develop our proposals for the operation of three runways at an expanded Heathrow. It will also help us design our future airspace for expansion, by understanding what we should consider in different geographic areas when designing future paths.

It provides an opportunity for you to share your views on two key topics related to expansion:

1. **Future operations**
(how we will use the runways); and,
2. **Airspace change for expansion**
(the routes aircraft will fly).

The changes to our flight paths follow a separate approvals process to the expansion of the airport on the ground. 

To get permission for the expansion of Heathrow (including how we operate our runways in the future), we must apply for a Development Consent Order (DCO), which will be examined by the Planning Inspectorate.

To get permission for changes to flight paths, we need to submit an Airspace Change Proposal to the Civil Aviation Authority (CAA).

Both processes will be overseen by the Secretary of State for Transport.

More information on the approvals processes is available in the information paper [How do we seek approval to expand Heathrow?](#)



Making better use of our existing runways

Alongside our consultation on airspace changes for an expanded Heathrow, we are also consulting on proposals to make better use of our two existing runways.

This involves a change to the way some aircraft arrive at the airport, known as Independent Parallel Approaches (or "IPA"). This change would be introduced in our current two-runway airport and would improve punctuality, reduce flight cancellations and would mean that the airport would be able to recover more quickly from delays. The proposed changes would also help to reduce the number of late running flights into the night which are disruptive to local communities. **We would like to introduce IPA even if we do not get approval to build a third runway.**

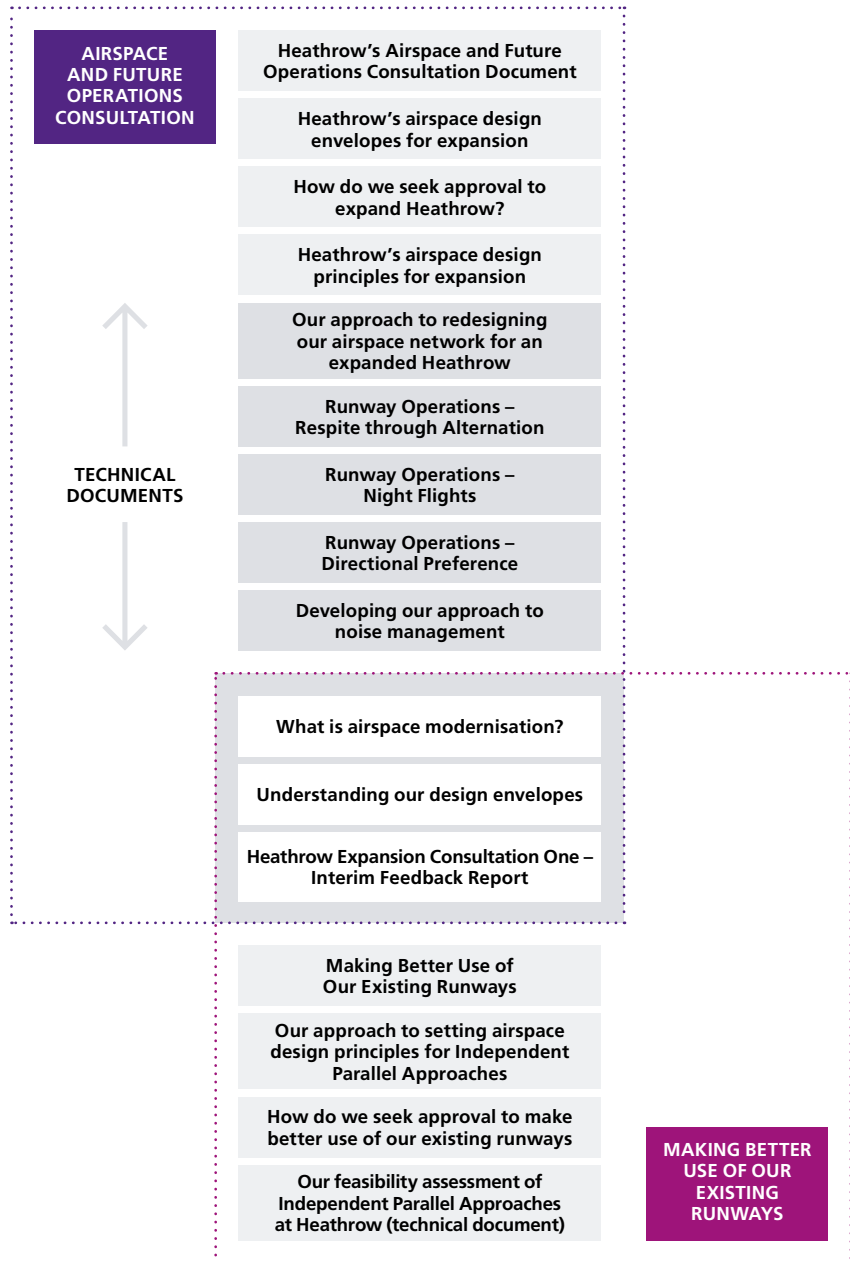
A separate document explains the IPA proposals and presents information on the geographical areas within which we would position the new arrivals flight paths. Some of these new flight paths may over-fly areas that are not currently overflowed by aircraft landing at or departing from Heathrow.

You can find out about all of our proposals at www.heathrowconsultation.com where we have produced a set of documents to help you to understand and feedback on our proposals.

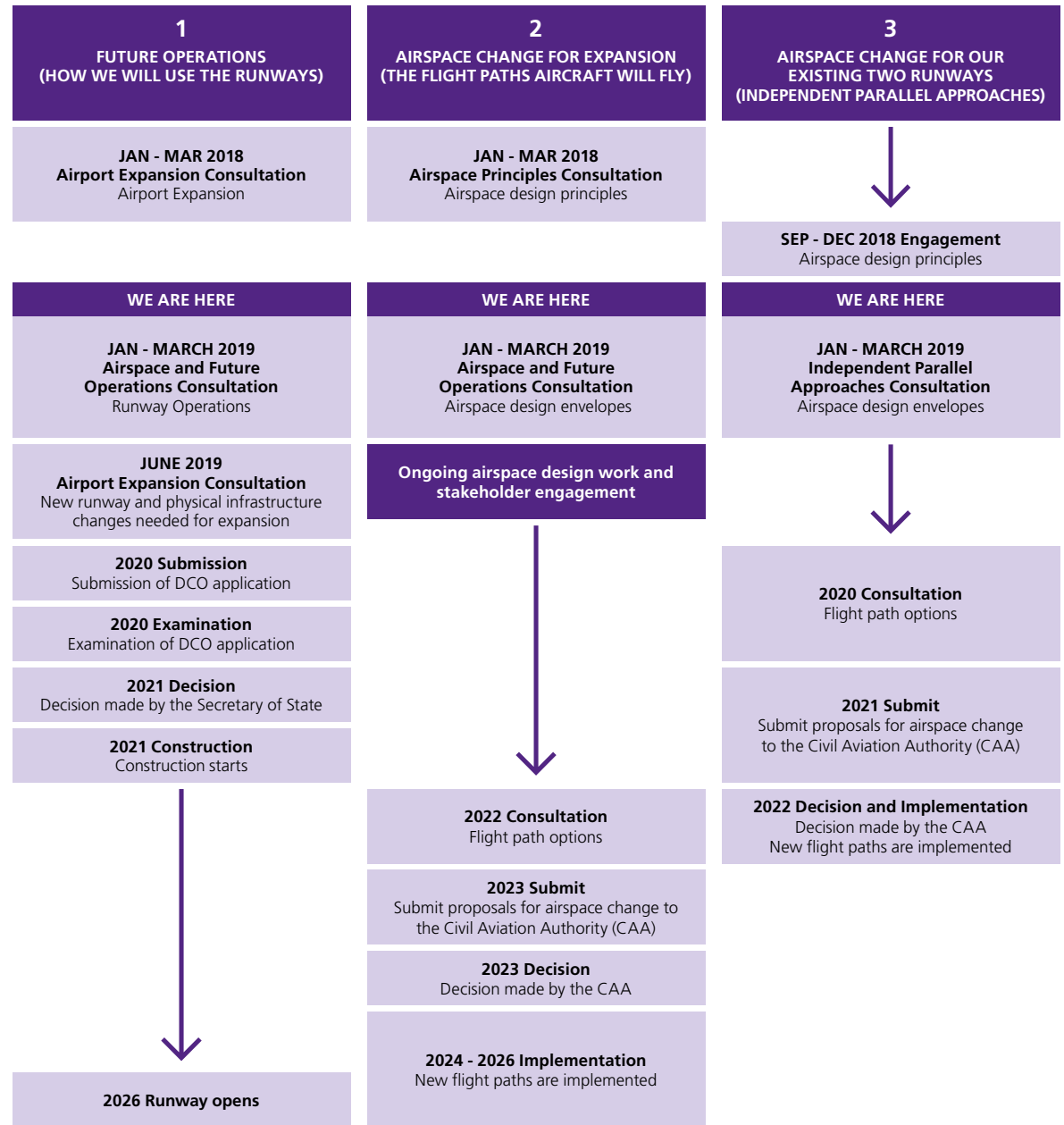
Information on proposed new arrivals flight paths can be found in **Making better use of our existing runways**.



Consultation documents



Indicative timeline





Section 2 – Managing noise at an expanded Heathrow

Heathrow has long been at the forefront of international efforts to tackle aircraft noise. Since the early 1970s Heathrow's noise footprint has reduced even though the number of flights has increased.

We have an existing long-term noise strategy set out in our Noise Action Plan which includes:

- incentives for airlines to use the most modern and quietest aircraft;
- a sound insulation scheme for the most affected houses and schools;
- continuous improvement of noise management with our airline partners – such as the reduction in the number of late running flights;
- continuous monitoring, reporting and management of noise to identify where improvements can be made; and
- regular engagement with community groups and industry stakeholders to tackle noise.

The noise contour map shows the size of the 57dB (LAeq) noise contour in 1974 compared to 2013¹.

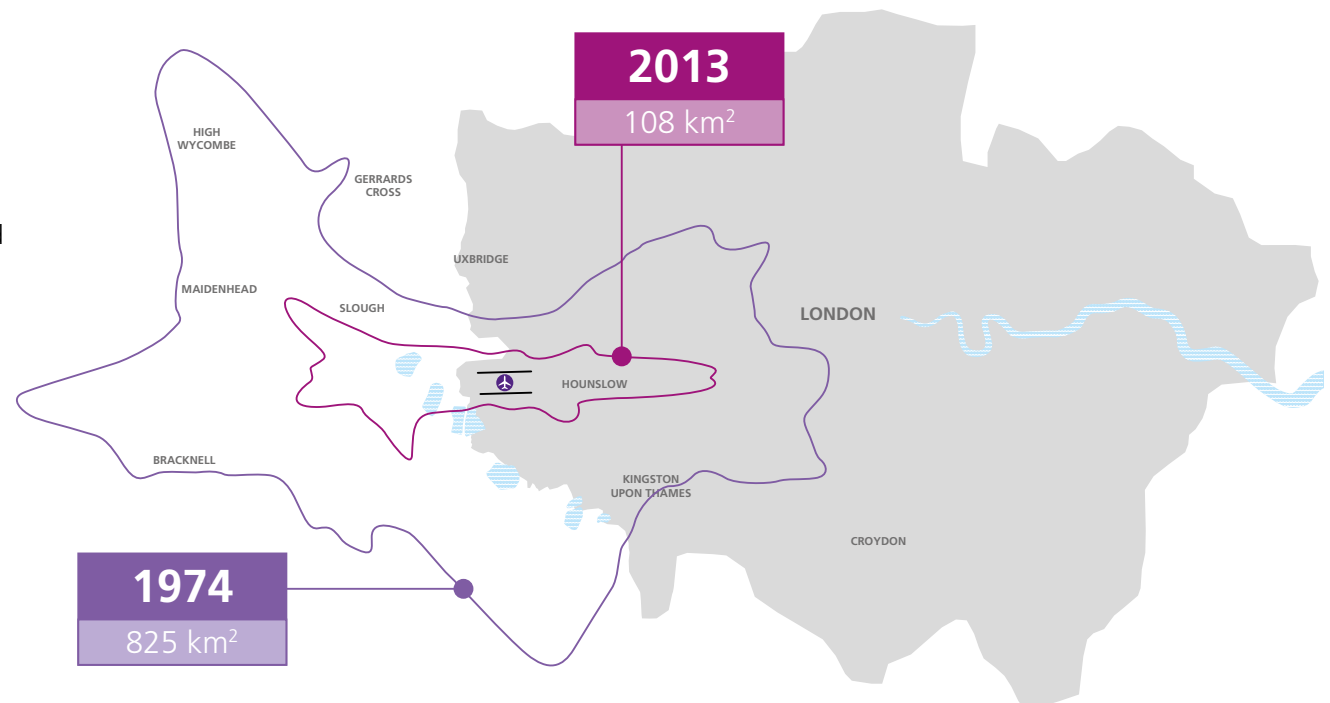
■ 2013 57 dBA contour

Leq equivalent sound level of aircraft noise in dB(A) over 16 hours (often called equivalent continuous sound level)

■ 1974 35NNI contour

Until 1990, the official index of aircraft noise exposure in the UK was the Noise and Number Index (NNI)

■ London Boundary



¹ 2013 is the baseline year used in the Airports NPS.

Developing a strategy for noise management

We appreciate that local communities are concerned about the proposed expansion of Heathrow and its potential noise effects. Whilst noise has reduced over recent decades, we know we need to continue to make it a priority.

Where we can, we want to take the opportunities presented by expansion to share the benefits of improving aircraft technology to reduce the impacts on local communities, while enabling airlines to grow.

Moving forward we are determined to put in place measures which deliver our strategy and are consistent with the Airports NPS, which provides the foundation for the future planning permission for the expansion of Heathrow. Parliament gave its approval for the Airports NPS on 25 June 2018.

The Airports NPS instructs Heathrow to come up with measures to control the environmental effects of expansion such as the potential impact on noise, air quality and traffic.

In relation to noise, the Airports NPS requires our expansion plans to avoid adverse (negative) effects on health and quality of life and to minimise the negative effects from aircraft operating at Heathrow. Some of the other requirements for noise management are explored in this booklet.

Proposals for a noise objective

The Government has to make sure that 'noise objectives' are set for certain airports where noise might be a problem.

We have been engaging with the Government on the development of proposals for a noise objective for Heathrow. Although it is for the Government to set the noise objective, we are consulting on a proposal for the Government to consider.

We are proposing a noise objective that reflects the Airports NPS but also takes account of national and international noise policy. Once set, it will guide the decisions that need to be made for Heathrow's future operations, such as those that are set out in this consultation.

Our draft proposal for a noise objective

To limit and, where possible, reduce the effects of noise on health and quality of life and deliver regular breaks from scheduled flights for our communities during the day and night. We need to do this whilst making sure the measures we put in place are proportionate and cost effective.

“limit and, where possible, reduce the effects of noise on health and quality of life”

For an expanded Heathrow, this means that we will meet our previous committed goal to ensure that the overall noise impact will be limited to not exceed 2013 levels of impact, which is the baseline set by the Airports NPS.

This part of the objective also means that as aircraft and navigational technology improves, we will seek to reduce these effects.

After expansion, we will update our targets over time through the noise envelope process to ensure the objective remains relevant. The noise envelope is explained later in this booklet.

“deliver regular breaks from scheduled flights for our communities”

This means providing predictable and regular scheduled breaks or reductions in aircraft noise.

“during the day and night”

This provides the assurance that we are also considering the effects of night flights and are seeking to manage the impacts from 11pm until 7am.

“whilst making sure the measures we put in place are proportionate and cost effective”

This means that every measure to manage noise is checked before it is put in place to make sure it achieves a balance. It must reduce the effects of noise, but must also be cost effective and take the local and national economic benefits of Heathrow’s operations into account. The need to ensure that measures are cost effective is a requirement of something known as the 'Balanced Approach' – this is explained on page 11.

Monitoring progress against the proposed noise objective

We have to carry out an 'environmental impact assessment' to identify all the potential effects of Heathrow expansion. The methods that we will use to measure and monitor noise at an expanded Heathrow will come from this detailed assessment.

These methods will be based on scientific research and are called "evidence based" measurements. We propose that they will be used to measure, monitor and track progress against the noise objective.

We also think progress should be measured using key measures and statistics that our stakeholders and communities find important, such as the numbers of late running aircraft at night and how well we keep to the published runway alternation pattern.

We will review our proposal for a noise objective using your feedback to this consultation. We will then submit it to the Secretary of State for consideration.

Once the objective has been set, it will be used to inform future decisions on operational noise management measures at Heathrow.

Question 1



- Do you support our proposals for a noise objective?
- Please provide any comments you have on our proposals for a noise objective.

Managing noise at an expanded Heathrow – next steps

Noise Envelope

We need a framework of limits and controls to manage noise in the future. This framework is known as a noise envelope and will include:

- the noise management controls;
- the rules we will put in place to use them;
- the ways we will measure their effectiveness; and
- how we will review them as Heathrow grows.

Our proposals for a noise envelope will be published as part of the next consultation later this year for you to provide your thoughts and feedback.

We are forming a Noise Envelope Design Group (NEDG) to guide and steer the creation of the noise envelope. Following your feedback to our consultation in 2018 the group will be made up of a small number of technical experts representing the interests of communities, passengers, local authorities and airlines.

We also plan to use focus groups and stakeholder engagement activities to help capture a range of views from different communities and stakeholder groups. This will involve engagement with the newly formed Independent Commission on Civil Aviation Noise (ICCAN).

The noise envelope proposals we put forward for our next consultation will reflect the feedback received from this current consultation and the engagement described above.

Please note: Later in this document you will read about the '**design envelopes**' that we have produced for the changes that are required to Heathrow's airspace.

The design envelopes are geographic areas where future flight paths could be positioned and are completely separate to the **noise envelope** that is being described here.

The Balanced Approach

We have to select noise management controls in accordance with the "Balanced Approach to Aircraft Noise Management", an international policy produced by ICAO (International Civil Aviation Organisation).

The goal of the Balanced Approach is to identify the noise-related measures that achieve maximum environmental benefit most cost-effectively, using objective and measurable criteria. The need to apply the Balanced Approach is a legal and policy requirement.

A key principle of the Balanced Approach is that non-restrictive measures (such as incentivising the use of quieter aircraft and requiring aircraft to use quieter operating measures) should be applied first, before any restrictive measures such as bans or quotas are used.

Our noise envelope will include a proposed package of measures that we will present at our next public consultation. Between this consultation and the next, we will engage with key stakeholder groups to help test and refine our options for noise management and assess them against the Balanced Approach.

We also intend to supplement this engagement with other activities such as focus groups and dialogue in our established engagement forums.

More information on the Balanced Approach can be found in the information paper **Developing our approach to noise management**.

Monitoring progress in the future

The noise envelope, including the package of measures, is designed to adapt to change, so it will need to be regularly monitored. The effectiveness of the package of measures will be revisited and tested over time.

Our proposals for the package of noise measures will be presented at our next consultation as part of the noise envelope and will then be legally secured through our DCO.

More information on the next steps for noise management at an expanded Heathrow can be found in the information paper **Developing our approach to noise management**.



More information on the DCO application process can be found in the information paper **How do we seek approval to expand Heathrow?**

Question 1 (cont.)



- Please provide any other comments or suggestions you have on our proposed approach to developing a package of noise measures for an expanded Heathrow.



Managing Heathrow's growth within environmental limits

We have always been clear that expansion is not a choice between the economy and environment – it must deliver for both. The expansion of Heathrow must be delivered within environmental limits, particularly around noise, air quality, carbon, and traffic.

We have already made a commitment to sustainable growth for the benefit of local communities in our strategy 'Heathrow 2.0'. To get permission to expand Heathrow we propose to formalise the commitments we have already made.

This consultation is focussed on runway operations, airspace and noise but we have also given thought to how the principle of a noise envelope (see previous section) could be extended to manage other effects of expansion.

We propose to put **legally binding obligations** in place to ensure the growth of the airport is only allowed to take place within the boundaries of the environmental criteria set out in the Airports NPS:

Aircraft Noise – the overall impact of aircraft noise must be limited and, where possible, lower than 2013 noise levels.

Air Quality – expansion must not affect the UK's ability to comply with its legal air quality obligations.

Carbon – expansion must not have a material impact on the ability of the UK to meet its carbon reduction targets.

Surface Access –

- Ensure that by 2030 half of all passengers travelling to the airport will do so by public and sustainable forms of transport such as rail or coach, rather than by car.
- Reduce all staff car trips by 25% by 2030, and 50% by 2040; this is everyone working at the airport rather than those just employed directly by Heathrow.
- Heathrow must 'strive to meet' its pledge to ensure that airport related traffic is no greater than today – although this is not expressed in the Airports NPS as an absolute limit.

The work undertaken for the Government and the Airports Commission in the run up to the designation of the Airports NPS concluded that an expanded Heathrow could operate within these criteria – and our own work has reached the same finding.

To remove any doubt and uncertainty and to minimise the impacts of our growth on local communities, we are proposing legally binding obligations to ensure that growth of the airport's operations can only take place if it respects each of these environmental limits.

Heathrow will only operate and grow within agreed environmental limits. In order to grow, Heathrow would be incentivised to drive innovation and environmental best practice.

We will set out detailed proposals for how future growth will be managed as part of our Airport Expansion consultation later this year. We will be seeking feedback on these proposals and we want local communities to have their say on our plans.

Section 3 – Future operations for an expanded Heathrow

What are 'future operations'?

At Heathrow we use specific runway operating procedures to manage noise and provide regular breaks from planes flying overhead for our communities.



We need to revise these procedures so that they can work at an expanded Heathrow and to meet the requirements of the Airports NPS. In this section we will focus on three operational procedures designed to manage noise:

- Providing breaks by alternating (switching) how we use our runways and airspace;
- Directional preference (the direction that planes take off and land); and
- Night flights.

We have set out how these procedures currently operate and how we propose to change or modify them for an expanded Heathrow.

We want to know what you think about our proposals.

Section 3.1 – Respite through alternation

With expansion we will be able to provide respite to communities affected by aircraft noise in two ways:

- **By alternating our runways**, we will provide respite for those living closer to the airport; and
- **By alternating our airspace**, we will provide respite for those living further away.

Airspace alternation is not currently possible but with expansion we can provide respite for communities further away from the airport that do not receive any respite today.

Our recommendation is that you read about both runway and airspace alternation because you may be affected by either type.

What is runway alternation?

We know that noise from planes can be disruptive to communities around Heathrow. During the day, when planes are landing and taking off to the west (westerly operations), we alternate the use of our two runways to provide local communities with respite.

Communities around Heathrow place great importance on the alternation system and we make every effort to stick to it. The alternation pattern means that for part of the day we use one runway for landings and the other for take-offs then, halfway through our day at 3pm, we switch over.

This gives some communities approximately 8 hours of respite a day.

At the end of each week we switch completely. What we did in the evening during the previous week, we now do in the morning and vice versa. This is so that communities get respite from planes in the morning one week and in the evening the next.

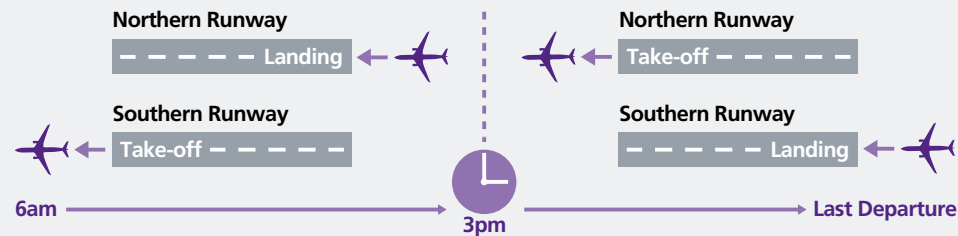
When planes take off and land towards the east (easterly operations) we do not alternate the runways because the taxiways are not in place for us to do so effectively during daytime operations.

With an expanded Heathrow we intend to introduce runway alternation on both easterly and westerly modes of operation, giving respite to communities to the east and west of the airport.

For more information on the introduction of runway alternation on easterly operations, please see www.heathrow.com/cranford



When on westerly operations we operate a runway alternation programme that runs in a two week cycle. This gives residents living under both runway flight paths respite from aircraft noise for half the day.



Runway alternation

Relief and Respite

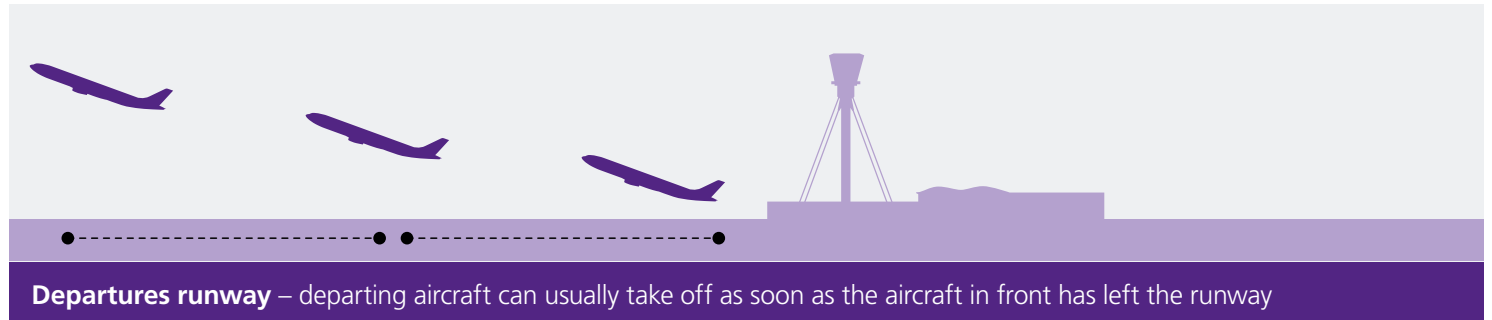
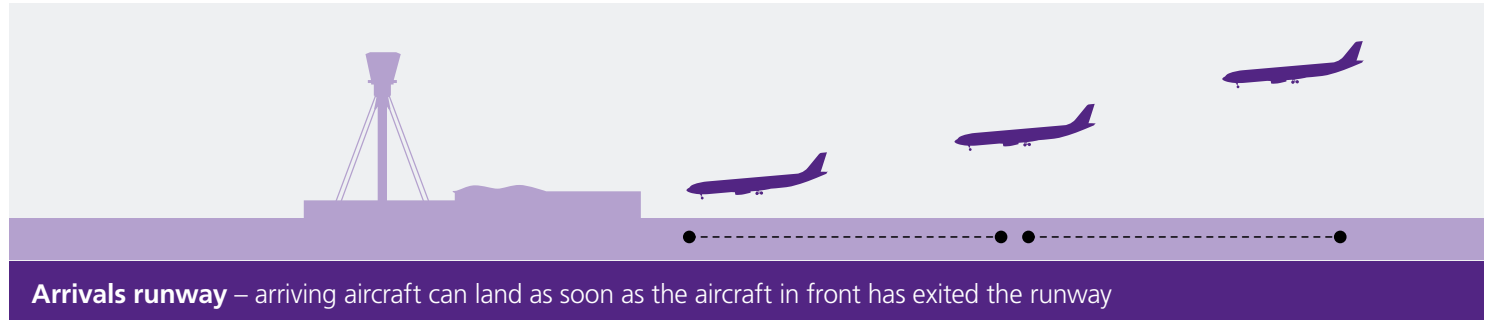
Relief = a break from or a reduction in aircraft noise

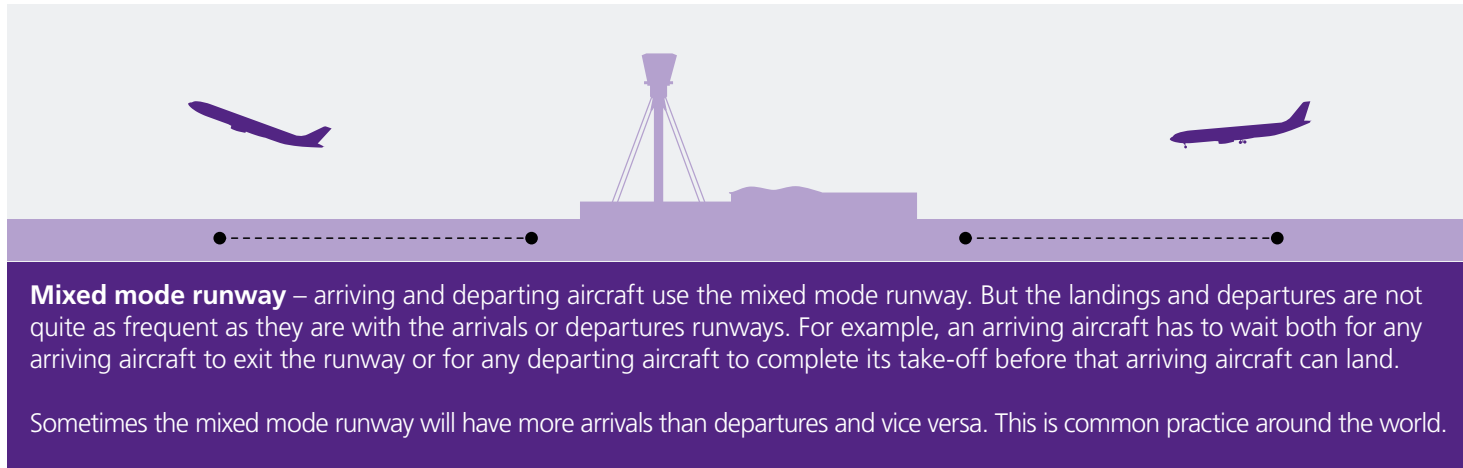
Respite = predictable relief from aircraft noise for a period of time



Runway alternation for an expanded Heathrow

Currently at Heathrow we mostly use one runway for departures and one runway for arrivals. With three runways we will be changing this so that one runway is used for arrivals, one runway is use for departures and the remaining runway is 'mixed mode' which means it will be used for both departures and arrivals.





Operating all three runways in mixed mode would deliver the most capacity for an expanded Heathrow but as you will see with the runway operating patterns, this would not provide respite to local communities so it has been ruled out. We will always have to have one runway operating in mixed mode to ensure a balance of arrivals and departures at the airport. The middle runway at an expanded Heathrow will never be in mixed mode for safety reasons so it will always be an arrivals or departures runway.

This means that there are four runway operating patterns to achieve the benefits of alternation for all affected communities. The diagrams on the following pages show how the four patterns could work.

Each pattern provides respite for two areas at once and the introduction of mixed mode means that some areas will also experience less intense periods of aircraft flying overhead.

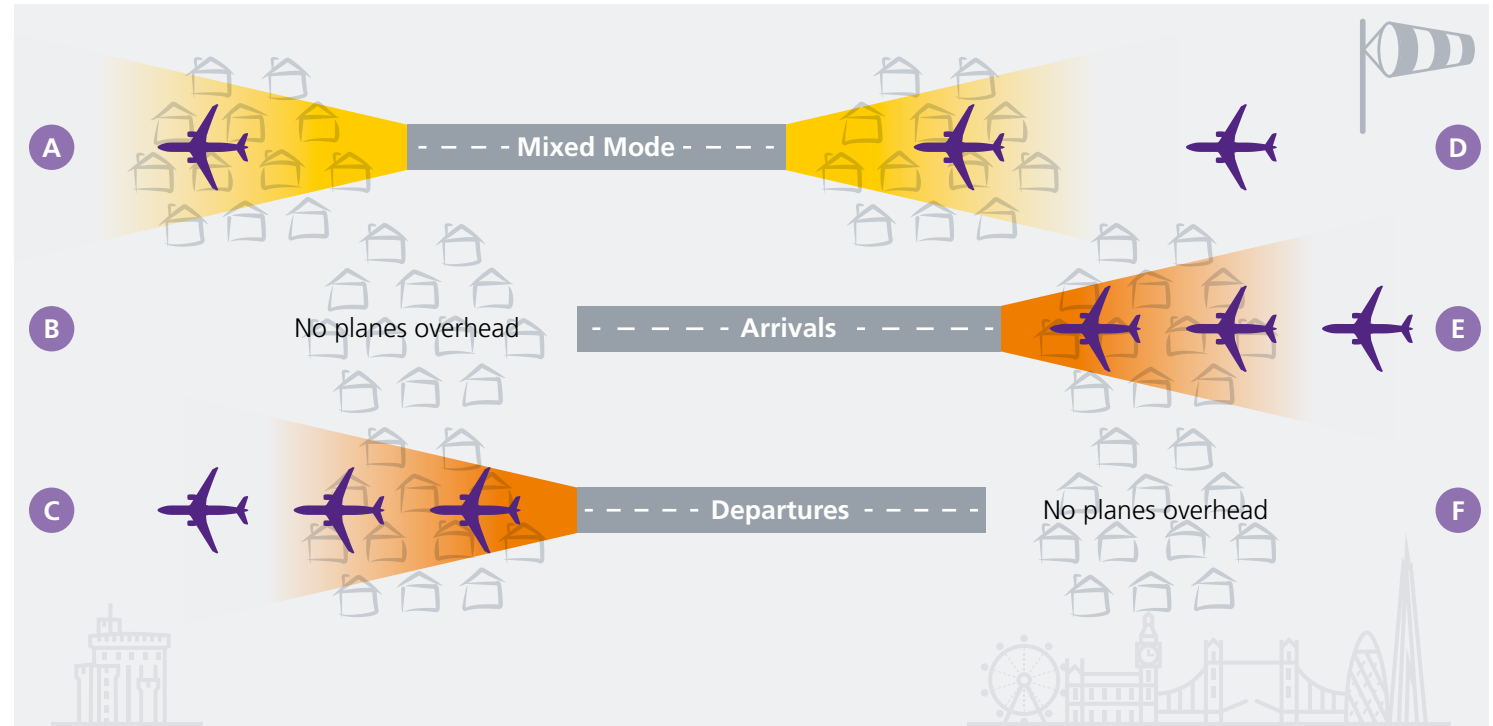
We plan to cycle through these runway operating patterns so that every community gets a share of respite.

Runway operating pattern 1

The diagram only shows westerly operations (aircraft arriving and departing towards the west). If the wind changes and Heathrow switches to easterly operations (aircraft arriving and departing towards the east) the operating direction will be reversed.

Please check the easterly operations column in the table below to see how communities could experience this operating direction on easterly operations.

Where an area is indicated as 'No planes overhead', it may be the case there will still be an awareness of aircraft landing/departing from the adjacent runways.



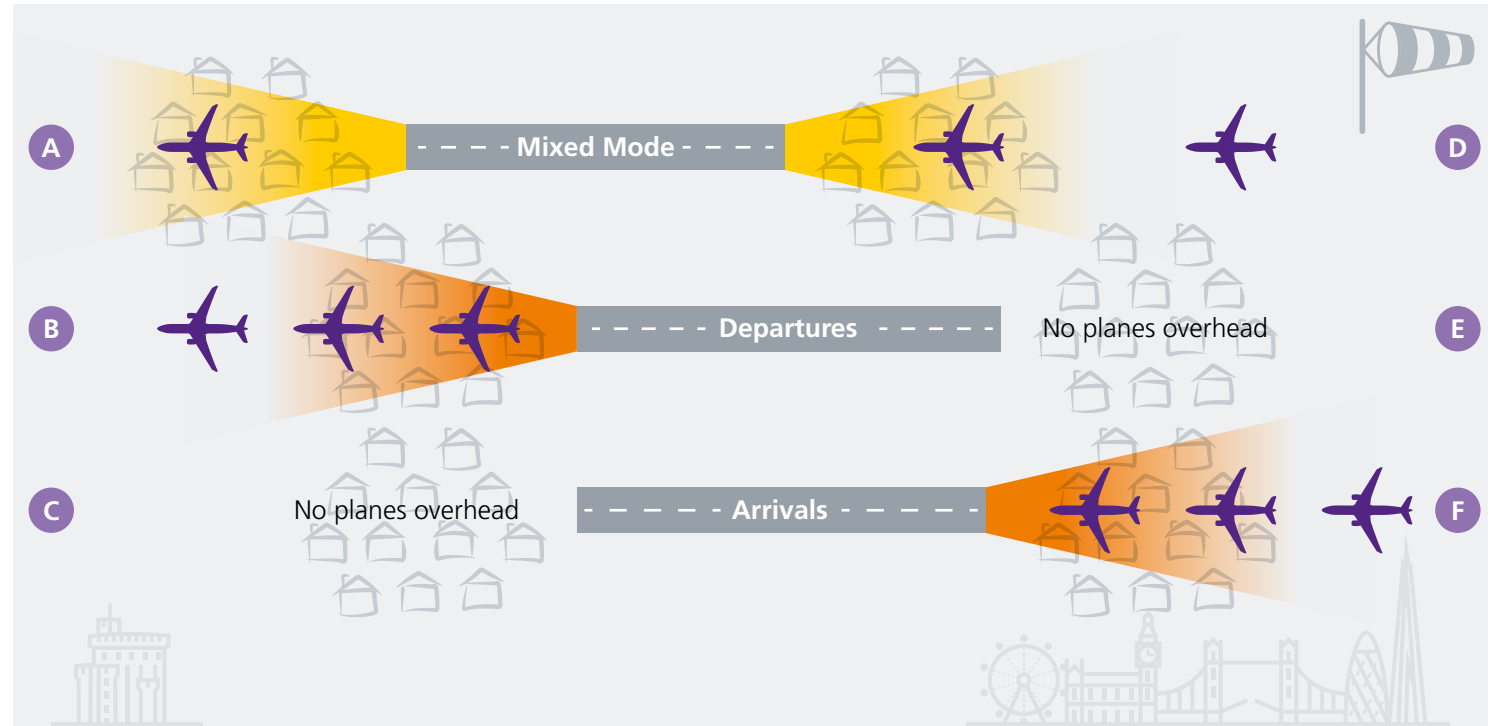
Runway operating pattern 1	Westerly operations	Easterly operations
Northern runway	Area A would experience departing aircraft but typically less frequently as they are spaced further apart. Area D would experience arriving aircraft but typically less frequently as they are spaced further apart.	Area A would experience arriving aircraft but typically less frequently as they are spaced further apart. Area D would experience departing aircraft but typically less frequently as they are spaced further apart.
Middle runway	Area B would have no planes overhead (respite). Area E would experience the stream of arriving aircraft.	Area B would experience the stream of arriving aircraft. Area E would have no planes overhead (respite).
Southern runway	Area C would experience the stream of departing aircraft. Area F would have no planes overhead (respite).	Area C would have no planes overhead (respite). Area F would experience the stream of departing aircraft.

Runway operating pattern 2

The diagram only shows westerly operations (aircraft arriving and departing towards the west). If the wind changes and Heathrow switches to easterly operations (aircraft arriving and departing towards the east) the operating direction will be reversed.

Please check the easterly operations column in the table below to see how communities could experience this operating direction on easterly operations.

Where an area is indicated as 'No planes overhead', it may be the case there will still be an awareness of aircraft landing/departing from the adjacent runways.



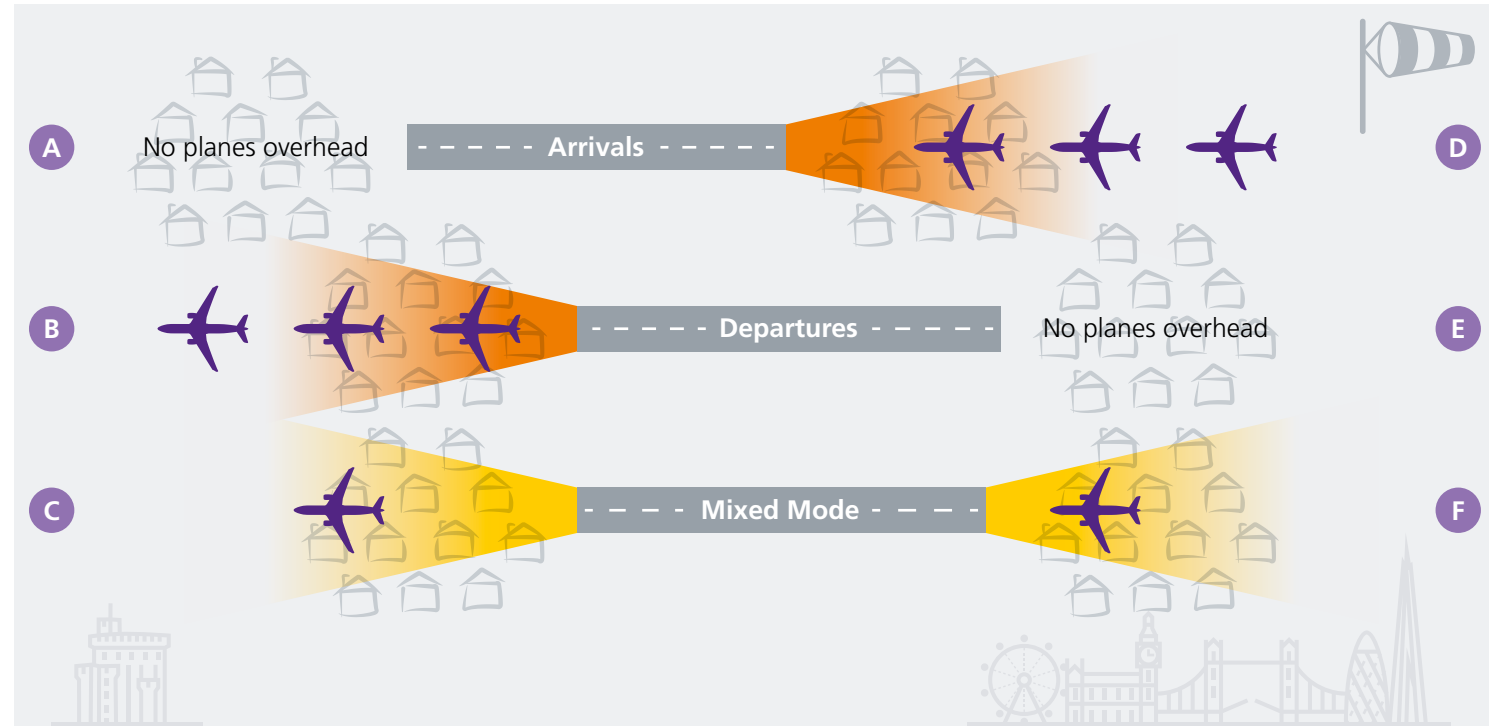
Runway operating pattern 2	Westerly operations	Easterly operations
Northern runway	Area A would experience departing aircraft but typically less frequently as they are spaced further apart. Area D would experience arriving aircraft but typically less frequently as they are spaced further apart.	Area A would experience arriving aircraft but typically less frequently as they are spaced further apart. Area D would experience departing aircraft but typically less frequently as they are spaced further apart.
Middle runway	Area B would experience the stream of departing aircraft. Area E would have no planes overhead (respite).	Area B would have no planes overhead (respite). Area E would experience the stream of departing aircraft.
Southern runway	Area C would have no planes overhead (respite). Area F would experience the stream of arriving aircraft.	Area C would experience the stream of arriving aircraft. Area F would have no planes overhead (respite).

Runway operating pattern 3

The diagram only shows westerly operations (aircraft arriving and departing towards the west). If the wind changes and Heathrow switches to easterly operations (aircraft arriving and departing towards the east) the operating direction will be reversed.

Please check the easterly operations column in the table below to see how communities could experience this operating direction on easterly operations.

Where an area is indicated as 'No planes overhead', it may be the case there will still be an awareness of aircraft landing/departing from the adjacent runways.



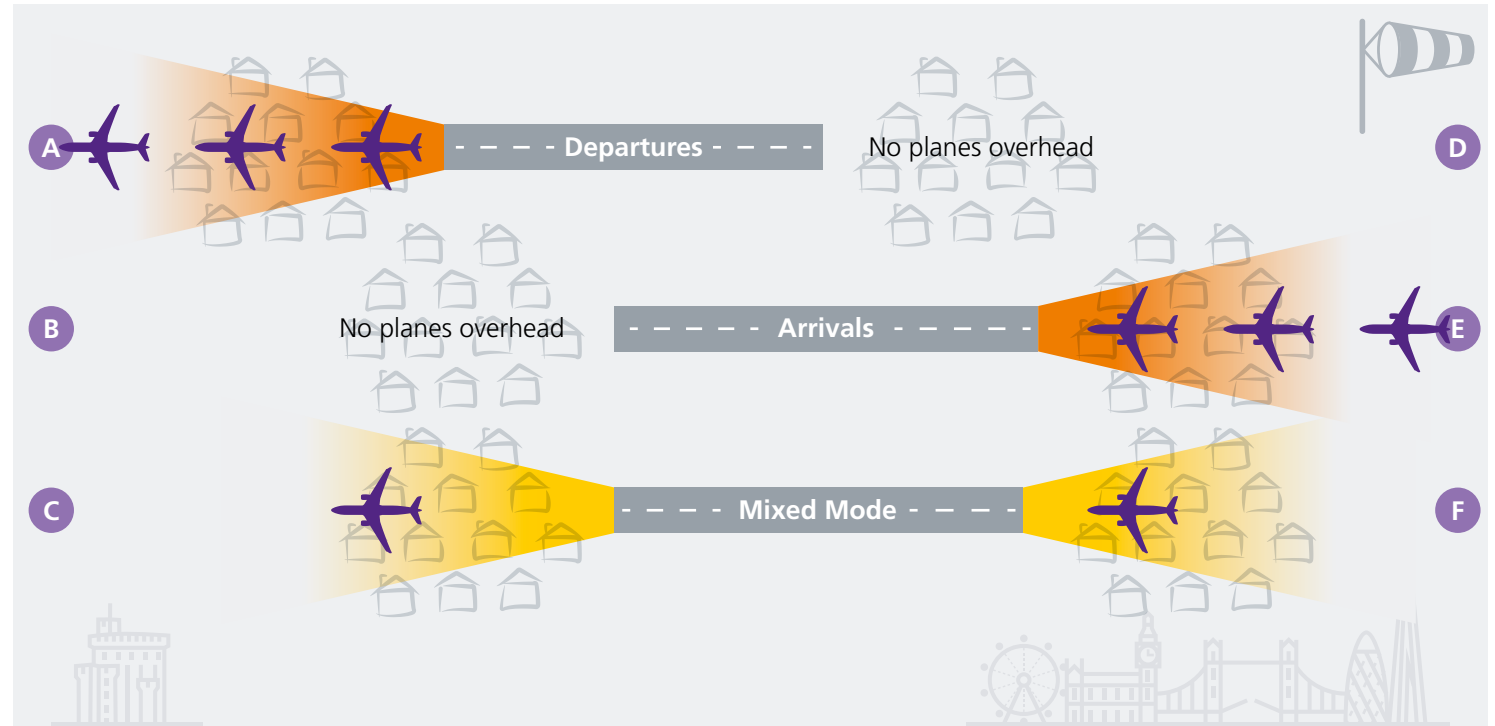
Runway operating pattern 3	Westerly operations	Easterly operations
Northern runway	Area A would have no planes overhead (respite). Area D would experience the stream of arriving aircraft	Area A would experience the stream of arriving aircraft. Area D would have no planes overhead (respite).
Middle runway	Area B would experience the stream of departing aircraft. Area E would have no planes overhead (respite).	Area B would have no planes overhead (respite) Area E would experience the stream of departing aircraft.
Southern runway	Area C would experience departing aircraft but typically less frequently as they are spaced further apart. Area F would experience arriving aircraft but typically less frequently as they are spaced further apart.	Area C would experience arriving aircraft but typically less frequently as they are spaced further apart. Area F would experience departing aircraft but typically less frequently as they are spaced further apart.

Runway operating pattern 4

The diagram only shows westerly operations (aircraft arriving and departing towards the west). If the wind changes and Heathrow switches to easterly operations (aircraft arriving and departing towards the east) the operating direction will be reversed.

Please check the easterly operations column in the table below to see how communities could experience this operating direction on easterly operations.

Where an area is indicated as 'No planes overhead', it may be the case there will still be an awareness of aircraft landing/departing from the adjacent runways.



Runway operating pattern 4	Westerly operations	Easterly operations
Northern runway	Area A would experience the stream of departing aircraft. Area D would have no planes overhead (respite).	Area A would have no planes overhead (respite). Area D would experience the stream of departing aircraft.
Middle runway	Area B would have no planes overhead (respite). Area E would experience the stream of arriving aircraft.	Area B would experience the stream of arriving aircraft. Area E would have no planes overhead (respite).
Southern runway	Area C would experience departing aircraft but typically less intensely as they are spaced further apart. Area F would experience arriving aircraft but typically less intensely as they are spaced further apart.	Area C would experience arriving aircraft but typically less frequently as they are spaced further apart. Area F would experience departing aircraft but typically less frequently as they are spaced further apart.

What is airspace alternation?

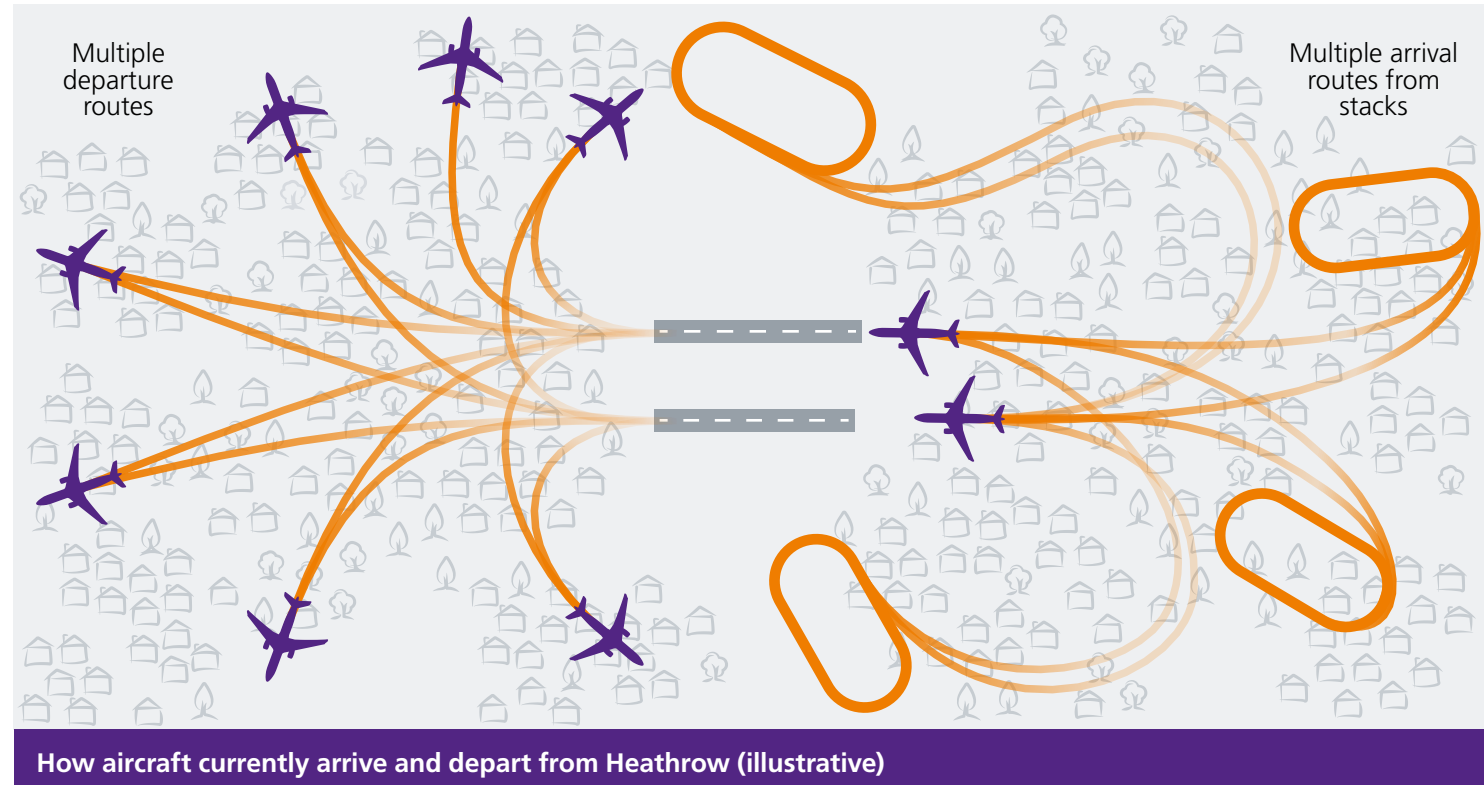
You have just read how runway alternation provides respite for communities under the arrivals and departures streams close to Heathrow.

With the modernisation of our airspace we are also developing our flight paths to provide 'airspace alternation' which will benefit communities further away from Heathrow.

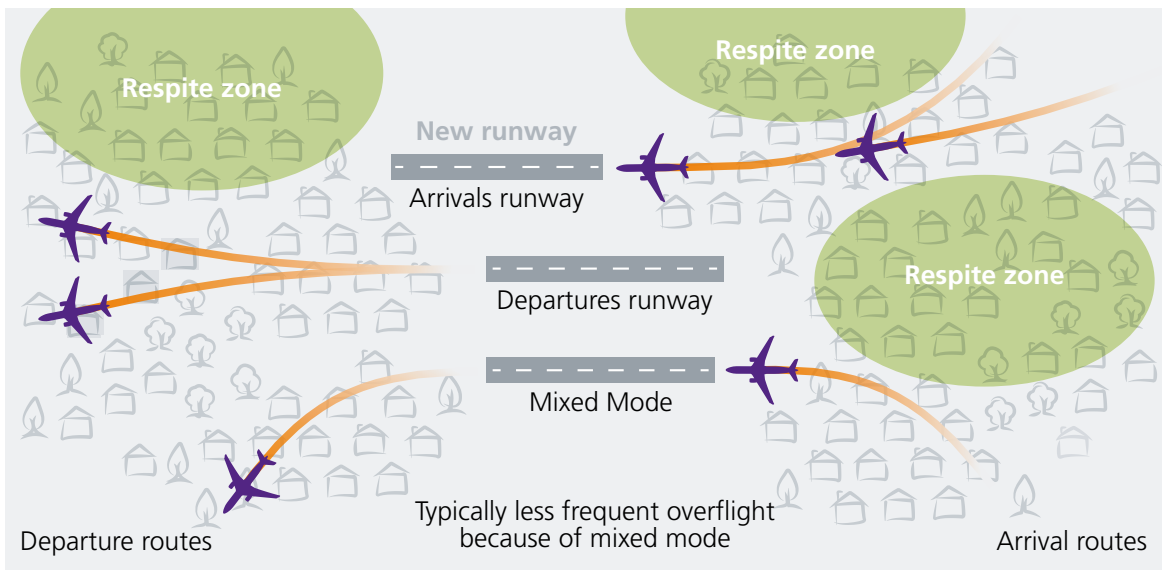
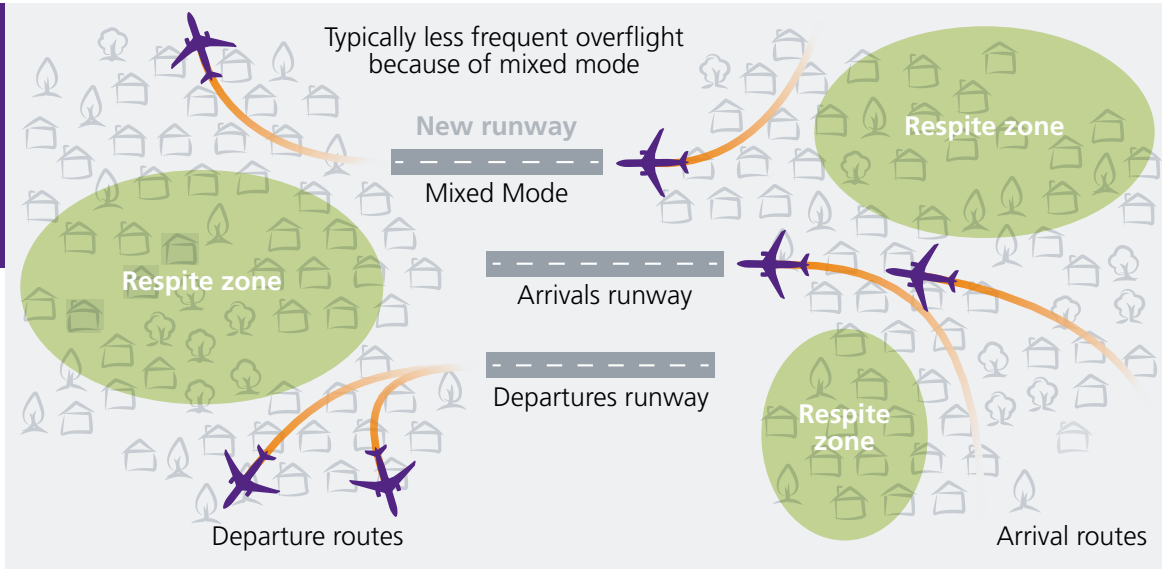
The diagram shows how aircraft currently arrive and depart from Heathrow. Aircraft often arrive at Heathrow via the holding stacks shown in the diagram. They circle in their stack until they are instructed to join the landing stream onto the runway.

There are no defined routes from the holding stacks to the final approach so aircraft fly over broadly the same areas to the landing stream whether they are using the northern or southern runway. Arrivals are spread across a wide area and this significantly reduces the amount of communities experiencing respite.

Departing aircraft fly defined routes. These are spread across a wide area however routes from different runways overlap which means that there is reduced respite for communities beneath these routes.



How aircraft could arrive and depart from Heathrow with airspace alternation (illustrative)



The diagrams shows two potential future runway operating patterns that use airspace alternation to provide respite to communities further away from Heathrow.

Depending on which runway is in use at the time, arriving and departing aircraft would use defined flight paths to fly to and from the airport. These flight paths would then alternate so that communities further away from the airport would get respite as well as those closer in.

Please note the diagrams only show two potential operating patterns. As we progress the design for runway alternation, this will deliver a corresponding airspace alternation pattern.

Flight path alternation is another method of alternating the position of aircraft within airspace alternation to provide respite for local communities. Flight path alternation involves having multiple flight paths from each runway end so that we can alternate, or “switch on/off” the use of flight paths at different times. This would share aircraft noise across different communities to offer respite even when the same runway is in use.

The combination of airspace and flight path alternation will offer relief from planes over a much wider area than today.



Duration and frequency of respite

There is a decision to be made about how often we change the runway operating pattern, and this will affect both runway and airspace alternation.

We know that in order to provide daily respite for every community close to the airport we would need to use each of the four runway operating patterns shown. This means that if each runway operating pattern was of equal length there would be a change every 4-5 hours.

Alternatively, we could provide longer periods of respite, but not every day.

It is not possible for every community to have respite every day for more than 4-5 hours.

Question 2



- Would you prefer to have longer periods of respite less frequently (all day on some days but no relief on other days) or a shorter period of respite (e.g. for 4-5 hours) every day?
- Please tell us the reasons for your preference.
- Please provide any other comments or suggestions you have on runway and airspace alternation.

We want your feedback on two options for the delivery of respite to local communities using our runway alternation pattern:


1. A pattern that delivers longer periods of respite, less often

We could use each operational pattern for a whole day, then move to a different operating pattern each subsequent day. This would mean that communities would get a whole day of respite every few days but have consecutive days of overflight with no respite.

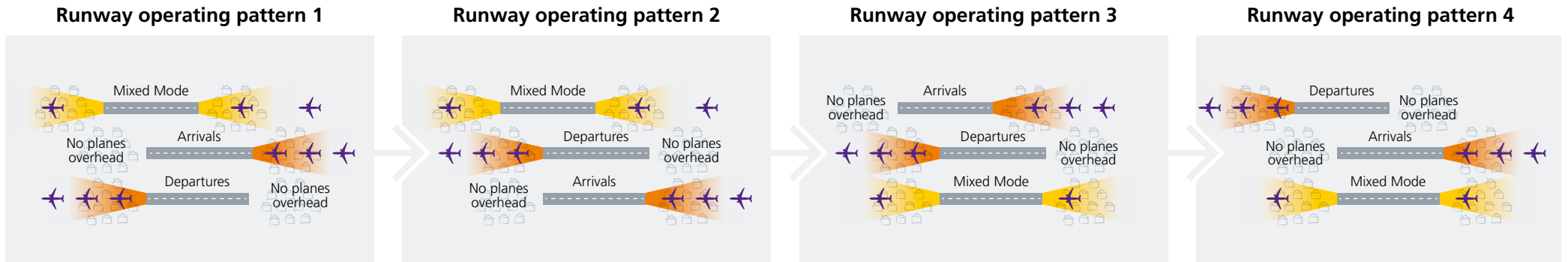
2. A pattern that delivers shorter periods of respite, more often

We could use each of the four runway operating patterns during the day which would mean that each community would have 4-5 hours respite every day.

The diagram shows how these two options could work.

More information on runway alternation can be found in the technical document Runway Operations – Respite through Alternation. 

If we were to have **longer breaks** we would stay on one of the runway alternation patterns **for a whole day** then change it each following day.



If we were to have **shorter breaks** we would change the runway alternation pattern **every 4-5 hours**.





Section 3.2 – Directional preference

The direction planes arrive and depart from Heathrow depends on the direction of the wind. For safety and performance reasons aircraft typically take off and land into the wind. This is because an aircraft's wing relies on the speed of the air moving over it (airspeed) to lift it off the ground.

When winds are light (below 5 knots – about 6 miles per hour) aircraft can potentially take off or land in either direction. Rules are set by Government to determine what to do in these circumstances. These are called a "directional preference" and they say in which direction operations should be when the winds are light and there is a choice. At Heathrow, winds are light on average 20% of the time.

During the day, a 'westerly preference' is operated at Heathrow. This is Government policy and means that even during periods of light easterly winds aircraft will continue to land in a westerly direction, making their final approach over London.

This was introduced in the 1960s to reduce the number of aircraft taking off in an easterly direction over London, the most heavily populated side of the airport. This was when departures were considered to be more disruptive to local communities than arrivals.

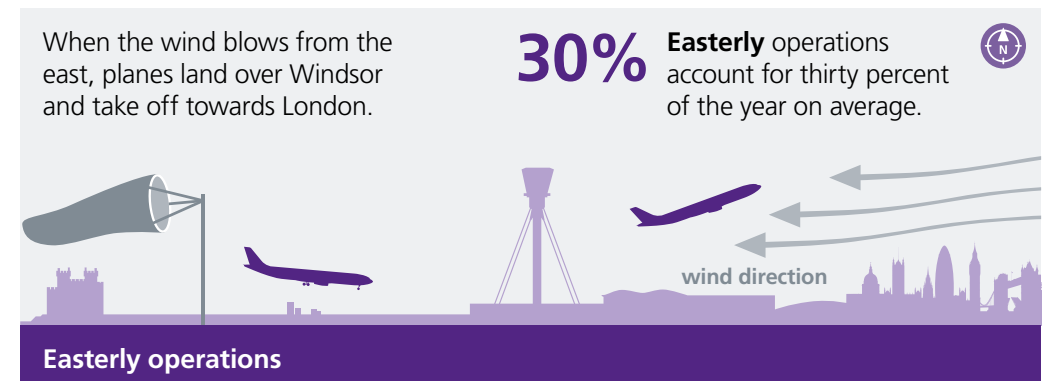
In the UK, the wind is mostly from the south west. That means that with a westerly preference in place the majority of aircraft (approximately 70% a year) arrive from the east (over London) and take off towards the west (over Berkshire/Surrey). This is known as 'westerly operations'.

When the wind blows from the east (and is over five knots), the direction of operation is switched and aircraft land from the west over Berkshire

and take off towards the east. This is known as 'easterly operations' and occurs approximately 30% of the time.

Following consultation in 2001, the Government decided that the westerly preference should be removed at night and particularly during the early morning period when there are more arrivals than departures.

This means that instead of westerly preference at night, we rotate between westerly and easterly operations to provide a fairer distribution of aircraft noise to the east and west of the airport. We can only do this when the wind direction allows us to or is below 5 knots.



'Managed' preference

We are thinking of moving to a 'managed' preference which would involve changing the direction of arriving and departing aircraft based on a set of criteria or rules designed to limit overall noise effects on communities and to help deliver periods of relief for them.

- If we wanted to minimise the number of people adversely affected by aircraft noise we could operate in a westerly direction during the day and in an easterly direction at night.
- We also know from stakeholder engagement and feedback that long periods of operation in any one direction and the potential combined impacts of our operations with other airports (such as London City – see diagram) are important issues that people experience with the current system of westerly preference.
- A managed preference could be used to break up periods of operating in one direction for example after 5 or 7 days (if the wind is low enough to allow a change).

Our work so far shows that if we managed the preference to minimise the total number of people affected by noise, it would mean that if there is a choice to do so, we should use westerly operations during the day and easterly operations at night.

Unlike during the day, easterly operations at night would minimise the total people affected by noise. This is because the majority of flights at night are arriving aircraft (which are quieter than departing aircraft) and would arrive from the west which is less densely populated compared to the east of the airport (London).



We have also been exploring the following options:

Westerly preference – as previously described, this is the existing directional preference used at Heathrow and has been in place for over 50 years.

- It reduces overall effects of noise on communities and reduces the total population exposed to noise (compared to easterly preference).
- But it is perceived to be an unfair balance of noise as communities to the west of the airport have longer periods of departing aircraft (which are slightly noisier than arriving aircraft) than communities to the east. Also, if we were to remain on westerly preference at night a larger population could be affected by noise due to the greater number of arrivals over central London at this time.

Easterly preference – this would involve switching the currently westerly preference to an easterly preference. It would mean that we would stay on easterly operations even if the wind was coming from the west and is below 5 knots for as long as possible. As the wind comes predominantly from the south west it would result in a roughly 50/50 split in easterly and westerly operations over the long term at Heathrow.

- Easterly preference would deliver a more balanced split between easterly and westerly operations – sharing noise across communities to the east and west of the airport for arrivals and departures.

- An easterly preference at night would reduce the overall population affected by noise as more aircraft would be arriving to the west of the airport over less densely populated areas.
- But easterly preference could result in more people being affected by noise overall because more departing aircraft (which are slightly noisier than arriving aircraft) would be flying over densely populated central London.

No preference – a no preference policy would mean that Heathrow would switch operations whenever the wind changes.

- A no preference policy would result in a much less predictable operation and could mean that we have to switch the direction of arriving and departing aircraft a number of times over the course of a day.
- This option would be difficult for Heathrow to operate as each change of operations from westerly to easterly (or vice versa) takes time and can cause delays.
- It is also the least predictable option for communities whose respite could be interrupted due to the much more frequent changes.

More information on directional preference can be found in the technical document **Runway Operations – Directional Preference.**



Question 3



- Should we prefer westerly operations during the day and easterly operations at night to reduce the total number of people affected by noise?
- Please tell us the reasons for your answer.
- Should we sometimes intervene to manage the direction of arriving and departing aircraft to provide relief from prolonged periods of operating in one direction – even if that means slightly increasing the number of people affected by noise?
- Please tell us the reasons for your answer.
- Please provide any other comments or suggestions you have on directional preference.

Section 3.3 – Night flights

We know that night flights are particularly sensitive for local communities, passengers and airlines.

The airport and airlines have already been successful in reducing and mitigating noise within limits set by the Government and we continue to strive to operate well within these limits, rather than simply meeting them.

Currently there is no formal ban on night flights at Heathrow but the Government has heavily restricted their use since the 1960s. These are some of the strongest restrictions on night flights of any hub airport in Europe.

As part of our proposed expansion we are proposing to introduce a scheduled night flight ban as well as a package of measures to manage noise from night operations.

Why we have night flights

Night flights are an important part of operations at airports around the world. The time differences in an inter-connected global transport system mean that it is difficult to avoid flights at night and early in the morning.

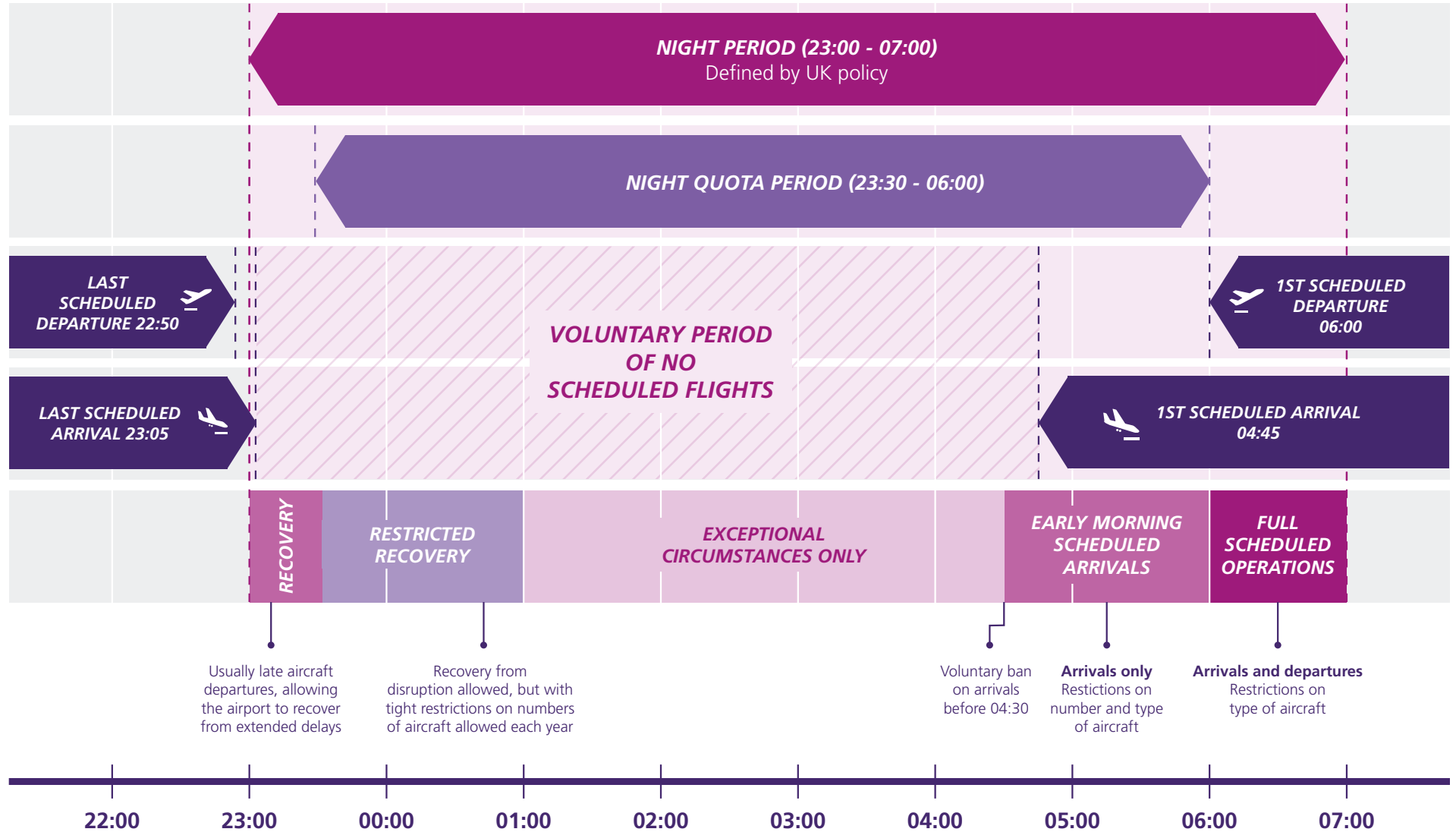
An early morning arrival means a full day's business can take place for some passengers while others may transfer onto a connecting flight at Heathrow.

Transfer passengers play an important role in maintaining the range and frequency of destinations served by Heathrow by feeding other flights. Independent studies have shown that night flights make a significant contribution to the UK economy.

However, research shows that exposure to noise at night from sources such as road traffic, railways and aircraft can affect our health and quality of life through interrupted sleep, it can also be annoying.

To address this, we are developing noise control measures which include a scheduled night flight ban to manage the effects of our night time operations.

Existing restrictions on night flights



'Scheduled' flights

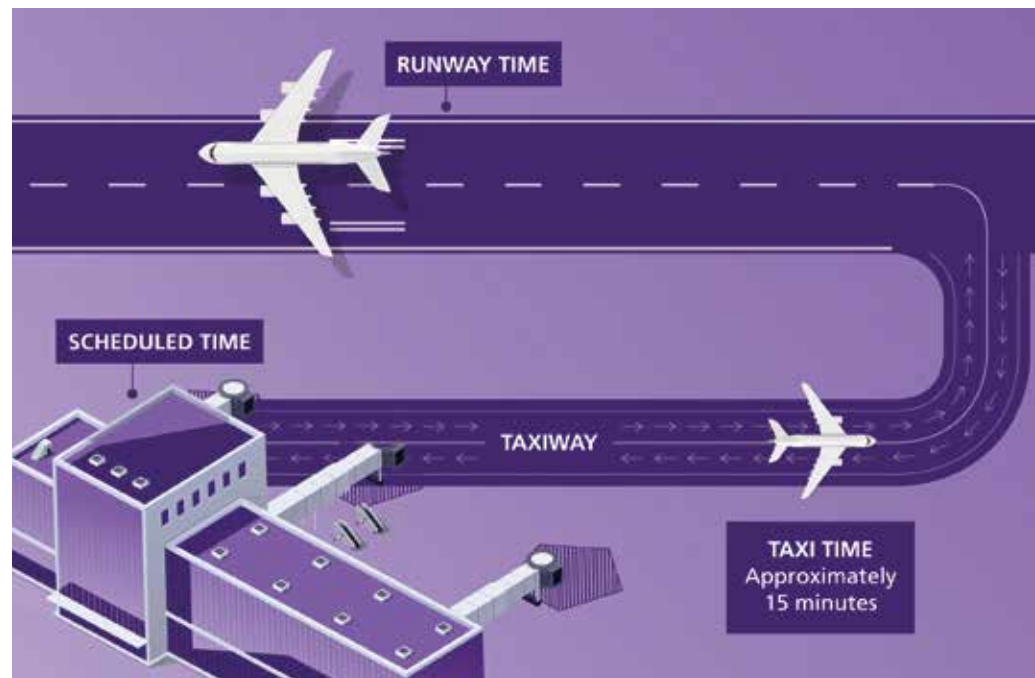
It is important to understand the difference between the scheduled time (the times shown on arrival and departure boards) and the time planes arrive or depart from the runway.

Using arrivals as an example:

- The **scheduled time** of an arrival is the time that the plane reaches the airport stand (when the plane stops at the terminal gate and you get off).
- The **runway time** is the time the plane touches down on the runway.

Today, there is approximately 15 minutes between the plane touching down on the runway and it taxiing to the airport stand (although this will vary between flights and times of the day).

It is the same for departures, the scheduled time is the time the plane will push back from the gate and the runway time will be approximately 15 minutes later when it takes off.



Restrictions on 'scheduled' night flights

At Heathrow we do not have any scheduled departures between 10:50pm and 6:00am or scheduled arrivals between 11.05pm and 4.45am.

This means that there are no scheduled flights after 11.05pm and before 4.45am.

Heathrow also has an arrangement with its airlines that any planes scheduled to arrive from 4.45am will not land on the runway before 4.30am.

Over 90% of all the scheduled movements that operate during the night quota period are early morning arrivals and the majority of these are scheduled to arrive after 5am.

In addition, Heathrow does not have any scheduled freight flights in the night quota period (11.30pm to 6am).

Scheduled night flights ban

The Government expects a ban on scheduled night flights for a period of 6.5 hours. In January 2018 we asked for feedback on the proposed 6.5 hour scheduled night flight ban between the hours of 11pm and 7am. We stated our preference for it to be between 11pm and 5.30am. A range of responses were received on the proposed length of the ban and when it should be put in place each night.

Local Authority feedback to the consultation was varied with most supporting the idea of a ban and over half suggesting that it should be longer.

Members of the public were also supportive of a ban on scheduled night flights with many suggesting it should be longer than 6.5 hours and that it should include all unscheduled aircraft.

Airlines expressed strong concerns about the economic impacts of a scheduled night flight ban and said that its introduction could result in flight cancellations and potentially entire route cancellations.

Further information can be found in the **Interim Consultation Feedback Report**.

Timing of a scheduled night flights ban

We continue to support the Government's expectation of a 6.5 hour scheduled night flights ban and we are currently evaluating this in line with the Balanced Approach (described on page 11). Our view is that a 6.5 hour ban should not begin before 11pm or end after 6am because of the following constraints:

- Scheduled ban starting before 11pm – we are not proposing to start the ban each night before 11pm because the night period in the UK is set by the Government and is between 11pm and 7am.
- Scheduled ban finishing after 6am – we are not proposing to extend the ban beyond 6am as this would have a significant economic impact and reduce Heathrow's ability to compete with other European hub airports. It would also mean that Heathrow could not accommodate the annual number of flights (at least 740,000 per year) required by the Airports NPS.

To help us decide on the proposed timing for the scheduled night flights ban we want to know how you think we should manage our early morning arrivals for an expanded Heathrow.

More information on night flights and night restrictions can be found in the technical document **Runway Operations – Night Flights**.



Early morning arrivals

The first scheduled arrivals at Heathrow in the morning are at 4.45am, this means they touch down on the runway from 4.30am onwards. As part of our proposed expansion and the introduction of a scheduled night flight ban we are proposing to land our early morning arrivals later than this.

Our early work has shown that to land our early morning arrivals later in the morning but still land the same number of flights (in a shorter amount of time) there are two options:

1. Schedule flights from 5.30am (runway time 5.15am) using **one runway**.
2. Schedule flights from 5.45am (runway time 5.30am) using **two runways**.

Question 4



Please note the exact times are subject to further evaluation of the options:

- To help inform our consideration of the options, we want to know whether you would prefer for us to:
 - Use one runway for scheduled arrivals from 5.30am (runway time 5.15am)
 - Use two runways for scheduled arrivals from 5.45am (runway time 5.30am)
- Please tell us the reasons for your preference.
- Please provide any other comments or suggestions you have on early morning arrivals.

Option 1 is an **earlier start** but by only using one runway, **fewer people** will be affected/overflowed on any given night.

If we open earlier and only use one runway for arrivals, communities would benefit from a later start (6am) two out of every three days.

All planes land on one runway.



5.15am Runway time



Option 2, is a **slightly later start** but **more people** will be affected/overflowed by the use of two runways on any given night.

If we open slightly later and use two runways for arrivals, communities would benefit from a later start (6am) one out of every three days.

Planes use both runways so flights are shared over a wider area in the early morning.



5.30am Runway time



Unscheduled night flights

Sometimes planes need to operate in the night period when they have not been scheduled to do so. This could be for a number of reasons such as delays that have built up during the day or for a technical fault with an aircraft that needs to be repaired.

There is always a delicate balance to be struck as to whether a flight should be allowed at night, considering the effects on local communities, passengers and the airline network.

Today we use a mixture of quota count and movement limits to control unscheduled night flights.

The 'quota count'

The quota count system has been in place at Heathrow since 1993 and applies to all the major London airports.

Each plane has a number of points based on how noisy it is, the noisier the plane – the higher the number of points.

If a plane lands or takes off during the night quota period (11.30pm-6am), its points count towards a limit based on whether it's operating during the summer or winter period.

The night quota count system is designed to discourage the use of noisier older planes and encourage the use of quieter newer planes.

No plane with a very high score (the oldest and noisiest) is allowed to take off or land during the night quota period.

The 'movement limit'

There is also a movement limit which restricts the total number of flights that can take place in the night quota period over each summer and winter period.

How the quota count and movement limit work together

The movement limit and quota count restrictions work together to make sure the overall number of night flights are limited and that the quietest planes are used:

- If newer quieter planes are used their night quota scores will be low – but the total number will be restricted by the movement limit.
- If noisier aircraft are used their night quota scores will be high and their number will be restricted by the quota count limit.

The quota count combined with the movement limit ensure the total number of night flights are restricted at Heathrow and the use of the quietest planes is encouraged.



In October 2018 we launched our **Quiet Night Charter** to identify voluntary initiatives to improve the performance of our operations and reduce the overall impact of unscheduled night flights.

The recovery period

We will still need a restricted recovery period (see night flight restrictions chart) for an expanded Heathrow. We are currently testing a range of measures to manage the entire night period.

The type of measures that we could use for the recovery period could include:

- Limiting the aircraft that are allowed to operate to the quietest types;
- Limiting the time they can operate during the scheduled night ban period ('unscheduled' flights that have been delayed);
- Restricting the quota count of aircraft that can operate in the recovery period (see next section for a description of this);
- Regular reviews of the quota count to make sure it achieves its objectives.

Question 5



- Please provide any comments or suggestions on how we should encourage the use of the quietest type of aircraft at night (outside the proposed scheduled night flight ban)?
- Please provide any other comments you have on night flights and restrictions.

Incentivising quieter aircraft at night

The Airports NPS expects Heathrow to incentivise the use of the quietest aircraft at night.

We have set out today's night quota system and would support continuation of a future night quota system for expansion.

In order to encourage the use of more modern and quieter aircraft, the Government also reduces the amount of quota points available in the night quota period as new planes and technology becomes available. We would also support this approach with expansion.

At Heathrow, we also already do this by charging lower landing fees for the quietest aircraft to operate at the airport. With the expansion of Heathrow we intend to continue this approach and incentivise the use of "best in class" aircraft.

We will also be reviewing the structure of our landing fees and engaging with airlines to understand how we can encourage them to use their quietest planes during the night at an expanded airport.

It is important to note that this and all the elements in this consultation tie back to the noise envelope (described in Section 2 of this document). The concept of the noise envelope will mean that to meet the targets or stay within the limits and grow sustainably, new and innovative technology, equipment and operating procedures will be needed.

Section 4 – Airspace change for an expanded Heathrow

What is 'Airspace Change'?

Airspace is the network of flight paths in the sky that aircraft follow when flying into, and out of, the UK's airports.

The expansion of Heathrow is not just about the physical changes required on the ground. Building a new runway will also lead to changes to the flight paths planes follow. This is known as an "airspace change".

The aviation industry is regulated by the Civil Aviation Authority (CAA) in the UK, and they ensure that the environmental impact of aviation on local communities is managed through efficient use of airspace. When changes to airspace are proposed, an airport is required to follow the CAA's Airspace Change Proposal (ACP) process. The process places great importance on engaging and consulting on airspace proposals throughout the process with a wide range of stakeholders, including potentially affected communities.

The Government is driving plans to modernise the UK's airspace to accommodate growing demand for air travel. The modernisation of UK airspace will happen regardless of the expansion of Heathrow, but combining the two provides Heathrow with a once in a generation opportunity to update and improve the way our airspace is used.

Changes that are made to accommodate a third runway at Heathrow will also need to fit in with the changing airspace of the UK and Europe. Heathrow is working closely with NATS (the UK's leading provider of air traffic control services) and the other airports in the south-east of England to develop an integrated approach to airspace modernisation.

More information on the airspace change process can be found in the information paper [How do we seek approval to expand Heathrow?](#)



More information on airspace modernisation and how this will affect the way aircraft fly can be found in the information paper [What is airspace modernisation?](#)





How does Heathrow gain approval for Airspace Changes for expansion and modernisation?

The Department for Transport (DfT) is responsible for all aviation policy in the UK, including airspace. The CAA is responsible for its regulation and for the Airspace Change Process which all airports must follow where changes to airspace are proposed. Heathrow is responsible for the design of any changes to flight paths into and out of the airport up to approximately 7,000ft, and NATS is responsible for changes to airspace above 7,000ft.

Changes to flight paths are submitted to and approved by the CAA, following the Airspace Design Guidance provided in its document known as 'CAP 1616'. This guidance sets out a process framework following a multi-stage approach for changing airspace. It places great importance on engaging and consulting on airspace proposals throughout the process with a wide range of stakeholders, including potentially affected communities. This is separate to the Development Consent Order (DCO) process that we will follow to get approval for the physical development that is required, as well as our proposals for how the airport will operate when the third runway is built. The DCO application will be examined by the Planning Inspectorate and will need to be approved by the Secretary of State for Transport.

Although a formal consultation is only required at a later stage of the process, given the scale and complexity of Heathrow's airspace changes, we have decided to carry out three phases of consultation. These stages are; the consultation on design principles in 2018, this consultation on design envelopes, and a future consultation on flight path options. This gives all stakeholders the best opportunity to be involved throughout the process to help shape the design and structure of Heathrow's future airspace.

This consultation on design envelopes gives you the opportunity to provide feedback that will help us to shape our flight path options for the future consultation. This means we do not have flight path options to consult on at this stage.

More information on how we will be seeking permission for new flight paths for expansion can be found in the information paper **How do we seek approval to expand Heathrow?**



Consultation approach

We are carrying out three stages of consultation on the changes that we need to make to the airspace above London and the surrounding areas.

The first two consultations are voluntary consultations to meet the CAA's requirement for us to 'engage' with relevant stakeholders. The third (and final) consultation is the statutory consultation required under the CAA's Airspace Change Process.



Consultation 1 Design principles

This consultation took place in January 2018 and focussed on 'design principles'. In this consultation we sought 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' were approved by the CAA and we will use them to help us redesign our airspace.



Consultation 2 Design envelopes

In this second consultation, we are presenting the geographic areas within which flight paths could be positioned. We are asking what local factors should be taken into account when developing new flight paths within these geographically defined areas known as 'design envelopes'.

This consultation



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.

Section 4.1 – Developing flight paths for an expanded Heathrow

This section sets out the process we are following to develop flight paths for a three-runway Heathrow. Our redesign of Heathrow's airspace includes the introduction of new air navigation technology to modernise the way aircraft fly.

Performance-based navigation

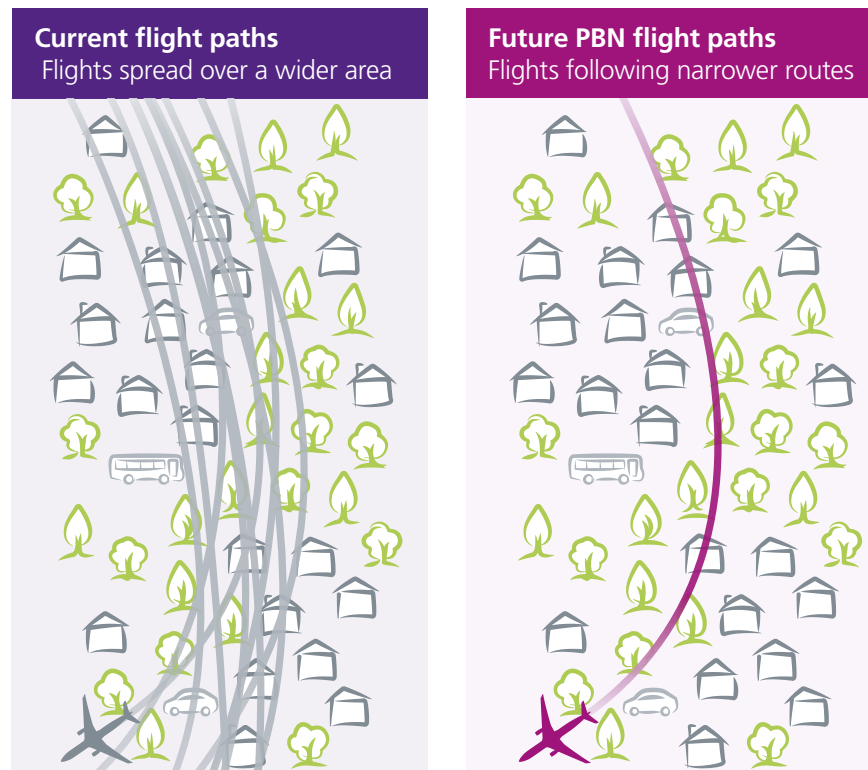
The introduction of Performance-based navigation (PBN) is the key to achieving airspace modernisation. PBN improves the accuracy of where aircraft fly by moving away from outdated and conventional navigation using ground-based beacons, to modern satellite navigation. This is similar to the sat navs that most people have in their cars today.

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. Heathrow needs to introduce PBN to meet our commitments to the Government's Airspace Modernisation Strategy.

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. It also provides opportunities to avoid noise sensitive areas.

PBN flight paths will be narrower and more concentrated than they are today and we understand that this may be a concern to some local communities. Heathrow is committed to working with residents, local stakeholders and the aviation industry to find ways to introduce PBN while seeking to limit negative effects from aircraft noise.

We have been discussing potential impacts of PBN with local stakeholders in Heathrow's regular community engagement forums over the last few years, and considering options to "share" aircraft noise to reduce the potential impact of concentration of flight paths. We also undertook a public consultation last year on Airspace Design Principles, where we asked for feedback on potential principles to guide how we design our future flight paths, including whether we should look to share flights across a wider area.



More information on airspace modernisation can be found in the information paper [What is airspace modernisation?](#)





Airspace design principles

Last year, during our first consultation, we asked for your feedback on some of the key principles that could be used as the basis for developing our future airspace design. We asked for your views and preferences relating to them, and we asked you to suggest any other design principles for us to consider.

We analysed the feedback we received from this consultation, together with feedback from our wider engagement with our stakeholders, and we then submitted a set of design principles to the CAA on 31 August 2018. You can read our Design Principles submission, and the supporting evidence in the document library at www.heathrowconsultation.com. It is also available on the CAA's website.

Our submission was approved by the CAA on 28 September 2018. These design principles will form the basis for developing our airspace design for future three runway operations, and will be used when comparing airspace design options.

Heathrow's airspace design principles for expansion are presented in the table below. Principles 1-5 are core requirements of the airspace design related to policy or regulation. They all have equal priority since any airspace design option will need to deliver against each of these. These are set out as Heathrow "Must...".

Principles 6-10 are the more strategic principles that Heathrow intends to deliver on, but inevitably some trade-offs will have to be made. These are set out as Heathrow "Should..." and are shown in the table in priority order.

Heathrow's airspace design principles for expansion

1. Must be safe
2. Must meet Airports National Policy Statement requirements, including capacity
3. Must meet 3 Airports National Policy Statement noise policy tests
4. Must meet local air quality requirements
5. Must meet commitments to the Government's Airspace Modernisation Strategy
6. Should limit, and where possible reduce, local noise effects from flights by:
 - a. Using more noise efficient operational practices
 - b. Minimising number of people newly overflown
 - c. Maximising sharing through predictable respite
 - d. Avoiding overflying communities with multiple routes
 - e. Maximising sharing through managed dispersal
 - f. Minimising total population overflown
 - g. Designing flight paths over commercial and industrial areas
 - h. Where appropriate, prioritising routing flight paths over parks and open spaces (rather than over residential areas), but avoiding overflight of Areas of Outstanding Natural Beauty (AONB)
7. Should minimise fuel/CO₂/greenhouse gases per flight
8. Should ensure operational efficiency and resilience to maximise benefits to all stakeholders
9. Should base our airspace design on the latest navigation technology widely available
10. Should minimise impact on other airspace users

Our design principles will be applied within the design envelopes when we design, and evaluate, flight path options.

More information on our airspace design principles for expansion and how we will use them to shape our future airspace design can be found in the information paper **Heathrow's airspace design principles for expansion**.





Structure for future flight paths

Our design envelopes are a product of an underlying structure for future flight paths which we have developed for an expanded Heathrow using the design principles. This structure defines the broad characteristics such as the minimum number of flight paths, how far apart they need to be to ensure they are kept safely separated, and the number (and types) of aircraft that would be likely to use them. It does not determine exactly where the flight paths would be positioned – this comes later in the design process.

This structure for future flight paths has been developed following the technical and operational assessment of a range of options. Responding to the consultation question on design envelopes does not require an understanding of the structure that they sit within, but we have provided a technical description for people who may be interested in this level of detail.

More detail on the structure for future flight paths and the process we have followed for its design can be found in the **Our approach to redesigning our airspace network for an expanded Heathrow**.



This is a technical document that describes the operational and technical specifications for future flight paths.

Have your say



We would welcome any feedback on this technical report: if you have comments on the work to date, or on the design process we are following, please include them in the 'other comments' box on the feedback form.

Design envelopes

Our team of airspace specialists has developed design envelopes for the flight paths required for an expanded Heathrow. A design envelope is a geographical area within which it is technically possible to position one or more flight paths. It does not mean that final flight paths will be spread across the full width of the envelope.

The envelopes have been divided into sections to show the heights that aircraft could be flying at for that portion of the envelope. Given that the height (altitude) of an aircraft affects the noise level experienced on the ground, we have assumed the lowest potential heights for these design envelopes. In reality, we would expect aircraft will be flying higher (and should therefore be quieter when heard from the ground).

The design envelopes also show the number of aircraft which might fly through that envelope in a given day.

Flight path options

Feedback from this consultation, together with our design principles and technical requirements, will be used to develop flight path options. These will be the actual routes that aircraft will fly.

We will present these flight path options, and seek feedback on them, in a final consultation (likely to be in 2022). We will also provide evidence of all the technical work undertaken when designing flight paths, and full analysis of the flight path options, at this stage.



Section 4.2 – Design envelopes for an expanded Heathrow

Design envelopes are the broad geographical areas within which flight paths will need to be positioned. Although the CAA's airspace change process does not require design envelopes to be developed or consulted on, we believe it will help stakeholders and communities to better understand whether the future changes could affect them.

Design envelopes have been created based on:

- a) Safety needs
- b) The need to fit into the wider, and higher, airspace network
- c) The need to have enough routes to meet future arrival and departure numbers

There are various options for using the three runways, with runways used for either departures or arrivals, or both (known as "mixed mode").

Some of the design envelopes are for departure routes, and some are for arrival routes.

Design envelopes for future departures and arrivals (18 envelopes in total), are presented at www.heathrowconsultation.com and in our 'Heathrow's airspace design envelopes for expansion' document.

Have your say



Our postcode checker can be used to show your home, or other chosen location, within a design envelope. Please visit www.heathrowconsultation.com to input your postcode and see whether you might be affected by our future airspace design.

We would like you to tell us about the local factors that you think we should consider when designing flight paths within these design envelopes.

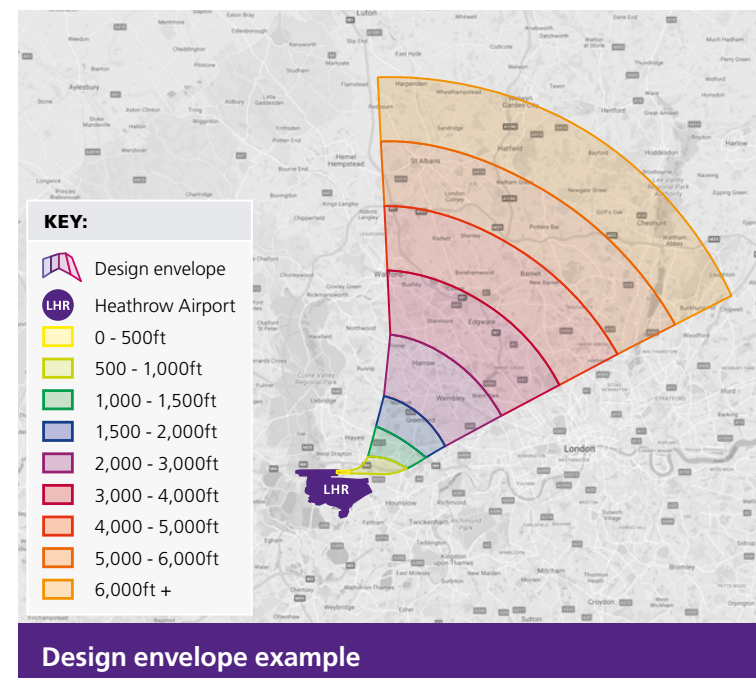
The design envelopes show the areas in which routes could be positioned. There will be at least one flight path through each design envelope. In some envelopes, there will need to be a minimum of two or three flight paths to provide enough capacity for aircraft.

In addition, we could put more flight paths through each design envelope. This could allow us to vary the use of flight paths at different times, giving people greater respite from aircraft noise. This is known as flight path alternation (see section 3.1). Flights would not be spread across these areas, instead they would follow specific flight paths through the areas. This means some areas within the envelopes will be overflowed but others will not.

The airspace design envelopes overlap in places. Therefore, a location may be shown as potentially overflowed by a number of different flight paths. However, the airspace design will seek to ensure flight paths are separated, either by a distance or by activation rules that mean that they are not in use at the same time. For example, a location may be within an envelope for departures during westerly operations and another envelope for arrivals during easterly operations, but these routes would never be active at the same time.

This means that the 'number of flights' figure given alongside each design envelope should be considered individually and not added together. The number of flights figure alongside each envelope shows a range of flights from zero to a maximum. The zero represents the fact that each flight path would have periods of inactivity, when they are effectively 'switched off'.

When it comes to establishing flight paths, our design principles aim to reduce the likelihood of multiple flight paths overflying the same communities, wherever possible.



Design envelope example

Hear for yourself



We are holding consultation events for you to meet our team, and many of these events will have a sound demonstration facility. This provides demonstrations to help you understand what aircraft may look and sound like at different heights, both outside and indoors.

We have already established our airspace design principles which will be fed into the design process. Our design process will also identify and consider local factors such as Areas of Outstanding Natural Beauty, National Parks and noise-sensitive buildings (such as schools, hospitals, or community centres) that could potentially be significantly affected by aircraft noise. This information will help us identify and evaluate options for the precise position of the new flight paths. However, we recognise that there may be other specific sites or locations which are particularly sensitive to the effects of aircraft flying overhead.

In the next phase of the design we will develop detailed flight path options, taking into account our design principles and feedback from this consultation. These detailed designs will enable us to produce noise contour maps showing the likely noise levels across all affected locations. This detailed noise information will be included in our final consultation on flight path options, likely to be in 2022.

Have your say



Please consider this information for your area(s) of interest and let us know whether there are any sites or locations that you think require special consideration. Please describe the special characteristics of these locations, and tell us why they would be sensitive to flights overhead (whether that is because of noise, the visual impact of aircraft overhead, and/or any other impact).

We will consider all responses. Those not already covered by the design principles will be fed into the design process.

Design envelopes for future departures and arrivals (18 envelopes in total), are presented at www.heathrowconsultation.com and in our 'Heathrow's airspace design envelopes for expansion' document.

Section 5 – Making better use of our existing runways

We are looking to bring in a number of changes before the third runway is operational, to make better use of our existing runways.

Independent Parallel Approaches

As part of this Airspace and Future Operations consultation, Heathrow is also consulting on a proposed short-term change to the way that some aircraft arrive at Heathrow. This is known as Independent Parallel Approaches (or "IPA") and involves some new arrival routes into Heathrow from the holding stacks. Some of these flight paths could overfly areas that are not affected by Heathrow arrivals today.

The introduction of IPA requires an airspace change to be approved by the CAA, and our current consultation on IPA will form part of our evidence of engagement with local communities and affected stakeholders.

IPA will make us more efficient and more resilient to disruption, reducing the chances of delays for passengers. Any airspace changes required would be replaced by our longer-term airspace design, if our third runway is approved.

For more information on the Independent Parallel Approaches project, and to have your say on the 'design envelopes' for potential IPA flight paths, please see our 'Making Better use of our existing runways' document.



You can also use the online postcode checker to see whether you might be affected by these new arrival routes at www.heathrowconsultation.com

We would also like to make changes to one of our departure routes on easterly operations known as 'Compton'. For more information please see www.heathrow.com/compton

Early Growth

As a first phase of our expansion plans, we are proposing to make increased use of our existing two runways, once approval for the physical expansion of Heathrow has been granted.

Currently, Heathrow is limited to 480,000 air transport movements (ATMs) each year.

In September 2016 we published proposals for the release of additional capacity before the third runway is operational. This would be an early phase of the lifting of the current ATM cap which would be necessary as part of our DCO application for expansion.

Releasing capacity using our existing two runways could generate significant economic benefits as the first phase of expansion. This capacity – up to 25,000 additional ATMs each year – could be released on a phased basis soon after planning consent is granted, so that the benefits of expansion can begin to be delivered well before the third runway is complete.

At this stage of consultation, we are not in a position to consult on the specific proposals for early growth. Our ability to bring forward early growth is dependent upon a range of factors, such as changes in the current airfield infrastructure, revised regulation of airlines slots, as well as other matters on which we are seeking feedback as part of this consultation, in particular:

- the noise objective which is agreed for Heathrow;
- the establishment of required airspace changes relating to the two existing runways, for Independent Parallel Approaches (IPA); and
- the detailed terms of a ban on scheduled night flights at Heathrow.

These matters are the subject of this current consultation and, once we have considered your feedback, we will be able to test the capacity for and implications of early growth. We will need to consider implications for terminal and stand capacity, environmental impacts, and how additional passengers would be accommodated in our surface access strategy. Our intention is to bring forward proposals for early growth at our next stage of consultation in June 2019.

We are planning to submit our proposals for early growth as part of our DCO application. These proposals will be examined by the Planning Inspectorate and will need to be approved by the Secretary of State for Transport.

Section 6 – Have your say

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

Get involved

This consultation runs for eight weeks from 8 January until 11.55pm on 4 March 2019. There are several ways you can find out more and provide us with your comments.

- **Visit our website**

One of the best ways to access the consultation is to visit our website to find more information and fill in our online consultation feedback form:
www.heathrowconsultation.com

- **Events**

We are holding events at venues throughout the consultation period. Members of our team will be on hand to answer your questions. Please visit our website or contact us on 0800 307 7996 for further information and details of event locations.

Many of our events will have a sound demonstration facility. This provides demonstrations to help you understand what aircraft may look and sound like at different heights, both outside and indoors.

Responding to the consultation

The deadline for responding to this consultation is **11.55pm on 4 March 2019**. You can provide us with your feedback in writing or online. Feedback received after this date may not be taken into consideration.



online via our project website:
www.heathrowconsultation.com



complete a **feedback form**, available at our exhibition events or on request using the contact details provided in this leaflet



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



Post your feedback form or write to us at:
FREEPOST LHR AFO CONSULTATION

We cannot respond individually to any questions sent via the website, freepost address or consultation email address. Feedback will be set out in a consultation feedback report that we will publish on our website.

Section 7 – Next steps

After the consultation has closed, we will review our proposals, considering your feedback.

Future operations

Later this year, we will be seeking your views on **our preferred scheme for Heathrow expansion**. It will cover our proposals to build and operate a new runway at Heathrow as well as the infrastructure required for expansion and importantly, we will also be asking you how we will manage and mitigate the effects of our growth.

Following this we will again review your feedback to help us reach a final plan for the expansion of the airport. We are on track to submit our application for development consent in 2020 and for our new runway to open in 2026.

Airspace change for expansion

Following analysis of your feedback we will develop our flight path options. We will also undertake continued engagement with representatives of our local communities and other stakeholders. We will set up stakeholder focus groups in some areas, to include people who haven't engaged with us before. We expect this engagement to take place in 2020-2021.

We will assess each option against our design principles and will present them to you at our final consultation, currently planned for 2022. You will have another opportunity to provide your feedback at this final, statutory, consultation.





**AIRSPACE &
FUTURE OPERATIONS**
CONSULTATION

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
0800 307 7996 (open Monday to Friday, 9am-6pm)



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