

# Richmond Heathrow Campaign



## Optioneering

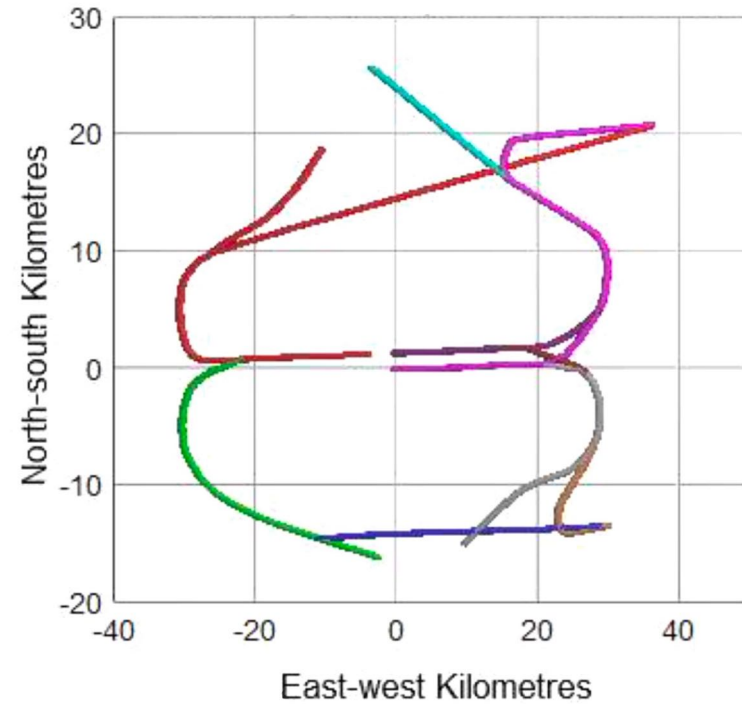
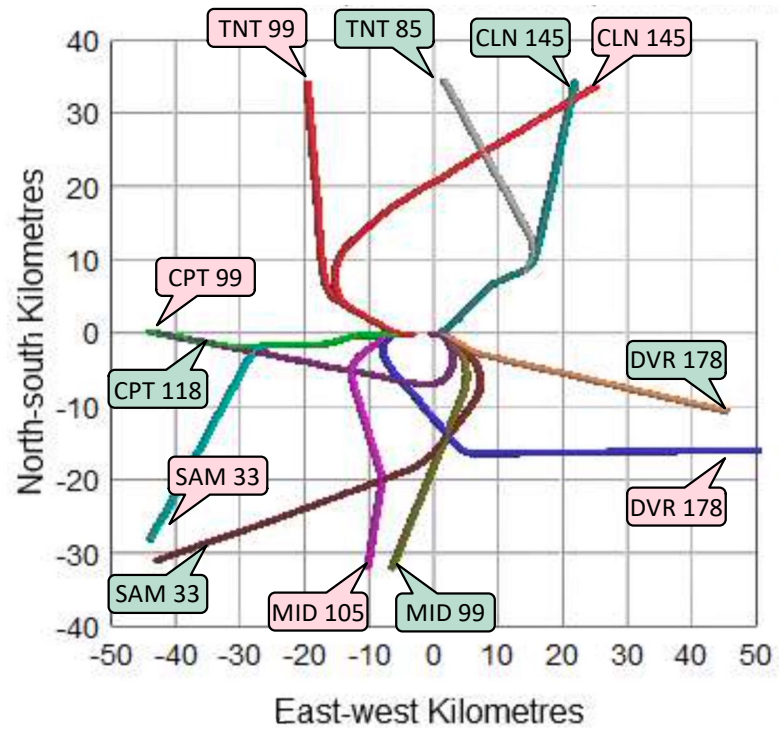
Peter Willan  
Neil Maybin

Presentation to NACF  
Wednesday 29 May 2024

# Existing Heathrow Flightpaths with Cranford Agreement

Total Westerly  
departures 658

Total Easterly  
departures 658



Departures – 18 Flightpaths

Rising to 24 once Cranford Agreement ends

Arrivals – 12 Flightpaths

Rising to 16 once Cranford Agreement ends

## Initial Options List from the CAA Portal

No.	Departures Day PBN	Option
1.	Dep. To West. Southern. PBN. Day. 27 L	5
2.	Dep. To West. Northern. PBN. Day 27R	5
3.	Dep. To East. Southern. PBN. Day. 09 R	6
4.	Dep. To East. Northern. PBN. Day. 09L	10

No.	Arrivals Day Vector	Option
9.	Arr. From West. Southern. Vector. Day. 09 R	11
10.	Arr. From West. Northern. Vector. Day 09 L	11
11.	Arr. From East. Southern. Vector. Day. 27 L	11
12.	Arr. From East. Northern. Vector. Day. 27 R	11

No.	Departures Night PBN	Option
5.	Dep. To West. Southern. PBN. Night. 27 L	5
6.	Dep. To West. Northern. PBN. Night 27 R	5
7.	Dep. To East. Southern. PBN. Night. 09 R	6
8.	Dep. To East. Northern. PBN. Night. 09 L	10

No.	Arrivals Night PBN	Option
13.	Arr. from West. Southern. PBN. Night. 09 R	18
14.	Arr. from West. Northern. PBN. Night. 09 L	19
15.	Arr. from East. Southern. PBN. Night. 27L	20
16.	Arr. from East. Northern. PBN. Night. 27 R	22

Total of 219 Initial Options:  
How does this compare with  
the 150 options in Heathrow's  
submission to the CAA?

No.	Arrivals Night Vector	Option
17.	Arr. From West. Southern. Vector. Night. 09R	11
18.	Arr. From West. Northern. Vector. Night 09 L	11
19.	Arr. From East. Southern. Vector. Night. 27L	11
20.	Arr. From East. Northern. Vector. Night. 27 R	11

# Example: Departures to East - Northern Runway 09L - PBN Day



Option A



Option B



Option C



Option D



Option E



Option F



Option G



Option H



Option I



Option J



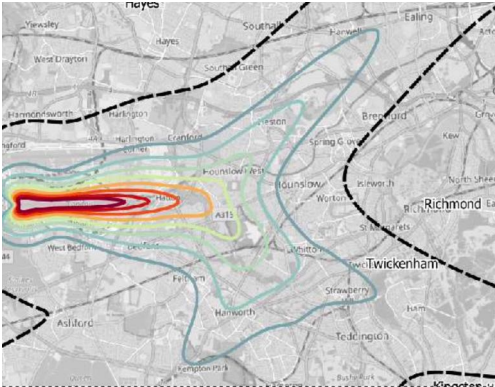
Existing

Flightpaths/Route	1	2	3
Potential options for 6 departure routes	1	64	729

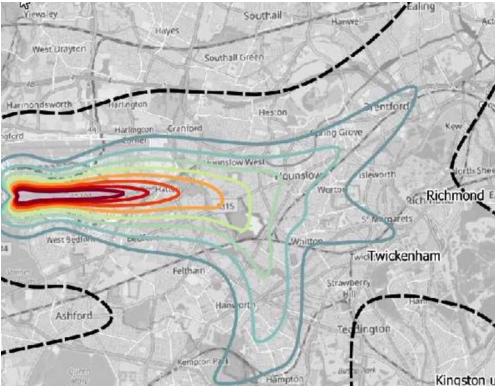
So how were the single flightpaths underlying these 10 options selected?

# Option Impact: Departure to East Southern Runway 09R: PBN Day compared with 'do nothing' (2019 base)

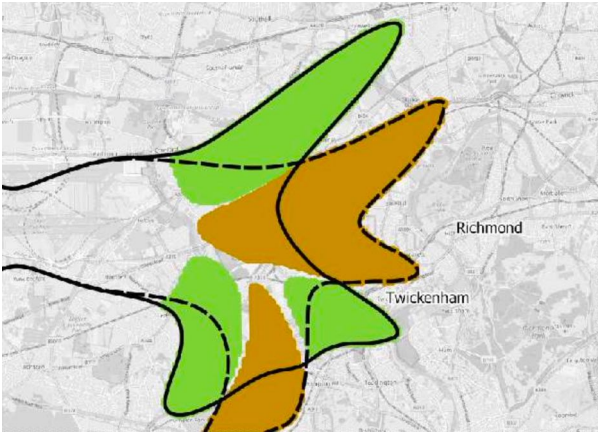
2019  
Base  
'do nothing'



Option B

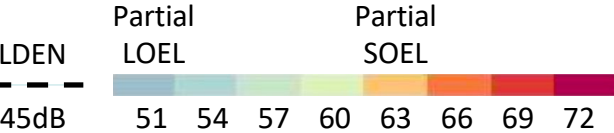


51dB LOEL



Green - 1dB  
difference or more

Brown + 1dB  
difference or more



# Option output statistics and metrics

## Departures to East, Southern Runway (09R), PBN Day

Metric	Base (dn)	B	C	F	G	I	J
Pop > Partial LOAEL (day-time LAeq, 16h)	169	184	175	178	172	174	175
Pop at least one event of N60 Lmax (day-time)	3,603	1,690	1,800	1,222	1,604	1,341	1,414
Pop > WHO Threshold (>45dB Lden)	734	677	741	752	739	768	814

### Longer list of Statistics and Metrics

Pop > Partial LOAEL (day-time LAeq, 16h)  
 Pop at least one event of N60 Lmax (day-time)

Air Quality  
 Climate Track distance

AONB/Nat Parks overflown once a day on avg (day-time)  
 AONB/Nat Parks at least one event of N65 Lmax (day-time)  
 Richmnd Pk overflown at least once a day on avg (day-time)  
 RAMSAR, SAC, SPA, SSSI sites overflown 0-1640ft change  
 RAMSAR, SAC, SPA, SSSI sites overflown 0-3000ft change

Capacity/Resilience  
 General Aviation comment  
 Change in fuel Burn +/-

Pop Overflown (60° @7kft) per day frequency by threshold >= N65 Lmax  
 Pop Noise Events per day frequency >= N65 Lmax by threshold

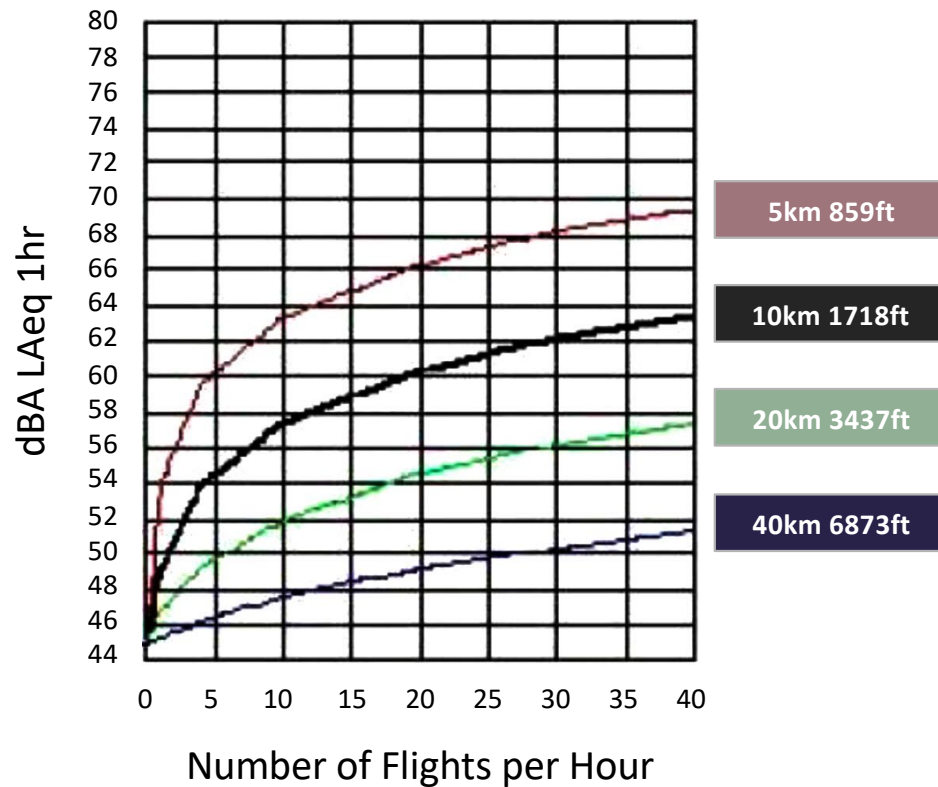
Noise Exposure  
 Pop > WHO Threshold (>45dB Lden)  
 Pop > Partial LOEL (>51 dB LAeq 16hr)

Noise Exposure Change  
 Pop with at least 1 dB decrease above Partial LOEL  
 Pop with at least 1 dB decrease brought out of Partial LOEL  
 Pop no change within Parial LOEL  
 Pop with at least 1 dB increase above Partial LOEL  
 Pop with at least 1 dB increase brought into Partial LOEL

# Flight Frequencies (Traffic Volumes)

## Relationship between Noise LAeq 1hr and number of flights

For illustration only. Not representative of any specific case.



What flight frequencies were used in the Initial options Appraisal?

## Vertical Ascent / Descent Rates

	<b>Do Nothing</b>	<b>Options</b>
<b>Ascent Rate</b>	4% – 13 %	Average 5.5%
<b>Descent Rate</b>	5.2% (3°)	5.24%

Is an average  
a reasonable  
assumption?

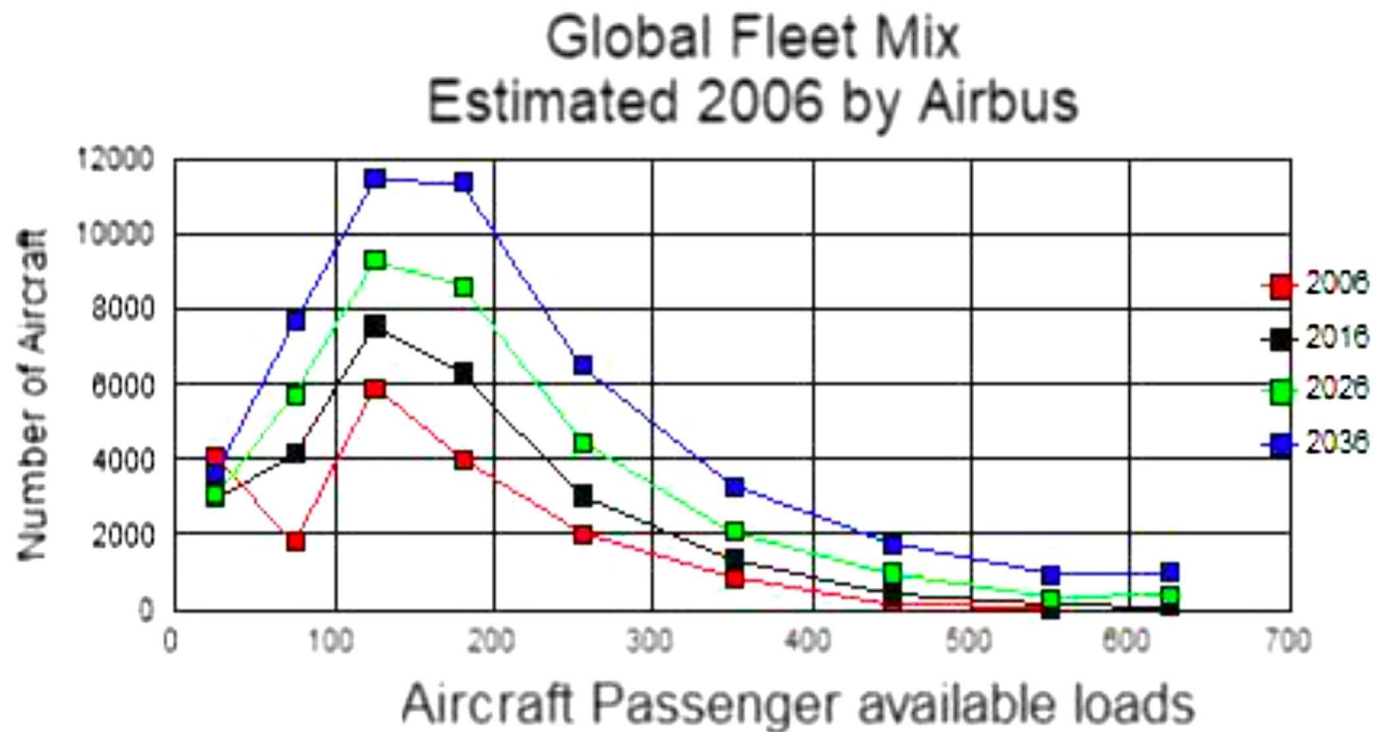


# Lateral PBN

	Ground Beacon	Traffic Control	Accuracy ±km	Do Nothing (No PBN)	Options (with PBN)
NPR to 4k ft	Yes	No	1.5	Yes	No
NPR above 4k ft	Yes	Yes	(vectored)	Yes	No
RNAV1	Yes	No	1.8	No	?
RNP1	No	No	1.8	No	?
RNP-AR	No	No	0.2 – 0.6	No	?

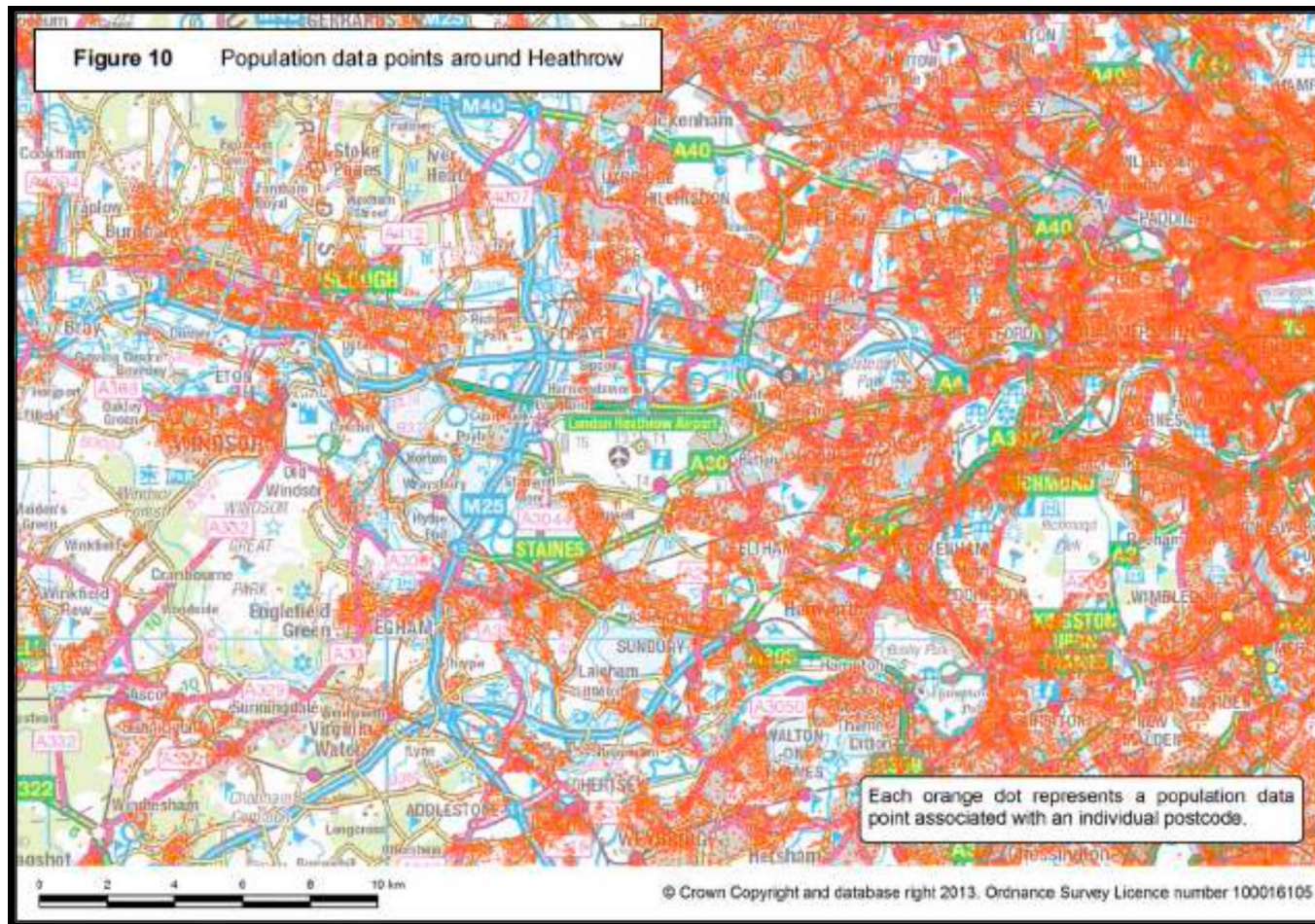
- PBN has substantial impact on distribution of noise.
- Options (PBN) and 'Do Nothing' (No PBN) are not a like-for-like comparison.
- Optioneering needs to identify impact of PBN separated from other factors.

## Heathrow Fleet Mix (based on Global Fleet Mix)



What Heathrow fleet type, passenger loads, weight, and route distances have been used in the Initial options Appraisal?

## Population and its Growth



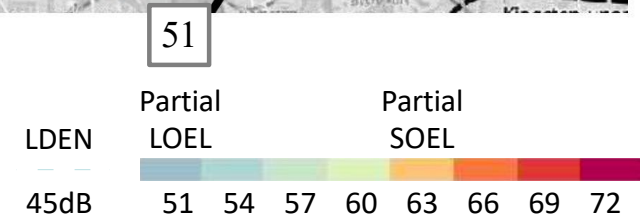
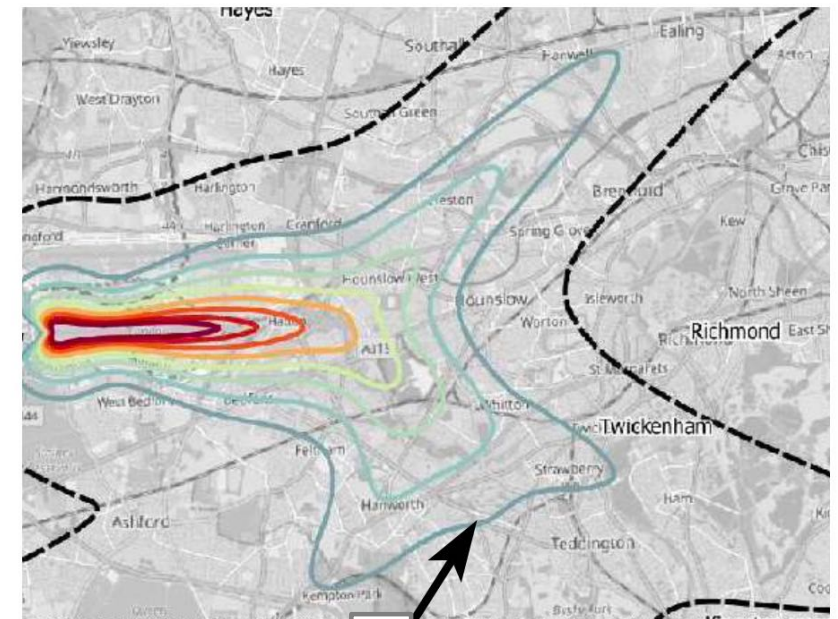
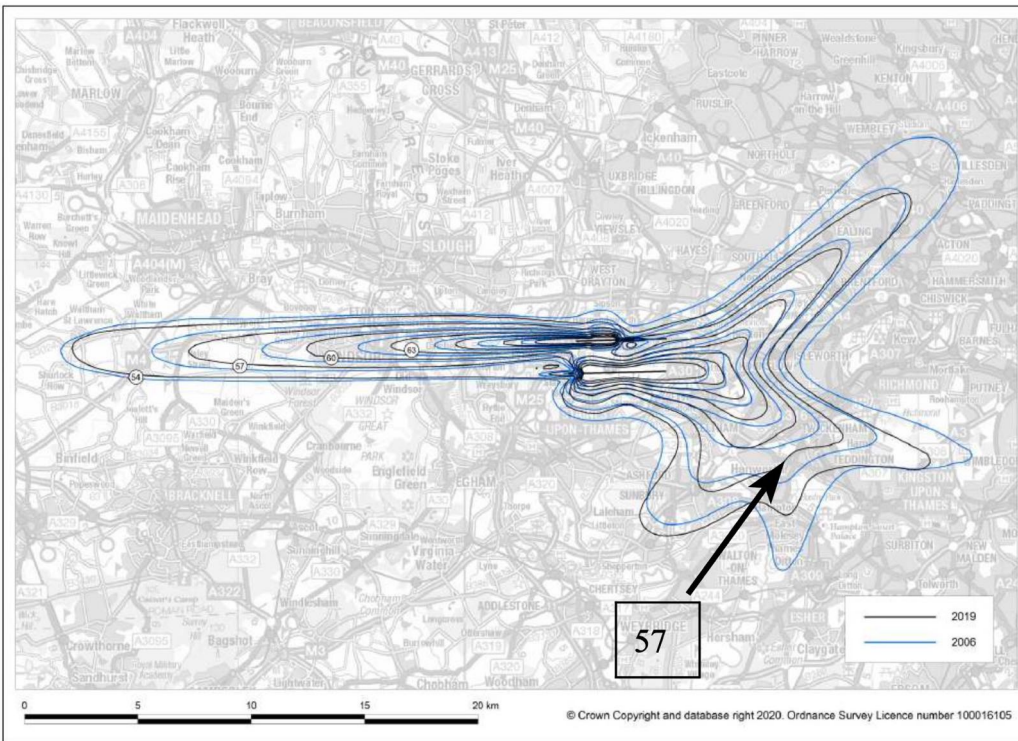
How has population distribution and growth been incorporated into the Initial Options Appraisal?

# Noise Contour and Population Discrepancies

From: *Heathrow Airport 2019 Summer Noise Contours and Noise Action Plan Contours CAP 2001 page 69*

From: *Heathrow Stage 2B submission to CAA July 2023 Appendix E A13.8 page 11*

Figure B6 Heathrow 2019 and 2006 average summer day 54-72 dB 100% E L<sub>Aeq,16h</sub> noise contours (with 2006 N-S runway usage)



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QUESTIONS?