AIRSPACE MODERNISATION AIRSPACE CHANGE PROPOSAL

ANNEX 4 - CLOO RESIDENT FOCUS GROUPS AND SCHOOLS FOCUS GROUPS JANUARY 2023

Heathrow

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January 2023

Airspace Modernisation

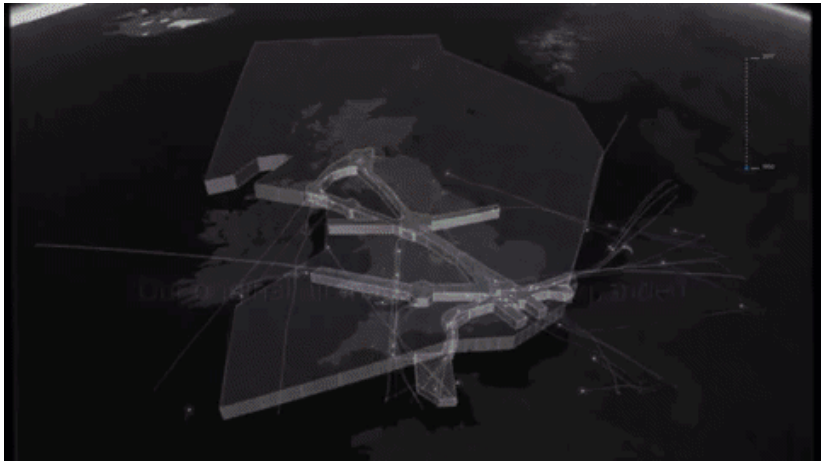
Step 2A Engagement: Resident Focus Group

The UK's Airspace

Heathrow has committed to modernise its airspace to help deliver the Government's Airspace Modernisation Strategy (AMS), along with other major airports and airfields in the UK.

The basic structure of UK flight paths was designed in the **1960s**, but a lot has changed since then:

- Demand for aviation has increased significantly
- Aircraft types have advanced and the way they fly has changed
- Navigation technology has evolved



The aims of the strategy are to:

- ✓ Make airspace more efficient,
- ✓ Reduce delays,
- ✓ Reduce CO_2 emissions,
- ✓ Reduce noise;
- ✓ Enhance safety; and
- ✓ Ensure there is capacity to meet future demand.

"Deliver quicker, quieter, and cleaner journeys"

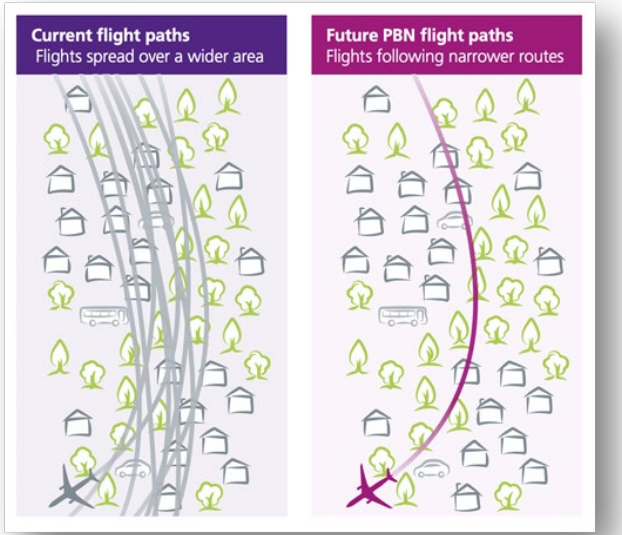
The introduction of performance-based navigation (PBN) is key to achieving airspace modernisation

Heathrow's new flight paths will use PBN.

PBN improves the accuracy of where aircraft fly by using modern satellite navigation and moving away from outdated and conventional navigation techniques using ground-based beacons (it is similar to GPS "sat nav" devices that most people use in their cars today).

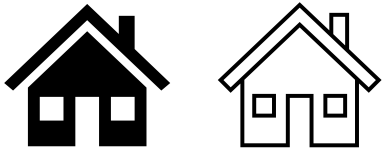
PBN allows more flexible positioning of routes and enables aircraft to fly them more accurately. This helps improve operational performance and reduce delays. It also provides opportunities to avoid noise sensitive areas.

Heathrow understand that narrower flight paths due to the introduction of PBN is a concern to some local communities. They are looking at options for mitigating the potential impacts of PBN through their new airspace design.

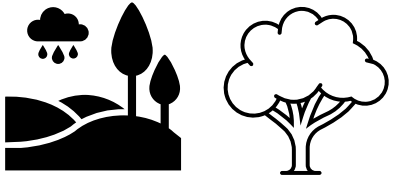


Heathrow need to consider all community and environmental groups who might be impacted

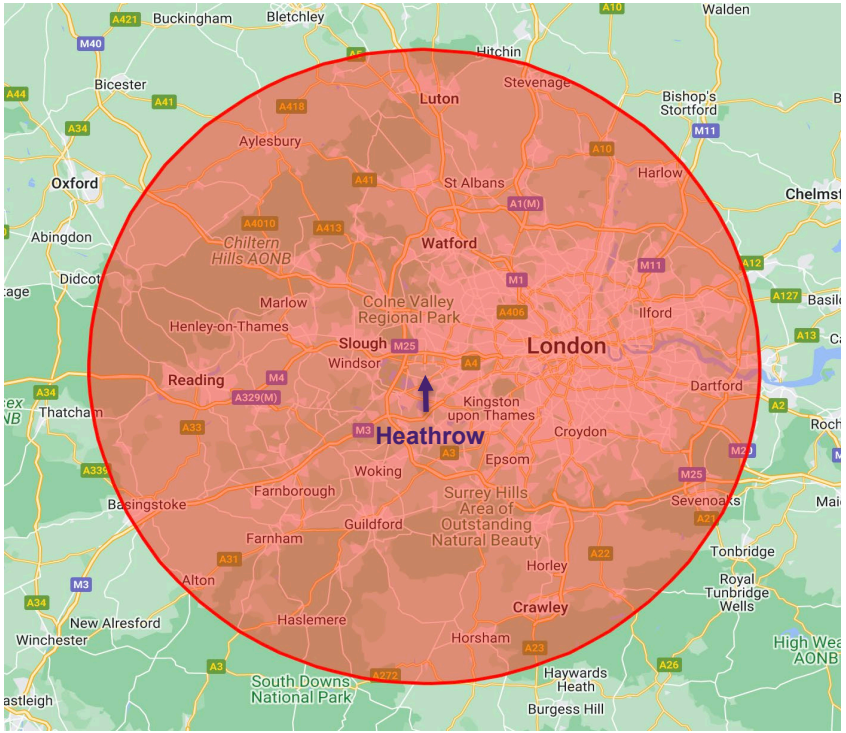
This ACP will result in changes to Heathrow's flight paths and to the areas overflown by them.



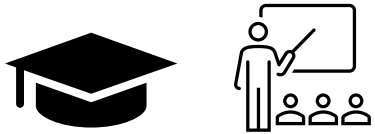
Local communities



Local & national parks



Heathrow have identified the area that could potentially be affected by this airspace change. This area may change as the proposal develops.



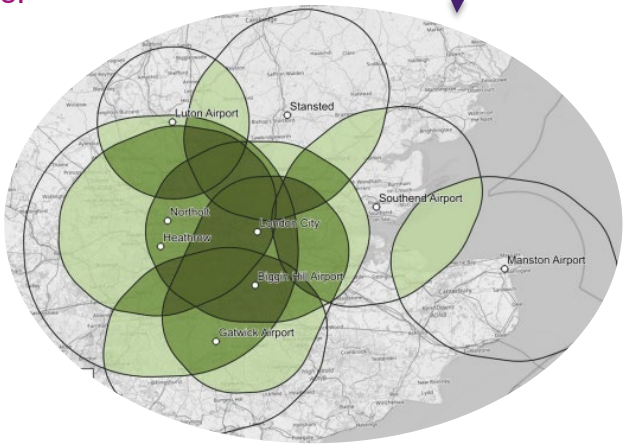
Local schools & universities

Councils & hospitals

Heathrow

Heathrow also need to consider a range of different aviation industry groups who might be impacted by the new airspace design

NATS are redesigning all UK airspace above 7,000ft and all flight paths to/from the airports need to integrate with this.



Neighbouring airports are also developing their own airspace modernisation plan.

UK Civil Aviation Authority

Department for Transport

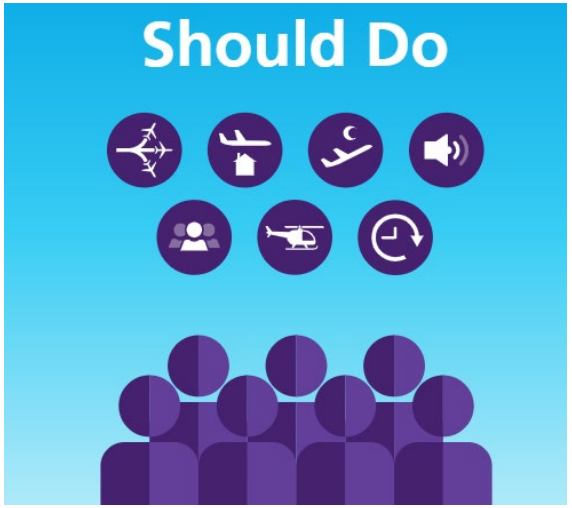
Heathrow must follow Government Policy and regulation when designing and assessing flight paths.

Airlines and airspace users must be kept up to date with any airspace change.

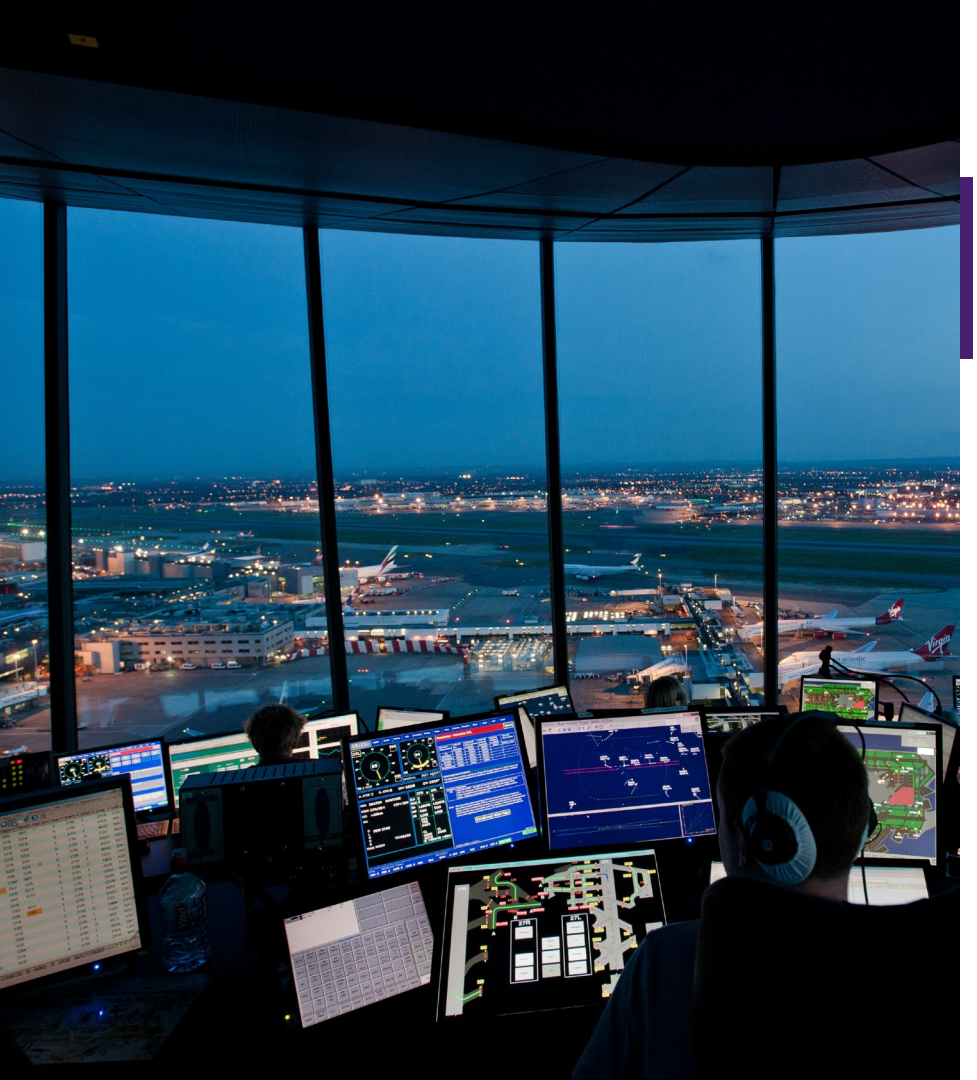
We set “Design Principles” early last year as objectives for the airspace design

The 12 Design Principles are things Heathrow 'must' and 'should' consider when redesigning flight paths.

- Be safe
- Remain within UK policy, regulation and legislation
- Use noise efficient operational practices where possible
- Reduce CO2 emissions
- Enable efficient use of 2 existing runways



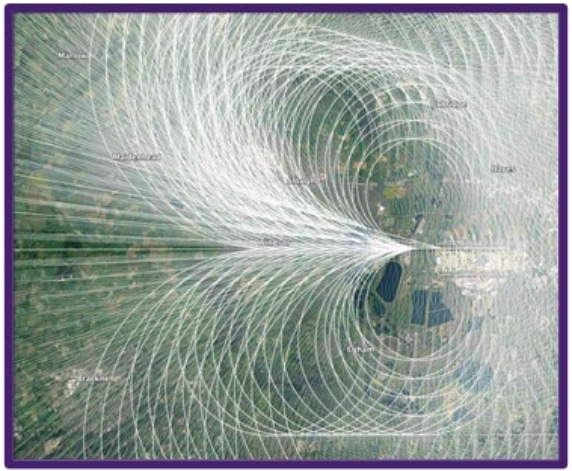
- Provide respite to those affected by noise
- Avoid overflying the same communities
- Minimise the negative impacts of late running flights
- Minimise the number of people experiencing more noise
- Minimise the total number of people overflown
- Consider operations of other airspace users
- Minimise the impact of changes to all stakeholders



Developing routes

Heathrow's Approach to Developing Options

Flooding:
Heathrow's approach to options development began with 'flooding' the area with hundreds of thousands of notional tracks drawn to/from each of the four runway ends to common upper airspace network points around the UK.



Sample of 'flooded' notional tracks for westerly departures from the northern runway – known as "27R departures"

Analyse:
They then analysed the tracks to see how well each one might achieve the design principles using both data and input from the Airspace Design Team. As a result, the number of tracks has been reduced.

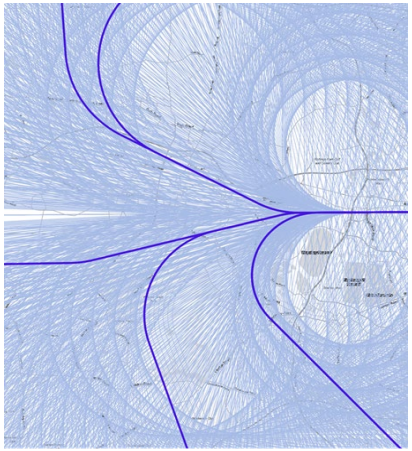


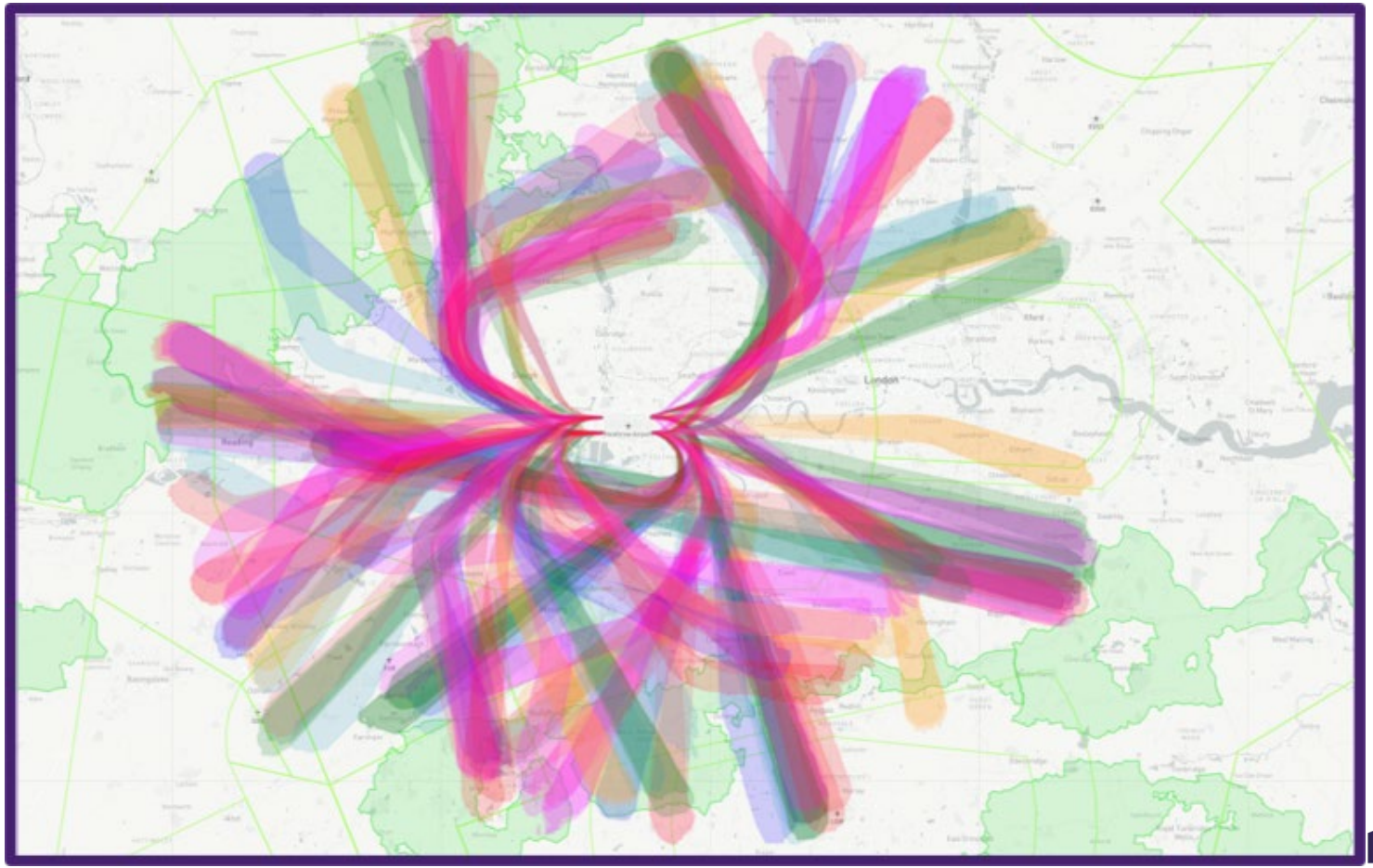
Illustration of the selection of notional tracks

Develop:
The team's air traffic control expertise was applied to select notional tracks that are likely to be operationally viable by considering issues such as:

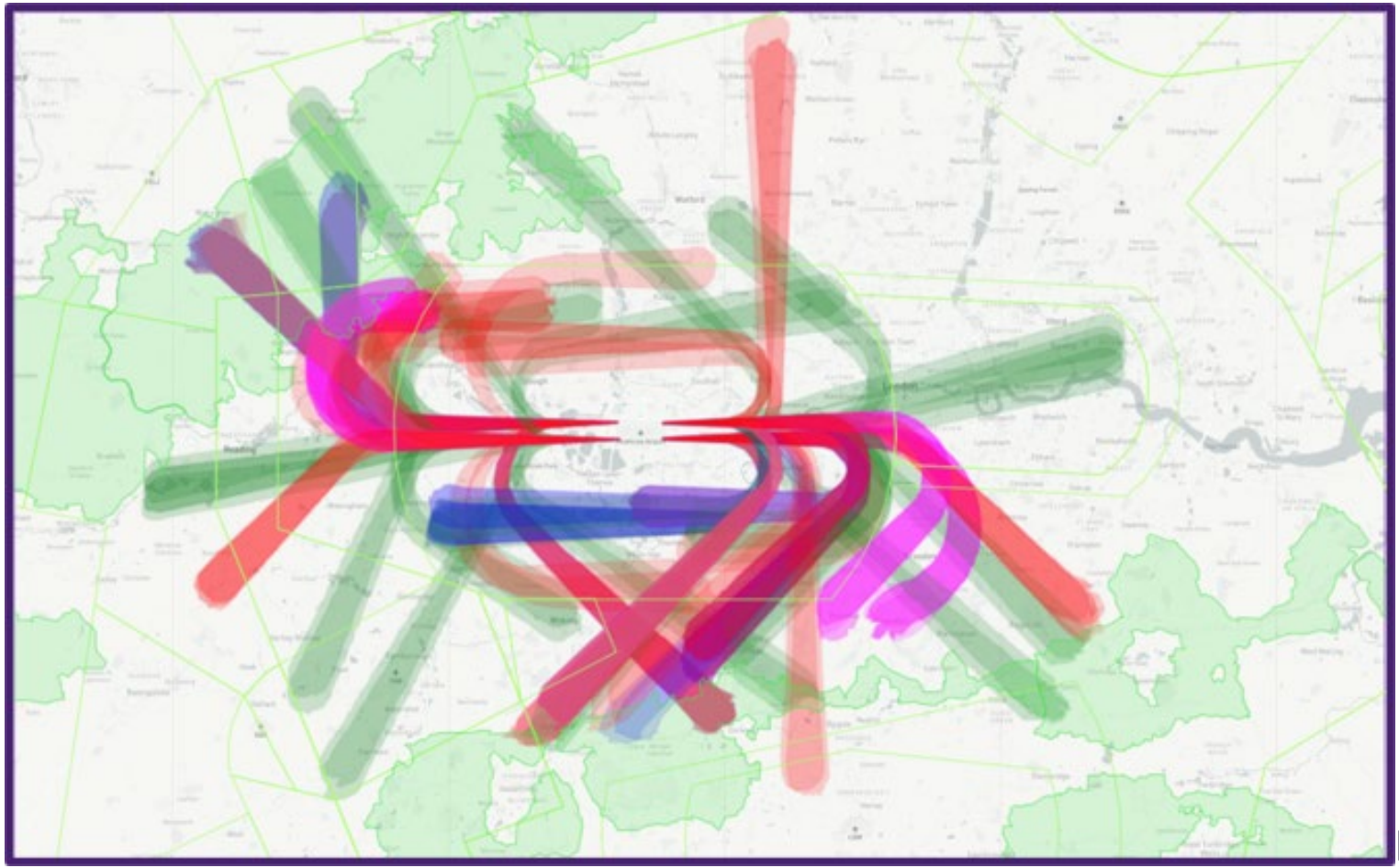
- Safety
- Surrounding airports
- Aircraft capability
- Sufficient separation from other routes

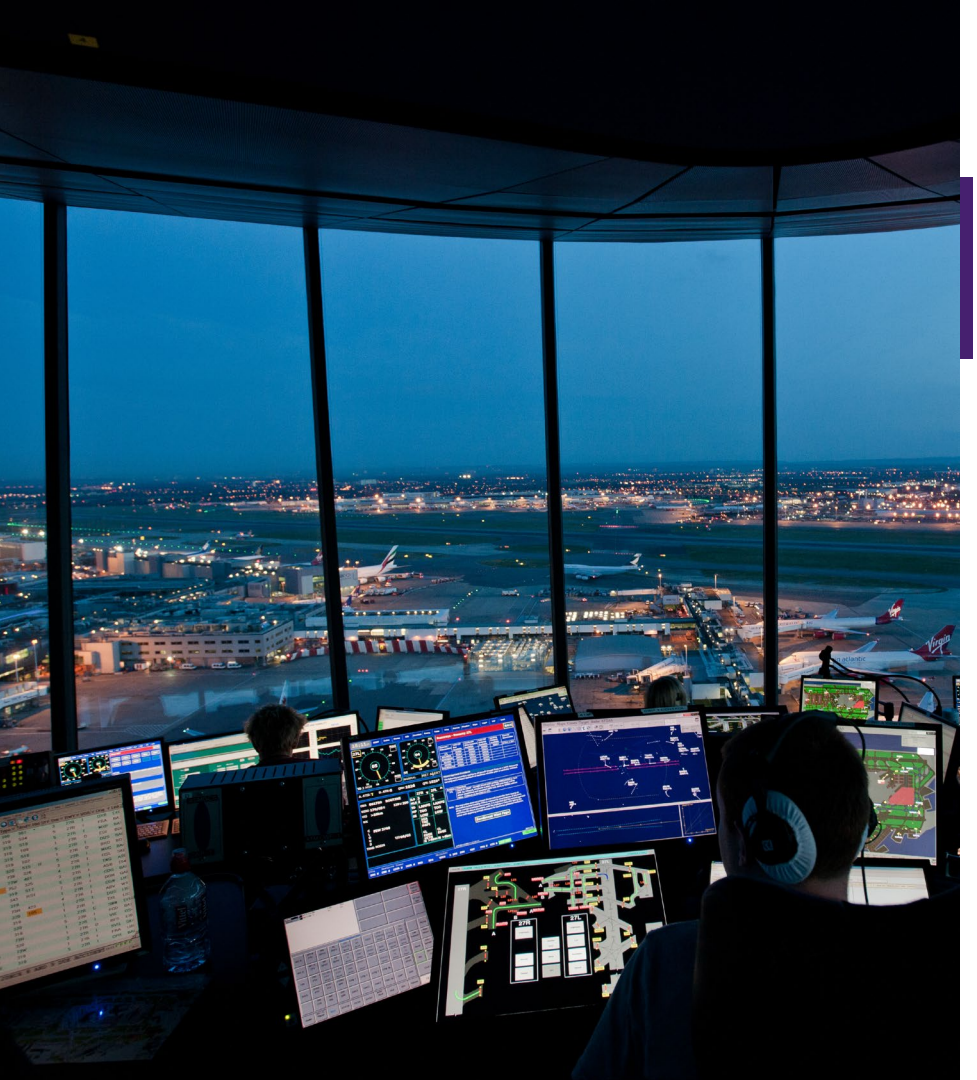
All flight path options designed to meet Design Principle 4 (direct flight paths to reduce carbon emissions)

All PBN Departure Options



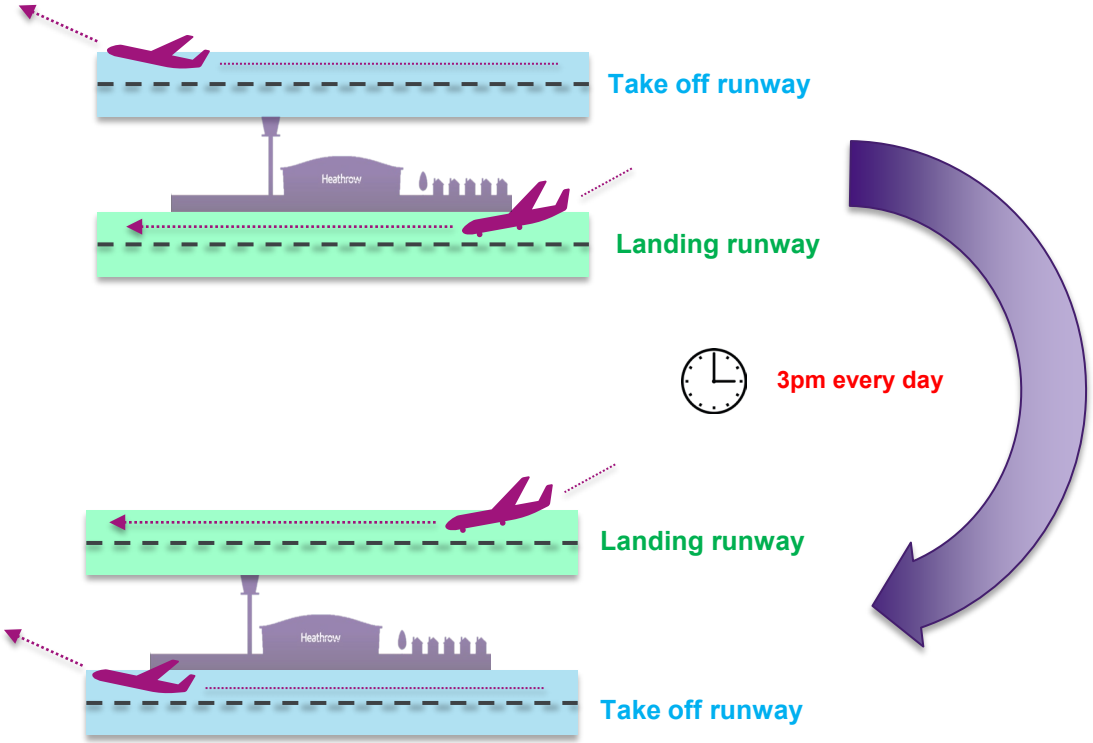
All PBN Arrival Options





Relief or respite from noise

How Heathrow operates its runways today to provide respite

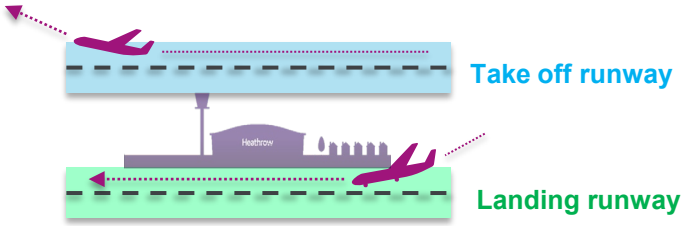


At Heathrow, there are two runways. Currently, they use one runway for aircraft taking off and the other runway for aircraft landing.

Swapping the runways means a fairer distribution of noise (respite) for the communities living under the flight paths

Delivering respite or relief from noise

1. **Respite via runway alternation**
2. Respite via route alternation
3. Relief via dispersion



Today's departure routes from both runways merge shortly after departure. This means that communities underneath those departure routes don't benefit from runway alternation to the same extent communities under arrivals might.

Today's easterly departure routes

ILLUSTRATIVE

Example of how Heathrow could design different flight paths to keep routes from the two runways separate

Heathrow are investigating whether departure routes from adjacent runways can follow different flight paths for longer to increase the number of people who benefit from runway alternation.

This can create issues too, since more people would be overflown.

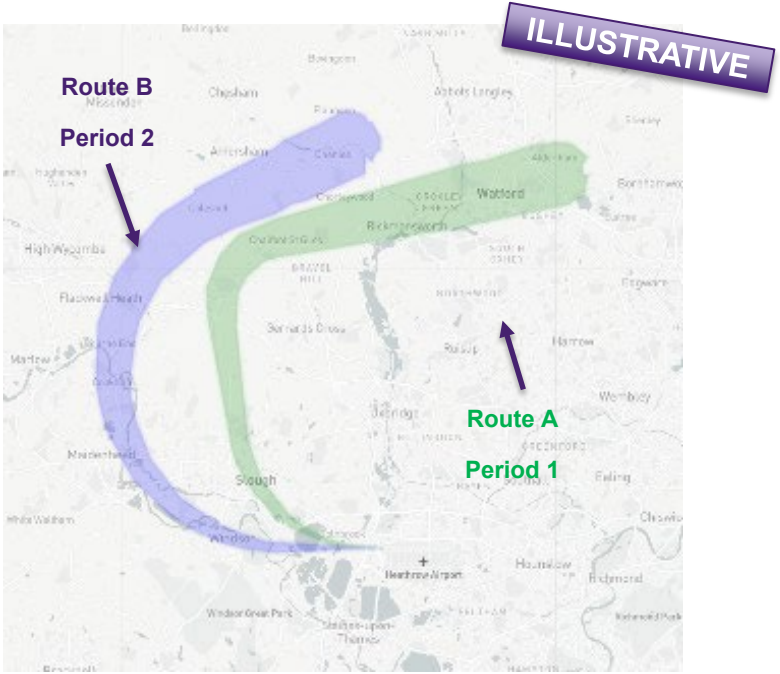
Heathrow

Delivering respite or relief from noise

1. Respite via runway alternation
2. **Respite via route alternation**
3. Relief via dispersion

Heathrow is exploring whether they could use different flight paths for a Departure or Arrival route at different times of the day to offer respite to overflown communities.

They will assess the effectiveness of these potential departure flight paths against factors including population, CO_2 emissions, noise, and operations.



Two potential departure flight paths heading towards the same point;

Route A could be used during Time Period 1

Route B could be used during Time Period 2

Heathrow

Heathrow have identified three potential concepts for *respite* or *relief* from noise

1. Respite via runway alternation
2. Respite via route alternation
3. **Relief via dispersion**

Relief
A break from, or a reduction in, aircraft noise
Respite
Scheduled “relief” from aircraft noise for a set period of time

Navigation of aircraft today is less precise than PBN, so leads to some natural dispersion of aircraft within today's routes

Heathrow is considering using different techniques to enable dispersion within a PBN environment, in collaboration with other airports.

Dispersion of flight paths within an allocated route would not give the significant break in noise required for "respite", but it could offer "relief" from noise for overflown communities.

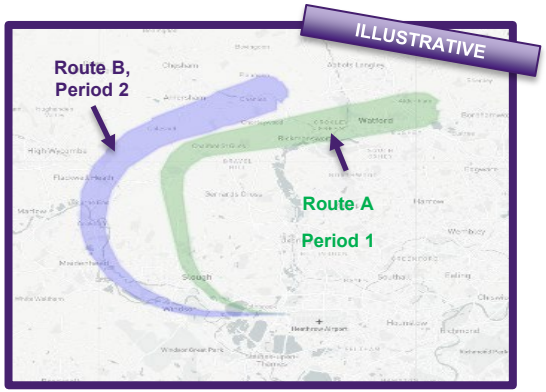
Which concept do you like best for providing overflown communities with a break from noise?

1 Respite via runway alternation

- \+ Overflown communities are given a break from noise for half of the day
- − More communities overflown than today

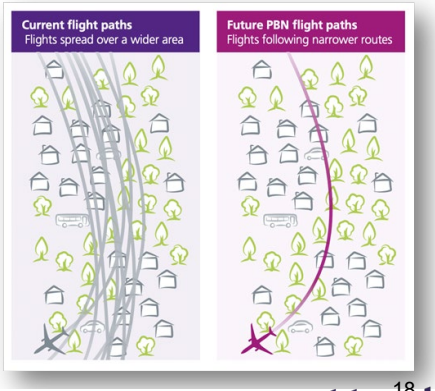
2 Respite via route alternation

- \+ Provides guaranteed breaks from noise for overflown communities
- − More communities overflown, more fuel burn on some routes

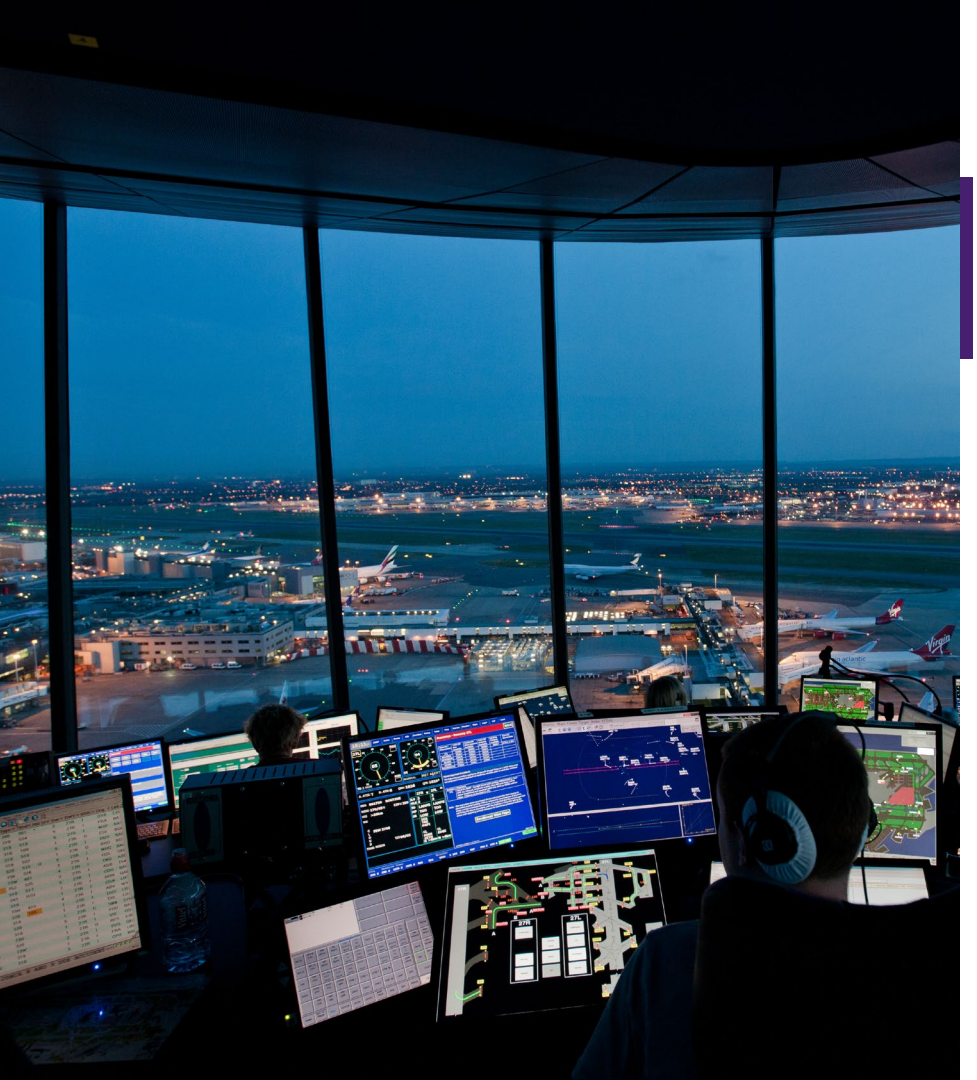


3 Relief via dispersion

- \+ Overflown communities experience fewer aircraft directly overhead
- − More people overflown, and less predictability about when aircraft will be overhead



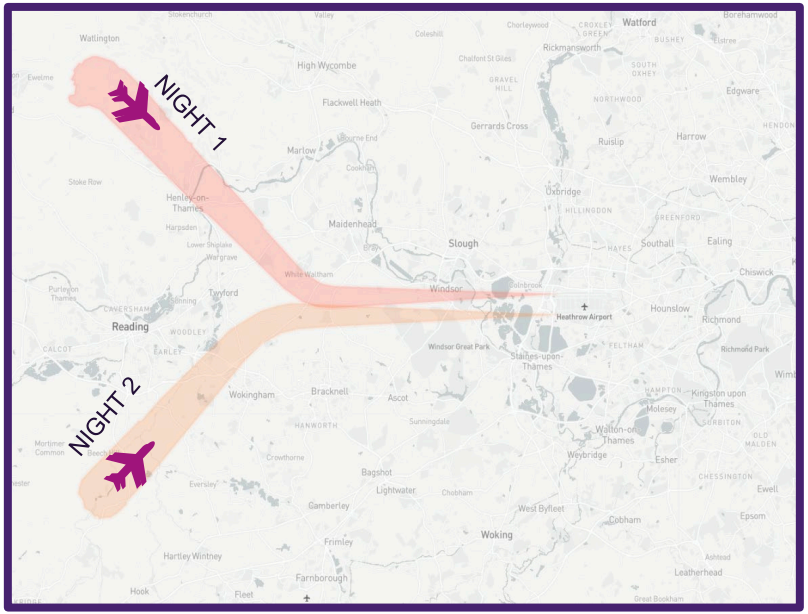
Heathrow



Minimising the effects of night flights

Minimising the negative effects of night flights

1 Early Morning Arrivals



Heathrow is exploring the use of 'switching on' PBN arrival flight paths for early morning hours (4:30 – 6am) to offer respite to overflown communities.

Flight paths could be alternated to ensure the same communities are not overflown each morning.

- ➕ Same communities not disturbed by noise each morning as it is spread across a few different routes
- ➖ Overflown communities will experience more flights overhead on the days their PBN arrival flight path is used

Minimising the negative effects of night flights

2 Late Departure Routes

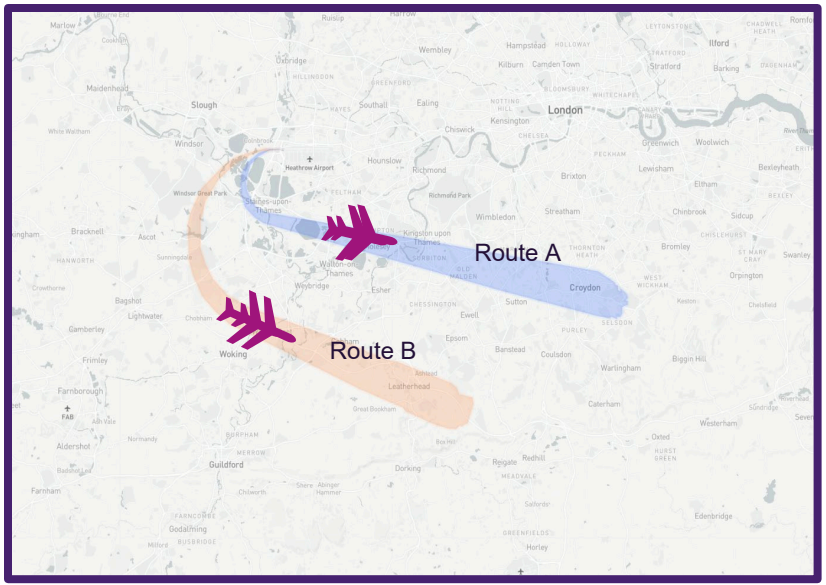
Heathrow is considering using ‘unique’ departure routes for occasional late running departures at night.

These departure routes could vary on a rotation pattern to reduce the disturbance experienced by communities.

- ➕ “Shares” late night flights across different communities
- ➖ Additional communities overflown late at night

Minimising the negative effects of night flights

3 Extra Departure Routes



Heathrow is considering the ability to ‘switch on’ additional departure routes to allow for extra capacity for flights to depart during the day, therefore reducing the risk of late running flights after 11pm.

- ⊕ Quicker recovery from disruption: fewer late-running flights into the night
- ⊖ Unpredictable overflight for communities late during the day

Any Questions?

HEATHROW AIRSPACE MODERNISATION
STAKEHOLDER ENGAGEMENT

Report of residents' focus groups
10 & 11 January 2023

Heathrow
Making every journey better

Headland

Contents

1. About this report

During Step 2A of its Airspace Change Proposal to deliver airspace modernisation, Heathrow is engaging with various potentially affected stakeholders. As part of this engagement, Heathrow wanted to hear directly from residents in areas which are currently overflown and/or might be overflown in the future.

Through this process, Heathrow wanted to hear from residents who do not typically engage with them and provide information about airspace change which would likely be new to them. This exercise sought to understand what these stakeholders thought on the process that Heathrow is following and explore concepts that Heathrow is developing to achieve respite and minimise the impact of night flights.

Headland Consultancy was engaged to support this work. Following guidance from Heathrow, Headland designed a research methodology and conducted two focus groups (moderated by an Association of Qualitative Research-qualified moderator). This report was written by Headland to reflect the findings and conclusions arising from the focus group.

These focus groups followed similar sessions held with residents in Wycombe, Windsor, Brentford & Isleworth, and Mitcham & Morden, as part of Heathrow's engagement for Stage 1 of this Airspace Change Proposal.

2. Methodology

Two focus groups were held on 10 and 11 January 2023, each lasting 1 hour 45 minutes. The focus groups were held in person in Bracknell on the first night, and in Surbiton on the second. Each group was recruited to contain ten participants, with 1 of the 20 unable to attend for personal reasons. Participants were recruited by independent qualitative fieldwork agency Leftfield International, and following standard practice in market research were each incentivised with a £50 cash payment.

Participants were assigned to a group depending on their age, gender, and location, with a range of demographics represented across the two groups. This is also standard practice in market research: focus group participants are more likely to speak openly when they share a similar background or characteristics to the other participants, without going so far as to recruit a group of near identical individuals. The division by location is helpful because it allows the groups to speak about their common experience of the impact of aircraft and the airport on their area.

Participants were also screened according to certain other characteristics and attitudes. In order to speak to residents who do not have strong opinions about Heathrow's operations, we excluded anyone with strong views in favour or against the impact of Heathrow on their area. We also excluded participants who work in, or who share a household with anyone working in any of the following industries: advertising, journalism, public relations, market research, marketing, media, aviation or at Heathrow itself.

In selecting the location of the groups, we sought to meet the following criteria:

- Residents of Surbiton
- Residents of Bracknell

See Fig 1 for an indication of the locations that participants were drawn from relative to typical current flight paths.

A. Bracknell
B. Surbiton

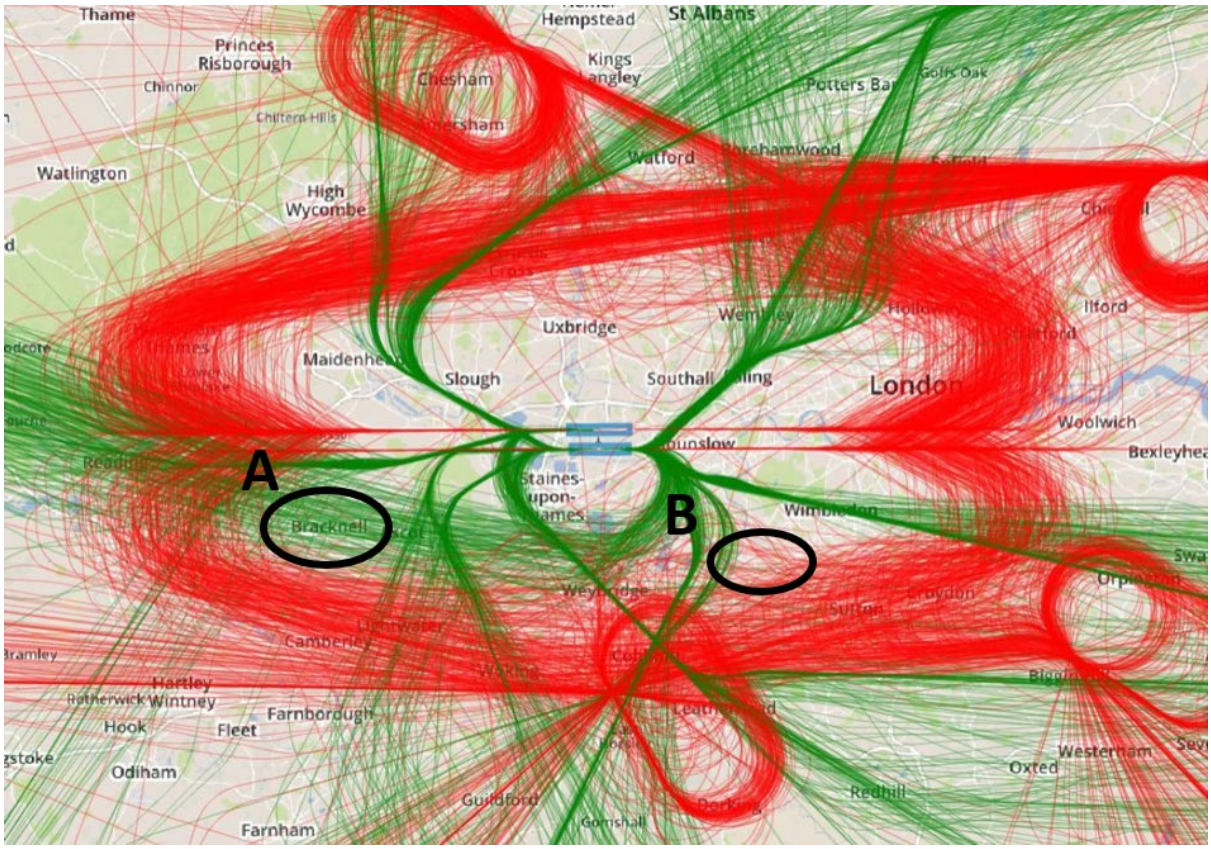


Fig. 1. Approximate locations that residents were recruited from.

3. Topics discussed

Both discussions followed this structure:

- Introduction
- Views and opinions on Heathrow and discussion of its local impacts
- Introduction to airspace modernisation and Performance Based Navigation (PBN)
- Explanation of the stakeholder groups that Heathrow must consider when assessing the impact of airspace modernisation
- Presentation of Design Principles
- Explanation of Heathrow's approach to developing flight path options
- Presentation of three concepts for respite from noise that Heathrow is exploring:
    - Runway alternation
    - Route alternation
    - Relief via dispersion
- Presentation of three concepts Heathrow is exploring for minimising the effects of night flights:
    - Early morning arrivals
    - Late departure routes
    - Extra departure routes

The topics listed above were presented in slides shown on a projector screen (containing text and illustrative diagrams) which was read out and explained by the moderator, as well as provided to the participants in the form of a physical copy. Participants consented to their views being recorded for this report.

4. Findings

Comments from both discussions are included.

Airspace Modernisation

After introducing the participants to the concept of the airspace modernisation, including its stated objectives, the initial reaction was that of positivity.

> On face value it [the changes] sound positive. All those things you listed I think it sounds like they are working and striving for the right changes rather than selfish decisions. It does sound like they are considering all elements.
>
> *Female, Bracknell*

However, residents in both Bracknell and Surbiton stated that it was hard to fully comment on the issue as these areas are not currently overflown to the extent that aircraft noise is noticed very much, although aircraft can currently be seen.

> I think it's quite hard to comment on it until you're directly impacted by it, so as someone who's never lived under a flight path, I don't know how that would be. If this impacted where I live perhaps, or where I was intending to live moving forwards, then I'd be able to comment on it more.
>
> *Male, Bracknell*

The concern raised by both groups was whether these changes would lead to more flights over areas like Bracknell and Surbiton; however, many wondered whether they would even notice increased noise levels, given that the aircraft are too high to be heard today in these areas and probably would be in the future.

> I think it all sounds very good and positive as long as it doesn't lead to more planes over Surbiton.
>
> *Male, Surbiton*

> For me thinking about growing up, the only thing I took notice of was noise [rather than other issues such as air pollution etc], and actually they're just going to be high enough in the sky around here to not hear them.
>
> *Female, Bracknell*

> You really don't [notice them], you see them, but you don't hear them.
>
> *Male, Surbiton*

Concern was raised in both groups that Heathrow would use this airspace change to their commercial advantage at the cost of communities. However, this didn't necessarily lead to a conviction against change, with participants in both groups saying that Heathrow is good for the wider UK economy.

> If they're thinking we can reduce costs on fuel, for example, and prioritise money at the end of the day over the people that it's affecting that isn't good.
>
> *Male, Surbiton*

> It's the economy isn't it… I know there's arguments for and against but you're looking at jobs to offer to people, so that people can either change careers or get promoted within the right sector… so I think it's massively positive.
>
> *Male, Bracknell*

It was reminded in both groups of the wider context that this is a government mandated process and part of a national programme to modernise airspace.

> I think that's a point that it might be worth making when you're talking to people, that it's not something they [Heathrow] thought up and want to do, it's basically being forced upon them by the government.
>
> *Female, Bracknell*

Participants spontaneously brought up the possible effect that Covid has had on community feedback towards noise, with questions as to whether the shift towards home working had led to more people noticing noise. They asked whether Heathrow needed to take account of this shift in where the population spends its time.

> I wonder what the difference would be like if you'd done this pre-Covid versus post-Covid because I wonder, for instance, if there were more people going out to work during the day and not really caring about the noise before, versus now a lot of people are working from home and they are much more conscious of the noise.
>
> *Male, Surbiton*

Process for developing a Comprehensive List of Options

The process that Heathrow is following to develop flight path options was received well by both sets of participants. Participants commented that the techniques seemed logical and that by generating many data points it appears that Heathrow were taking a lot of different considerations into account.

> I think it sounds clever, really clever – I didn't realise how much went into these plans.
>
> *Male, Surbiton*

We explained to participants that Heathrow's approach to developing flight path options was to start with a "blank sheet of paper" when designing routes, rather than starting from existing routes and making changes. This led to discussion within both groups as to whether this had been the best choice in method. Those in favour deemed this approach to be 'brave' and stated that the only way to achieve the ambitious objectives that Heathrow had set themselves was by making big changes to airspace design. This seemed to be the majority view.

> I think that having to factor in all of these different approaches, such as aircraft changing as well, means that the blank paper approach is the only option to be able to assess all the different considerations.
>
> *Female, Surbiton*

Some residents discussed the possibility that by making big changes to routes that are currently in place, the numbers of people newly affected by aircraft noise could be much higher. They believed that those who are already in areas affected by flight paths are used to it, and that those choosing to move to that area will know to expect overflight and potential noise impacts.

> The people who have experienced it, or maybe they've chosen to live in those areas, they've had to accept it already, whereas the other haven't.
>
> *Female, Surbiton*

Those who disagreed with the blank slate approach also stated that the areas currently affected have already experienced the impact on house prices, and that by possibly affecting new areas, the negative impact on associated house prices would be detrimental.

> Why would you potentially drive the price of housing down in more areas when you could affect less people. If you applied that to any other negative impact on someone's life, you would always say to affect less people.
>
> *Male, Surbiton*

Both groups of residents agreed that provided the decision-making process was fair for all stakeholders involved, and that it was not based on factors they considered "arbitrary", such as who "shouted loudest" or the wealth of the area, then it seems reasonable.

> If you can show the evidence that there's not an initial bias that, for example, they [Heathrow] don't want to go over rich people's houses and show that this is an open process with all the risks considered and reasoning that is good.
>
> *Male, Surbiton*

However, both groups of participants pointed to the lack of hard data/evidence available on the amount of people overflown and likely noise impact of aircraft to be able to accurately compare and

decide on processes that they agreed with. They understood that at this stage this was not possible but would be provided in future consultations.

Respite

The concept of respite was popular among residents, but the implications of spreading out the impacts of noise resulted in a debate around whether it is better to affect more people most likely to be newly overflown, or to affect fewer people in the same communities, but more intensely.

> It's a very difficult question, it's like a moral question. You can speak about it objectively as having all of the impact on some people or half the impact on twice as many people, but the answer might be completely variable from person to person.
>
> *Male, Bracknell*

This had an understandable impact on which concept for achieving respite was preferred. We presented three potential concepts:

1. **Runway alternation** – Heathrow is investigating whether departure routes from adjacent runways can follow different flight paths for longer to increase the number of people who benefit from runway alternation.
2. **Route alternation** – Heathrow is exploring whether they could use different flight paths for a Departure or Arrival route at different times of the day to offer respite to overflown communities.
3. **Dispersal for relief** – Heathrow is considering using different techniques to enable dispersion within a PBN environment, in collaboration with other airports.

Participants agreed on the idea that greater sharing of impact would mean **new** people being overflown. The idea of overflying new communities to achieve respite was not rejected, but that overflying existing communities was preferable.

> At the moment the people that live there know the planes are going to fly there and you've had to accept that when choosing where to live, or staying where you live – whereas people who might be newly affected are not used to it at the moment and haven't got a tolerance and would be most annoyed.
>
> *Female, Bracknell*

There was an extensive debate between Concepts 1 and 2 for achieving respite, with Concept 1 being narrowly preferred. Participants suggested that shorter periods of alternation (i.e. within the day) were preferable, because longer periods would make it harder to tolerate the noise when it returned. They also suggested that the potentially longer routes, greater fuel burn, and perceived lower operational efficiency of Concept 2 were problematic in comparison to Concept 1.

> I think it's worse [route alternation], I think the original version [runway alternation] is better, because I think you're going to disrupt more people who haven't experienced it, whereas the people who have experienced it or maybe have chosen to live in those areas, they've already accepted it.
>
> *Female, Surbiton*

> If you have a week of nothing, then you have a week of noise, you'll be like this is hell, then it'll be off again. Whereas if you have it constantly, you'll gradually get used to it.
>
> *Female, Bracknell*

> The second one [route alternation], is a waste of time – you're getting a new route that's affecting new people and you're burning twice the amount of fuel, so that's a no-go area, a no brainer.
>
> *Male, Surbiton*

Concept 3, dispersal for relief, was not received well across both groups. Participants felt that this did not provide sufficient relief with the aircraft still flying near enough to affect those on the ground regardless of whether it was directly overhead. They believed the noise would be continual, as opposed to the definite, guaranteed break from noise offered by Concepts 1 and 2 for respite. It is

worth pointing out that with none of the participants currently experiencing intense aircraft noise, they acknowledged that they struggled to imagine what the effects of PBN-led concentration might be. But they also thought it would be unlikely to affect their area regardless, because of the anticipated height of the aircraft.

> It's [dispersal] not going to change anything on the noise levels. If you live anywhere on that picture, you're still going to experience it, whether it's constant or whether you've got breaks - it's still going to be in that area.
>
> *Female, Surbiton*

> By the time it gets to this distance it's going to be 5, 6 thousand foot high at least, so even if it had changed completely to going above us, it's not going to be [noticeable] here.
>
> *Female, Surbiton*

Night flights

We presented three concepts as to how Heathrow would handle early-morning arrivals and late-night departures:

- **Early morning flight arrivals** – Heathrow is exploring the use of 'switching on' PBN arrival flight paths for early morning hours (04:30 – 06:00am) to offer respite to overflown communities. Flight paths could be alternated to ensure the same communities are not overflown each morning.
- **Late departure routes** – Heathrow is considering using 'unique' departure routes for occasional late running departures at night. These departure routes could vary on a rotation pattern to reduce the disturbance experienced by communities.
- **Extra departure routes** – Heathrow is considering the ability to 'switch on' additional departure routes to allow for extra capacity for flights to depart during the day, therefore, reducing the risk of late running flights after 11pm.

Early morning arrivals and late departure routes were treated similarly across the groups, with the consensus being that residents thought night-time was a more sensitive period and that the priority should be to expose the least amount of people to noise. They assumed that it would be harder for residents to become used to noise during this more sensitive time. This was a clear finding from the groups, in contrast to the respite discussion, where participants were evenly divided on the benefits and drawbacks of concepts to create respite.

> I think ultimately if you're used to that every morning, with it being that time, I guess you become used to being able to sleep through, or whatever your coping mechanism is with it – so alternating it every other day is not really enough respite to actually make much of a difference.
>
> *Female, Bracknell*

> I would just say half as many people twice as intense, and just have it constant every single night - because ultimately why would you affect twice as many people potentially at the cost of twice as many properties in those particular areas?
>
> *Male, Surbiton*

Some residents did disagree however, stating that it would be better to avoid the same people being unable to sleep or disturbed every night by alternating routes and spreading out the impact of noise to affect less people. These participants were in the minority overall.

> It's better to alternate in my opinion, so that every morning you aren't being woken up in the middle of the night.
>
> *Female, Surbiton*

With respect to extra departure routes for late-night departures, participants were more likely to think about the benefits to passengers. They suggested that the priority should be to get waiting passengers and aircraft departing as quickly as possible to minimise delays. Participants empathised more with the passengers waiting for flights, relating to the feeling of travelling on holiday or returning

home. They suggested that given flight disruption was irregular and relatively short lived, it would be better to share the adverse impacts (terminal waiting times, knock-on delays, aircraft noise) and prioritise benefitting those travelling.

> I've got my consumer hat on my head on that one, I feel like if my late-night flight to Thailand got cancelled because there was only one route in all of the sky to leave, I'd be fuming – it's ad hoc disruption.
>
> *Female, Bracknell*

> I feel like if you're used to noise up to a certain time, and if we are only talking about half an hour to an hour, what's an extra hour? Rather than introducing it to a whole group of people that wouldn't be affected otherwise. By the time you notice the difference it would be too late anyway so does it really matter?
>
> *Female, Bracknell*

January 2023

Introduction to Heathrow Airport

Step 2A Engagement: Schools Focus Group

Heathrow

Agenda

Who knows anyone that works at Heathrow and what do they do?

Airspace Modernisation

What do you think airspace modernisation might mean?

Inside Heathrow's Control Tower. Source: NATS Press Office

Heathrow's four holding stacks, or 'waiting rooms' for arriving aircraft. Source: NATS Press Office

Heathrow's Airspace Modernisation

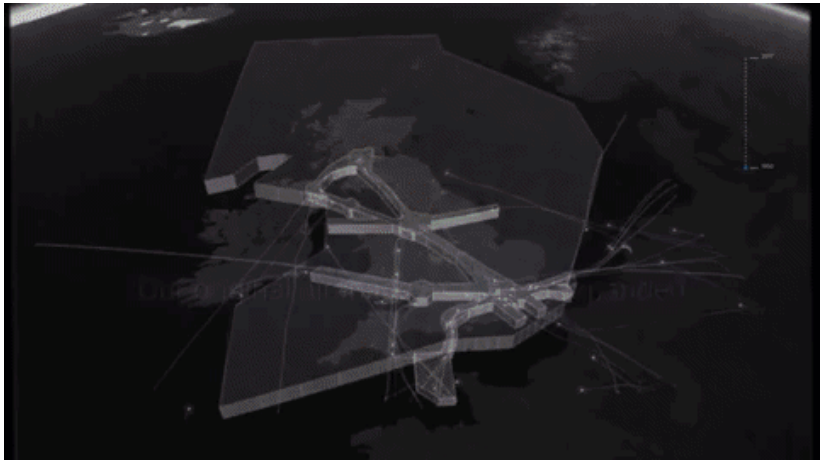
https://www.heathrow.com/company/local-community/noise/airspace-modernisation

The UK's Airspace

Airspace is the space above land that aircraft fly in.

Each day, around 6,000 aircraft and 600,000 people fly above our heads in UK skies.

Like a road network, airspace is a crucial 'invisible infrastructure' that helps connects people, businesses, and trade across the country and around the world.



The basic structure of UK flight paths was designed in the **1960s**, but a lot has changed since then:

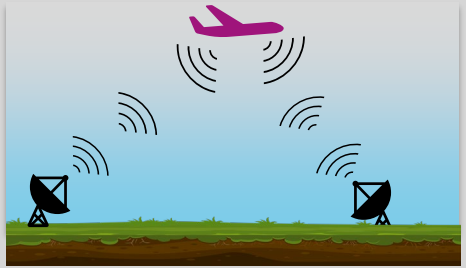
- Demand for aviation has increased significantly
- Aircraft types have advanced and the way they fly has changed
- Navigation technology has evolved

Performance-based navigation (PBN)

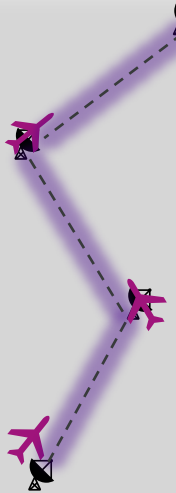
PBN improves the accuracy of where aircraft fly by using modern satellite navigation. This moves away from outdated and standard navigation techniques using ground-based beacons.

The Government has instructed UK airports to modernise their flight paths using PBN, and PBN is also being introduced at airports around the world.

Outdated Technology

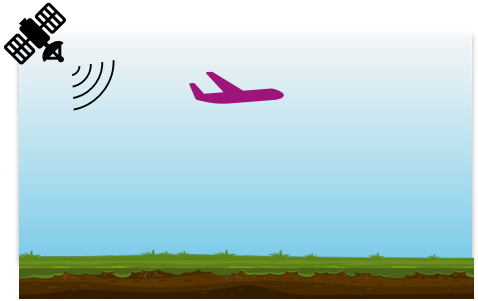


Ground based beacons provide navigation signals for the aircraft to follow

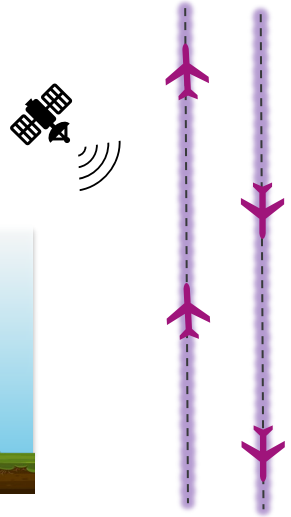


Beacons send signals intermittently so aircraft do not fly accurately on one path

Modern Technology

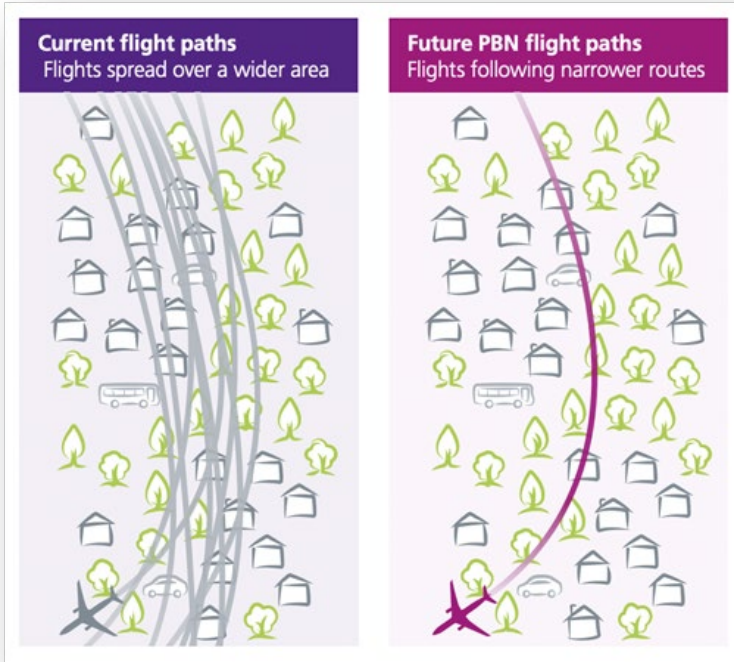


Satellites can provide aircraft with smoother navigation – like a car Sat-Nav



Aircraft fly more accurately and directly

Performance-based navigation (PBN)



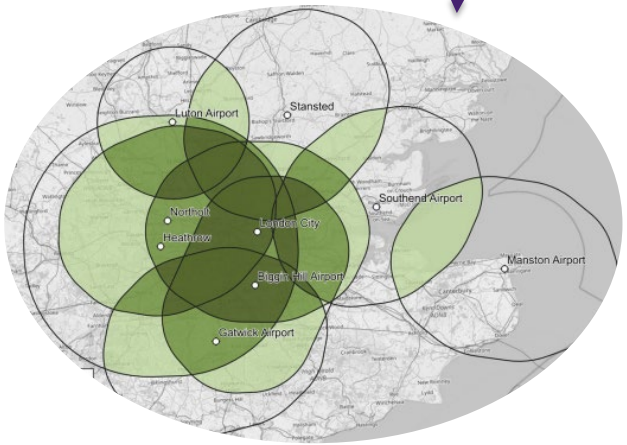
Using PBN allows an aircraft to fly more accurately on a narrower route, causing the potential of concentrated noise on the ground beneath.

But it also provides the flexibility to potentially introduce alternative flight paths that can be switched on and off to provide areas overflown with a break from aircraft noise.

We need to consider a range of different aviation industry groups who might be impacted by our new airspace design

NATS

NATS are redesigning all UK airspace above 7,000ft and all flight paths to/from the airports need to integrate with this.



Neighbouring airports are also developing their own airspace modernisation plan.

UK Civil Aviation Authority

Department for Transport

We need to follow Government Policy and regulation when designing and assessing flight paths.

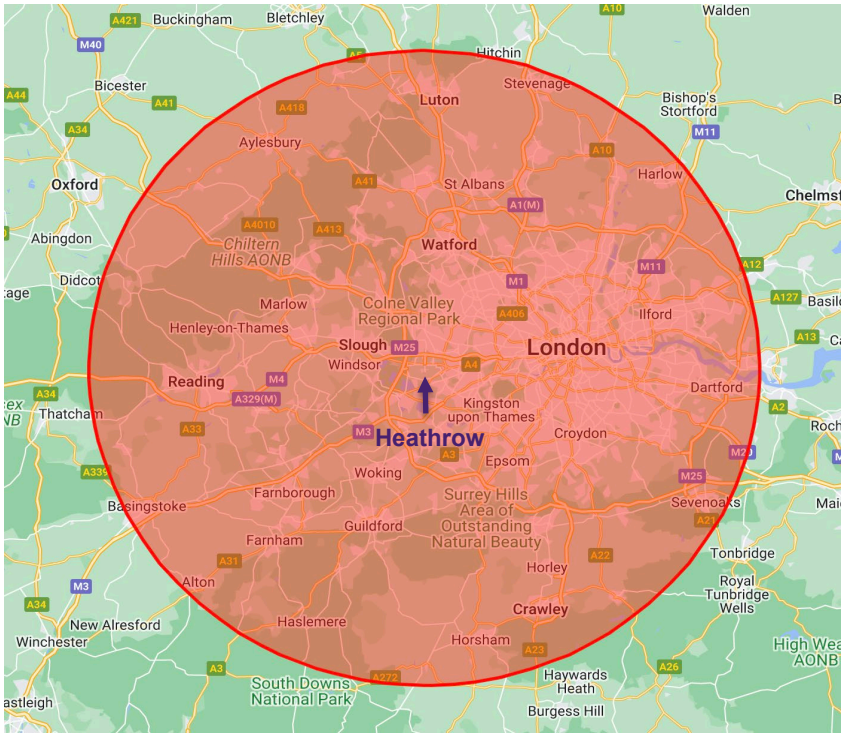
Airlines and airspace users must be kept up to date with any airspace changes.

Heathrow

We also need to consider all community and environmental groups who might be impacted

Local Communities

Local & national parks



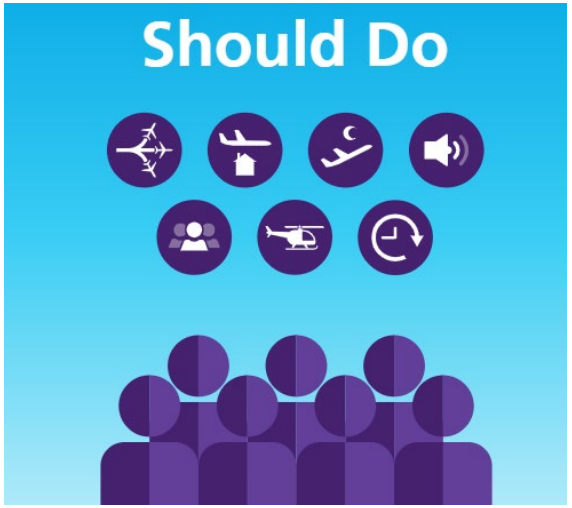
Local schools & universities

Councils & hospitals

We set “Design Principles” early last year as objectives for the airspace design

The 12 Design Principles are things Heathrow 'must' and 'should' consider when redesigning flight paths.

- Be safe
- Remain within UK policy, regulation and legislation
- Use noise efficient operational practices where possible
- Reduce CO2 emissions
- Enable efficient use of 2 existing runways

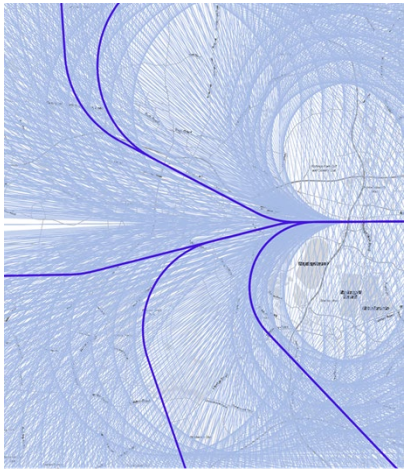


- Provide respite to those affected by noise
- Avoid overflying the same communities
- Minimise the negative impacts of late running flights
- Minimise the number of people experiencing more noise
- Minimise the total number of people overflown
- Consider operations of other airspace users
- Minimise the impact of changes to all stakeholders

Our approach to developing the Options – Flight Paths

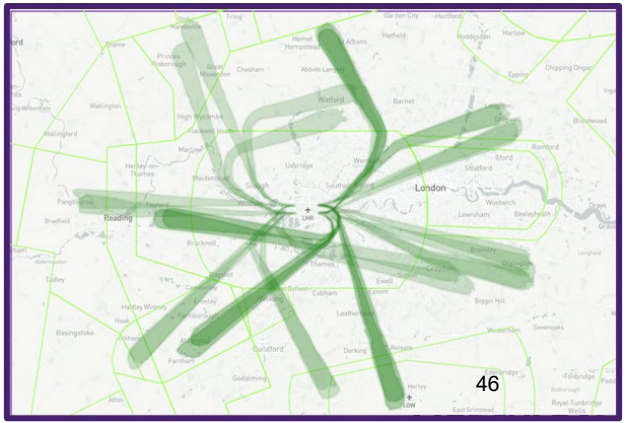
Flooding:
Our approach to options development began with ‘flooding’ the area with hundreds of thousands of lines drawn to/from each runway to common upper airspace network points in the UK.

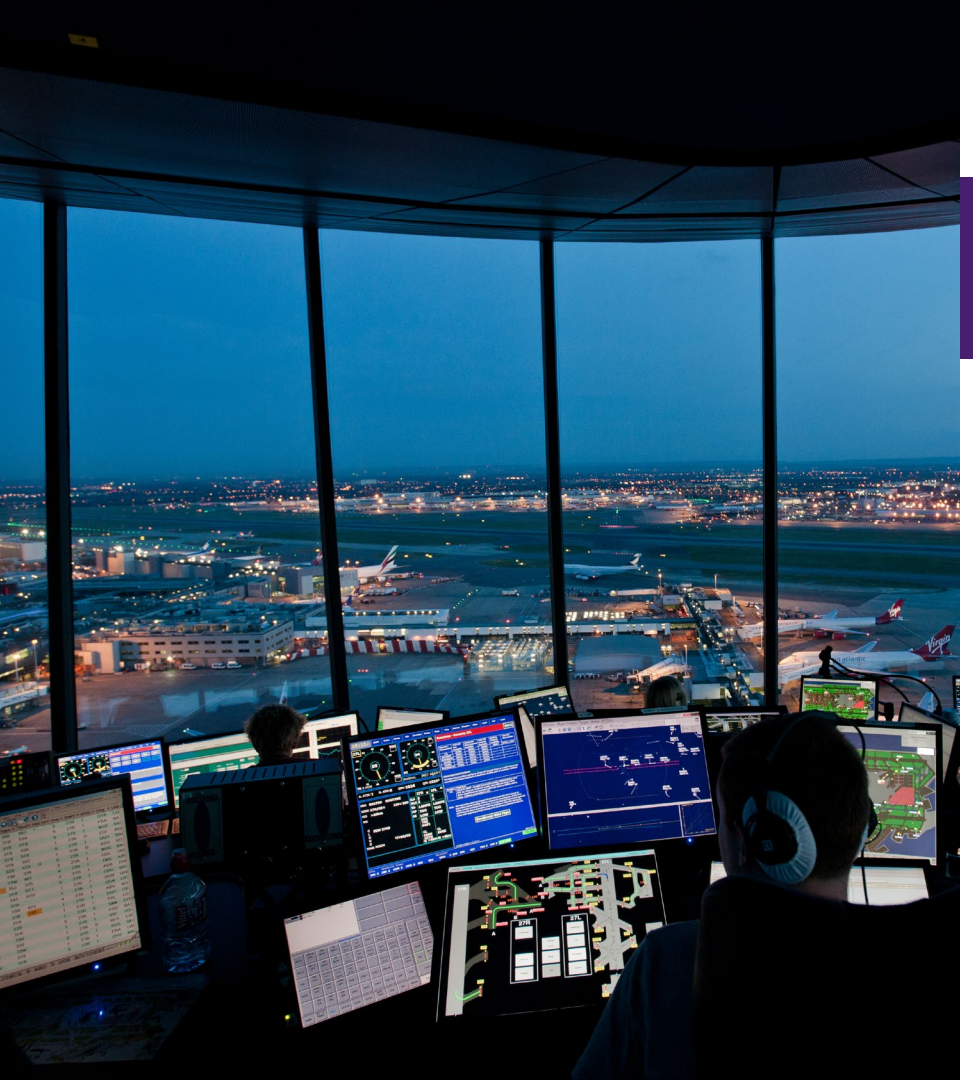
Analyse:
We then analysed the tracks to see how well each one might achieve the design principles using both data and input from the Airspace Design Team. As a result, the number of tracks has been reduced.



Develop:
The team’s air traffic control expertise was applied to select the lines that are likely to be operationally viable by considering issues such as:

- Safety
- Surrounding airports
- Sufficient separation from other routes





Concepts for discussion

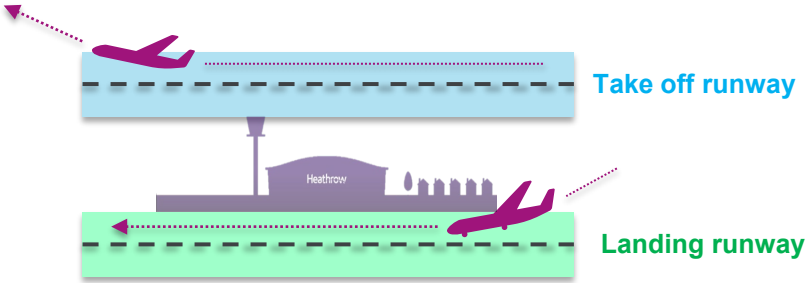
Relief or respite from noise

1. Runway alternation
2. Route alternation
3. Dispersion

Minimising the effects of early morning flights and late departures

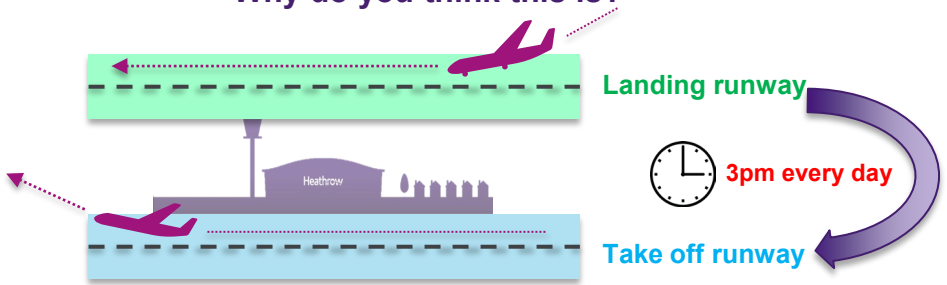
How are we considering noise from Heathrow's operation?

At Heathrow, we have two runways. Currently, we use one runway for aircraft taking off and the other runway for aircraft landing.

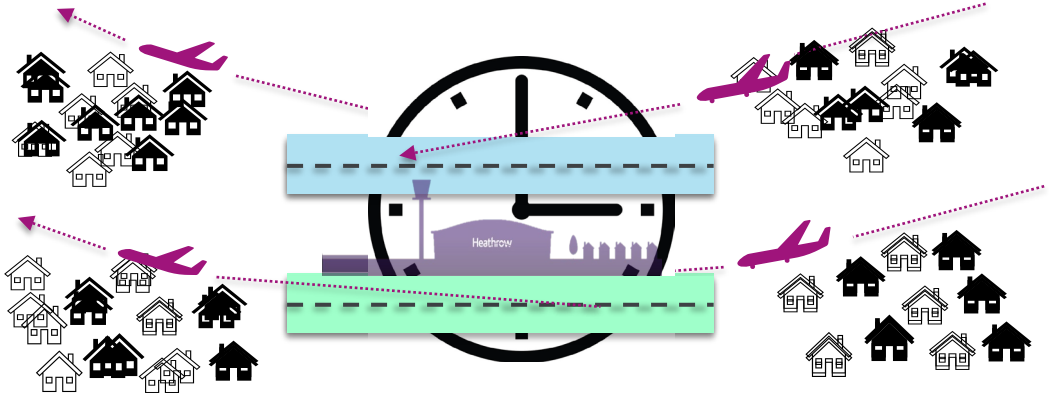


At 3pm every day, the runways swap over.

Why do you think this is?



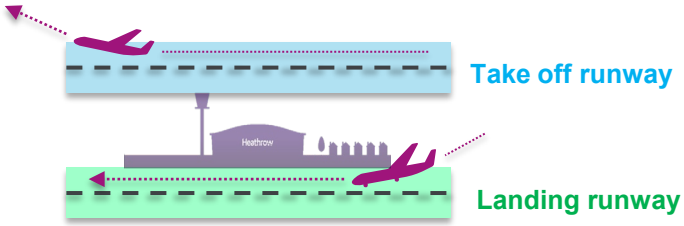
Swapping the runways means a fairer distribution of noise (respite) for the communities living under the flight paths



Heathrow

Delivering respite or relief from noise

1. **Respite via runway alternation**
2. Respite via route alternation
3. Relief via dispersion



Today's departure routes from both runways merge shortly after departure. This means that communities underneath those departure routes don't benefit from runway alternation to the same extent communities under arrivals might.

Today's easterly departure routes

Example of how we could design different flight paths to keep routes from the two runways separate

We are investigating whether departure routes from adjacent runways can follow different flight paths for longer to increase the number of people who benefit from runway alternation.

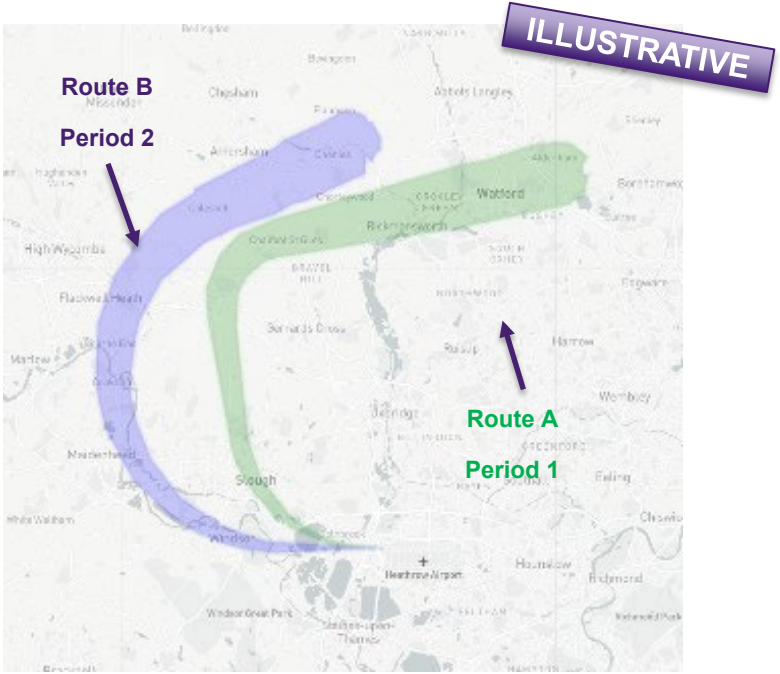
There are potential disbenefits too, since more people would be overflown.

Delivering respite or relief from noise

1. Respite via runway alternation
2. **Respite via route alternation**
3. Relief via dispersion

Heathrow is exploring whether we could use different flight paths for a Departure or Arrival route at different times of the day to offer respite to overflown communities.

We will assess the effectiveness of these potential departure flight paths against factors including population, CO_2 emissions, noise, and operations.



Two potential departure flight paths heading towards the same point;

Route A could be used during Time Period 1

Route B could be used during Time Period 2

We have identified three potential concepts for delivering *respite* or *relief* from noise

1. Respite via runway alternation
2. Respite via route alternation
3. **Relief via dispersion**

Relief
A break from, or a reduction in, aircraft noise
Respite
Scheduled “relief” from aircraft noise for a set period of time

Navigation of aircraft today is less precise than with PBN, so leads to some natural dispersion of aircraft within today's routes.

Heathrow is considering using different techniques to enable dispersion within a PBN environment, in collaboration with other airports.

Dispersion of flight paths within an allocated route would not give the significant break in noise required for "respite", but it could offer "relief" from noise for overflown communities.

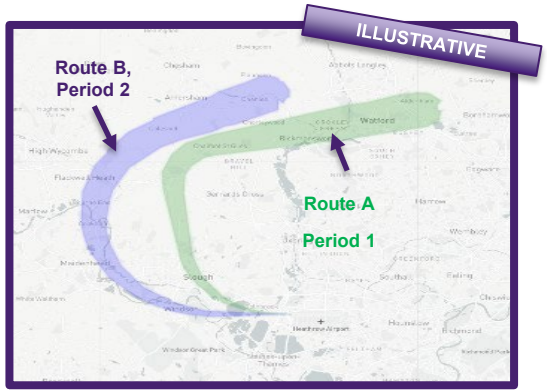
Which concept do you like best for providing overflown communities with a break from noise?

1 Respite via runway alternation

- ➕ Overflown communities are given a break from noise for half of the day
- ➖ More communities overflown than today

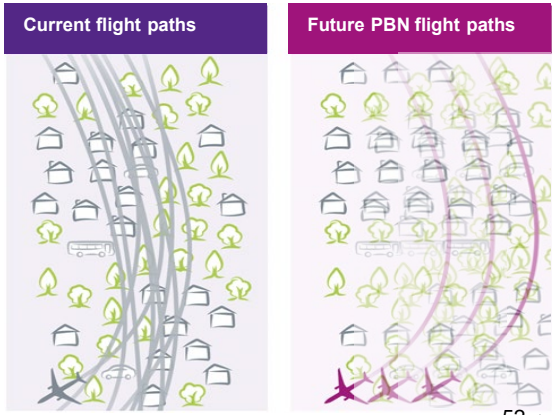
2 Respite via route alternation

- ➕ Provides guaranteed breaks from noise for overflown communities
- ➖ More communities overflown.
  Potential fuel burn impact



3 Relief via dispersion

- ➕ Overflown communities experience fewer aircraft directly overhead
- ➖ More people overflown, and less predictability about when aircraft will be overhead

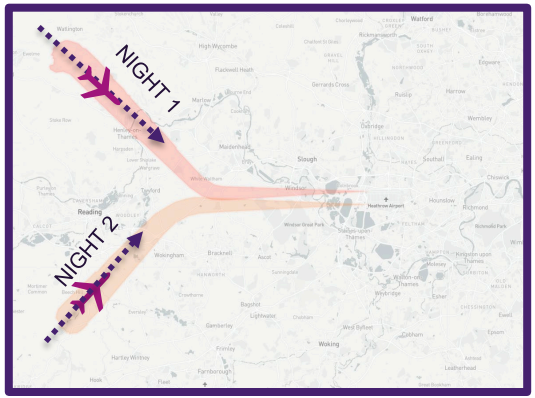


Heathrow

Which concept do you like best for minimising the negative effects of early morning and late running flights?

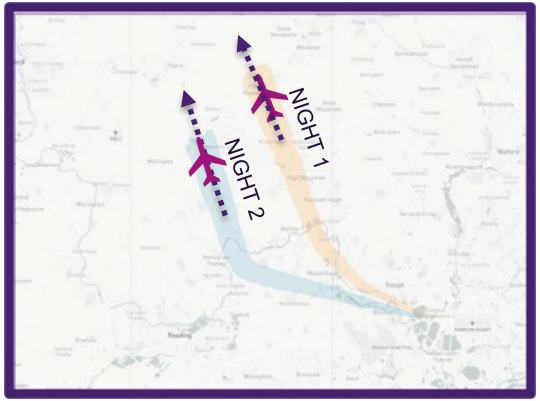
1 Early Morning Arrivals

- \+ Same communities not disturbed by noise each morning as it is spread across a few different routes
- − Overflown communities will experience more flights overhead on the days their PBN arrival flight path is used



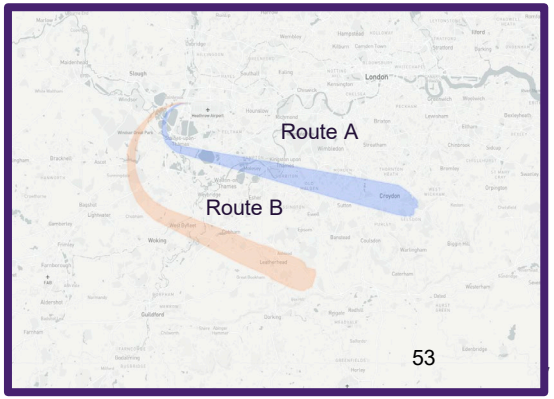
2 Late Departure Routes

- \+ “Shares” noise from late running flights across different communities
- − Additional communities overflown late at night



3 Extra Departure Routes

- \+ Quicker recovery from disruption: fewer late-running flights into the night
- − Unpredictable overflight for communities late during the day



Any Questions?

For more on Heathrow careers:

www.heathrow.com/company/careers

www.heathrowacademy.co.uk

Airspace Modernisation ACP: Stage 2 Engagement

School Focus Group: West Thames College – Isleworth, 9 January 2023

Attendees:

- Four Heathrow representatives
- Group of 24 Aviation Operations students aged 17-18: approx. 17 male, 7 female. 2 teachers.

1. Airspace Modernisation and PBN

Heathrow summarised the Government's Airspace Modernisation Strategy and explained that a new airspace change proposal (ACP) has been initiated in support of this. When prompted with an introduction to airspace modernisation, students responded that the strategy is linked to urbanisation, with the need to "design airspace for modern day city needs".

Students were supportive of "modernisation", and all nodded to show their understanding of Heathrow's explanation of Performance Based Navigation (PBN) technology and the potential impacts on noise experienced by overflown communities.

2. Approach to developing the Comprehensive List of Options (CLoO)

Heathrow explained the need to involve industry stakeholders in the ACP and asked students why it is important to communicate with other airports when redesigning the airspace under 7,000ft. Multiple students listed London's airports accurately, and agreed that as other countries are modernising, the UK must keep pace with the other airports and align its airspace design to government strategy. Heathrow pointed out that this coordination effort is very complex, both within the UK and further afield.

A particularly informed student described the CAA's responsibilities, and Heathrow referred the student to CAP1616 as they were interested in further reading.

When prompted to consider the concerns of Heathrow's local community and environmental stakeholders, students listed the following factors:

- New flight paths over people's houses
- Changes in noise and air pollution
- More traffic on the road network surrounding the airport
- Less peace in public parks
- One student said "when you're in class you won't be able to concentrate as you'll be distracted by looking at the planes. Although I like looking at them!"
- Around half of the students agreed that the noise impact of planes overflying schools is likely to have an impact on learning, whereas others disagreed.

Heathrow explained, at a high level, their approach to developing the CLoO with one student querying how the options were going to be reduced from around 300 to 1. Heathrow clarified that there is not going to be one, single option as the technical team is assessing how the flight path options work together in a system including various factors such as environmental impact analysis, and other airports and NATs ACPs.

3. Debate around potential concepts for delivering respite or relief from noise

a) Runway alternation

Heathrow introduced the current context of runway alternation, and one student confidently explained the weekly operational pattern including naming the runway ends. Heathrow asked why runway alternation practices are in place, with one student responding that it is “to give people a chance to rest more”.

Heathrow explained the conceptual idea for delivering respite via runway alternation by designing departure routes from adjacent runways that follow separate flight paths for a longer period of time. Heathrow discussed the merits and disbenefits of this concept, initiating a discussion around the following two options posed to students:

Option A: Keep the routes separate for longer after departure, therefore spreading the noise to more people that may be newly overflown.

Option B: Keep the flight paths similar to today’s operations where they merge shortly after departure, therefore not exposing new people to noise.

Students made the following comments/contributions:

- One student said Option A means that “in the future, noise will be less further out so they [communities] won’t be affected as much”.
- Another student disagreed, preferring Option B as overflying new communities creates the risk of “property prices will decrease and people will move further away”.

Heathrow prompted further discussion around the consistency of noise impact, asking students their thoughts on experiencing noise to varying degrees all day compared with more frequent noise up to 3pm followed by a break in noise.

- A student expressed concerns that runway alternation is not a viable solution for some people’s shift patterns. They felt it was too inconsistent and disruptive for people finishing work at 5pm (as an example) to return home and experience noise after 3pm one week and then the next week they do not. This makes it difficult to get used to the noise and suggested that the 3pm rule should be more of a daily practice.
- A fourth student agreed, stating that a time other than 3pm, such as switching runway use earlier in the day, might work better to avoid noise disturbance in the evening when people are trying to relax and sleep.

The consensus from the group was that predictability of overflight and knowing when to expect noise disturbance throughout the day is more important for local communities and schools than the positioning of the flight paths.

b) Route alternation

Heathrow presented the second concept exploring the use of different flight paths for a departure or arrival route at different times of the day to offer respite to overflown communities. Heathrow posed the following options to students for discussion:

Option A: Keep the routes the same as today’s operations and continue to overfly the same communities all the time.

Option B: ‘Switch on’ more routes to expose more, potentially new, people to noise but for a shorter amount of time.

One student stated that “instead of using concepts, can you have a concept with one route but try to keep it around areas that are the least concentrated with housing like sparsely populated towns. This would be instead of flying over a highly populated town and annoying a lot of people”. Heathrow asked the rest of the group for their thoughts, with students nodding

but pointing out that flying over concentrated areas is “unavoidable” due to the geographical location of Heathrow.

A student agreed with Option A minimising the total number of people overflown and asked whether Heathrow’s curfew for night flight operations could be “scrapped” and instead design flight paths “that go over as many parks as possible”. Heathrow responded the airport’s operations are restricted and not something the ACP team can change. The general view in the group was a preference to overfly fewer people than today, if possible.

Turning towards the negative impacts of route alternation, Heathrow asked students about potential increased fuel burn, noise, and the possibility of longer routes.

Students made the following comments/contributions:

- A student commented on the capabilities of different aircraft types, stating that it would be good to have “a regulation where specific aircraft types have to fly the longer route as they are more fuel efficient. For example, put a 777 on a shorter route and a 787 on a longer route to burn less fuel”.
- Another student said that “passengers care about CO_2 emissions, but a lot of people would not want to fly a longer route and pay more because they feel it doesn’t benefit them directly”.
- A third student agreed and commented that airlines can charge passengers more for flying a longer route but that this might not be affordable for families.

c) Relief via dispersion

Heathrow explained the final concept of using different techniques to enable dispersion within a PBN environment, providing relief to communities. Heathrow summarised that overflown communities would experience fewer aircraft directly overhead but that more people in total will be overflown, with less predictability.

Students made the following comments/contributions:

- Another student pointed out that “since Heathrow and Gatwick are all changing their flight paths, people are going to be affected by new flight paths from other airports”, alluding to the combined effort required between London’s airports in providing relief to local communities.
- A third student said that “on arrival, if a plane flies at 7,000ft over north London could they come in over the airport and circle around” suggesting that keeping planes higher for longer on arrival is better for communities near the airport. Heathrow responded that they are considering noise efficient practices and are working with NATs to understand changes to holding stacks.

Overall, the general view was that runway alternation or route alternation are the best options for providing local communities with respite, as long as Heathrow provides predictability by communicating when and where people can expect to be overflown.

The night flight concepts were not discussed due to time constraints and Heathrow did not want to curtail the productive discussion that took place around respite.

Airspace Modernisation ACP: Stage 2 Engagement

School Focus Group: Uxbridge College – Uxbridge, 11 January 2023

Attendees:

- Two Heathrow representatives
- Group of 13 students, a mixture of NCFE Level 3 and Level 4 Extended learners (all studying UK airports and passenger airlines): 3 males, 10 females. 1 teacher.

1. Airspace Modernisation and PBN

Heathrow asked students about their experience of overflight. A Hounslow-based student commented that planes fly over their house which is "a bit annoying" and that they are sometimes woken up by aircraft noise. Another student agreed and shared their experience of noise from Northolt's military operations.

Heathrow summarised the Government's Airspace Modernisation Strategy and explained that a new airspace change proposal (ACP) has been initiated in support of this. When prompted with an introduction to airspace modernisation, students responded with the following contributions, agreeing that the strategy is a good idea overall:

- One student referred to the opportunity for Heathrow to reduce delays and make efficient use of their two runways.
- Another student agreed that airspace modernisation will "make everything smoother" as aircraft can be held in the sky for longer or in different ways.

The group understood Heathrow's explanation of PBN and was prompted to consider the potential noise and carbon impacts of the technology. One student empathised with overflown communities and summed up by stating that they would "feel irritated with the constant noise, but you [Heathrow] will get less complaints as you will be overflying less people". They then suggested that Heathrow could soundproof houses to help residents get used to aircraft noise.

Regarding the trade-off between noise levels and carbon emissions, students preferred "more noise and less carbon" suggesting that limiting fuel burn impacts of flight paths was to be prioritised as it is beneficial for the environment.

2. Approach to developing the Comprehensive List of Options (CLoO)

Heathrow explained the need to involve industry stakeholders in the ACP. When prompted to consider the concerns of Heathrow's local community and environmental stakeholders, students listed the following factors:

- People are more likely to move house if they have not been overflown before which will impact property demand and prices.
- Noise disturbance in open spaces and public parks where people are relaxing.
- Noise disturbance and distraction during school lessons.
- Local Authorities may have to handle increased complaints from residents about changes to flight paths relating to noise and property prices.

3. Debate around potential concepts for delivering respite or relief from noise

a) Runway alternation

Heathrow introduced the current practice of runway alternation, and a student demonstrated their understanding of Heathrow's aim to "distribute the noise from one area to another".

Heathrow explained the first conceptual idea for delivering respite via runway alternation by designing departure routes from adjacent runways that follow separate flight paths for a longer period. Heathrow discussed the merits and disbenefits of this concept, initiating a discussion around the following two options:

Option A: Keep the routes separate for longer after departure, therefore spreading the noise to more people that may be newly overflown.

Option B: Keep the flight paths similar to today's operations where they merge shortly after departure, therefore not exposing new people to noise.

Students made the following comments/contributions:

- One student made the case for Option A stating that runway alternation "gives fairer distribution of the noise as constantly it's the same people getting the noise today."
- A student agreed stating that "you wouldn't mind experiencing noise if newly overflown because it is more fair". However, another member of the group pointed out the likely increase in noise complaints from newly overflown communities.
- A fourth student weighed up the pros and cons of both and said that by improving runway alternation "everyone is going to be prepared and know when it's [planes overhead] going to happen. People will know the routine and it will be predictable".

Overall, the group liked the strong predictability of the runway alternation concept, and tended to prefer Option A over Option B as sharing the noise was perceived as fairer. Opinions diverged over the impact this will have on communities, particularly those that are newly overflown.

b) Route alternation

Heathrow presented the second concept exploring the use of different flight paths for a departure or arrival route at different times of the day to offer respite to overflown communities. Heathrow explained that 'switching on' more routes would share the noise more widely but expose more, potentially new, people to noise but for a short period of time.

Students made the following comments/contributions in response:

- A student suggested that it is better to alternate between "week A" of routes and "week B" of route patterns rather than regular runway alternation at 3pm and experience more constant noise as a result. Some students nodded in agreement after this comment.
- Others, however, preferred the greater predictability of runway alternation, commenting that route alternation is "annoying" and that during the respite period, "some people might dread that their turn is coming next week for experiencing noise".
- Another student agreed comparing route alternation to runway alternation saying that the noise routine will take longer to get used to, particularly for those newly overflown.

c) Relief via dispersion

Heathrow explained the third concept of using different techniques to enable dispersion within a PBN environment, providing relief to communities. Heathrow summarised that overflown communities would experience fewer aircraft directly overhead but that more people in total will be overflown, with less predictability.

Students made the following comments/contributions:

- One student related this concept to the idea of “turning down” the noise, rather than completely stopping the noise like the previous two concepts. They said that “if you completely stop the noise then people will realise what ‘ideal’ could look like and then they might decide to move house to somewhere not overflown”. This suggests a preference for relief via dispersion, rather than concepts that provide respite.
- A student pointed out that dispersing noise using PBN routes is less predictable.
- Another student responded by stating that it is “better to share the noise”.

Overall, the general view was that predictability is important, and whilst none of the concepts emerged as a front runner, runway alternation stimulated the most debate and was preferred to route alternation.

4. **Debate around potential concepts for minimising the effects of early morning flights and late running departures**

Heathrow introduced three concepts for minimising the effects of early morning flights and late running departures:

a) **Early Morning Arrivals** - involves ‘switching on’ PBN arrival flight paths for early morning hours between 04:30 – 06:00 to offer respite to overflown communities. They explained the pros and cons of this concept, noting that alternating flight paths would spread out the noise to more areas but that these communities will experience an increase in flights overhead on the days that their PBN arrival flight path is used compared to today.
b) **Late Departure Routes** - using ‘unique’ departure routes for occasional late running departures at night. These departure routes could vary on a rotation pattern to reduce the disturbance experienced by communities. Similar to the early morning arrivals concept, Heathrow explained that this shares noise more equitably across different communities but creates the risk of overflying more, potentially new communities late at night, after 23:00.
c) **Extra Departure Routes** - involves ‘switching on’ additional departure routes to allow for extra operational capacity and minimise the risk of flights departing after 23:00. They pointed out the disbenefit of this concept that overflight is unpredictable for those communities overflown.

Students made the following comments/contributions:

- A student felt that switching on routes in the night, as per options A and C, would be “unbearable as people don’t want to be woken up”.
- Another student said that “people will get used to night flights but if these are switched on and off, people will notice it more and it has more of an impact. It’s better to keep the same people that are hearing the noise”.
- A third student commented that extra departure routes are better to help Heathrow manage delays and that this should be their priority. Another student disagreed, asking “why impact new people”, recommending that Heathrow “stick to what you’ve got because overflying new people will become a big problem, they won’t be expecting it and won’t like it disturbing their sleep”. They also mentioned that people have a choice when buying property to consider where flight paths are.

In contrast to the respite debate where the priority centred on sharing the noise impact, the students felt that the night-time period was a more sensitive time than during the day and tended towards minimising the number of people who are newly overflown.

Airspace Modernisation ACP: Stage 2 Engagement

School Focus Group: UTC Heathrow - Northwood, 12 January 2023

Attendees:

- Three Heathrow representatives
- Group of 12 Year 12 various STEM subject A Level students: 10 males, 2 females. 1 teacher.

1. Airspace Modernisation and PBN

Heathrow asked students about their experience of overflight and aircraft noise. A Hounslow-based student shared that they are frequently disturbed during the night by aircraft overhead which is “annoying” but noted that newer aircraft are quieter.

Heathrow summarised the Government’s Airspace Modernisation Strategy and explained that a new airspace change proposal (ACP) has been initiated in support of this. When prompted with an introduction to airspace modernisation, students demonstrated their understanding with the following contributions:

- A student explained that “when aircraft are flying, they change between ATC zones, so airspace modernisation is about reviewing the zones to see if they should be extended or shortened and whether aircraft can do tighter landing paths to avoid neighbourhoods” as technology is improving.
- Another student followed up on the point of technological improvement commenting that landing systems, ATC, and radar need to keep up with the changes to make the airspace more efficient.

The group understood Heathrow’s explanation of PBN, and when prompted to consider the disbenefits of old technology, such as greater fuel burn.

2. Approach to developing the Comprehensive List of Options (CLoO)

Heathrow explained the need to involve industry stakeholders and students understood the importance of communicating with other airports when redesigning the airspace under 7,000ft.

When prompted to consider the concerns of Heathrow’s local community and environmental stakeholders, students listed the following factors:

- Residents’ wellbeing and sleep will be impacted if living under flight paths. People are more likely to move house if they have not been overflown before to areas that are not overflown which will impact property demand and prices.
- Air ambulance journey time and take off options may be impacted.
- Greater noise disturbance in open space and public parks may reduce visitor numbers.
- Local Authorities may receive increased complaints from residents or groups of residents who are resistant to changes to flight paths.
- Greater noise disturbance for students at school which impacts concentration levels.

3. Debate around potential concepts for delivering respite or relief from noise

a) Runway alternation

Heathrow introduced the current practice of runway alternation, and a student commented on the benefits of providing a fair distribution of noise.

Heathrow explained the first conceptual idea for delivering respite via runway alternation by designing departure routes from adjacent runways that follow separate flight paths for a longer period. Heathrow discussed the merits and disbenefits of this concept, initiating a discussion around the following two options posed to students:

Option A: Keep the routes separate for longer after departure, therefore spreading the noise to more people that may be newly overflown.

Option B: Keep the flight paths similar to today's operations where they merge shortly after departure, therefore not exposing new people to noise.

Students made the following comments/contributions:

- One student pointed out the dilemma that communities currently overflown are used to the noise, suggesting that Option A is risky as overflying new communities will likely cause greater annoyance and complaints.
- A student agreed and questioned whether the impact on newly overflown areas would be manageable, suggesting that "the issues are just being moved somewhere else".

The group did not indicate a preference for sharing noise across communities and suggested that surveying residents was helpful to understand residents' attitudes toward aircraft noise.

b) Route alternation

Heathrow presented the second concept exploring the use of different flight paths for a departure or arrival route at different times of the day to offer respite to overflown communities. Heathrow posed the following options to students for discussion:

Option A: Keep the routes the same as today's operations and continue to overfly the same communities all the time.

Option B: 'Switch on' more routes to expose more, potentially new, people to noise but for a shorter amount of time.

Students made the following comments/contributions in response:

- A student preferred Option A, commenting that it is "better to have routes always the same" as these flight paths will be predictable, and communities will know when to expect a guaranteed break from noise.
- A second student contradicted this point from an airline's perspective, suggesting that airlines may prioritise fuel burn over noise impact and will therefore prefer shorter routes that are possible through Option B.
- Another student said that Option B means that "newly overflown residents will be quite shocked. You need to give them a bit of warning to help them understand the changes".

Overall, the students indicated that predictability in overflight is important for both route alternation and runway alternation.

c) Relief via dispersion

Heathrow explained the third concept of using different techniques to enable dispersion within a PBN environment, providing relief to communities. Heathrow summarised that overflown communities would experience fewer aircraft directly overhead but that more people in total will be overflown, with less predictability.

Students made the following comments/contributions:

- One student stated that PBN "wouldn't make a difference because, either way, it [overflight] is still varied and changing every 45 seconds". They suggested that the relief is "too random", indicating their preference for the previous two concepts.
- Another student acknowledged that residents may still be "upset" that they live under flight paths but highlighted that they believed the relief provided by dispersion is effective as the total aircraft noise experienced is reduced.
- A third student agreed, commenting that Heathrow "can't please everyone".

Heathrow asked students to consider all three concepts for providing relief or respite, and whether they would prefer to be overflown more frequently and irregularly for a long period or experience overflight more intensely for shorter periods of time as routes are 'switched on' and 'switched off'. The students voted:

- Runway alternation – 0 votes
- Route alternation – 3 votes
- Dispersion – 7 votes

Earlier in the discussion, importance was placed on predictability; however, providing relief via dispersion resulted in the groups' majority preference. Students justified their choice by stating that overflown communities are likely to get used to regular noise that will be less intense than runway and route alternation solutions.

4. **Debate around potential concepts for minimising the effects of early morning flights and late running departures**

Heathrow introduced three concepts for minimising the effects of early morning flights and late running departures:

a) **Early Morning Arrivals** - involves 'switching on' PBN arrival flight paths for early morning hours between 04:30 – 06:00 to offer respite to overflown communities. They explained the pros and cons of this concept, noting that alternating flight paths would spread out the noise to more areas but that these communities will experience an increase in flights overhead on the days that their PBN arrival flight path is used compared to today.
b) **Late Departure Routes** - using 'unique' departure routes for occasional late running departures at night. These departure routes could vary on a rotation pattern to reduce the disturbance experienced by communities. Similar to the early morning arrivals concept, Heathrow explained that this shares noise more equitably across different communities but creates the risk of overflying more, potentially new communities late at night, after 23:00.
c) **Extra Departure Routes** - involves 'switching on' additional departure routes to allow for extra operational capacity and minimise the risk of flights departing after 23:00. They pointed out the disbenefit of this concept that overflight is unpredictable for those communities overflown.

Heathrow asked students to consider the potential impact of sharing the noise across more, potentially newly overflown areas, during the night compared to the day time period.

Students made the following comments/contributions:

- A student commented that spreading the noise is not desirable as some people are light sleepers and would be easily woken up by noise during the night period.

- Another student indicated their preference for route alternation as it is predictable and people will know to expect noise every other night, for example.
- A third student disagreed, stating that “[constant] noise all the time every night is better” as people get used to this and asked if Heathrow can “make planes quieter”.
- Another student referred to dispersion suggesting that “this is the best option for night flights as people don’t want constant noise when trying to sleep”.

Students struggled to reach a consensus on the concepts for minimising the impact of early morning arrivals and late running departures. They agreed that the night period tends to be more sensitive than during the day, meaning that noise is likely to be perceived as causing greater disturbance. The group debated ways for Heathrow to manage this issue through their use of concepts to mitigate the impact of flight paths.