

# NOISE RELIEF

**Some practical proposals to improve the noise climate for communities under the Heathrow flight paths**



# Contents

Introduction .....	3
The Proposals .....	4
Proposal 1.....	5
Stagger the Arrivals Joining Point.....	5
Current Trend - when a west wind blows .....	5
More concentration during busy periods .....	6
Current Trend - when an east wind blows .....	8
Our Proposal.....	9
Proposal 2.....	10
Increase Variation in Departure Routes .....	10
Our Proposal.....	11
<i>How it could be implemented:</i> .....	11
Proposal 3.....	12
Promote Fairer Night Flight Arrival Distribution .....	12
Current Trends .....	13
The Current Night Flight Pattern.....	13
Our Proposal.....	14
Proposal 4.....	15
Reduce Simultaneous Overflight by both Heathrow and London City arrivals.....	15
Our Proposal.....	16

# Introduction

This report contains four proposals which aim to improve the noise climate for communities under the Heathrow flight paths. They try to address key concerns which residents have raised with us. They are not intended as a panacea to all the noise problems faced by all communities. Their aim is to provide some relief from the noise in advance of the major changes to its flights paths which Heathrow expects to introduce from about 2025 onwards.

Heathrow is consulting on its proposals for these new flight paths. They will represent the biggest change to Heathrow's airspace since the airport opened in 1946. The proposals are being driven by new technology. Airports across the world are altering the way planes are controlled during landing, departing and while en route. The new technology replaces the current ground-based navigation methods with a satellite system and will mean the introduction of narrow, precise flights paths. Heathrow aims to introduce multiple paths of this kind that can be rotated in order to give communities predictable periods of respite from noise.

The new system, though, is still some years away. This report looks at what might be possible in the meantime to give communities some relief. We are aware that the new ICCAN Head Commissioner would like to hear ideas for some positive solutions to minimise impacts of noise on the community, so we are presenting our proposals as a challenge to the aviation industry. We understand that some solutions may be regarded as constituting an airspace change, a process that can take many years, but ask the industry to consider the ways in which the pace of implementation could potentially be speeded up.

The proposals come from HACAN but I would like to thank Heathrow Airport and NATS for their technical advice and for compiling and sharing key data. I also want to acknowledge the work of my co-author Dr Maureen Korda in compiling this report.

John Stewart

Chair HACAN

May 2019

# The Proposals

## **One –**

(see section 1)

**Stagger the arrivals  
joining point**

## **Two –**

(see section 2)

**Increase variation in  
departure routes**

## **Three –**

(see section 3)

**Promote fairer night  
flight arrival  
distribution**

## **Four –**

(see section 4)

**Reduce simultaneous  
overflight by both  
Heathrow and  
London City arrivals**

# Proposal 1

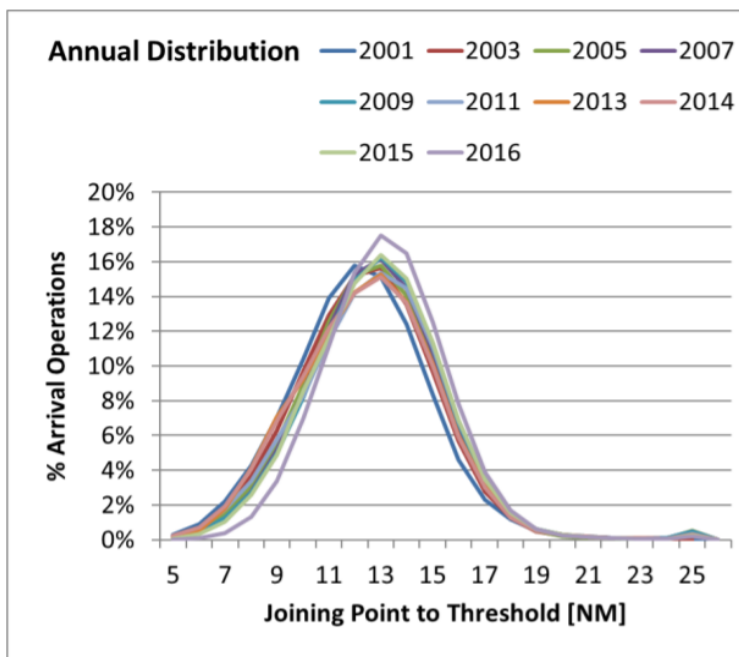
## Stagger the Arrivals Joining Point

The point at which aircraft join their final approach path to Heathrow has become more concentrated over the last 15 years or so. 95% of planes now join within a 4.8 nautical mile band either side of the average join point, reduced from a previous value of 5.4. This reduction creates more noise where planes currently join. Our proposal to reduce this concentration would bring some relief to people living within that band.

### Current Trend - when a west wind blows

Aircraft need to line up with the runway at a height of not lower than 2,500ft. For most aircraft this height occurs at about 9 nautical miles away from landing on the runway. When planes are landing over London from the east, this final line-up will happen no further west than about Putney. In reality, the average joining point is at over 13 nautical miles.

#### 1.1.1 Distribution pattern of Joining Points



Year	Average Joining Point (NM)	Standard Deviation (NM)
2001	12.7	2.6
2003	12.9	2.6
2005	13.2	2.7
2007	13.3	2.6
2009	13.4	2.7
2011	13.2	2.7
2013	13.0	2.7
2014	13.0	2.7
2015	13.4	2.6
2016	13.7	2.4
Average	13.2	2.6

The above table (right) shows from its Standard Deviation data that in 2016:

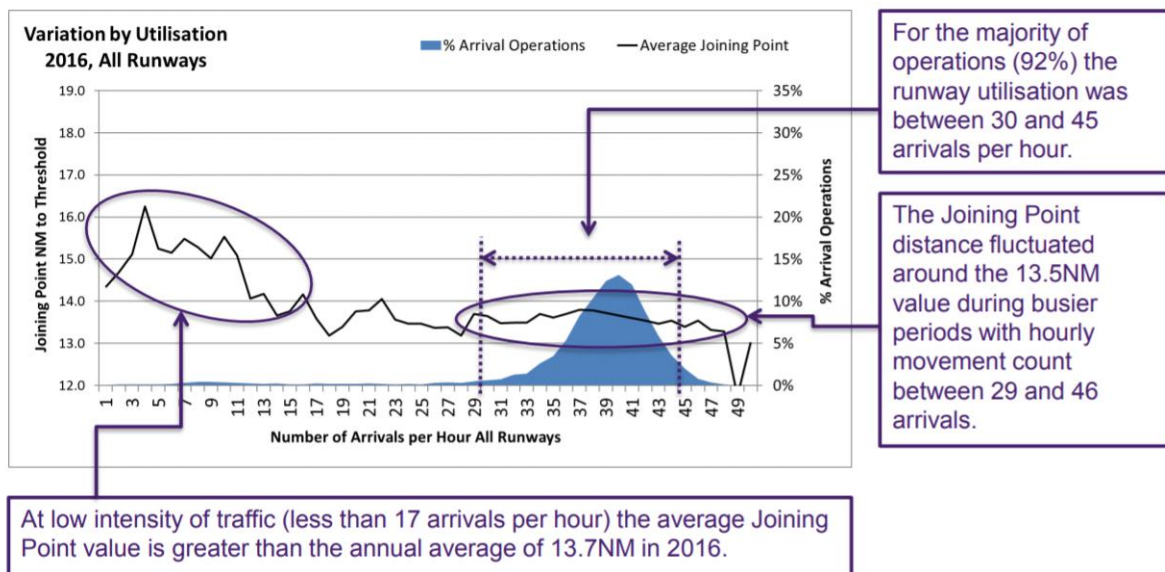
- 95% of planes joined the final approach between 9.9 and 18.5 nm from runway
- 68% of planes joined the final approach between 11.3 and 16.1 nm from runway
- The average joining point was 13.7 nm from runway

The above chart (left) shows the distribution of joining point distance when a west wind is blowing (about 70% of the time in a typical year) and planes land over London.

- The 2016 curve is much steeper between the 6 - 16% marks in both directions than the 2001 curve. This comparison indicates a less distributed trend.
- The 2016 curve shows far fewer arrivals up to 10 nm than all other curves, but particularly when comparing with the 2001 curve.
- The 2016 curve shows more arrivals east of the average of 13.7nm than all other curves and particularly when comparing with the 2001 curve.

In rough geographical terms, Chiswick is about 7 nautical miles from Heathrow; the Oval 13 nautical miles and Woolwich 19 nautical miles.

## More concentration during busy periods



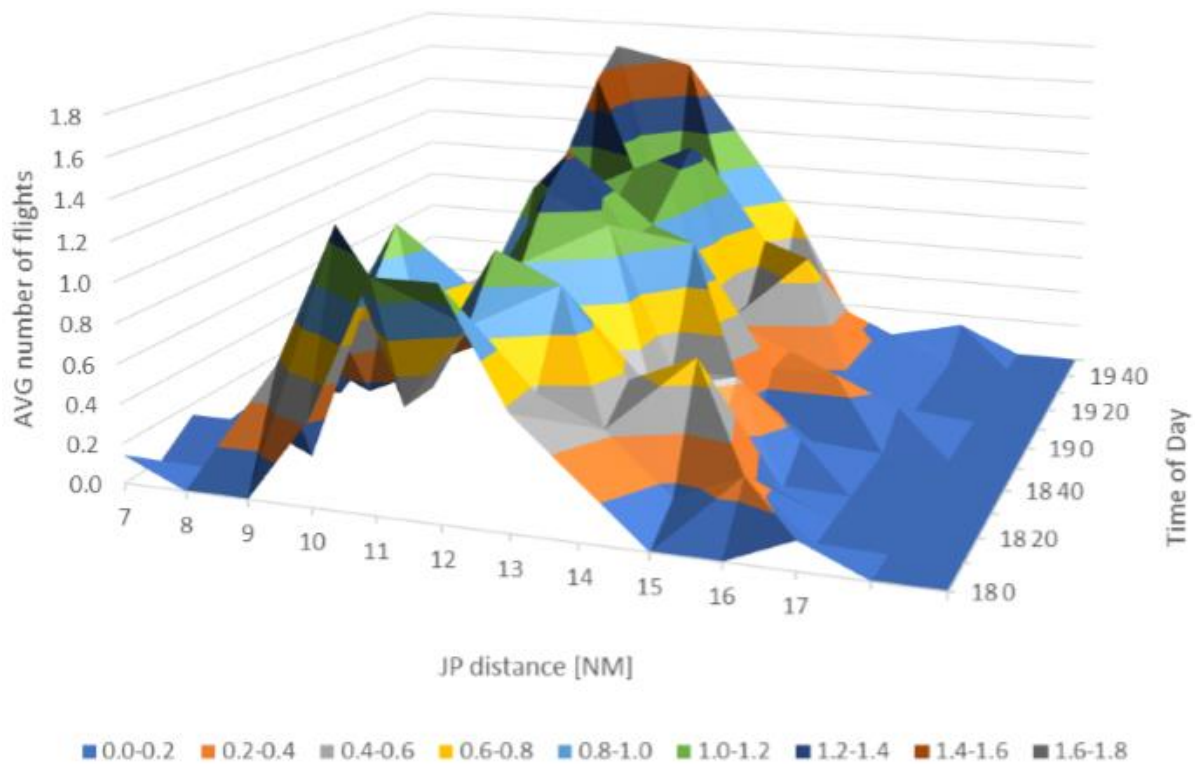
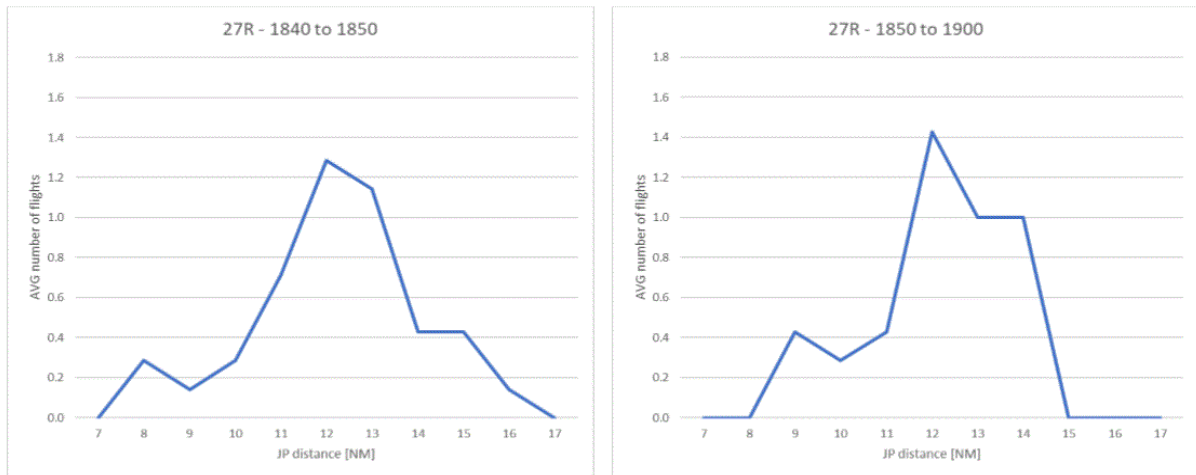
There are two extremes in the above data: where there are between 1-10 arrivals per hour, and where there are 36-44 arrivals per hour.

**During the busiest times** of the day when there are 36-44 arrivals per hour, the joining point averages at 13.7nm and a high percentage of planes use this.

**During quieter periods** the percentage joining even further out is also high, albeit of a much smaller number of arrivals.

The reason that the joining point is more concentrated during busy times is that air traffic controllers use predictable patterns in order to ensure the higher number of arrivals is dealt with as safely as possible. During less busy times there is more leeway.

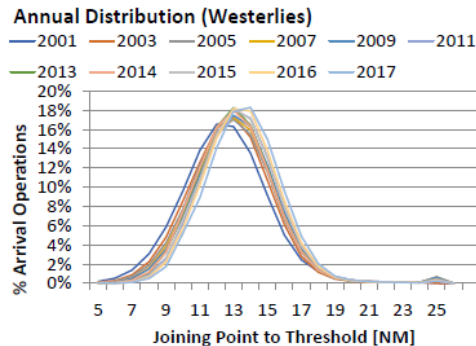
Increased concentration during busy periods can result in planes passing over the same communities in rapid succession. The following 2 charts show arrivals between 18:40 and 19:00 hrs, averaged per day over a 7 day period for runway 27R, in two separate plots of 10 minutes per chart. They are cross sections of the fuller 3-D chart that plots data for the whole 2-hour period from 18:00 to 20:00. The data shows how communities at distances where peak values occur experience most of the arrivals bunching overhead.



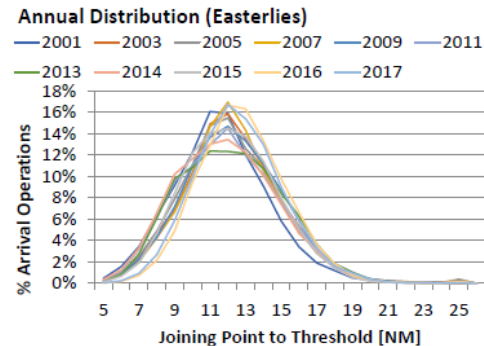
## Current Trend - when an east wind blows

The general pattern is the same as when the west wind blows, with aircraft tending to join between 13 and 15 nautical miles from the airport. The following two charts show data from 2001 to 2017.

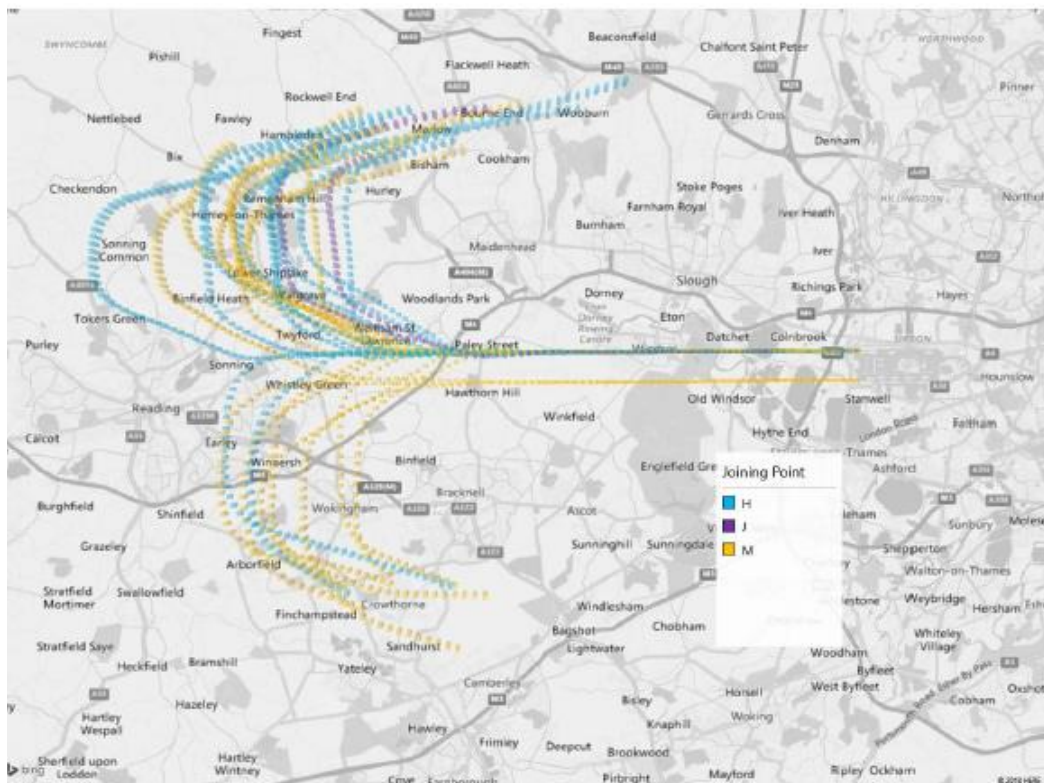
### Westerlies



### Easterlies

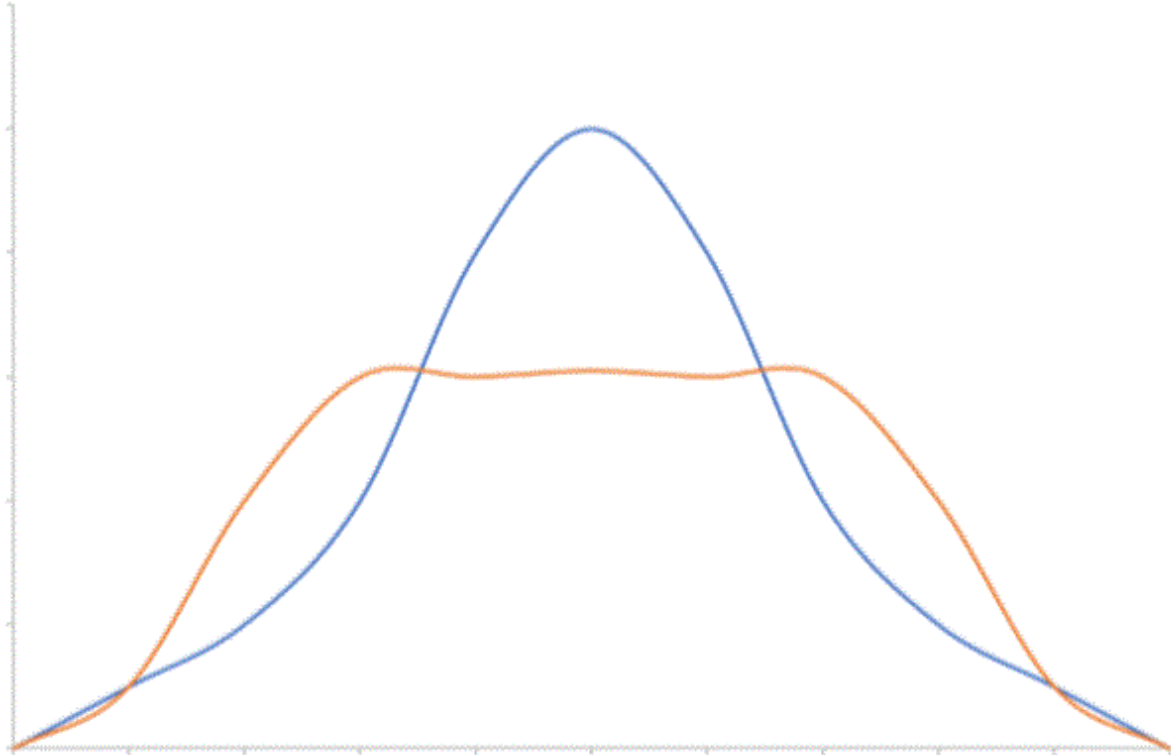


However, aircraft can be more 'in place' when they turn - probably because many of them will have flown some considerable distance either to the north or south of London from their holding stacks, giving air traffic control more time to organise them.



## Our Proposal

Our proposal is to flatten the curves. We are suggesting that more aircraft join their final approach between 8nm to 11nm from the airport in order to ease the current bunching that occurs within the enclosed distance of 11 to 16nm. Although this would increase flight numbers over some areas, it provides a way of sharing noise that would be reverting to a pattern similar to that of some years ago. The sketch shows how this flattening would spread the joining point to remove the current peak.



### To make it happen

- Challenge the industry to seek opportunities that will make this proposal a reality
- Explore with the Civil Aviation Authority what consultation may be required
- Explore how the Civil Aviation Authority (Air Navigation) (Amendment) Directions 2018 could provide wider approach paths.
- Work with Heathrow and NATS to implement the proposal while engaging with the CAA

# Proposal 2

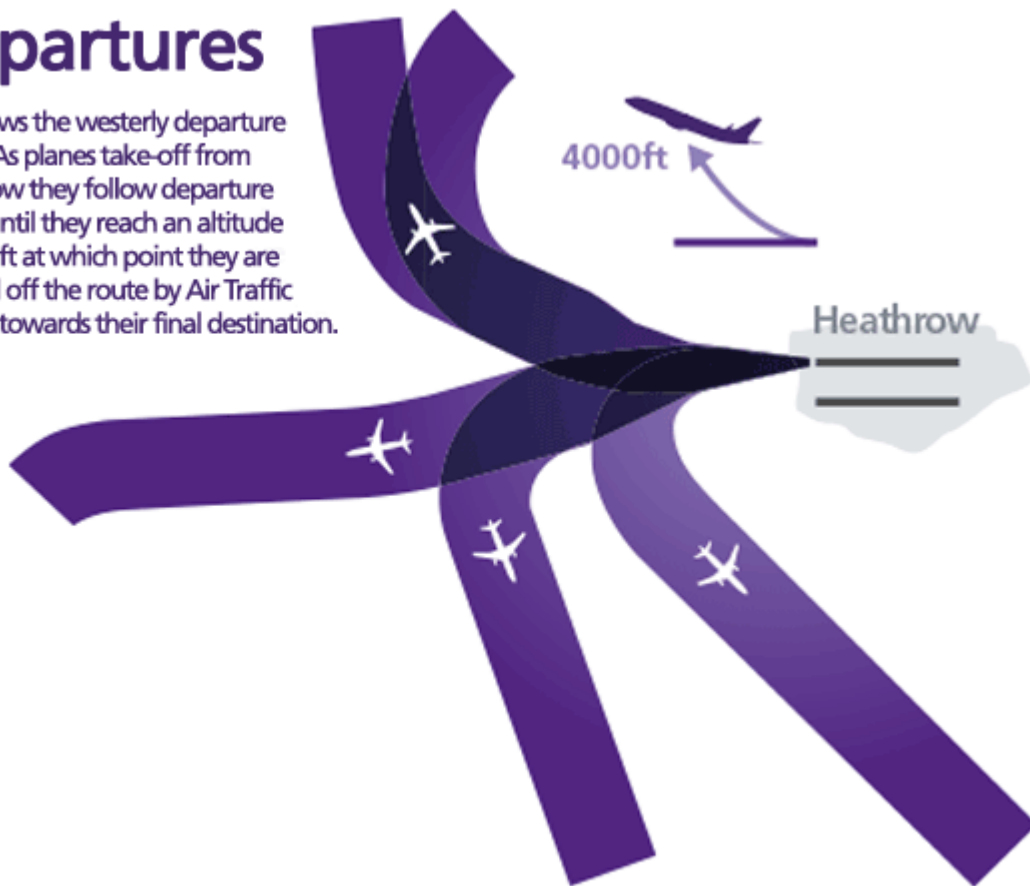
## Increase Variation in Departure Routes

### Current Trends

Over the last decade or so, aircraft have flown increasingly along the centreline of the Noise Preferential Routes (NPRs). Improved technology has enabled them to do this. While it has reduced the noise for some communities, it has meant more concentration of the noise over the heads of people living underneath the centreline.

### Departures

This shows the westerly departure routes. As planes take-off from Heathrow they follow departure routes until they reach an altitude of 4,000ft at which point they are directed off the route by Air Traffic Control towards their final destination.



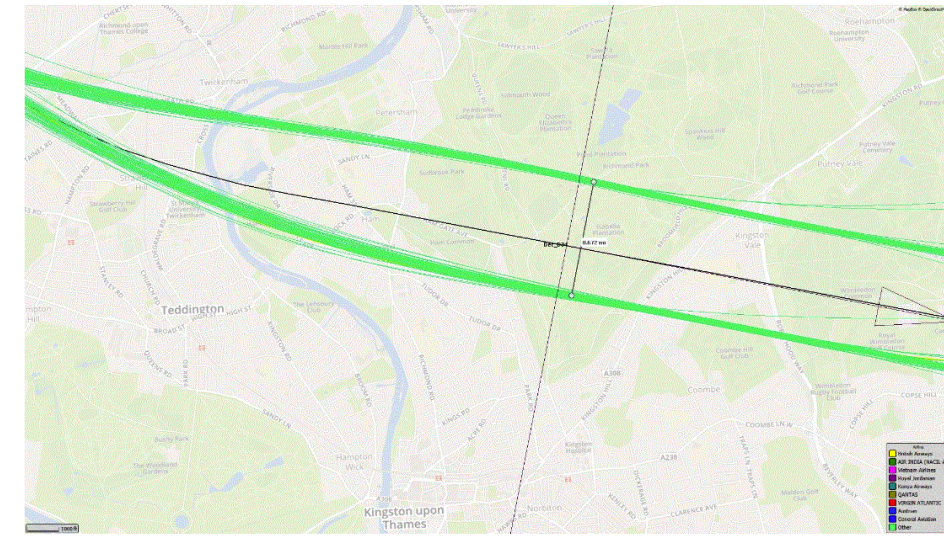
The Noise Preferential Routes have been in place since the 1960s. They are 3 kilometres wide. Departing aircraft are expected to stay within them until they reach 4,000ft. Until the last 10 years or so, planes dispersed across an NPR when taking off. But the introduction of precision technology has allowed the majority of aircraft to follow the centreline. This has meant a gradual, but significant change for many communities.

## Our Proposal

**Our proposal is to vary the flight paths within a Noise Preferential Route.** This fairer distribution could be done by giving different codes to different aircraft. The simplest proposal might be to give BA aircraft one code and the rest of the airlines another one.

An indicative map below shows what could be done:

Screenshot showing result of coding differences - tracks can still be within NPR



Areas to the edge of the NPR would get more planes than they have had in recent years but 15-20 years ago, when there was much more dispersal within an NPR than there is today, these areas got a lot of planes. When the big changes take place to Heathrow flight paths around 2025, the flight paths routes may change again, but our proposal would give communities some respite in the meantime through a fairer distribution of the departing flights.

***How it could be implemented:***

Coding is the key to the implementation. Aircraft are given codes. One of the functions of these codes can be to point the plane in the direction of a particular departure path. For safety reasons there is a limit to the number of paths which can be created. But a simpler coding system, such giving BA aircraft one code and the rest of the airlines another one would create an element of relief for communities.

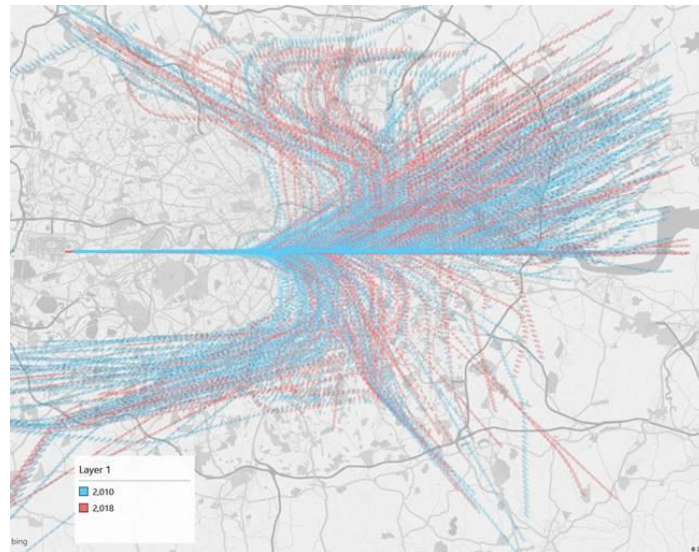
### To make it happen:

- Engage with the coding houses
- Explore with the Civil Aviation Authority what consultation may be required
- Challenge the industry to think creatively to make this happen
- Work towards its effective implementation

## Proposal 3

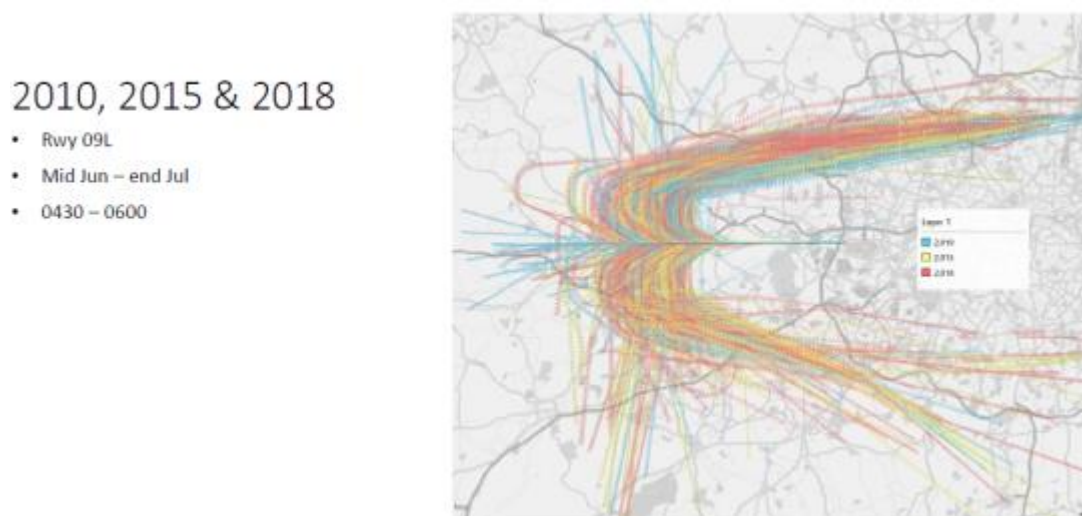
### Promote Fairer Night Flight Arrival Distribution

Over the last decade or so the routes taken by night flights – those planes arriving before 6am - have become less varied. Night flight routes may well change when Heathrow introduces its new flight paths around 2025. In the meantime we are suggesting there is scope for the pre-6am flights to be more varied before they join their final approach, which they are required to do at no lower than 3,000 ft (at around Wandsworth when arriving from the east). We show data for planes arriving over London from the east.



The above chart shows the 0430-6000 am 2010 flights in blue and the 2018 flights in pink.

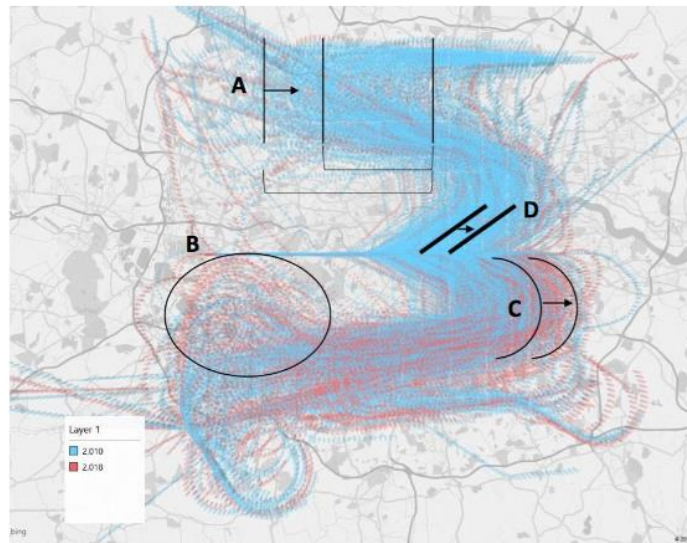
The next chart shows the position when an east wind blows and the aircraft approach from the west (blue 2010; red 2015; yellow 2018).



The next chart shows differences between 2010 and 2018 for the busy hour between 6 and 7 am when both runways are used.

## 2010 & 2018

- A. 2018 flights turning earlier than 2010; turn line shifted to the East
- B. Flights leaving stack drift more to the North in 2018
- C. Final turn from the South shifted towards East in 2018
- D. 2018 line shifted to the East compared to 2010 (taking into account traffic volume difference – 2010 saw much more traffic approaching from the North)



## Current Trends

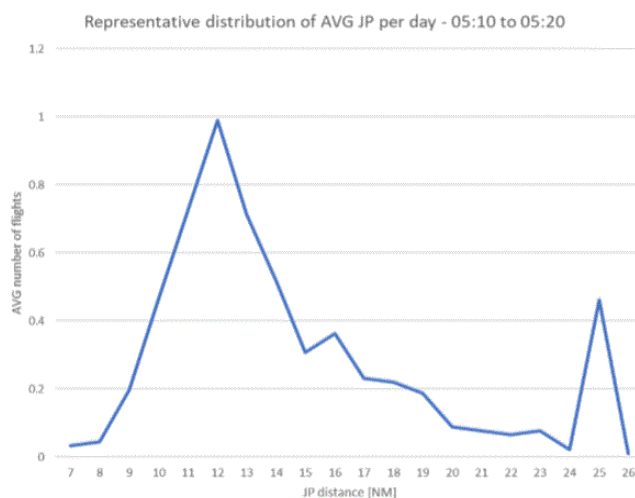
### The Current Night Flight Pattern

There are 16/18 scheduled flights permitted between 11.30pm and 6am. These are all arrivals with the first plane landing at Heathrow just after 4.30am. On some nights however, there are more than 16/18 flights between those hours. This is due to occurrence of late departures from Heathrow, the number of which has fallen in recent years. There is a system of runway rotation for the flights which land between 4.30am and 6am. One week they land on the northern runway; the next week on the southern. This, however, just applies to West London.

The charts below shows flights are bunched when they join their final approach, resulting in some communities experiencing the bulk of the night flights. The first chart is a single 10 minute cross section taken from the following 3-D chart.

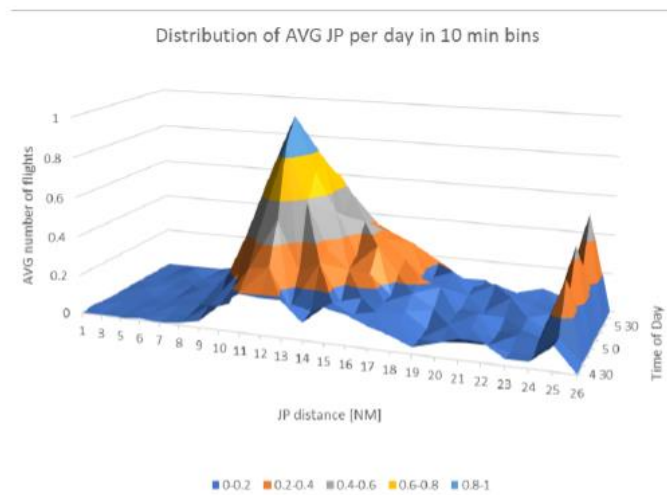
### Frequency of flights per colour band:

- All runways
- 0430 – 0600 flights
- Time window shown: 0510 – 0520 (peak time)
- 91 days
- Shows average value per day



## Frequency of flights per colour band: 10 min

- All runways
- 0430 – 0600 flights
- 91 days
- Shows average value per day



## Our Proposal

We are proposing that the routes taken by pre-6am flights become less concentrated before they join their final approach path. This would require instructions from NATS to its air traffic controllers to vary the routes they use to guide individual aircraft.

### To make it happen:

- Engage with NATS, Heathrow Airport and the Civil Aviation Authority
- Identify the challenges in implementing the proposal
- Consult on it as appropriate
- Work towards its effective implementation

# Proposal 4

## Reduce Simultaneous Overflight by both Heathrow and London City arrivals

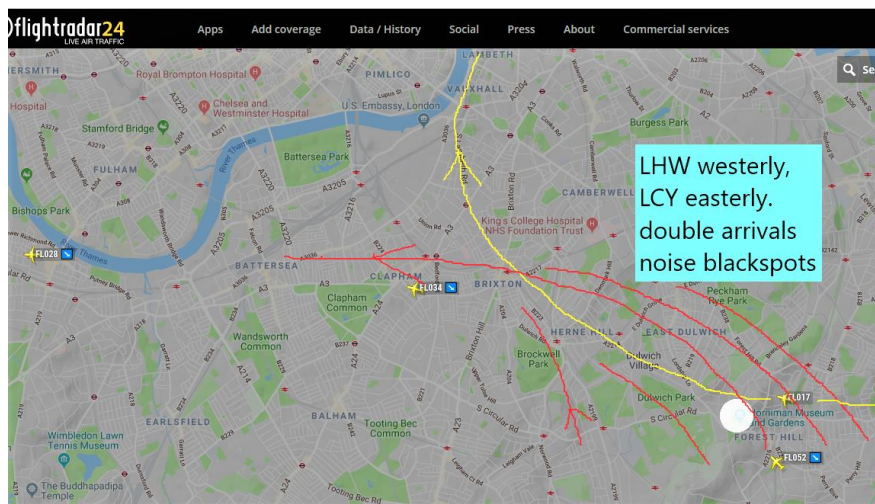
### Current Trends

There are parts of London which are overflowed by both Heathrow and London City aircraft – on some days at the same time.



**City and Heathrow aircraft criss-crossing over SE London (picture courtesy of Tim Walker)**

- The NE London quadrant from Bow and Stratford through Leyton and Leytonstone to Wanstead and South Woodford are overflowed by Heathrow arrivals and London City departures when a west wind is blowing;
- London City Airport itself is overflowed by Heathrow planes during a west wind!
- A swathe of SE London from Eltham in the east to Vauxhall and London Bridge in the west are overflowed by Heathrow planes when the west wind is blowing and by City aircraft during an east wind;
- There are days when these areas can be flown by both Heathrow and London City aircraft, resulting in excess of 50 planes an hour passing over some communities at busy times – this because when the east wind is less than about 5 knots Heathrow planes continue to fly over London as if the west wind was blowing - known as ‘westerly preference’ - whereas London City planes switch direction as soon as the wind switches.



The graph shows a London City aircraft (yellow) crossing Heathrow aircraft in SE London on one of the days when the area got arrivals to both Heathrow and City (courtesy of Tim Walker)

- The situation of communities being overflown by both Heathrow and London City aircraft became much more noticeable after February 2016 when City concentrated all its arrival and departure flight paths. Before then, its aircraft were much less of a problem in SE London and, indeed, in many parts of East and NE London.

## Our Proposal

Heathrow flight paths over SE and NE London are likely to change significantly in the years beyond 2025 when the airport introduces its new flight paths driven by the new satellite technology. They are expected to take the form of precision flight paths which will be rotated to give communities relief from the noise. London City will also be looking again at its current flight paths.

**In the light of these developments our proposal is modest:** Heathrow and London City shall explore ways of reducing the number of days when communities in SE London are overflown by both sets of planes.

### To make it happen:

- Encourage Heathrow and London City to deepen their cooperation through discussion, data-sharing and joint monitoring
- Call on London City and Heathrow to explore ways of coordinating their directional and wind-dependent landings in order to avoid areas being overflown by both sets of aircraft at the same time
- Liaise with the Civil Aviation Authority, NATS and both airports
- Consult as appropriate

**Authors:** John Stewart, HACAN & Mo Korda, SE London resident. HACAN can be contacted at [johnstewart2@btconnect.com](mailto:johnstewart2@btconnect.com); 020 7737 6641. [www.hacan.org.uk](http://www.hacan.org.uk)