

Heathrow Airport 2022 Summer and Noise Action Plan Contours

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Contents

Contents	3
Summary	5
Chapter 1	6
Introduction	6
Chapter 2	7
Noise modelling methodology	7
ANCON noise model	7
Flight tracks	7
Flight profiles	7
Noise data	8
Traffic data	9
Runway modal splits	10
Topography	11
Population database	12
Chapter 3	13
Results	13
2022 summer day actual $L_{Aeq,16h}$ contours	13
2022 summer day standard $L_{Aeq,16h}$ contours	14
2022 summer day single mode $L_{Aeq,16h}$ contours	14
2022 summer night actual $L_{Aeq,8h}$ contours	17
2022 summer night single mode $L_{Aeq,8h}$ contours	18
2022 summer day overflight contours and track density diagrams	20
2022 summer night overflight contours and track density diagrams	20
2022 L_{day} contours	21
2022 $L_{evening}$ contours	22
2022 L_{night} contours	23
2022 L_{den} contours	24
2022 $L_{Aeq,6.5h}$ night contours	25

Long-term contour trends	26
Cumulative area, population and household counts – comparisons with 2006	26
2022 L_{den} noise contours – comparisons with 2006	27
L_{den} noise change diagrams	28
2022 L_{night} noise contours – comparisons with 2006	28
L_{night} noise change diagrams	28
2022 L_{night} single mode noise contours	29
2022 N65 annual 16-hour day contours	31
N65 annual 16-hour day change diagrams	32
2022 N70 annual 16-hour day contours	32
N70 annual 16-hour day change diagrams	34
2022 N70 annual 16-hour day single mode contours	34
2022 N60 annual 8-hour night contours	35
N60 annual 8-hour night change diagrams	36
Chapter 4	37
Conclusions	37
References	38
Figures	39
Tables	83
ANCON type descriptions	105
Glossary	109

Summary

1. This report presents the Heathrow 2022 average summer 16-hour day and 8-hour night L_{Aeq} contours, and annual L_{day} , $L_{evening}$, L_{night} , L_{den} and $L_{Aeq,6.5h}$ night Noise Action Plan contours. The noise modelling used radar and noise data from Heathrow's Noise and Track Keeping (NTK) system. Mean flight tracks and dispersions, and average flight profiles of aircraft height, speed and thrust for each aircraft type, were calculated using these data. The 2022 contours were impacted to a lesser extent by the COVID-19 pandemic compared to the previous two years, as international air travel recovered.
2. Aircraft movements at Heathrow recovered significantly in 2022 from the previous year. Average summer 16-hour day movements in 2022 (1041.5) increased by 90%¹ from 2021 (548.9). Average summer 8-hour night movements in 2022 (73.7) increased by 102% from 2021 (36.6). Annual 24-hour period movements increased by 95% from 535.0 in 2021 to 1042.0 in 2022.
3. The 54 dB $L_{Aeq,16h}$ contour area for the 2022 average summer day (actual runway modal split 68% west / 32% east) was 106.9 km², 57% larger than in 2021 (68.0 km²). Contour areas were up to 94%² larger in 2022 compared to 2021. These area increases can be attributed primarily to the 90% rise in summer day movements in 2022. The 54 dB population count was 309,200, an increase of 71% from 2021 (181,300).
4. The 2022 standard modal split (78% west / 22% east) 54 dB $L_{Aeq,16h}$ contour area was 108.5 km², 53% larger than in 2021 (70.9 km²). Contour areas were up to 90% larger in 2022 compared to 2021. The 54 dB population count was 296,500, an increase of 62% from 2021 (182,600).
5. The 2022 average summer night 48 dB $L_{Aeq,8h}$ contour area based on the actual runway modal split (68% west / 32% east) was 79.5 km², a 60% increase from 2021 (49.7 km²). The 48 dB population count was 250,600, an increase of 69% from 2021 (148,600).
6. The 2022 55 dB L_{den} contour area increased by 53% to 115.6 km² (2021: 75.6 km²). The 2022 50 dB L_{night} contour increased in area by 77% to 54.2 km² (2021: 30.6 km²). The 48 dB $L_{Aeq,6.5h}$ night contour area increased by 77% to 22.1 km² in 2022 (2021: 12.5 km²).

¹ The percentage traffic changes given in this report are based on unrounded movement numbers.

² For the 63 dB $L_{Aeq,16h}$ contour.

Chapter 1

Introduction

- 1.1 This report presents the 2022 summer noise contours generated for London Heathrow Airport, which up until 2015 had been produced by the Environmental Research and Consultancy Department (ERCD) on behalf of the Department for Transport (DfT). From the 2016 study onwards, ERCD has been commissioned directly by Heathrow Airport Ltd (HAL).
- 1.2 The latest version of the UK civil aircraft noise model, ANCON (version 2.4), has been used to estimate the noise exposure around Heathrow Airport. The model calculates the emission and propagation of noise from arriving and departing air traffic and is validated using noise measurements made around Heathrow.
- 1.3 The noise exposure metric used is the Equivalent Continuous Sound Level (L_{Aeq}), and in particular $L_{Aeq,16h}$ (07:00-23:00 local time), which is calculated over the 92-day summer period from 16 June to 15 September. The background to the use of this index is explained in DORA Report 9023 (**Ref 1**). The $L_{Aeq,16h}$ contours in this report have been plotted from 54 to 72 dB in 3 dB steps. This is because the 'Survey of Noise Attitudes' (SoNA 2014) (**Ref 2**) found that the degree of annoyance (based on the percentage of respondents highly annoyed) previously occurring at 57 dB, now occurs at 54 dB. The average summer day $L_{Aeq,16h}$ contours have been plotted from 54 dB since 2016.
- 1.4 Night-time $L_{Aeq,8h}$ contours have also been calculated from 48 to 72 dB in 3 dB steps in accordance with standard practice. Average summer night $L_{Aeq,8h}$ contours were first calculated for Heathrow for 2013 following the publication of the Aviation Policy Framework in March 2013 (**Ref 3**).
- 1.5 Noise Action Plan contours have also been produced for the following metrics: annual L_{day} , $L_{evening}$, L_{night} , L_{den} and $L_{Aeq,6.5h}$ night³.

³ Based on the combined summer and winter seasons, i.e. 27 March 2022 to 26 March 2023.

Chapter 2

Noise modelling methodology

ANCON noise model

- 2.1 The noise contours were calculated using the latest version of the UK civil aircraft noise model ANCON (version 2.4), which is developed and maintained by ERCD on behalf of the Department for Transport (DfT). A technical description of the ANCON model can be found in R&D Report 9842 (**Ref 4**).
- 2.2 ANCON is fully compliant with the European guidance on noise modelling, ECAC.CEAC Doc 29 (4th edition), published in December 2016 (**Ref 5**). This guidance document represents internationally agreed best practice as implemented in modern aircraft noise models. The Fourth edition introduced some minor changes to the modelling of start-of-roll noise, which were incorporated in the 2017 software update to ANCON (version 2.4).

Flight tracks

- 2.3 Mean departure and arrival flight tracks were generated from summer 2022 radar data. Mean tracks are the mathematical representation of an NPR/SID route swathe, consisting of a central track that defines the average aircraft position along the route swathe. Lateral dispersions across the route swathe were modelled by multiple sub-tracks derived from a statistical analysis of the underlying radar track data. The Heathrow NPR/SID routes are shown in **Figure B1** of **Appendix B**.

Flight profiles

- 2.4 Average flight profiles of height, speed and thrust were also based on summer 2022 radar data. These profiles represent the aircraft heights, speeds and thrust settings at various distances from the runway, averaged across all the routes for each ANCON type⁴, for departures and arrivals separately. Daytime flight profiles were generated as in previous years. All aircraft types operating at night were modelled with daytime profiles.

⁴ See **Table D1** for a list of ANCON types.

- 2.5 The application of reverse thrust following touchdown was modelled for all ANCON types where applicable. Reverse thrust was included in both the day and night contours.

Noise data

- 2.6 Noise levels for each ANCON aircraft type are checked and updated each year according to the latest noise measurements, so they represent the best available data.
- 2.7 At Heathrow, the Noise and Track-Keeping (NTK) system captures data from both fixed and mobile noise monitors around the airport. Noise event data for individual aircraft operations are matched to operational data provided by the airport. The Heathrow NTK system uses 12 fixed monitors positioned approximately 6.5 km from start-of-roll, together with an array of mobile monitors that can be deployed anywhere within the NTK radar coverage area. Further information on the noise monitors can be found in CAP 1149 (**Ref 6**).
- 2.8 The noise data collected were screened by ERCD with reference to several criteria so that only reliable data were used in the analysis:
- Noise data that lay outside a 'weather window' were discarded. This ensured that the data used were not affected by adverse meteorological conditions such as precipitation and strong winds⁵.
 - The maximum noise level of the aircraft event had to exceed the noise monitor threshold by at least 10 dB to avoid underestimates of the Sound Exposure Level (SEL).
 - Only measurements obtained from aircraft operations that passed through a 60-degree inverted cone, centred at the noise monitor, were retained to minimise the effects of lateral attenuation and lateral directivity.⁶
 - At a given noise monitor location and for each ANCON type, the number of flight operations with valid noise measurements had to account for at least 75% of total overflights. This ensured that the resulting average noise level was not biased higher than the true average noise level due to missing measurements for quieter flights below the monitor threshold or not meeting the aforementioned L_{Amax} criterion.

⁵ Wind speeds above 10 m/s, in accordance with ISO 20906 (**Ref 7**).

⁶ *Lateral attenuation* is the excess sound attenuation caused by the ground surface, which can be significant at low angles of elevation. *Lateral directivity* is the non-uniform directionality of sound radiated laterally about the roll axis of the aircraft – this is influenced to a large extent by the positioning of the engines.

- 2.9 The ANCON model calculates aircraft noise using a noise database expressing SEL as a function of engine power setting and slant distance to the receiver – also known as the ‘Noise-Power-Distance’ (NPD) relationship. The ANCON noise database is continually reviewed and updated with adjustments made annually when measurements show this to be necessary.
- 2.10 The most significant SEL noise database updates following noise measurements undertaken in 2022 were as follows:
- **EA320V** – on departure, up to about 1 dB noisier at distances beyond 15 km from start of roll. On arrival, up to 2 dB quieter beyond 4 km from threshold.
 - **EA320NEO** – on arrival, up to 1 dB quieter beyond 11 km from threshold.
- 2.11 Validation of L_{Amax} levels for each aircraft type, which are the basis of ‘Number Above’ contours (but not the L_{Aeq} contours), was also undertaken for 2022. The most significant L_{Amax} noise database updates were as follows:
- **EA320V** – on departure, up to about 1.5 dB noisier at distances beyond 15 km from start of roll. On arrival, up to 2 dB quieter beyond 6 km from threshold.
 - **EA320NEO** – on arrival, up to 1 dB quieter beyond 11 km from threshold.

Traffic data

- 2.12 The contours were calculated using 2022 movement data extracted from the Heathrow NTK system, which stores radar data supplemented by daily flight plans. Breakdowns of the aircraft movements by ANCON aircraft type for the average summer day (07:00-23:00 local time) and night (23:00-07:00 local time) are summarised in **Tables C1-C2** of **Appendix C**. The traffic numbers have been divided by 92 in the tables to provide daily average figures. Detailed descriptions of individual ANCON aircraft types are given in **Table D1** of **Appendix D**.
- 2.13 The COVID-19 pandemic had a smaller effect on Heathrow traffic levels in 2022 compared to the previous two years, as air travel recovered. The average number of daily movements at Heathrow over the 2022 summer day period (1041.5) was 90% higher than the previous year (2021: 548.9). Average summer night movements rose by 102% in 2022 to 73.7 (2021: 36.6).
- 2.14 Annual 2022 24-hour average movements were 1042.0, an increase of 95% from 2021 (535.0). Annual average 12-hour day, 4-hour evening and 8-hour night movements increased by 83%, 166% and 84% respectively. Movements over the 6.5-hour night period also increased, by 99%. Annual average movements for the above time periods are summarised in **Tables C3-C7**.

- 2.15 Breakdowns of annual 24-hour movements by 'Noise Class' from 2006 to 2022 are illustrated in **Figure B2**. The Heathrow fleet mix can be considered in terms of aircraft 'Noise Class' categories (A-H), which are ranked in ascending order of noise emission, i.e. from the quietest (A) to the noisiest (H). Since 2019, Noise Classes C-E have each been split into 3rd and 4th generation subclasses, e.g. 'C3' (3rd gen.) and 'C4' (4th gen.), where C4, D4 and E4 represent the more modern, quieter 4th generation types, as defined below:
- Noise Class C4 = B738MAX, B739MAX, E190E2, EA221, EA223, EA320NEO, EA321NEO
 - Noise Class D4 = B789, B7810, EA359, EA3510
 - Noise Class E4 = B748, EA38GP, EA38R

Runway modal splits

- 2.16 In general, aircraft will take-off and land into a headwind to maximise lift during take-off and landing. The wind direction, which varies over the course of a year, will therefore have an important influence on the usage of runways.⁷ The ratio of westerly (i.e. Runway 27L/27R) and easterly (i.e. Runway 09L/09R) operations is referred to as the *runway modal split*.
- 2.17 Two sets of contours have been produced for the 2022 summer 16-hour day:
- (a) Using the 'actual' modal split over the $L_{Aeq,16h}$ day period; and
 - (b) Assuming the 'standard' modal split over the $L_{Aeq,16h}$ day period, i.e. the long-term modal split calculated from the 20-year rolling average. For 2022, this is the 20-year period from 2003 to 2022. Using the standard modal split enables year-on-year comparisons without the runway usage significantly affecting the contour shape.
- 2.18 The 2021 and 2022 runway modal splits for the day and night summer periods are summarised in **Table 1**. The percentage of westerly operations for daytime was 13% higher in 2022 compared to 2021, and 12% higher at night.

⁷ A 'westerly preference' is used at Heathrow, meaning operations in westerly mode even if there is a light tailwind, to reduce the use of easterly SIDs that tend to overfly more populated areas than the westerly SIDs.

Table 1 Heathrow 2021 and 2022 summer and annual runway modal splits

Time period	2021 actual split (W/E percentage)	2022 actual split (W/E percentage)	2021 standard split (W/E percentage)	2022 standard split (W/E percentage)
Summer 16h day	55 / 45	68 / 32	78 / 22	78 / 22
Summer 8h night	56 / 44	68 / 32		
Annual 12h day	71 / 29	72 / 28		
Annual 4h evening	71 / 29	71 / 29		
Annual 8h night	71 / 29	73 / 27		
Annual 24h	71 / 29	72 / 28		
Annual 6.5h night	70 / 30	73 / 27		

Note: The 6.5-hour night covers the period from the end of March in one year to the end of March in the following year, according to the start of the summer and end of the winter night quota seasons.

- 2.19 A higher proportion of westerly movements at Heathrow tends to cause an increase in contour area. Conversely, a higher proportion of easterly movements at Heathrow tends to reduce the contour area. During easterly operations, departures from Runway 09L are restricted by the Cranford Agreement, resulting in most departures operating from Runway 09R, whilst landings are on Runway 09L. This concentrates traffic onto fewer flight paths, reducing the overall contour area.
- 2.20 Runway modal splits for the 2022 annual metrics are also summarised in **Table 1**. The runway modal split percentages for departures and arrivals separately, for each of the annual periods modelled, L_{day} , $L_{evening}$, L_{night} , L_{den} and $L_{Aeq,6.5h}$ night, are summarised in **Tables C8-a** to **C8-e** respectively, for 2006-2022.

Topography

- 2.21 The topography around Heathrow Airport was modelled by accounting for terrain height. This was achieved by geometrical corrections for source-receiver distance and elevation angles. Other more complex effects, such as lateral attenuation from uneven ground surfaces and noise screening/reflection effects due to topographical features, were not considered.
- 2.22 ERCD holds Ordnance Survey terrain height data on a 50-metre grid for the whole of England. Interpolation was performed to generate height data at each of the calculation points on the receiver grid used by the ANCON noise model.

Population database

- 2.23 Estimates were made of the population and households enclosed within the noise contours. The population data used in this report for the 2022 contours are a 2022 update of the latest 2011 Census supplied by CACI Limited.⁸ The CACI population database contains data referenced at the postcode level. Population and household numbers associated with each postcode are assigned to a single coordinate located at the postcode's centroid.
- 2.24 Within the extent of the 2022 standard 54 dB $L_{Aeq,16h}$ contour, the population count was 0.2% higher with the 2022 population database compared to the 2021 database. This provides an indication of the effect of any population changes in the vicinity of the airport on the results presented in Chapter 3.

⁸ www.caci.co.uk

Chapter 3 Results

2022 summer day actual $L_{Aeq,16h}$ contours

- 3.1 The 2022 summer day $L_{Aeq,16h}$ noise contours generated with the actual runway modal split (68% west / 32% east) are shown in **Figure B3** of **Appendix B**. The contours are plotted from 54 to 72 dB at 3 dB intervals and overlaid onto the 2021 contours plotted at the 54 and 57 dB levels only (**Ref 8**).
- 3.2 Cumulative estimates of the areas, populations and households within the 2022 contours are provided in **Table 2**, along with the figures from 2021.

Table 2 Heathrow 2021 and 2022 summer day actual modal split $L_{Aeq,16h}$ contours – area, population and household estimates

$L_{Aeq,16h}$ (dB)	Area (km ²)			Population			Households		
	2021	2022	change	2021	2022	change	2021	2022	change
> 54	68.0	106.9	+57%	181.3	309.2	+71%	65.1	117.7	+81%
> 57	39.9	63.0	+58%	78.9	157.5	+100%	26.5	56.4	+113%
> 60	22.8	36.7	+61%	24.1	67.0	+178%	7.8	22.5	+188%
> 63	10.9	21.1	+94%	4.5	21.2	+371%	1.5	7.0	+367%
> 66	5.6	10.2	+82%	0.5	4.4	+780%	0.2	1.5	+650%
> 69	3.2	5.2	+63%	< 0.1	0.5	(n/a)	< 0.1	0.2	(n/a)
> 72	2.0	3.0	+50%	0.0	< 0.1	(n/a)	0.0	< 0.1	(n/a)

Note: Populations and households are given in thousands. The 2021 and 2022 population/household counts are based on 2021 and 2022 CACI updates of the 2011 Census respectively.

- 3.3 The 2022 summer day actual 54 dB $L_{Aeq,16h}$ contour enclosed an area of 106.9 km² and a population of 309,200. This area was 57% larger than in 2021 (68.0 km²), and the population count was 71% higher (2021: 181,300).
- 3.4 The contour area and population increases can be attributed primarily to the 90% rise in summer day movements in 2022. The population changes were also influenced by the effect on contour shapes of the 13% shift in runway modal split between 2021 (55% west / 45% east) and 2022 (68% west / 32% east).

2022 summer day standard $L_{Aeq,16h}$ contours

- 3.5 The 2022 summer day $L_{Aeq,16h}$ noise contours generated with the standard runway modal split (78% west / 22% east) are shown in **Figure B4**. The contours are plotted from 54 to 72 dB at 3 dB intervals and overlaid onto the 2021 contours plotted at the 54 and 57 dB levels only.
- 3.6 Cumulative estimates of the areas, populations and households within the 2022 contours are provided in **Table 3**, along with the figures from 2021.

Table 3 Heathrow 2021 and 2022 summer day standard modal split $L_{Aeq,16h}$ contours – area, population and household estimates

$L_{Aeq,16h}$ (dB)	Area (km ²)			Population			Households		
	2021	2022	change	2021	2022	change	2021	2022	change
> 54	70.9	108.5	+53%	182.6	296.5	+62%	66.9	113.5	+70%
> 57	40.4	64.5	+60%	83.6	160.1	+92%	28.5	57.9	+103%
> 60	23.2	36.6	+58%	31.7	67.5	+113%	10.5	22.8	+117%
> 63	11.3	21.5	+90%	5.9	24.6	+317%	2.0	8.1	+305%
> 66	5.6	10.3	+84%	1.2	4.6	+283%	0.3	1.5	+400%
> 69	3.2	5.2	+63%	< 0.1	0.7	(n/a)	< 0.1	0.2	(n/a)
> 72	2.0	2.9	+45%	0.0	< 0.1	(n/a)	0.0	< 0.1	(n/a)

Note: Populations and households are given in thousands. The 2021 and 2022 population/household counts are based on 2021 and 2022 CACI updates of the 2011 Census respectively.

- 3.7 The 2022 summer day standard 54 dB $L_{Aeq,16h}$ contour enclosed an area of 108.5 km² and a population of 296,500. This area was 53% larger than in 2021 (70.9 km²), whilst the population count was 62% higher (2021: 182,600).

2022 summer day single mode $L_{Aeq,16h}$ contours

- 3.8 The Heathrow 2022 summer day $L_{Aeq,16h}$ noise contours for 100% westerly and 100% easterly modes assuming the 2006 north-south runway usage (to eliminate the effects of differences in north-south runway usage between 2022 and 2006) are shown in **Figures B5 and B6** respectively. The contours are plotted from 54 to 72 dB at 3 dB intervals and overlaid onto the corresponding single mode contours for 2006.

3.9 Cumulative estimates of the areas, populations and households within the 2006 and 2022 summer day single mode $L_{Aeq,16h}$ contours are provided in **Tables 4** and **5**.

Table 4 Heathrow 2006 and 2022 summer day $L_{Aeq,16h}$ 100% W contours (assuming 2006 N-S runway usage) – area, population and household estimates

$L_{Aeq,16h}$ (dB)	Area (km ²)			Population			Households		
	2006	2022	change	2006	2022	change	2006	2022	change
> 54	215.6	113.7	-47%	638.6	323.7	-49%	289.5	126.0	-56%
> 57	126.5	66.7	-47%	297.0	169.6	-43%	128.0	62.7	-51%
> 60	69.4	37.2	-46%	113.7	76.2	-33%	46.5	26.0	-44%
> 63	38.5	22.0	-43%	50.5	33.2	-34%	20.1	10.9	-46%
> 66	23.4	10.9	-53%	18.3	6.5	-64%	7.0	2.1	-70%
> 69	13.0	5.4	-58%	5.2	1.7	-67%	2.0	0.5	-75%
> 72	6.7	2.9	-57%	1.1	< 0.1	(n/a)	0.4	< 0.1	(n/a)
> 54				638.6	272.2	-57%	289.5	118.2	-59%
> 57				297.0	132.5	-55%	128.0	55.3	-57%
> 60				113.7	57.7	-49%	46.5	22.6	-51%
> 63				50.5	25.7	-49%	20.1	9.8	-51%
> 66				18.3	5.4	-70%	7.0	2.0	-71%
> 69				5.2	1.3	-75%	2.0	0.4	-80%
> 72				1.1	< 0.1	(n/a)	0.4	< 0.1	(n/a)

Note: Populations and households are given in thousands. The 2006 population/household counts are based on a 2006 CACI update of the 2001 Census. The 2022 population/household counts are based on a 2022 CACI update of the 2011 Census. **Estimates for 2022 using the 2006 population database are shown in blue.**

Table 5 Heathrow 2006 and 2022 summer day L_{Aeq,16h} 100% E contours (assuming 2006 N-S runway usage) – area, population and household estimates

L _{Aeq,16h} (dB)	Area (km ²)			Population			Households		
	2006	2022	change	2006	2022	change	2006	2022	change
> 54	196.6	100.4	-49%	516.9	281.6	-46%	216.1	106.4	-51%
> 57	112.7	54.7	-51%	324.6	168.1	-48%	136.4	62.5	-54%
> 60	63.4	31.2	-51%	169.4	69.6	-59%	69.6	25.6	-63%
> 63	35.0	17.3	-51%	71.9	16.7	-77%	28.4	6.2	-78%
> 66	18.9	9.8	-48%	22.3	3.6	-84%	8.7	1.4	-84%
> 69	10.6	5.3	-50%	3.6	0.9	-75%	1.6	0.3	-81%
> 72	6.2	2.9	-53%	0.9	0.1	-89%	0.4	< 0.1	(n/a)
> 54				516.9	236.6	-54%	216.1	98.2	-55%
> 57				324.6	138.9	-57%	136.4	57.0	-58%
> 60				169.4	57.1	-66%	69.6	23.5	-66%
> 63				71.9	13.0	-82%	28.4	5.5	-81%
> 66				22.3	2.7	-88%	8.7	1.2	-86%
> 69				3.6	0.7	-81%	1.6	0.3	-81%
> 72				0.9	0.1	-89%	0.4	< 0.1	(n/a)

Note: Populations and households are given in thousands. The 2006 population/household counts are based on a 2006 CACI update of the 2001 Census. The 2022 population/household counts are based on a 2022 CACI update of the 2011 Census. **Estimates for 2022 using the 2006 population database are shown in blue.**

- 3.10 For the westerly single mode contours, the 2022 areas have all decreased relative to 2006, by up to 58%. The population and household counts in 2022 were also all lower than in 2006.
- 3.11 For the easterly single mode contours, the 2022 areas have also all decreased relative to 2006, by up to 53%. Both population and household numbers were lower at all contour levels in 2022 compared to 2006.
- 3.12 Populations and household estimates for 2022, assuming the 2006 population database, are shown in blue in the lower half of each table. These figures indicate that the populations would have decreased even more at most contour levels had population encroachment not occurred between 2006 and 2022.

2022 summer night actual $L_{Aeq,8h}$ contours

- 3.13 The 2022 summer night $L_{Aeq,8h}$ noise contours generated with the actual runway modal split (68% west / 32% east) are shown in **Figure B5**. The contours are plotted from 48 to 63 dB at 3 dB intervals and overlaid onto the 2021 contours plotted at the 48, 51 and 54 dB levels only.
- 3.14 Cumulative estimates of the areas, populations and households within the 2022 contours are provided in **Table 6**, along with the figures from 2021.

Table 6 Heathrow 2021 and 2022 summer night actual modal split $L_{Aeq,8h}$ contours – area, population and household estimates

$L_{Aeq,8h}$ (dB)	Area (km ²)			Population			Households		
	2021	2022	change	2021	2022	change	2021	2022	change
> 48	49.7	79.5	+60%	148.6	250.6	+69%	54.7	95.8	+75%
> 51	23.7	48.6	+105%	57.8	136.8	+137%	19.2	49.3	+157%
> 54	12.0	23.4	+95%	23.2	55.6	+140%	7.4	18.3	+147%
> 57	5.6	11.8	+111%	3.3	19.8	+500%	1.0	6.2	+520%
> 60	2.9	5.7	+97%	0.6	3.3	+450%	0.2	1.0	+400%
> 63	1.6	3.1	+94%	< 0.1	1.0	(n/a)	< 0.1	0.3	(n/a)
> 66	1.0	1.8	+80%	0.0	< 0.1	(n/a)	0.0	< 0.1	(n/a)
> 69	0.5	1.1	+120%	0.0	< 0.1	(n/a)	0.0	< 0.1	(n/a)
> 72	0.2	0.6	+200%	0.0	0.0	(-)	0.0	0.0	(-)

Note: Populations and households are given in thousands. The 2021 and 2022 population/household counts are based on 2021 and 2022 CACI updates of the 2011 Census respectively.

- 3.15 The 2022 night actual 48 dB $L_{Aeq,8h}$ contour enclosed an area of 79.5 km² and a population of 250,600. The 48 dB area was 60% larger than in 2021 (49.7 km²), whilst the population count was 69% higher (2021: 148,600).
- 3.16 The contour area and population increases can be attributed primarily to the 102% rise in summer night traffic levels in 2022. The population changes were also influenced by the effect on contour shapes of the 12% shift in runway modal split between 2021 (56% west / 44% east) and 2022 (68% west / 32% east).

2022 summer night single mode $L_{Aeq,8h}$ contours

- 3.17 The Heathrow 2022 summer night $L_{Aeq,8h}$ noise contours for 100% westerly and 100% easterly modes assuming the 2006 north-south runway usage are shown in **Figures B8** and **B9** respectively. The contours are plotted from 48 to 66 dB at 3 dB intervals (the 69 and 72 dB contours have been omitted for clarity) and overlaid onto the corresponding single mode contours for 2006.
- 3.18 Cumulative estimates of the areas, populations and households within the 2006 and 2022 summer night single mode $L_{Aeq,8h}$ contours are provided in **Tables 7** and **8**.

Table 7 Heathrow 2006 and 2022 summer night 100% W $L_{Aeq,8h}$ contours (assuming 2006 N-S runway usage) area, population and household estimates

$L_{Aeq,8h}$ (dB)	Area (km ²)			Population			Households		
	2006	2022	change	2006	2022	change	2006	2022	change
> 48	118.3	78.0	-34%	431.8	284.0	-34%	195.7	109.6	-44%
> 51	71.4	50.1	-30%	188.5	173.2	-8%	80.2	64.2	-20%
> 54	42.2	26.1	-38%	99.1	79.6	-20%	40.6	27.0	-33%
> 57	23.3	12.2	-48%	47.3	36.1	-24%	18.4	11.5	-38%
> 60	11.8	5.8	-51%	21.6	8.6	-60%	8.2	2.5	-70%
> 63	6.4	2.9	-55%	7.4	1.9	-74%	2.5	0.5	-80%
> 66	3.5	1.5	-57%	1.7	< 0.1	(n/a)	0.6	< 0.1	(n/a)
> 69	2.0	0.9	-55%	0.2	< 0.1	(n/a)	0.1	< 0.1	(n/a)
> 72	1.3	0.5	-62%	0.0	0.0	(-)	0.0	0.0	(-)

Note: Populations and households are given in thousands. The 2006 population/household counts are based on a 2006 CACI update of the 2001 Census. The 2022 population/household counts are based on a 2022 CACI update of the 2011 Census.

Table 8 Heathrow 2006 and 2022 summer night 100% E $L_{Aeq,8h}$ contours (assuming 2006 N-S runway usage) area, population and household estimates

$L_{Aeq,8h}$ (dB)	Area (km ²)			Population			Households		
	2006	2022	change	2006	2022	change	2006	2022	change
> 48	112.0	74.7	-33%	197.3	132.9	-33%	81.4	50.8	-38%
> 51	68.9	46.2	-33%	120.8	69.5	-42%	49.5	27.4	-45%
> 54	39.4	23.5	-40%	52.0	17.2	-67%	21.9	7.3	-67%
> 57	20.5	11.5	-44%	7.9	2.4	-70%	3.5	1.0	-71%
> 60	11.2	5.6	-50%	1.8	1.0	-44%	0.8	0.4	-50%
> 63	6.2	2.8	-55%	0.7	0.2	-71%	0.3	0.1	-67%
> 66	3.4	1.5	-56%	0.2	0.0	-100%	0.1	0.0	-100%
> 69	1.9	0.8	-58%	0.0	0.0	(-)	0.0	0.0	(-)
> 72	1.1	0.5	-55%	0.0	0.0	(-)	0.0	0.0	(-)

Note: Populations and households are given in thousands. The 2006 population/household counts are based on a 2006 CACI update of the 2001 Census. The 2022 population/household counts are based on a 2022 CACI update of the 2011 Census.

- 3.19 For the westerly single mode contours, the areas have all decreased in 2022 relative to 2006, by up to 62%. Populations and households were also lower in 2022. At the 51 dB level, the population reduction was smaller than expected, which may be attributed to the effects of population encroachment in some of the areas around Heathrow.
- 3.20 For the easterly single mode contours, the 2022 areas were lower at all contour levels, by up to 58%. Population and households were also lower in 2022 compared to 2006.

2022 summer day overflight contours and track density diagrams

- 3.21 Contours showing the number of 2022 average summer 16-hour day overflights (see **Ref 9**) up to 4,000 ft AMSL for elevation angle⁹ thresholds of 48.5 and 60-degrees at the ground receiver, are shown in **Figures B10a-B10b** respectively. The results are plotted at levels of 1, 5, 20 and 100 overflights per 16-hour day.
- 3.22 The 4,000 ft AMSL height cut-off has been used because up to this height, noise is prioritised over emissions based on Government guidance (**Ref 10**). Aircraft at an elevation angle of 48.5 degrees from an observer are approximately 3 dB quieter than if they are directly overhead. A 3 dB difference is generally regarded as the smallest perceptible difference between two noise levels. Aircraft at an elevation angle of 60 degrees are approximately 1.5 dB quieter than if they are directly overhead, a difference which may not be perceptible. On balance, a 48.5-degree elevation angle threshold is recommended by the CAA for the representation of overflight.
- 3.23 It should be noted that these overflight contours have been included as a supplementary metric to provide insight into the number of aircraft flyover events that might be observed. As yet there are no established methods for assessing the annoyance or health impacts from various levels of overflight.
- 3.24 Overflight track density diagrams for the 2022 average summer day, which indicate the number of overflights using colour-shading, are provided for 48.5 and 60-degree elevation angles in **Figures B11a-B11b** respectively.

2022 summer night overflight contours and track density diagrams

- 3.25 Contours showing the number of 2022 average summer 8-hour night overflights up to 4,000 ft AMSL for 48.5 and 60-degree elevation angles are shown in **Figures B12a-B12b** respectively. The results are plotted at levels of 1, 5 and 20 overflights per 8-hour night.
- 3.26 Similarly, there are currently no established methods for assessing sleep disturbance or health impacts from night-time overflights.
- 3.27 Overflight colour-coded track density diagrams for the 2022 average summer night are provided in **Figures B13a-B13b** respectively for 48.5 and 60-degree elevation angles.

⁹ The elevation angle is defined as the angle between the ground and the aircraft as seen from the observer at ground level.

2022 L_{day} contours

- 3.28 The 2022 annual L_{day} noise contours generated with the actual runway modal split (72% west / 28% east) are shown in **Figure B14**. The contours are plotted from 55 to 75 dB at 5 dB intervals, and overlaid onto the 2021 contours (actual modal split 71% west / 29% east).
- 3.29 Cumulative estimates of the areas, populations and households within the 2022 contours are provided in **Table 9**, along with the figures from 2021.

Table 9 Heathrow 2022 L_{day} contours - area, population and household estimates

L _{day} (dB)	Area (km ²)			Population			Households		
	2021	2022	change	2021	2022	change	2021	2022	change
> 55	63.2	91.4	+45%	155.9	256.5	+65%	55.6	96.9	+74%
> 60	25.2	37.1	+47%	35.7	68.9	+93%	11.8	23.3	+97%
> 65	7.7	13.4	+74%	2.8	8.5	+204%	0.9	2.8	+211%
> 70	2.9	4.3	+48%	< 0.1	0.2	(n/a)	< 0.1	0.1	(n/a)
> 75	1.3	1.9	+46%	0.0	< 0.1	(n/a)	0.0	< 0.1	(n/a)

Note: Populations and households are given in thousands. The 2021 and 2022 population/household counts are based on 2021 and 2022 CACI updates of the 2011 Census respectively.

- 3.30 The 2022 55 dB L_{day} contour enclosed an area of 91.4 km² and a population of 256,500. This area was 45% larger than in 2021 (63.2 km²), and the population count was 65% higher (2021: 155,900). The increases in area and population can be attributed mainly to the 83% rise in movements over the 12-hour day period.

2022 Levening contours

- 3.31 The 2022 annual Levening noise contours generated with the actual runway modal split (71% west / 29% east) are shown in **Figure B15**. The contours are plotted from 55 to 75 dB at 5 dB intervals and overlaid onto the 2021 contours (actual modal split 71% west / 29% east).
- 3.32 Cumulative estimates of the areas, populations and households within the 2022 contours are provided in **Table 10**, along with the figures from 2021.

Table 10 Heathrow 2022 Levening contours - area, population and household estimates

Levening (dB)	Area (km ²)			Population			Households		
	2021	2022	change	2021	2022	change	2021	2022	change
> 55	39.4	70.5	+79%	74.5	176.9	+137%	25.2	63.7	+153%
> 60	15.0	28.5	+90%	7.0	36.8	+426%	2.4	12.3	+413%
> 65	4.7	9.4	+100%	< 0.1	3.2	(n/a)	< 0.1	1.1	(n/a)
> 70	2.0	3.3	+65%	0.0	< 0.1	(n/a)	0.0	< 0.1	(n/a)
> 75	1.0	1.5	+50%	0.0	< 0.1	(n/a)	0.0	< 0.1	(n/a)

Note: Populations and households are given in thousands. The 2021 and 2022 population/household counts are based on 2021 and 2022 CACI updates of the 2011 Census respectively.

- 3.33 The 2022 55 dB Levening contour enclosed an area of 70.5 km² and a population of 176,900. This area was 79% larger than in 2021 (39.4 km²), and the population count was 137% higher (2021: 74,500). The increases in area and population can be attributed mainly to the 166% rise in movements over the 4-hour evening period.

2022 L_{night} contours

- 3.34 The 2022 annual L_{night} noise contours generated with the actual runway modal split (73% west / 27% east) are shown in **Figure B16**. The contours are plotted from 50 to 70 dB at 5 dB intervals and overlaid onto the 2021 contours (actual modal split 71% west / 29% east) plotted at the 50 and 55 dB levels only.
- 3.35 Cumulative estimates of the areas, populations and households within the 2022 contours are provided in **Table 11**, along with the figures from 2021.

Table 11 Heathrow 2022 L_{night} contours - area, population and household estimates

L _{night} (dB)	Area (km ²)			Population			Households		
	2021	2022	change	2021	2022	change	2021	2022	Change
> 50	30.6	54.2	+77%	92.6	173.2	+87%	32.1	64.1	+100%
> 55	9.1	16.6	+82%	22.2	43.5	+96%	7.0	14.2	+103%
> 60	2.8	5.0	+79%	1.7	3.2	+88%	0.5	0.9	+80%
> 65	1.1	1.9	+73%	0.0	< 0.1	(n/a)	0.0	< 0.1	(n/a)
> 70	0.3	0.8	+167%	0.0	0.0	(-)	0.0	0.0	(-)

Note: Populations and households are given in thousands. The 2021 and 2022 population/household counts are based on 2021 and 2022 CACI updates of the 2011 Census respectively.

- 3.36 The 2022 50 dB L_{night} contour enclosed an area of 54.2 km² and a population of 173,200. This area was 77% larger than in 2021 (30.6 km²), and the population count was 87% higher (2021: 92,600). The increases in area and population can be attributed mainly to the 84% rise in movements over the 8-hour night period.

2022 L_{den} contours

- 3.37 The 2022 annual L_{den} noise contours generated with the actual runway modal split (72% west / 28% east) are shown in **Figure B17**. The contours are plotted from 55 to 75 dB at 5 dB intervals and overlaid onto the 2021 contours (actual modal split 71% west / 29% east).
- 3.38 Cumulative estimates of the areas, populations and households within the contours are provided in **Table 12**, along with the figures from 2021.

Table 12 Heathrow 2022 L_{den} contours - area, population and household estimates

L _{den} (dB)	Area (km ²)			Population			Households		
	2021	2022	change	2021	2022	change	2021	2022	change
> 55	75.6	115.6	+53%	215.7	366.5	+70%	80.9	142.2	+76%
> 60	30.2	48.7	+61%	60.3	118.1	+96%	20.1	41.2	+105%
> 65	9.1	17.4	+91%	7.1	24.0	+238%	2.2	7.7	+250%
> 70	3.2	5.3	+66%	0.1	1.8	+1700%	< 0.1	0.5	(n/a)
> 75	1.4	2.1	+50%	0.0	< 0.1	(n/a)	0.0	< 0.1	(n/a)

Note: Populations and households are given in thousands. The 2021 and 2022 population/household counts are based on 2021 and 2022 CACI updates of the 2011 Census respectively.

- 3.39 The 2022 55 dB L_{den} contour enclosed an area of 115.6 km² and a population of 366,500. This area was 53% larger than in 2021 (75.6 km²), and the population count was 70% higher (2021: 215,700). The increases in area and population can be attributed mainly to the 95% rise in movements over the 24-hour period.

2022 $L_{Aeq,6.5h}$ night contours

- 3.40 The 2022 annual $L_{Aeq,6.5h}$ night contour generated with the actual runway modal split (73% west / 27% east) is shown in **Figure B18** plotted at the 48 dB level and overlaid onto the 2021 contour (actual modal split 70% west / 30% east).
- 3.41 Cumulative estimates of the area, population and households within the 48 dB contour are provided in **Table 13**, along with the figures from 2021.

Table 13 Heathrow 2022 $L_{Aeq,6.5h}$ night contour - area, population and household estimates

$L_{Aeq,6.5h}$ (dB)	Area (km ²)			Population			Households		
	2021	2022	change	2021	2022	Change	2021	2022	change
> 48	12.5	22.1	+77%	41.7	66.9	+60%	13.5	22.3	+65%

Note: Populations and households are given in thousands. The 2021 and 2022 population/household counts are based on 2021 and 2022 CACI updates of the 2011 Census respectively.

- 3.42 The 2022 48 dB $L_{Aeq,6.5h}$ night contour enclosed an area of 22.1 km² and a population of 66,900. This area was 77% larger than in 2021 (12.5 km²), and the population count was 60% higher (2021: 41,700). The increase in area and population can be attributed mainly to the 99% rise in movements over the 6.5-hour night period.

Long-term contour trends

- 3.43 The long-term trends in contour area, population and households for L_{day} , $L_{evening}$, L_{night} , L_{den} and $L_{Aeq,6.5h}$ night are shown in **Figure B19-B23** respectively. The trends are for the lowest contour level plotted, for 2006-2022. Three-year moving average (MA) trend lines for area, population, households and movements are shown. The effects of the response to the COVID-19 pandemic on area, population and household statistics in 2020-2021, are clearly evident in the trend charts.

Cumulative area, population and household counts – comparisons with 2006

- 3.44 The 2006 and 2022 cumulative results in **Tables C9-C13** of **Appendix C** show that the 2022 annual contour areas were all below 2006 base year levels across all noise metrics. For example, the 55 dB L_{den} contour area in 2022 was 115.6 km², which was 53% smaller than the 2006 L_{den} 55 dB area of 244.7 km² (see **Table C12**).
- 3.45 Although 24-hour movements in 2022 nearly doubled from 2021 as air travel recovered from the effects of the COVID-19 pandemic, they were still approximately 20% lower than in 2006.
- 3.46 All population and household counts were lower in 2022 compared to 2006, in line with the area decreases. These reductions in population would have been even greater had there not been population encroachment in the areas around Heathrow between 2006 and 2022. To illustrate the effects of encroachment, population and household counts for the 2022 contours have also been made using the 2006 population database. These counts, highlighted in blue in **Tables C9-C13**, confirm that the population and household counts would have reduced further across all noise metrics and at most contour levels had there not been any population encroachment between 2006 and 2022.
- 3.47 Historically, the Heathrow noise contour area had been largely influenced by the Boeing 747-400 aircraft type. However, their numbers have decreased from an average of 135 movements per 24-hour day in 2006 to 1 movement in 2022. Newer, quieter aircraft types such as the Airbus A380, Boeing 787-8/9/10 and Airbus A320NEO/A321NEO were not in service in 2006, but by 2022 there were an average of 32, 142 and 192 daily movements of these types respectively. Such fleet changes have helped to reduce the Heathrow contour areas between 2006 and 2022.

2022 L_{den} noise contours – comparisons with 2006

- 3.48 A comparison diagram of the 2022 and 2006 L_{den} contours can be found in **Figure B24**. The contour lobes associated with departures turning to the north have shortened considerably because the older and noisier Boeing 747-400 aircraft have been replaced by quieter types such as the Boeing 777-300ER and Airbus A380, and also because movements have yet to recover to pre-pandemic levels. A similar change is seen in the contour lobe formed by westerly departures turning to the south (on the DVR/DET route¹⁰). Westerly arrival movements were more prevalent on the northern runway in 2006, thus the contour lobes to the east of the airport in 2006 were more expansive along the Runway 27R extended centreline compared to 2022. There was a 2% higher percentage of westerly operations in 2022 compared to 2006.
- 3.49 To eliminate the effects of differences in the runway modal split and the north-south runway usage between 2006 and 2022, the 2022 L_{den} contours have also been produced using the 2006 base year actual runway modal split and the 2006 north-south runway usage. They are overlaid onto the 2006 contours, plotted at 55, 60 and 65 dB only, in **Figure B25**. The cumulative areas, populations and households within the adjusted L_{den} contours are summarised in **Table C14**, and reductions compared to 2006 are seen at all contour levels. As the effects of the W/E and N/S runway splits have been removed, this means that the contour differences that are visible are due to the remaining changes, including:
- improvements to the aircraft fleet;
 - variations in the tracks actually flown; and
 - variations in the number of each aircraft on each route.
- 3.50 It should be noted that noise from different events with the same aircraft type on the same track with the same fuel load can still vary due to procedural differences, whether standard procedures or those of individual pilots. The modelling attempts to reflect the average noise level for an aircraft, flight track, stage length (distance flown) and weather. As the ANCON model is updated annually to reflect actual and average noise levels, the modelling results are the best practicable representation of the actual noise exposure.

¹⁰ See **Figure 1** for the Heathrow SID route diagram.

L_{den} noise change diagrams

- 3.51 In order to identify the areas where L_{den} noise levels have increased or decreased whilst excluding the effect of weather patterns and other factors on runway usage, a 'noise change' map has been produced to compare the noise exposure between the 2022 and 2006 L_{den} noise contours, assuming the 2006 actual runway modal split and the 2006 north-south runway usage for 2022¹¹ (see **Figure B26**). The 2006 L_{den} modal split was 70% west / 30% east. The outer extent of the above 2006 and 2022 55 dB L_{den} contours has been used as the boundary (i.e. assessment area 'envelope'¹²) of the noise changes.
- 3.52 As expected, all areas have experienced noise reductions, which reflects the phase-out of the older, noisier aircraft types between 2006 and 2022, as well as residual effects from the COVID-19 pandemic on movement levels. It is estimated that 76% of the total area within the L_{den} noise change boundary has experienced a decrease in noise of at least 3 dB.

2022 L_{night} noise contours – comparisons with 2006

- 3.53 A diagram comparing the 2022 and 2006 L_{night} contours can be found in **Figure B27**. Overall reductions in contour area between 2006 and 2022 can be seen. The cumulative areas, populations and households for these contours are summarised in **Table C11**. The 2022 50 dB L_{night} contour area of 54.2 km² was 36% smaller than in 2006 (84.4 km²), and the population count within this contour fell by 16%. Without the effects of population encroachment between 2006 and 2022, the population count would have reduced by 34%.

L_{night} noise change diagrams

- 3.54 A noise change diagram has been produced comparing 2022 L_{night} with 2006 L_{night} assuming the 2006 L_{night} actual runway modal split and the 2006 north-south runway usage for 2022 (see **Figure B28**). The 2006 L_{night} modal split was 72% west / 28% east. The outer extent of the 2006 and 2022 50 dB L_{night} contours has been taken as the boundary of the noise changes. It can be seen that most areas (98%) have experienced reductions in noise level of at least 1 dB, which reflects the replacement of the older, noisier types between 2006 and 2022, as well as residual effects from the COVID-19 pandemic. For example, there were 21 movements of the B744R per night in 2006, but by 2022

¹¹ That is, the 2022 L_{day}, L_{evening} and L_{night} contours (the constituent parts of 2022 L_{den}) have been modelled with the 2006 L_{day}, L_{evening} and L_{night} runway modal splits respectively.

¹² See Glossary for an explanation of the 'envelope'.

there were none. It is estimated that 43% of the total area within the L_{night} noise change boundary experienced a decrease in noise of at least 3 dB.

2022 L_{night} single mode noise contours

3.55 Single mode 2022 L_{night} contours have been produced assuming the 2006 L_{night} north-south runway usage (see **Figures B29** and **B30**). They are overlaid onto the corresponding single mode L_{night} contours for 2006. Cumulative estimates of the areas, populations and households within these contours are provided in **Tables 14** and **15**.

Table 14 Heathrow 2006 and 2022 L_{night} 100% W contours (assuming 2006 N-S runway usage) – area, population and household estimates

L_{night} (dB)	Area (km ²)			Population			Households		
	2006	2022	change	2006	2022	change	2006	2022	change
> 50	86.0	52.8	-39%	282.8	191.5	-32%	124.8	71.4	-43%
> 55	35.2	16.8	-52%	78.2	57.2	-27%	31.5	18.8	-40%
> 60	11.9	4.9	-59%	23.7	8.0	-66%	9.0	2.3	-74%
> 65	4.3	1.6	-63%	2.9	0.1	-97%	1.0	< 0.1	(n/a)
> 70	1.6	0.6	-63%	< 0.1	0.0	(n/a)	< 0.1	0.0	(n/a)

Note: Populations and households are given in thousands. The 2006 population/household counts are based on a 2006 CACI update of the 2001 Census. The 2022 population/household counts are based on a 2022 CACI update of the 2011 Census.

Table 15 Heathrow 2006 and 2022 L_{night} 100% E contours (assuming 2006 N-S runway usage) – area, population and household estimates

L_{night} (dB)	Area (km ²)			Population			Households		
	2006	2022	change	2006	2022	change	2006	2022	change
> 50	86.0	49.1	-43%	282.8	65.0	-77%	124.8	25.9	-79%
> 55	35.2	16.2	-54%	78.2	4.5	-94%	31.5	1.9	-94%
> 60	11.9	4.7	-61%	23.7	0.6	-97%	9.0	0.3	-97%
> 65	4.3	1.5	-65%	2.9	0.0	-100%	1.0	0.0	-100%
> 70	1.6	0.6	-63%	< 0.1	0.0	(n/a)	< 0.1	0.0	(n/a)

Note: Populations and households are given in thousands. The 2006 population/household counts are based on a 2006 CACI update of the 2001 Census. The 2022 population/household counts are based on a 2022 CACI update of the 2011 Census.

- 3.56 The contour areas and counts of population and households for both 100% westerly and 100% easterly modes have all decreased in 2022 compared to 2006.

2022 N65 annual 16-hour day contours

- 3.57 N65 contours (i.e. contours showing the number of aircraft noise events above 65 dB L_{Amax}) have been produced for the 2022 annual average 16-hour day period (07:00-23:00 local time), for which the actual runway modal split was 74% west / 26% east.
- 3.58 The N65 contours for both 2022 and 2006¹³ are overlaid in **Figure B31** (for clarity, only the 50, 200 and 500-event levels are shown in the diagram). At the 50-event level, it can be seen that the 2022 contours are generally smaller; however, there is an extension to the contour lobe to the west of Windsor Forest, which was caused by 22% higher movement rates on the westerly CPT/GOGSI departure routes in 2022 compared to the equivalent CPT/SAM routes in 2006.
- 3.59 The estimated cumulative areas, populations and households are summarised in **Table 16** for N65 values of 50,100, 200 and 500 events.

Table 16 Heathrow 2006 and 2022 annual average 16-hour day N65 contours - area, population and household estimates

N65	Area (km ²)			Population			Households		
	2006	2022	Change	2006	2022	Change	2006	2022	change
> 50	267.2	181.2	-32%	754.3	514.3	-32%	337.2	202.8	-40%
> 100	162.5	113.5	-30%	470.8	321.3	-32%	209.9	124.3	-41%
> 200	83.0	48.6	-41%	223.5	111.4	-50%	96.3	39.1	-59%
> 500	13.2	0.7	-95%	3.3	0.0	-100%	1.4	0.0	-100%

Note: Populations and households are given in thousands. The 2006 population/household counts are based on a 2006 CACI update of the 2001 Census. The 2022 population/household counts are based on a 2022 CACI update of the 2011 Census.

- 3.60 The results show that the 50-event N65 contour area reduced by 32% between 2006 and 2022. This reflects the 21% lower movement total in 2022 and the replacement of the noisiest aircraft types such as the Boeing 747-400 by quieter types, such as the Airbus A380, Boeing 777-300ER and B787-8/9/10. Areas also decreased at the higher contour levels. The population count within the 50-event contour was 32% lower in 2022, and population decreases were also found at the higher contour levels.

¹³ The 2006 modal split was 70% W / 30% E.

N65 annual 16-hour day change diagrams

- 3.61 An N65 change map has been produced comparing the 2022 and 2006 annual 16-hour N65 results, assuming the 2006 actual runway modal split for 2022 (see **Figure B32**). The boundary for the changes is the outer extent of these contours.
- 3.62 Around 94% of the area within the change boundary experienced reductions in the number of noise events exceeding 65 dB L_{Amax} . There were some areas with increases of up to 50 or more N65 events south of Windsor - this was due to the higher movement rates on the westerly CPT and GOGSI (previously SAM) departure routes in 2022. An area in the vicinity of Egham also experienced increases of up to 50 N65 events, which was caused by the calculated DET mean departure track being positioned more to the west in 2022 compared to 2006¹⁴. Some regions to the east of the southern runway showed increases of up to 10 N65 events. This was caused by a higher proportion of westerly arrivals on the northern runway in 2006, in contrast to 2022 when the westerly arrivals were split more evenly between the two runways.

2022 N70 annual 16-hour day contours

- 3.63 N70 contours (i.e. contours showing the number of aircraft noise events above 70 dB L_{Amax}) have also been produced for the 2022 annual average 16-hour day period (07:00-23:00 local time), for which the actual runway modal split was 74% west / 26% east.
- 3.64 The N70 contours for 2022 and 2006¹⁵ are overlaid in **Figure B33** (for clarity, only the 50, 200 and 500-event levels are shown in the diagram). The 2022 contours are overall smaller than in 2006.
- 3.65 The estimated cumulative areas, populations and households are summarised in **Table 17** for N70 values of 50,100, 200 and 500 events.

¹⁴ Variances in mean track position over time can be caused by factors such as changes in the fleet mix using the route (track-keeping characteristics will vary between different aircraft types).

¹⁵ The 2006 runway modal split was 70% W / 30% E.

Table 17 Heathrow 2006 and 2022 annual average 16-hour day N70 contours - area, population and household estimates

N70	Area (km ²)			Population			Households		
	2006	2022	Change	2006	2022	change	2006	2022	change
> 50	119.7	79.9	-33%	252.0	195.9	-22%	105.0	73.3	-30%
> 100	71.4	51.7	-28%	136.0	112.1	-18%	56.9	39.1	-31%
> 200	41.8	23.6	-44%	63.4	27.0	-57%	24.8	8.8	-65%
> 500	2.1	0.0	-100%	< 0.1	0.0	(n/a)	< 0.1	0.0	(n/a)

Note: Populations and households are given in thousands. The 2006 population/household counts are based on a 2006 CACI update of the 2001 Census. The 2022 population/household counts are based on a 2022 CACI update of the 2011 Census.

3.66 The 50-event N70 contour area reduced between 2006 and 2022 by 33%, reflecting the 21% lower movement rate in 2022 and the replacement of the noisiest aircraft such as the Boeing 747-400 with quieter types such as the Airbus A380, Boeing 777-300ER and the Boeing 787-8/9/10. Areas also reduced at the higher contour levels. The population count for the 50-event contour fell by 22%.

3.67 N70 contours for 2022 assuming both the 2006 actual runway modal split and the 2006 north-south runway usage are overlaid onto the 2006 contours in **Figure B34** (for clarity, only the 50, 200 and 500-event levels are shown in the diagram). The estimated cumulative areas, populations and households are summarised in **Table 18** for N70 values of 50,100, 200 and 500 events. Areas and population counts have decreased at all contour levels.

Table 18 Heathrow 2006 and 2022 annual average 16-hour day N70 contours (assuming 2006 modal split and 2006 N-S runway usage) - area, population and household estimates

N70	Area (km ²)			Population			Households		
	2006	2022	change	2006	2022	change	2006	2022	change
> 50	119.7	80.1	-33%	252.0	195.2	-23%	105.0	72.8	-31%
> 100	71.4	51.1	-28%	136.0	112.0	-18%	56.9	39.0	-31%
> 200	41.8	26.4	-37%	63.4	33.7	-47%	24.8	11.0	-56%
> 500	2.1	0.0	-100%	< 0.1	0.0	(n/a)	< 0.1	0.0	(n/a)

Note: Populations and households are given in thousands. The 2006 population/household counts are based on a 2006 CACI update of the 2001 Census. The 2022 population/household counts are based on a 2022 CACI update of the 2011 Census.

N70 annual 16-hour day change diagrams

- 3.68 An N70 change map has been produced comparing the N70 results for 2022 with those for 2006, assuming the 2006 actual runway modal split and the 2006 north-south runway usage for 2022 (see **Figure B35**). The boundary for the changes is the outer extent of these contours.
- 3.69 The whole assessment area is exposed to reductions in the number of noise events exceeding 70 dB L_{Amax}, with around 54% of the area experiencing reductions of at least 50 N70 events.

2022 N70 annual 16-hour day single mode contours

- 3.70 Single mode 2022 annual 16-hour day N70 contours have been produced assuming the 2006 north-south runway usage for 2022 (**Figures B36 and B37**). They are overlaid onto the corresponding single mode N70 contours for 2006. Cumulative estimates of the areas, populations and households within these contours are provided in **Tables 19 and 20** for 100% westerly and 100% easterly modes respectively.
- 3.71 The areas and population counts have reduced at all contour levels in 2022 compared to 2006.

Table 19 Heathrow 2006 and 2022 annual 16-hour day N70 100% W contours (assuming 2006 N-S runway usage) – area, population and household estimates

N70	Area (km ²)			Population			Households		
	2006	2022	change	2006	2022	Change	2006	2022	change
> 50	121.8	81.9	-33%	220.1	178.0	-19%	92.8	66.7	-28%
> 100	77.7	54.5	-30%	133.6	120.0	-10%	55.1	43.3	-21%
> 200	51.3	29.5	-42%	94.7	49.4	-48%	38.6	16.7	-57%
> 500	4.6	0.0	-100%	0.3	0.0	-100%	0.1	0.0	-100%

Note: Populations and households are given in thousands. The 2006 population/household counts are based on a 2006 CACI update of the 2001 Census. The 2022 population/household counts are based on a 2022 CACI update of the 2011 Census.

Table 20 Heathrow 2006 and 2022 annual 16-hour day N70 100% E contours (assuming 2006 N-S runway usage) – area, population and household estimates

N70	Area (km ²)			Population			Households		
	2006	2022	change	2006	2022	change	2006	2022	change
> 50	97.9	63.8	-35%	312.1	201.6	-35%	131.4	75.6	-42%
> 100	62.3	41.2	-34%	179.0	124.1	-31%	73.8	45.4	-38%
> 200	41.6	25.2	-39%	92.2	42.7	-54%	36.8	16.1	-56%
> 500	18.0	5.0	-72%	11.0	1.1	-90%	5.0	0.4	-92%

Note: Populations and households are given in thousands. The 2006 population/household counts are based on a 2006 CACI update of the 2001 Census. The 2022 population/household counts are based on a 2022 CACI update of the 2011 Census.

2022 N60 annual 8-hour night contours

3.72 N60 contours (i.e. contours showing the number of aircraft noise events above 60 dB L_{Amax}) have been produced for the 2022 annual average 8-hour night period (23:00-07:00 local time), for which the actual runway modal split was 73% west / 27% east. The N60 contours for 2022 and 2006 are overlaid in **Figure B38** at the 10, 20 and 50-event levels. The runway modal split in 2006 was 72% west / 28% east.

3.73 The estimated cumulative areas, populations and households are summarised in **Table 21**. The 10 and 20-event N60 contour areas decreased by 13% and 32% respectively between 2006 and 2022, reflecting the 13% lower movement total in 2022 and the phaseout of the Boeing 747-400 aircraft. Population and household counts were also lower in line with the area decreases.

Table 21 Heathrow 2006 and 2022 annual average 8-hour night N60 contours - area, population and household estimates

N60	Area (km ²)			Population			Households		
	2006	2022	change	2006	2022	change	2006	2022	change
> 10	184.4	160.7	-13%	837.2	813.8	-3%	387.6	336.7	-13%
> 20	89.9	61.5	-32%	389.9	290.9	-25%	175.7	114.7	-35%
> 50	0.5	0.0	-100%	< 0.1	0.0	(n/a)	< 0.1	0.0	(n/a)

Note: Populations and households are given in thousands. The 2006 population/household counts are based on a 2006 CACI update of the 2001 Census. The 2022 population/household counts are based on a 2022 CACI update of the 2011 Census.

N60 annual 8-hour night change diagrams

- 3.74 An N60 change map has been produced comparing the 2022 and 2006 annual 8-hour night N60 results, assuming the 2006 actual runway modal split for 2022 (see **Figure B39**). The boundary for the changes is the outer extent of these contours.
- 3.75 Around 89% of the area within the boundary is subject to reductions in the number of noise events exceeding 60 dB L_{Amax} . The region around the runway 09L arrival centreline experiences N60 increases of between 0 and 5 events due to the 25% higher usage of the northern runway for easterly arrivals in 2022 compared to 2006.

Chapter 4

Conclusions

- 4.1 Year 2022 average summer day $L_{Aeq,16h}$ and night $L_{Aeq,8h}$, and annual L_{day} , $L_{evening}$, L_{night} , L_{den} and $L_{Aeq,6.5h}$ night contours have been generated for Heathrow Airport using the ANCON noise model.
- 4.2 Summer daytime movement numbers nearly doubled in 2022 compared to 2021, as the effects of the COVID-19 pandemic on air travel diminished. In 2022, there were an average of 1041.5 summer 16-hour day movements at Heathrow, 90% higher than in 2021 (548.9).
- 4.3 The 2022 average summer day 54 dB $L_{Aeq,16h}$ actual modal split (68% west / 32% east) contour area was 106.9 km², 57% larger than in 2021 (68.0 km²). The population count within this contour increased by 71% to 309,200 (2021: 181,300).
- 4.4 The 2022 standard modal split (78% west / 22% east) 54 dB $L_{Aeq,16h}$ contour area increased by 53% to 108.5 km² (2021: 70.9 km²), and the population count increased by 62% to 296,500 (2021: 182,600).
- 4.5 The 2022 average summer 8-hour night movement total (73.7) was 102% higher than in 2021 (36.6). The area of the 2022 48 dB $L_{Aeq,8h}$ night actual modal split (68% west / 32% east) contour increased by 60% to 79.5 km² (2021: 49.7 km²), and the population count increased by 69% to 250,600 (2021: 148,600).
- 4.6 The 2022 55 dB L_{den} contour area increased by 53% to 115.6 km² (2021: 75.6 km²) and the population count of 366,500 was 70% higher (2021: 215,700).
- 4.7 The 2022 50 dB L_{night} contour increased in area by 77% to 54.2 km² (2021: 30.6 km²) and the population count increased by 87% to 173,200 (2021: 92,600).
- 4.8 The 48 dB $L_{Aeq,6.5h}$ night contour area increased by 77% to 22.1 km² (2021: 12.5 km²) and the population count increased by 60% to 66,900 (2021: 41,700).

APPENDIX A

References

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10. Department for Transport, *Air Navigation Guidance 2017: Guidance to the CAA on its environmental objectives when carrying out its air navigation functions, and to the CAA and wider industry on airspace and noise management*, October 2017.

APPENDIX B

Figures

Figure B1 Heathrow NPR/SID routes

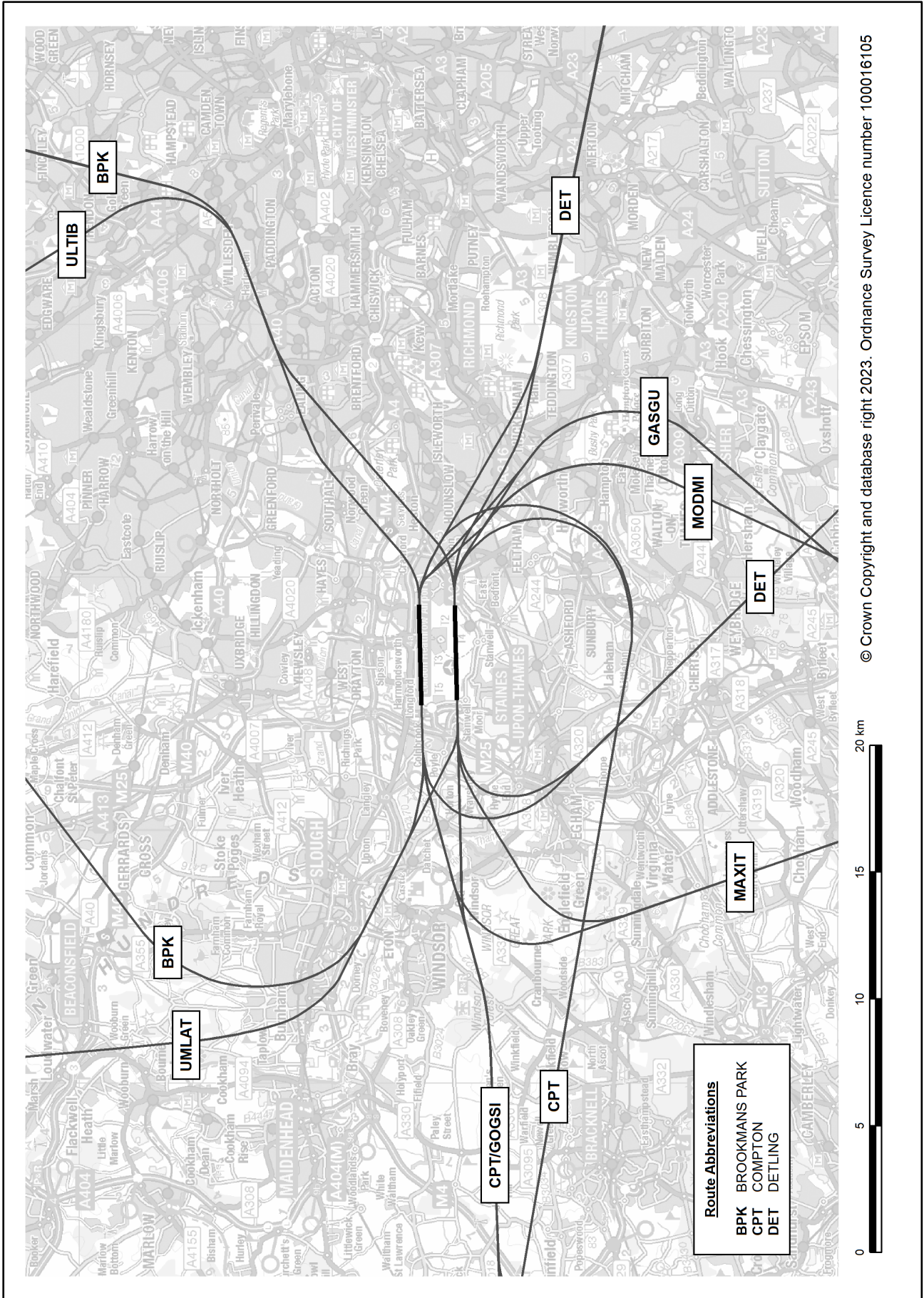
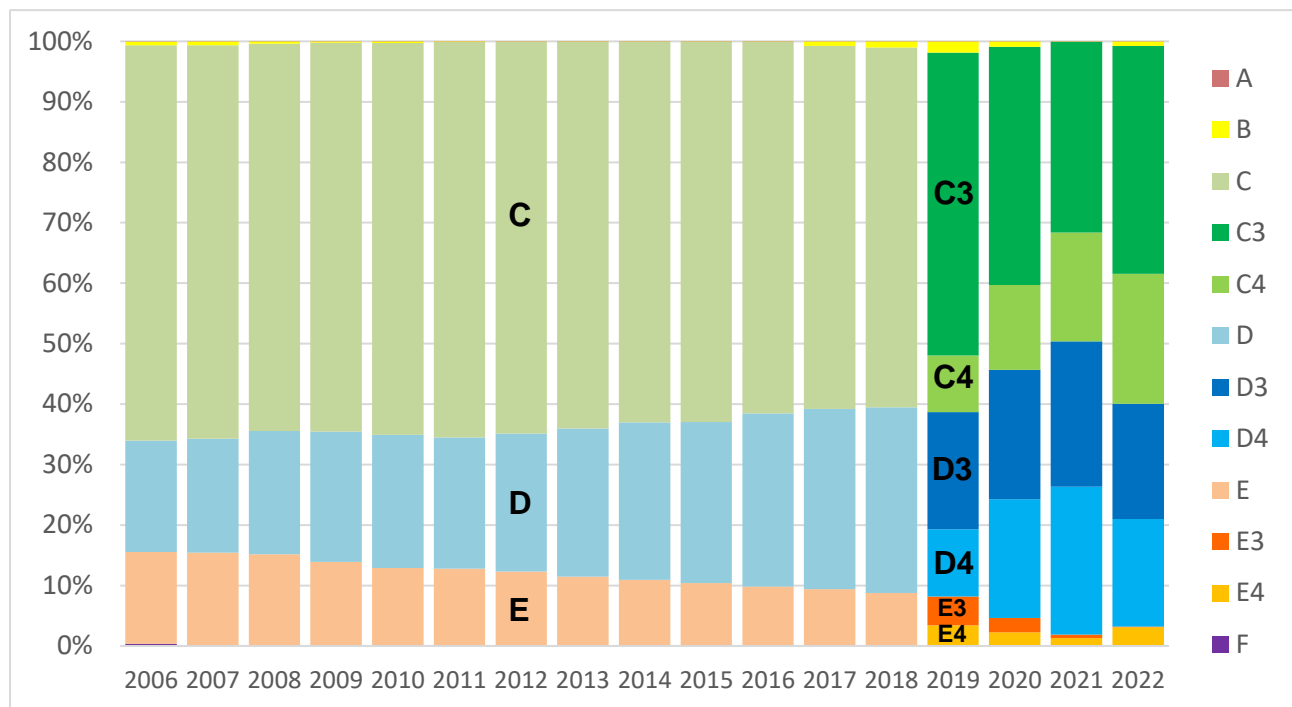


Figure B2 Heathrow annual average 24-hour movements by Noise Class

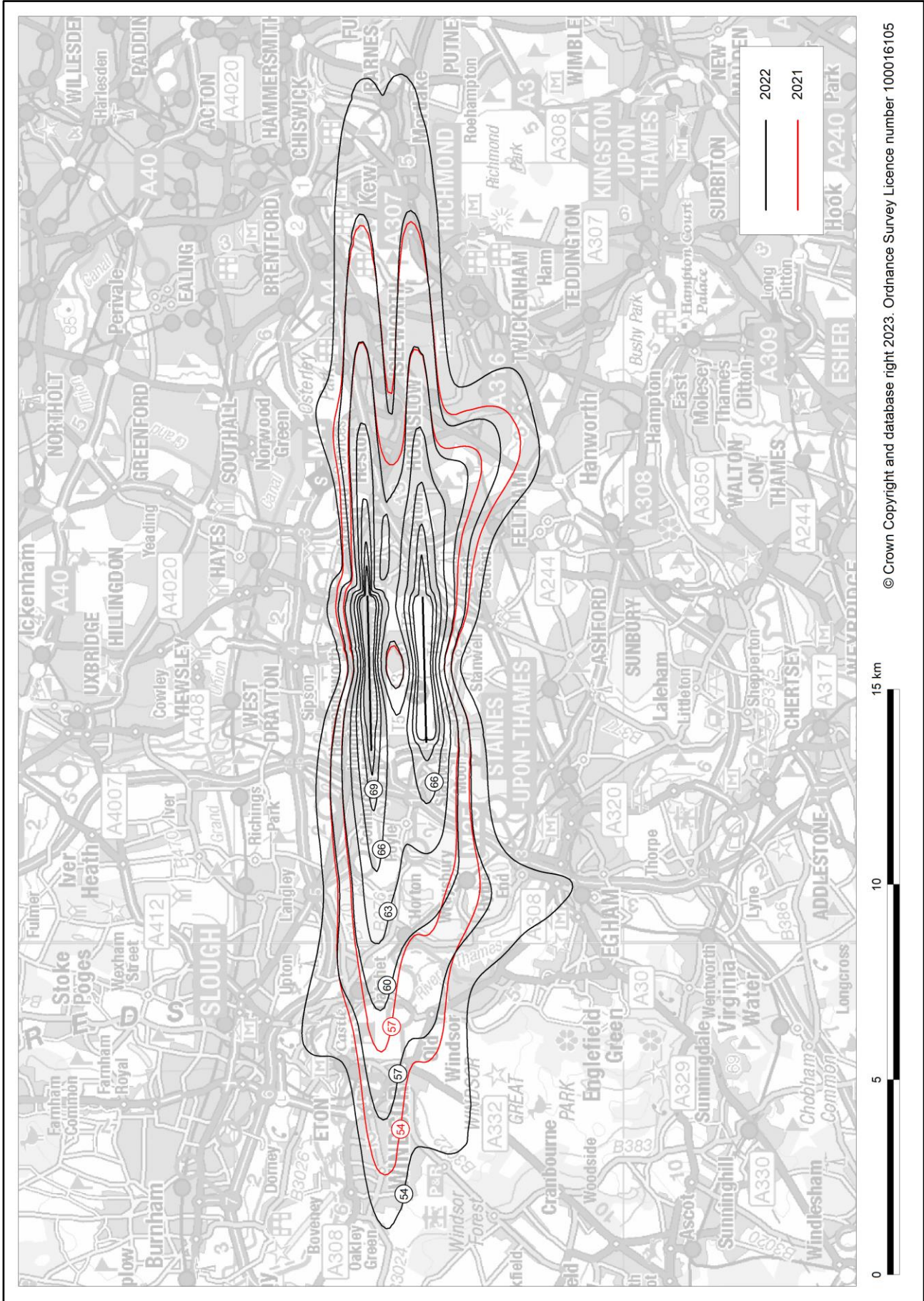


Note: Noise Class descriptions are given below:

Key to Noise Classes

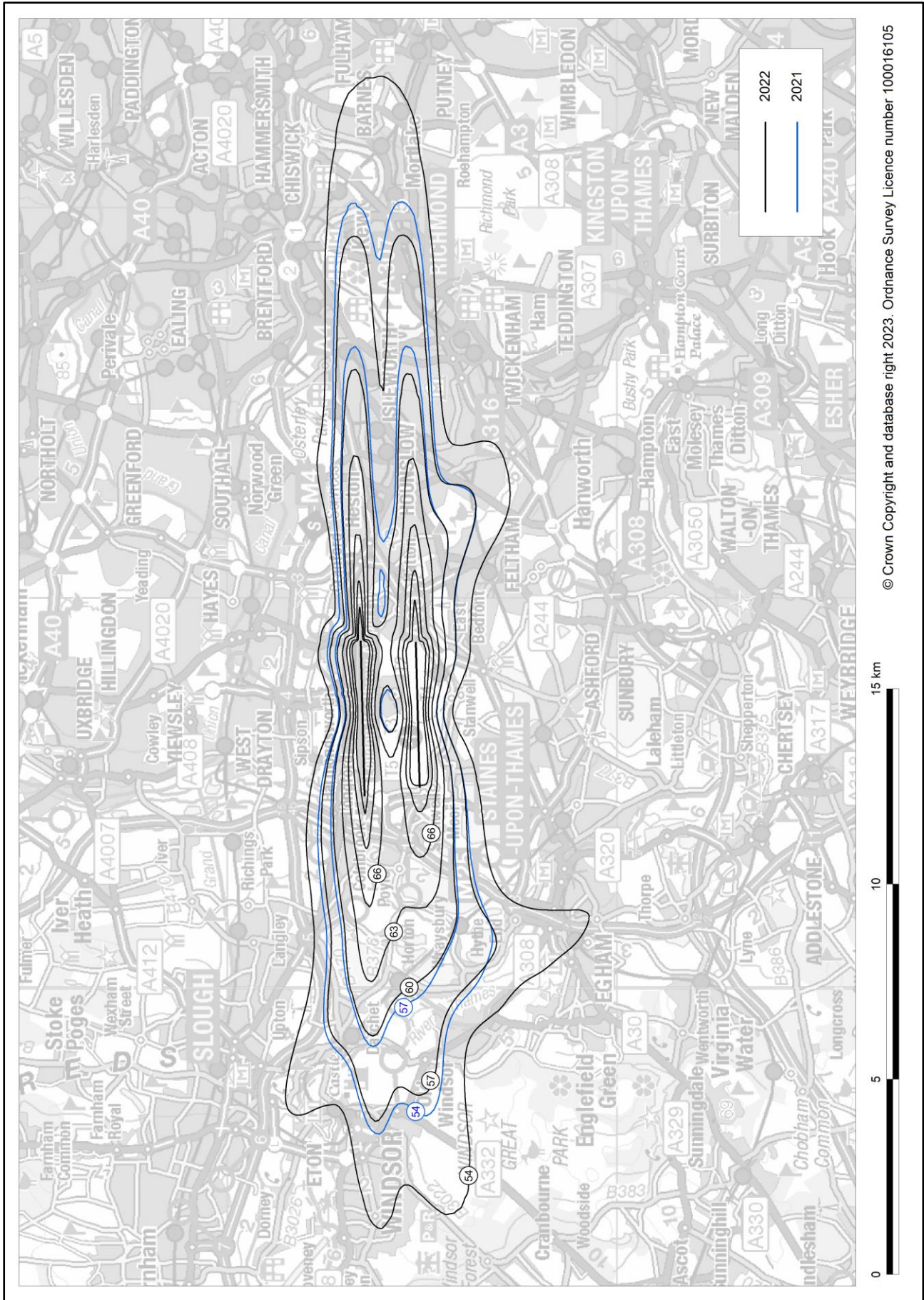
- A** Small propeller (single/twin piston and turboprop light aircraft)
- B** Large propeller (twin and 4-propeller aircraft), e.g. ATR-42, BAe ATP
- C** Narrow-body aircraft (up to 2018), e.g. Airbus A319, Boeing 737-800
- C3** 3rd generation narrow-body aircraft (from 2019), e.g. Airbus A319, Boeing 737-800
- C4** 4th generation narrow-body aircraft (from 2019), e.g. Airbus A320neo, Boeing 737 MAX 8
- D** Wide-body twins (up to 2018), e.g. Airbus A330, Boeing 777-200
- D3** 3rd generation wide-body twins (from 2019), e.g. Airbus A330, Boeing 777-200
- D4** 4th generation wide-body twins (from 2019), e.g. Airbus A350-900, Boeing 787-9
- E** Wide-body 3 or 4-engine aircraft (up to 2018), e.g. Airbus A380, Boeing 747-400
- E3** 3rd generation wide-body 4-engine aircraft (from 2019), e.g. Boeing 747-400
- E4** 4th generation wide-body 4-engine aircraft (from 2019), e.g. Airbus A380
- F** 1st generation wide-body 3 or 4-engine aircraft, e.g. Boeing 747-200
- G** 2nd generation narrow-body twins (including Ch.2 and hush-kitted versions), e.g. Boeing 737-200
- H** 1st generation narrow-body 3 or 4-engine aircraft (including hush-kitted versions), e.g. Boeing 707

Figure B3 Heathrow 2022 and 2021 average summer day actual modal split $L_{Aeq,16h}$ noise contours



Note: the 2022 summer day actual modal split was 68% W / 32% E (2021: 55% W / 45% E).

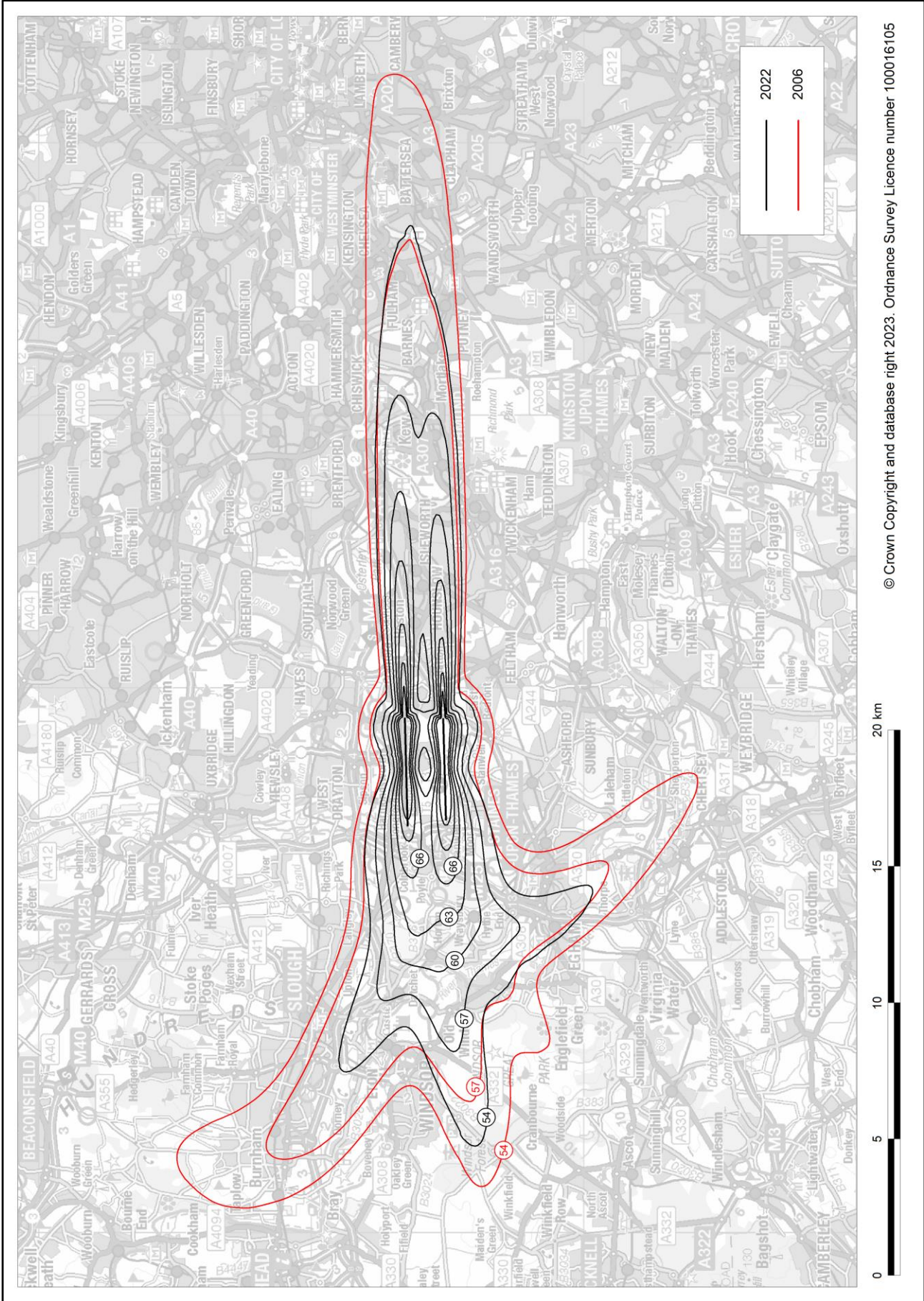
Figure B4 Heathrow 2022 and 2021 average summer day standard modal split $L_{Aeq,16h}$ noise contours



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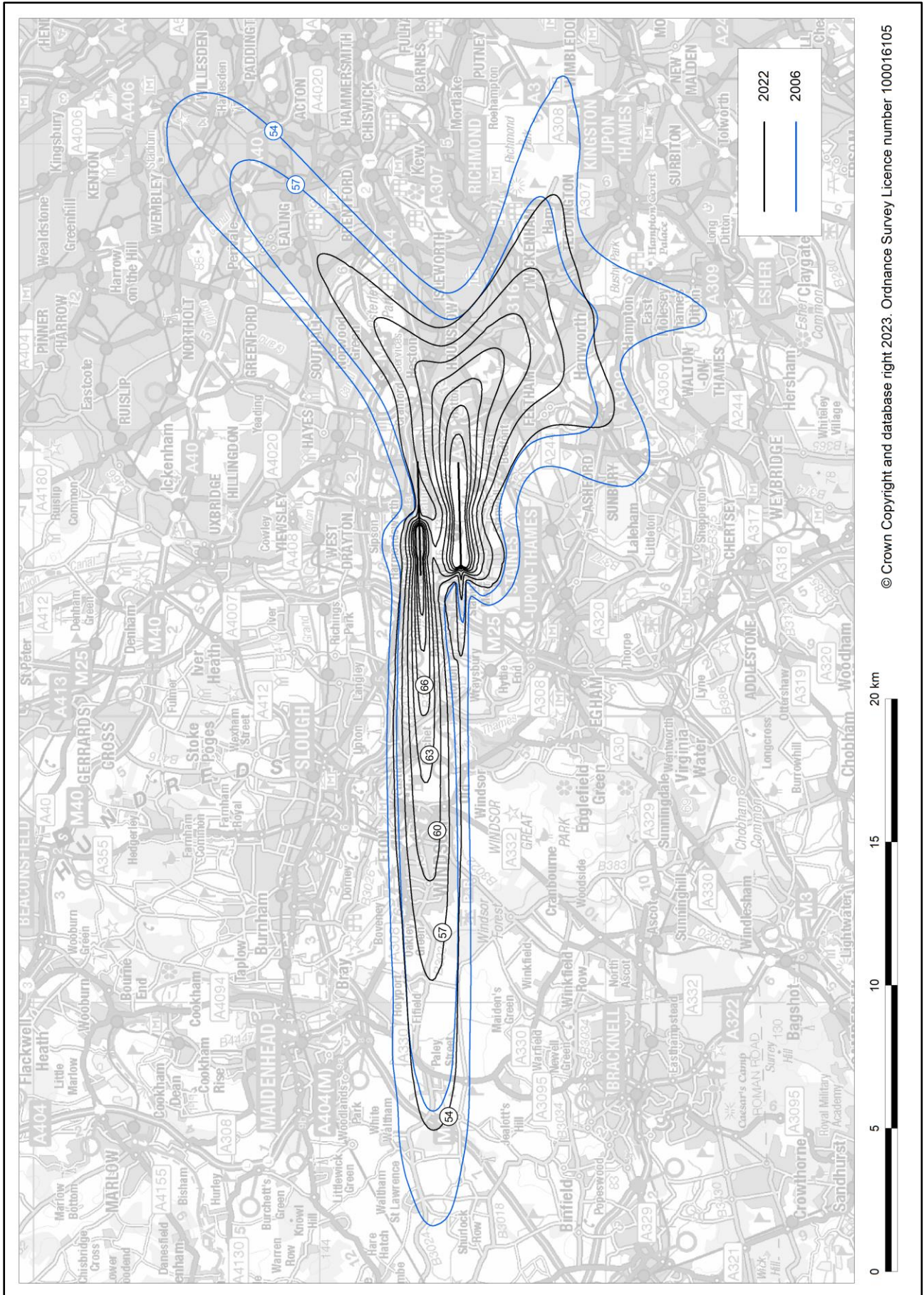
Note: the 2022 summer day standard modal split was 78% W / 22% E (2021: 78% W / 22% E).

Figure B5 Heathrow 2022 and 2006 average summer day 54-72 dB 100% W LAeq,16h noise contours (with 2006 N-S runway usage)



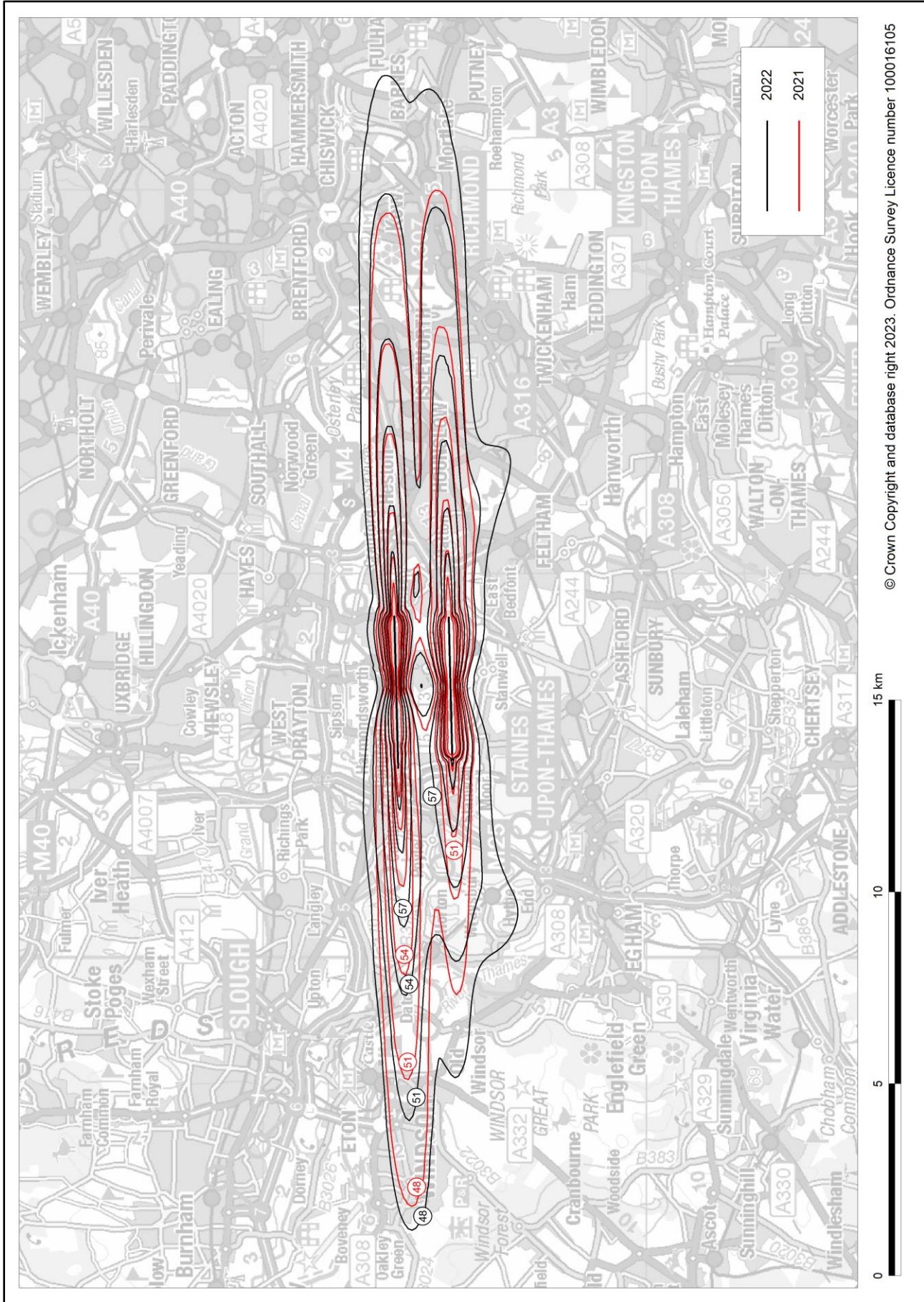
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Figure B6 Heathrow 2022 and 2006 average summer day 54-72 dB 100% E L_{Aeq,16h} noise contours (with 2006 N-S runway usage)



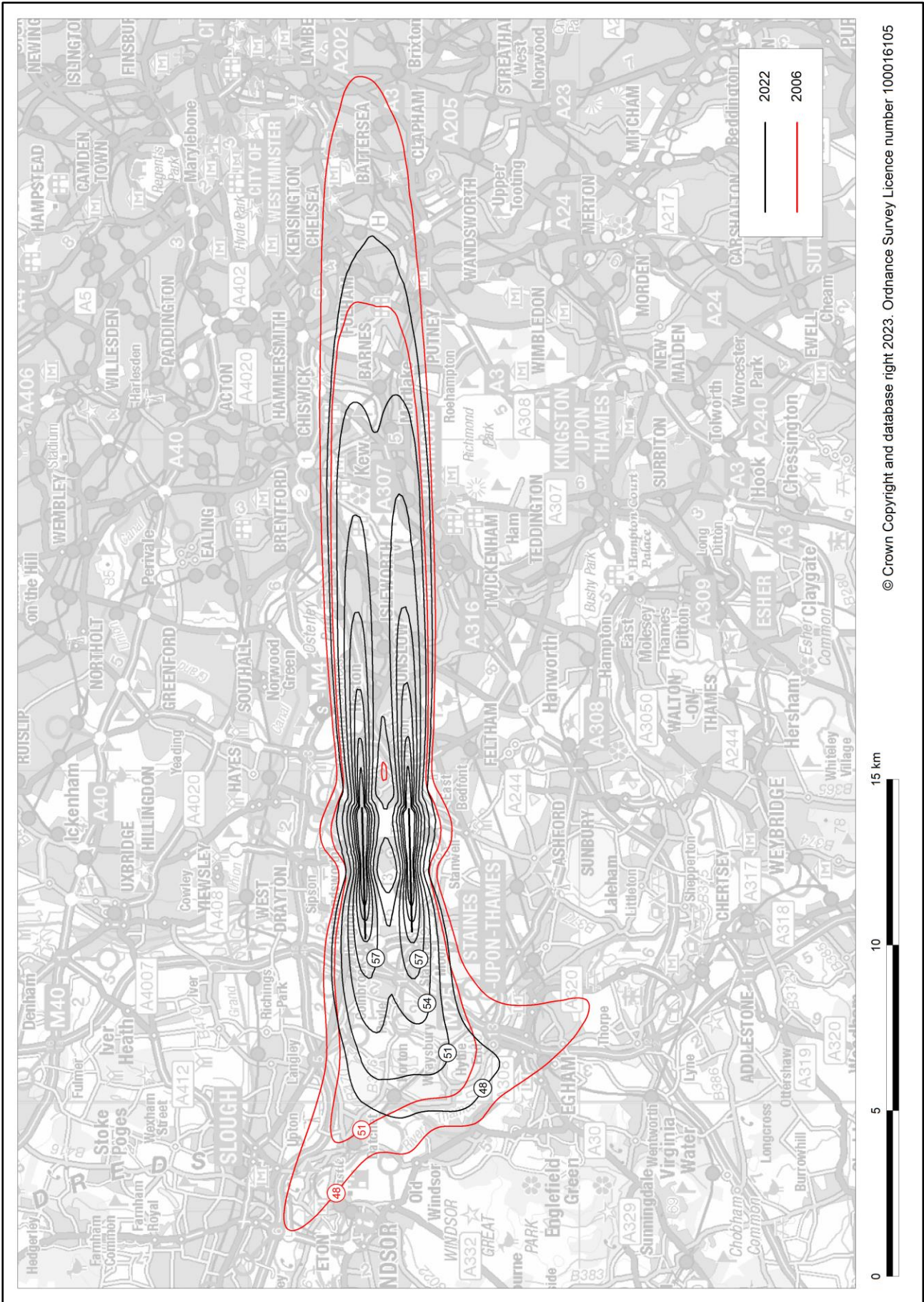
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Figure B7 Heathrow 2022 and 2021 average summer night actual modal split $L_{Aeq,8h}$ noise contours



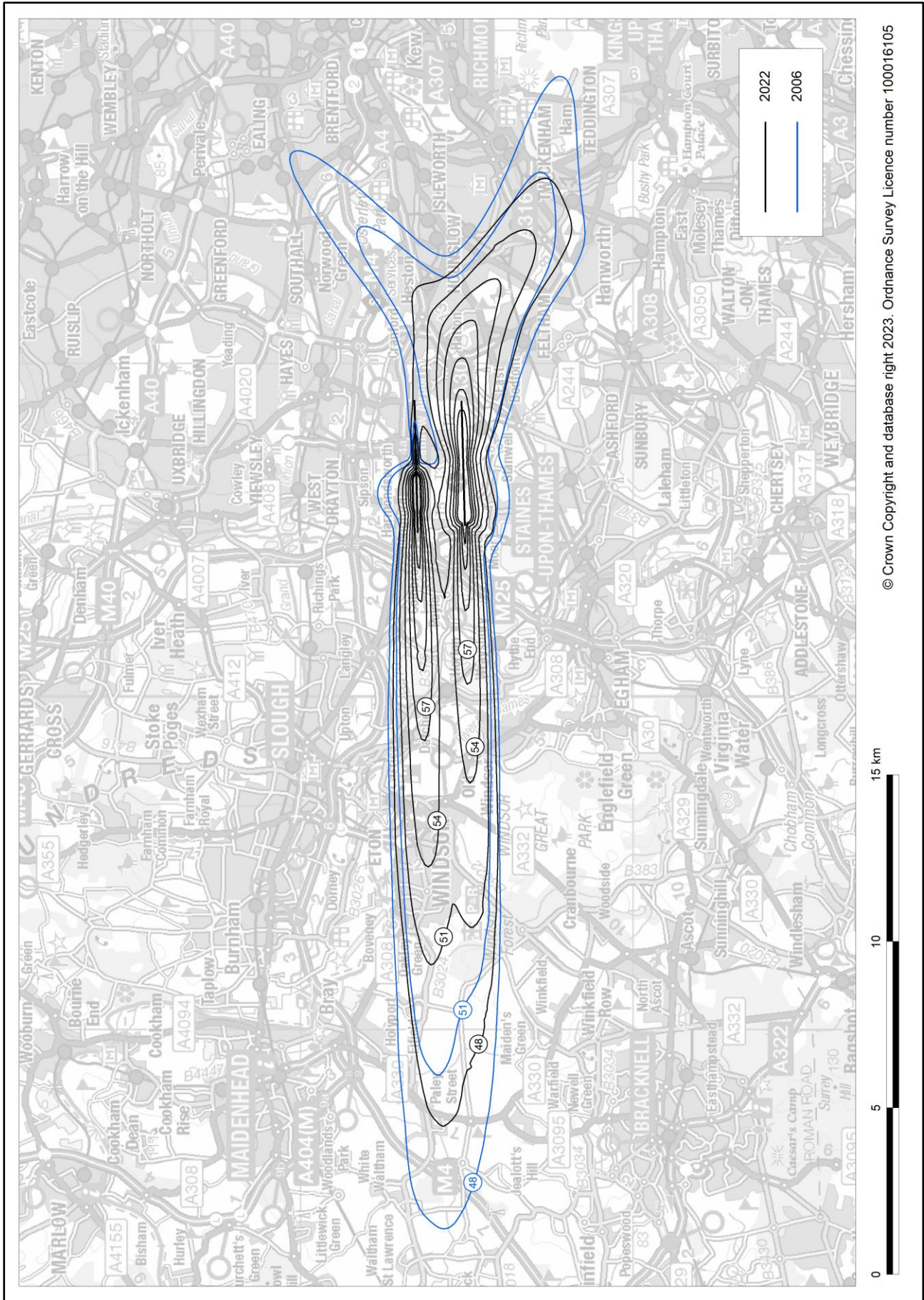
Note: the 2022 summer night actual modal split was 68% W / 32% E (2021: 56% W / 44% E).

Figure B8 Heathrow 2022 and 2006 average summer night 48-66 dB 100% W L_{Aeq,8h} noise contours (with 2006 N-S runway usage)



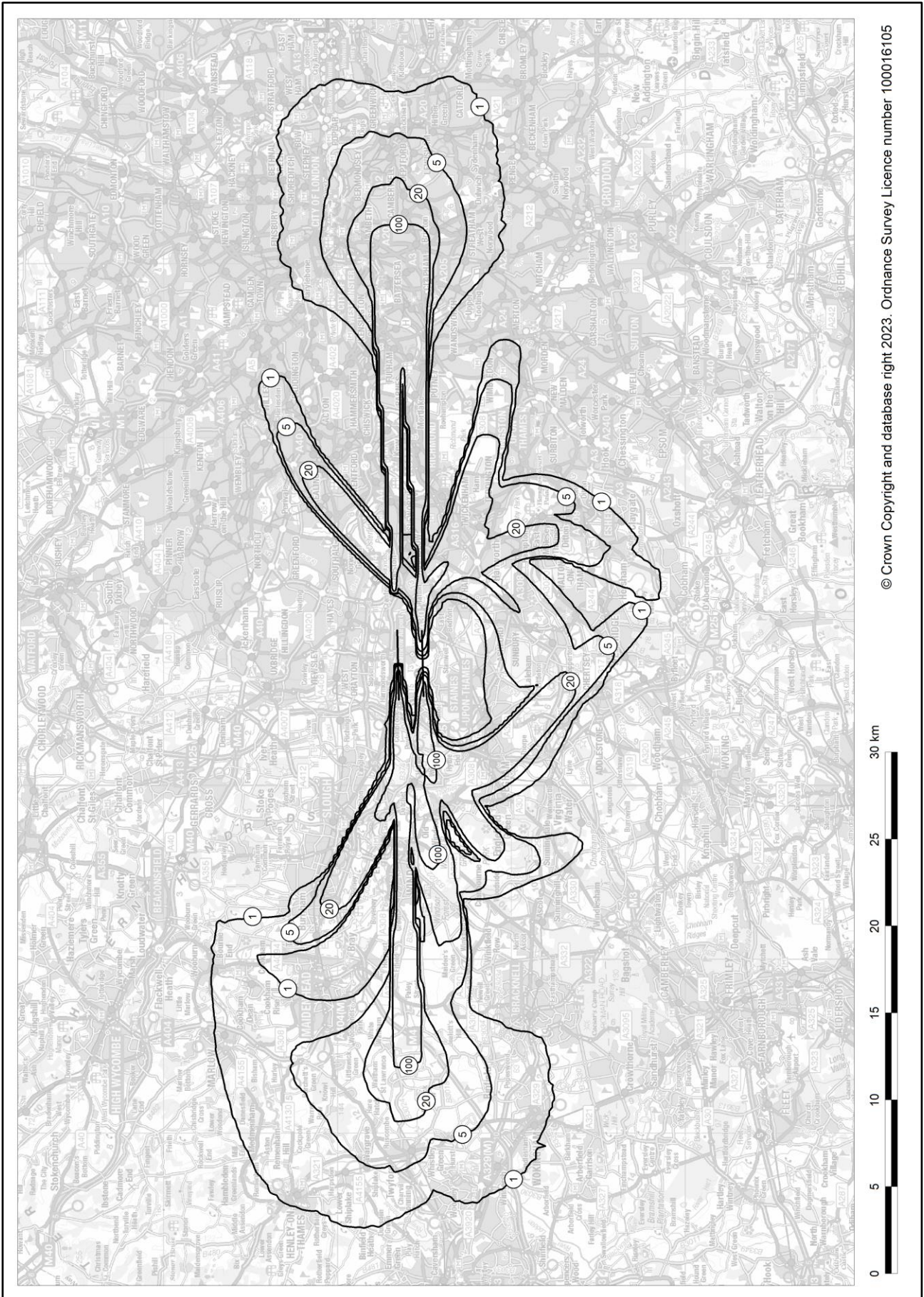
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Figure B9 Heathrow 2022 and 2006 average summer night 48-66 dB 100% E L_{Aeq,8h} noise contours (with 2006 N-S runway usage)



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Figure B10a Heathrow 2022 average summer day overflight contours (assuming 48.5-degree elevation angle)



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Figure B10b Heathrow 2022 average summer day overflight contours (assuming 60-degree elevation angle)

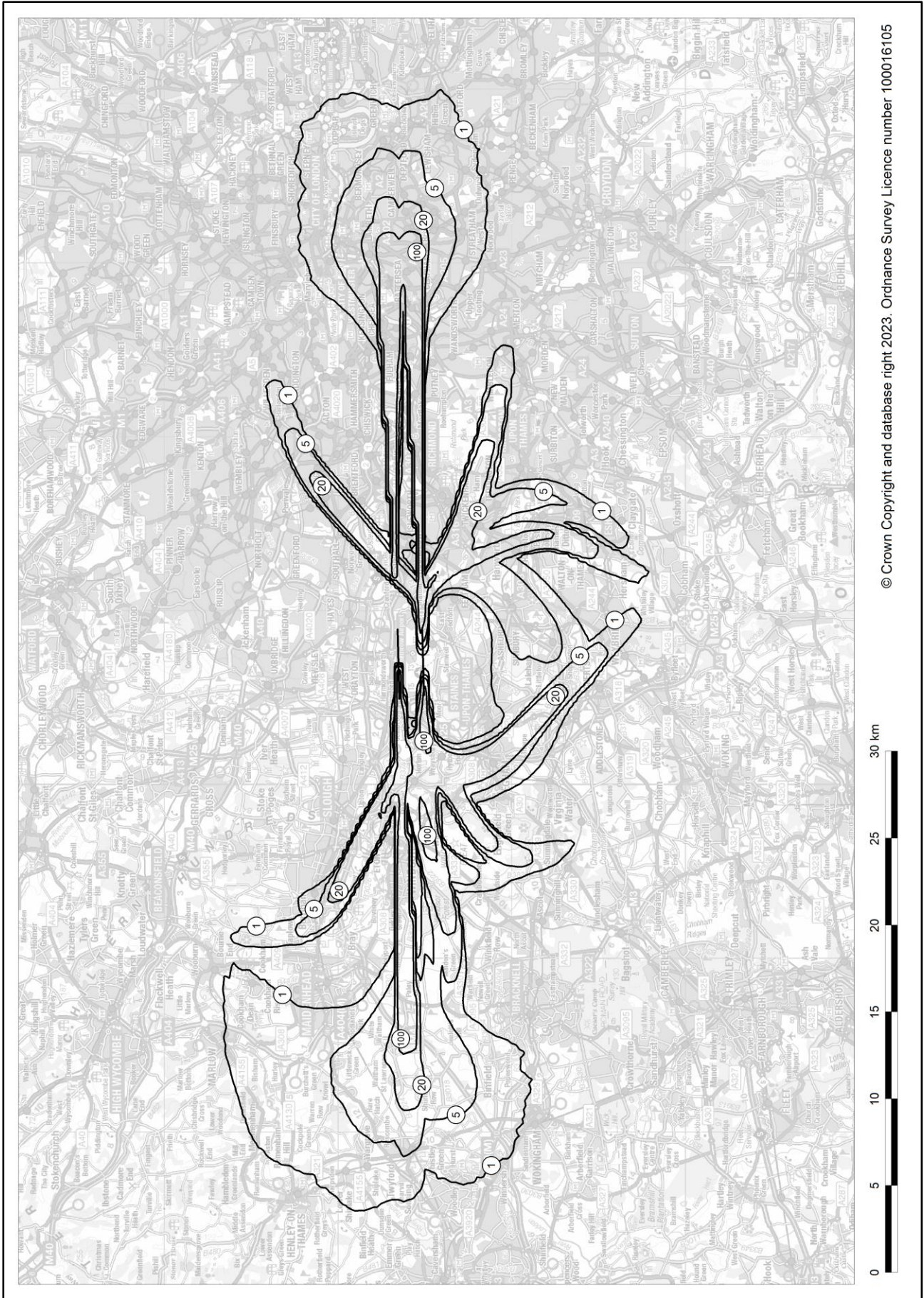


Figure B11a Heathrow 2022 average summer day overhead track density diagram (assuming 48.5-degree elevation angle)

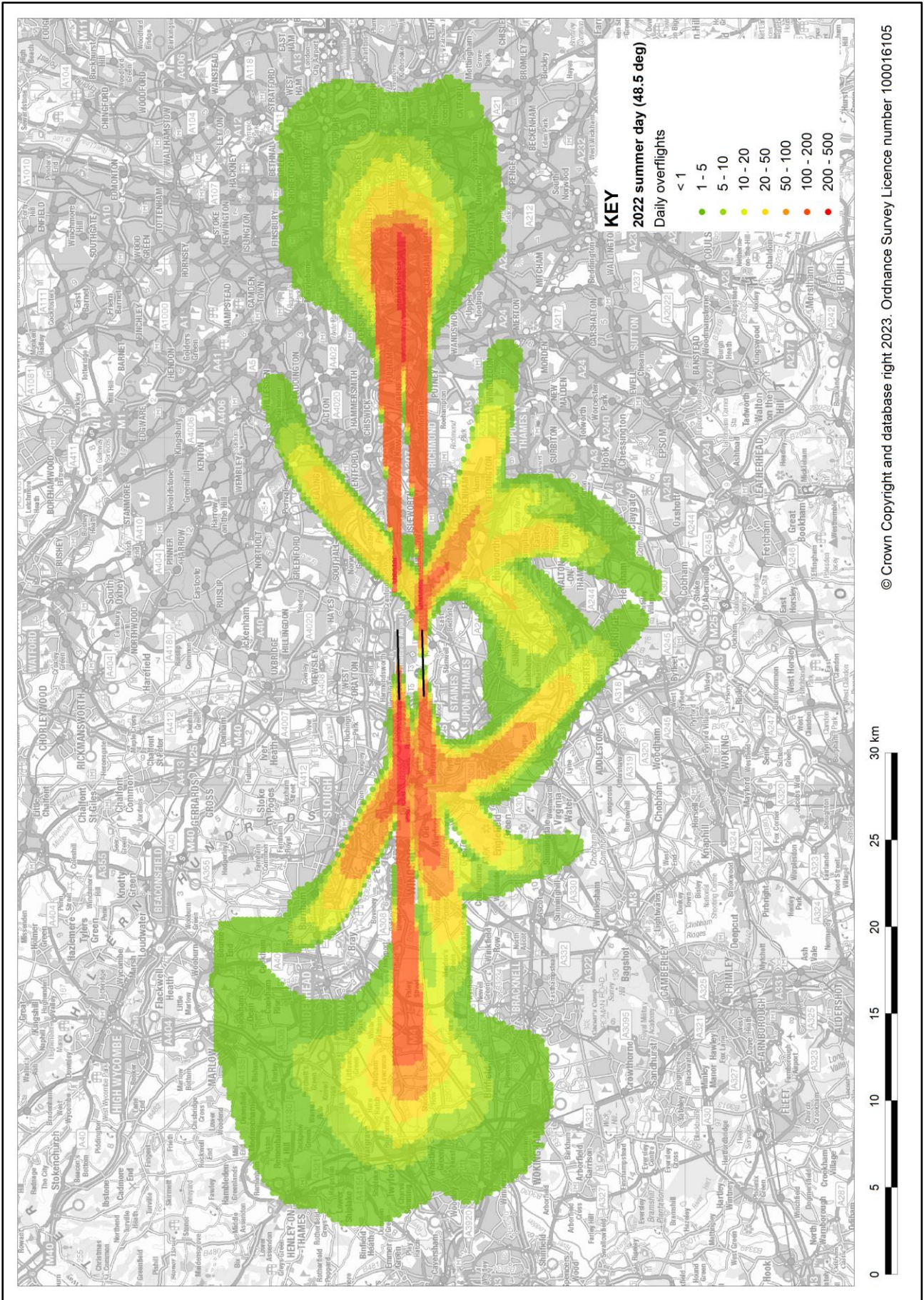


Figure B11b Heathrow 2022 average summer day overhead track density diagram (assuming 60-degree elevation angle)

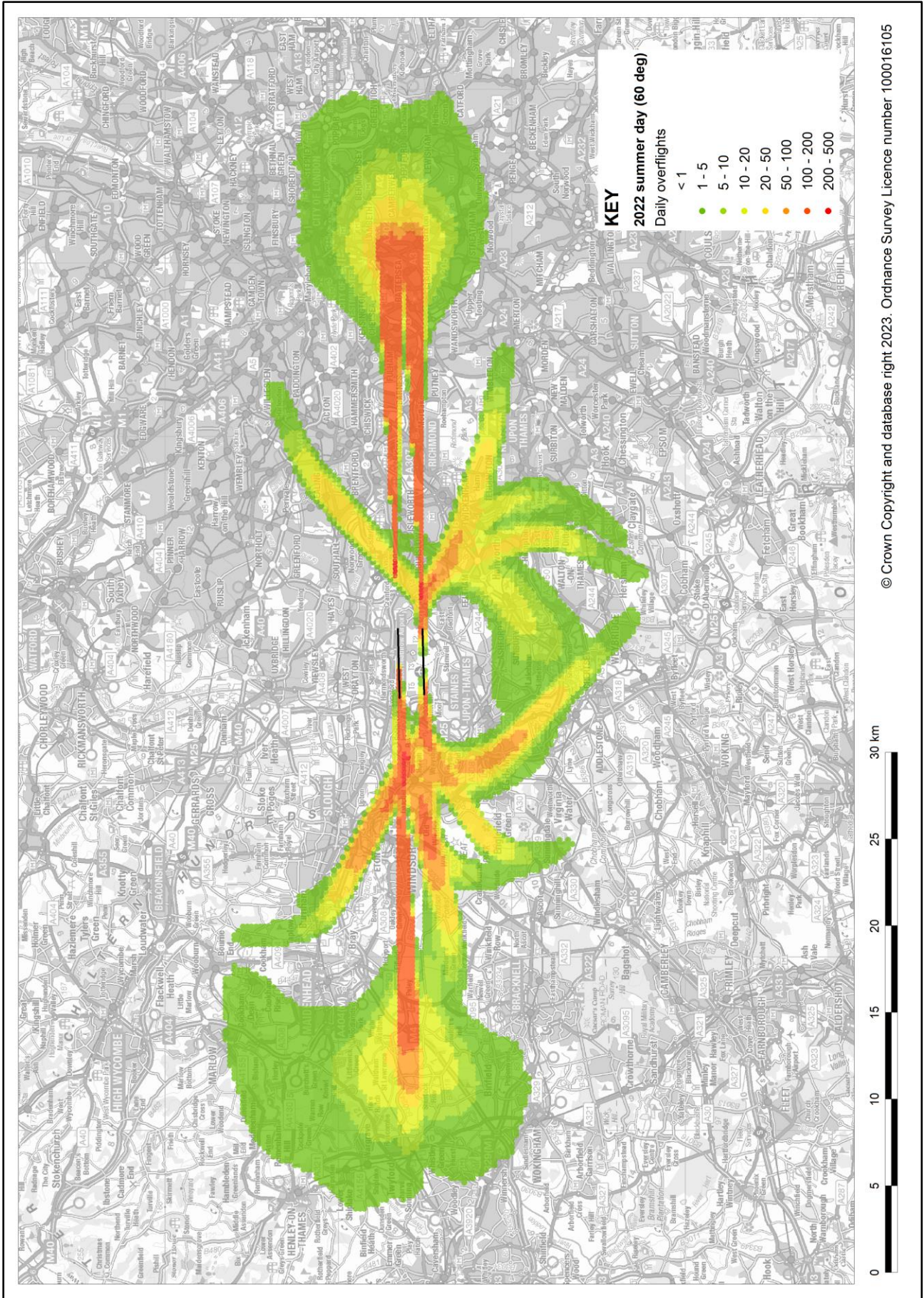


Figure B12a Heathrow 2022 average summer night overflight contours (assuming 48.5-degree elevation angle)



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Figure B12b Heathrow 2022 average summer night overflight contours (assuming 60-degree elevation angle)



Figure B13a Heathrow 2022 average summer night overflight track density diagram (assuming 48.5-degree elevation angle)

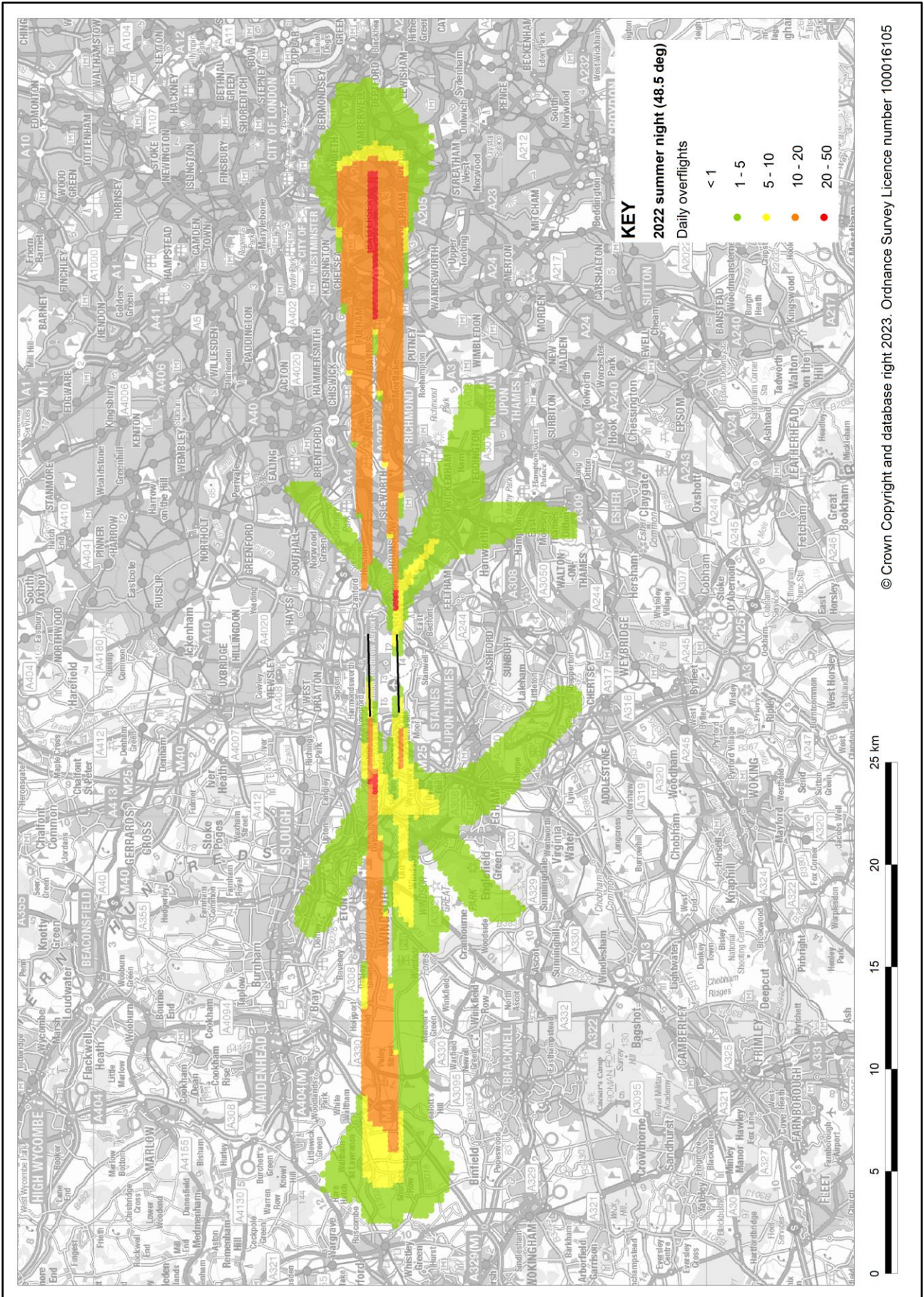
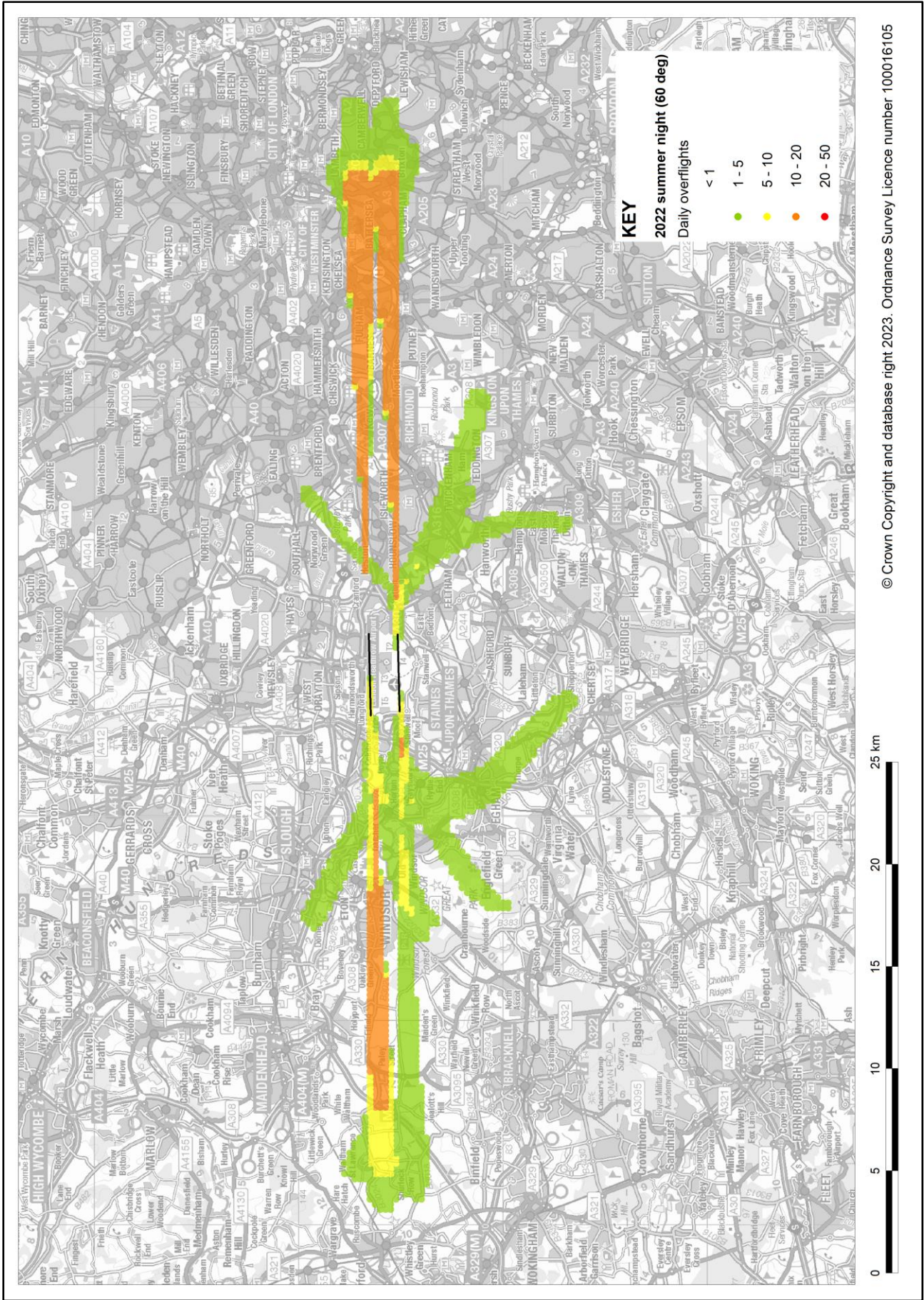
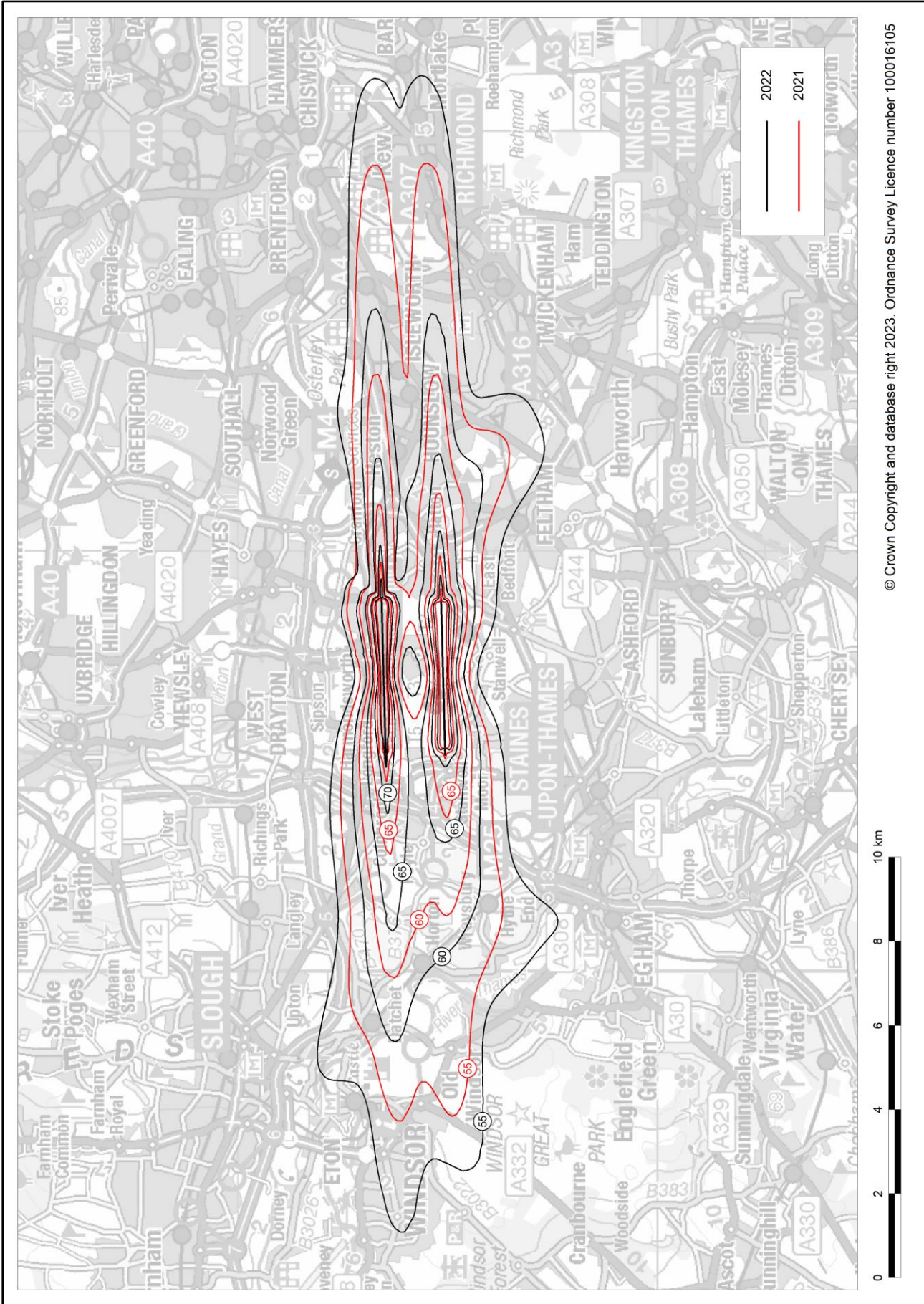


Figure B13b Heathrow 2022 average summer night overhead flight track density diagram (assuming 60-degree elevation angle)



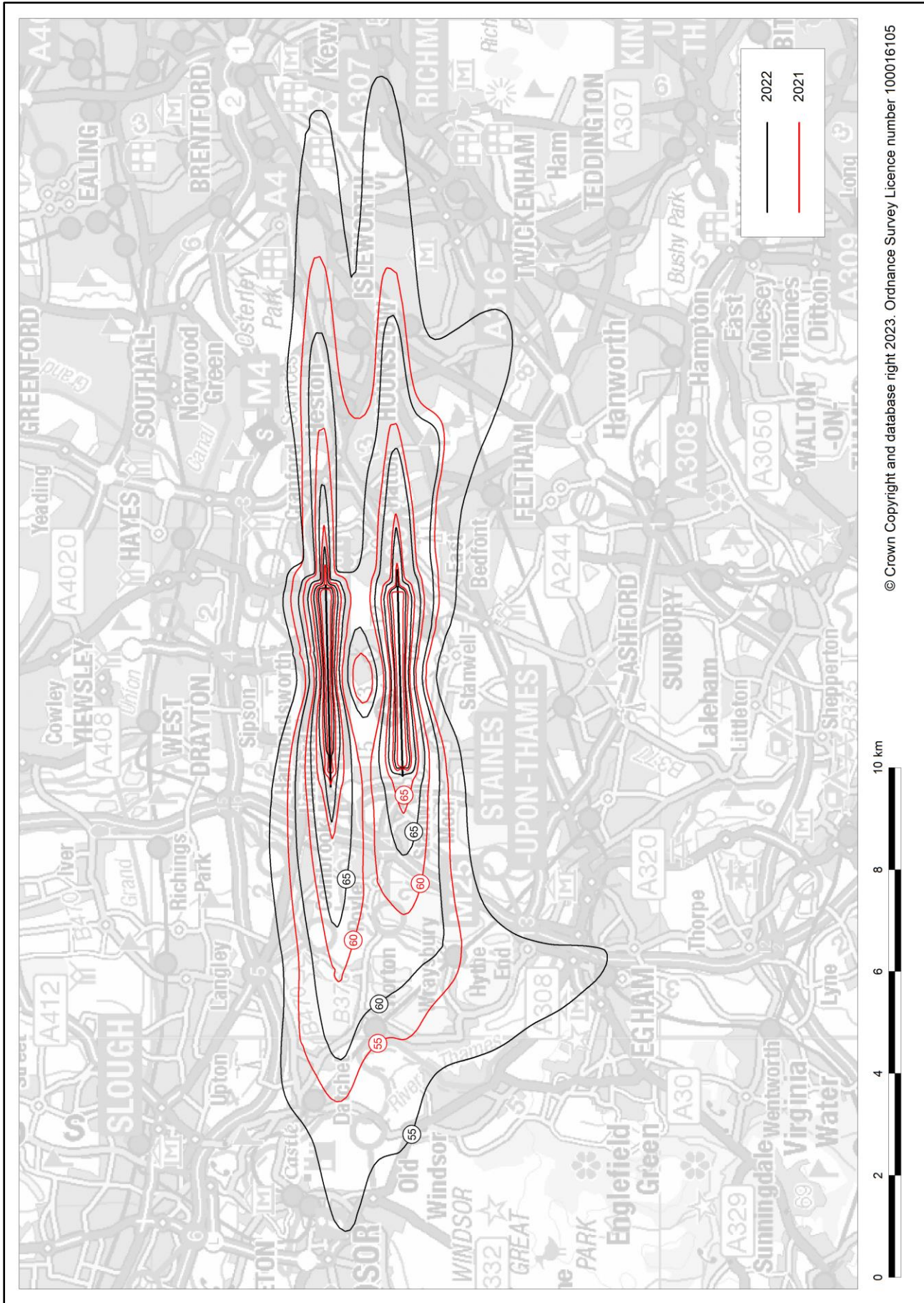
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Figure B14 Heathrow 2022 and 2021 L_{day} noise contours



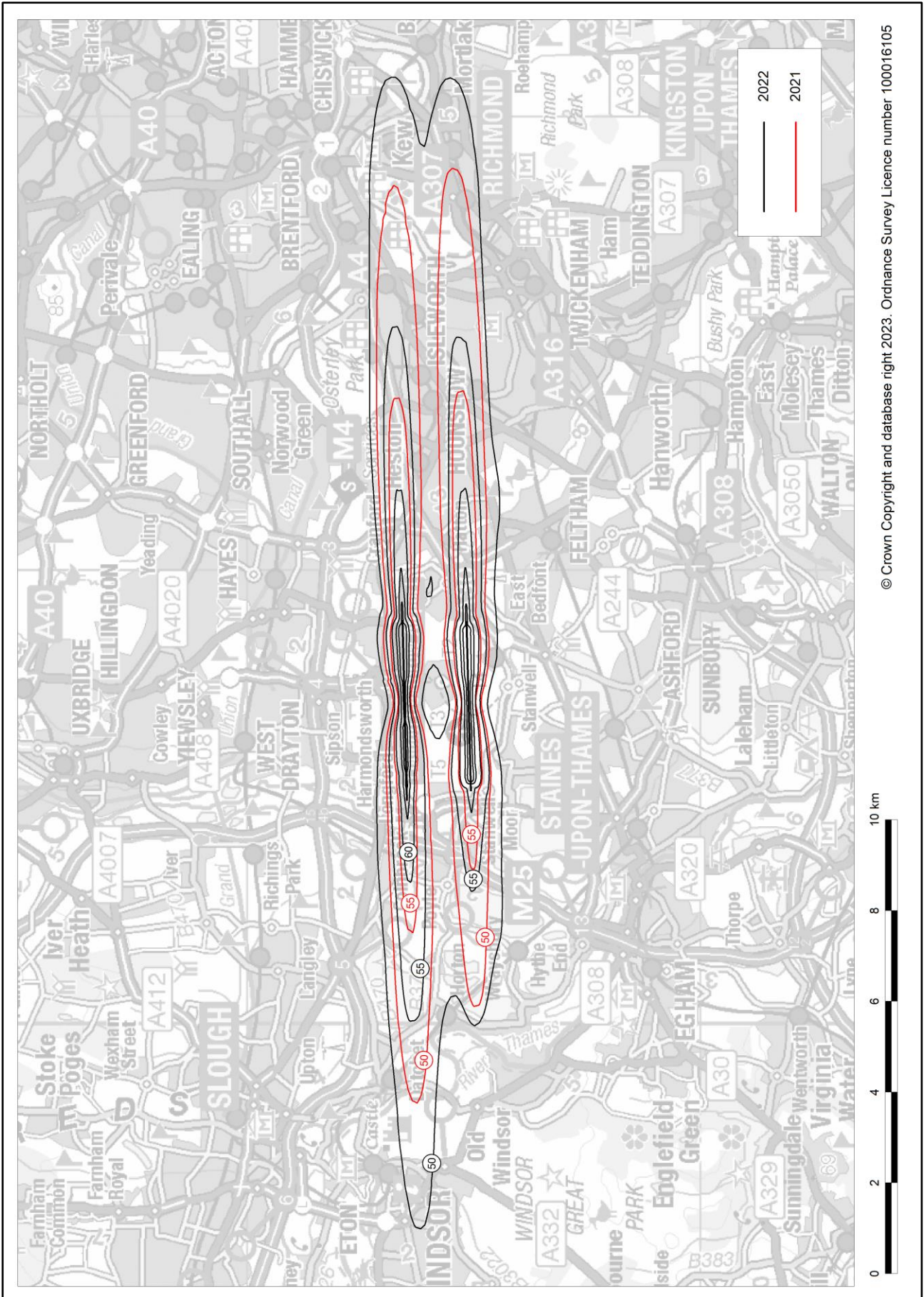
Note: the 2022 annual 12h day actual modal split was 72% W / 28% E (2021: 71% W / 29% E).

Figure B15 Heathrow 2022 and 2021 Levening noise contours



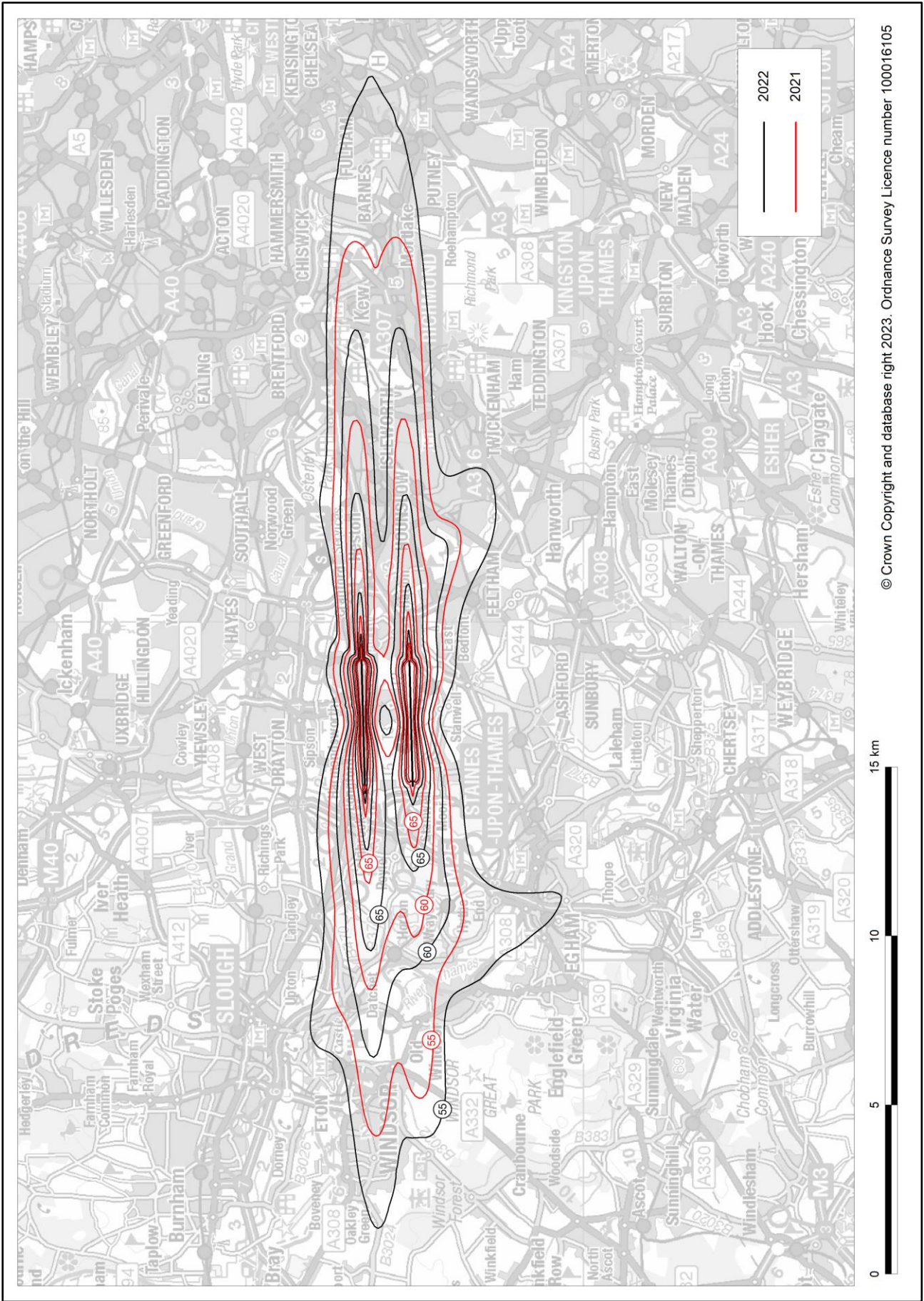
Note: the 2022 annual 4h evening actual modal split was 71% W / 29% E (2021: 71% W / 29% E).

Figure B16 Heathrow 2022 and 2021 L_{night} noise contours



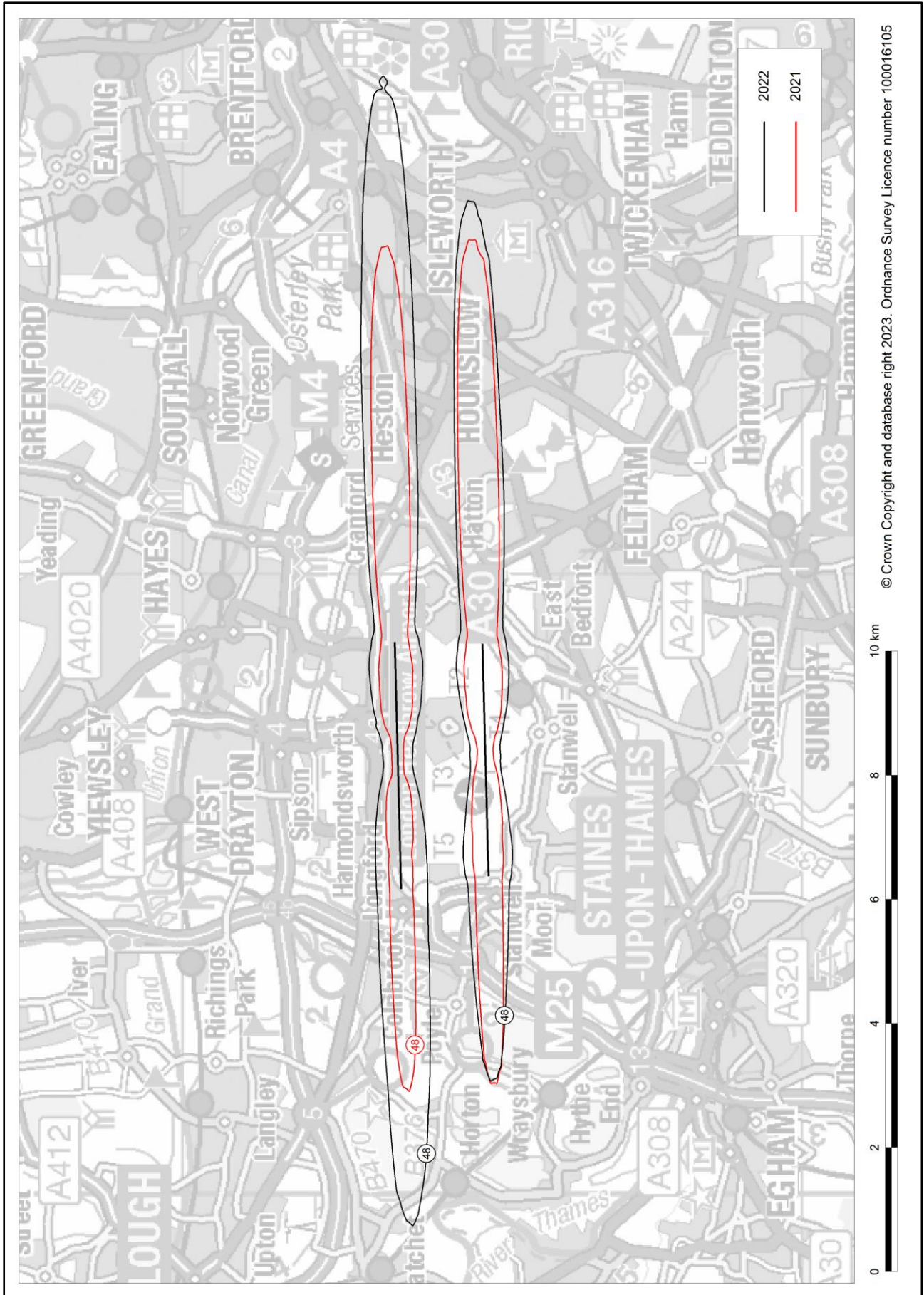
Note: the 2022 annual 8h night actual modal split was 73% W / 27% E (2021: 71% W / 29% E).

Figure B17 Heathrow 2022 and 2021 L_{den} noise contours



Note: the 2022 annual 24h actual modal split was 72% W / 28% E (2021: 71% W / 29% E).

Figure B18 Heathrow 2022 and 2021 L_{Aeq,6.5h} night noise contours



Note: the 2022 annual 6.5h night actual modal split was 73% W / 27% E (2021: 70% W / 30% E).

Figure B19 Heathrow 2006-2022 55 dB L_{day} contour area, population and household trends

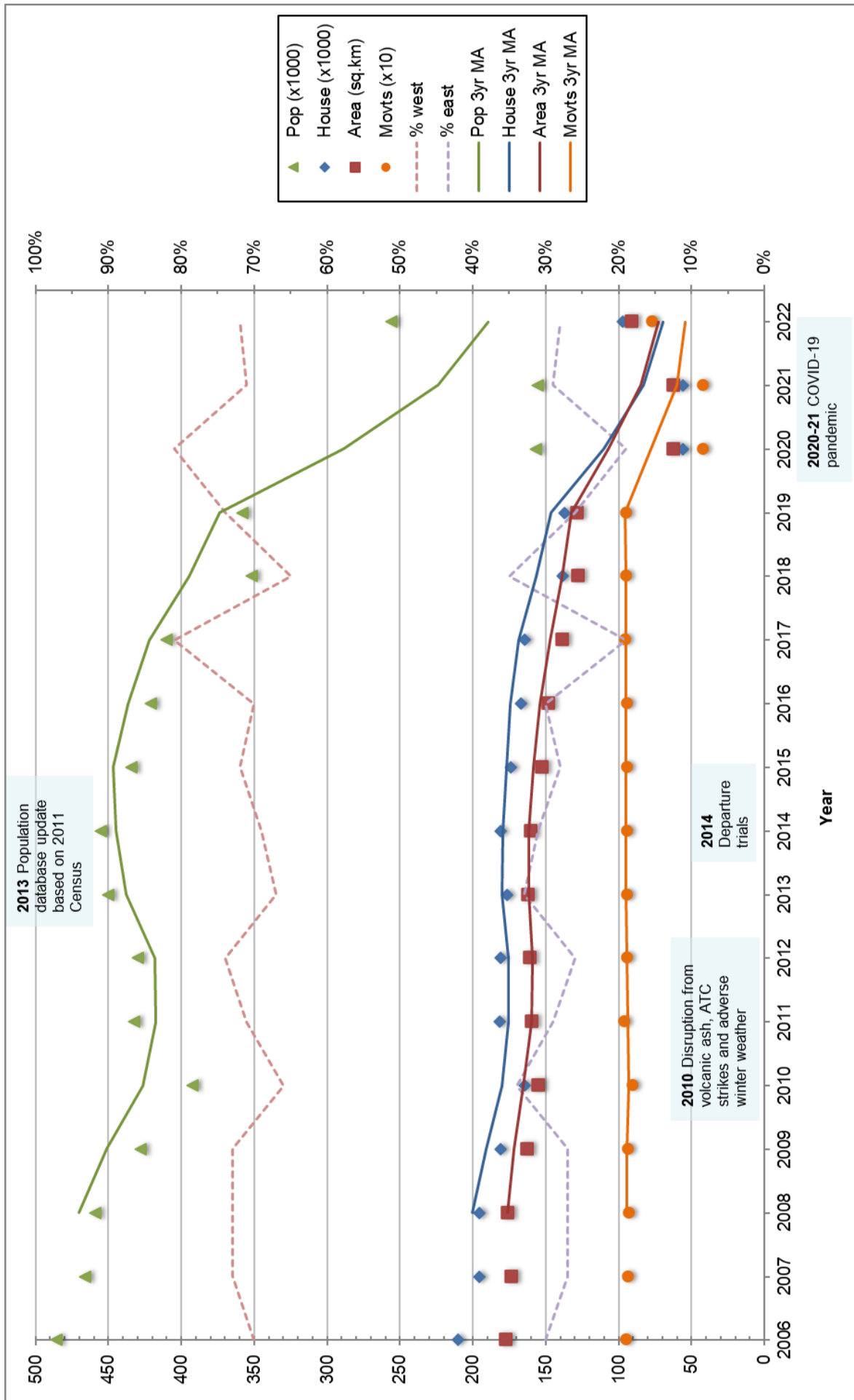


Figure B20 Heathrow 2006-2022 55 dB Levening contour area, population and household trends

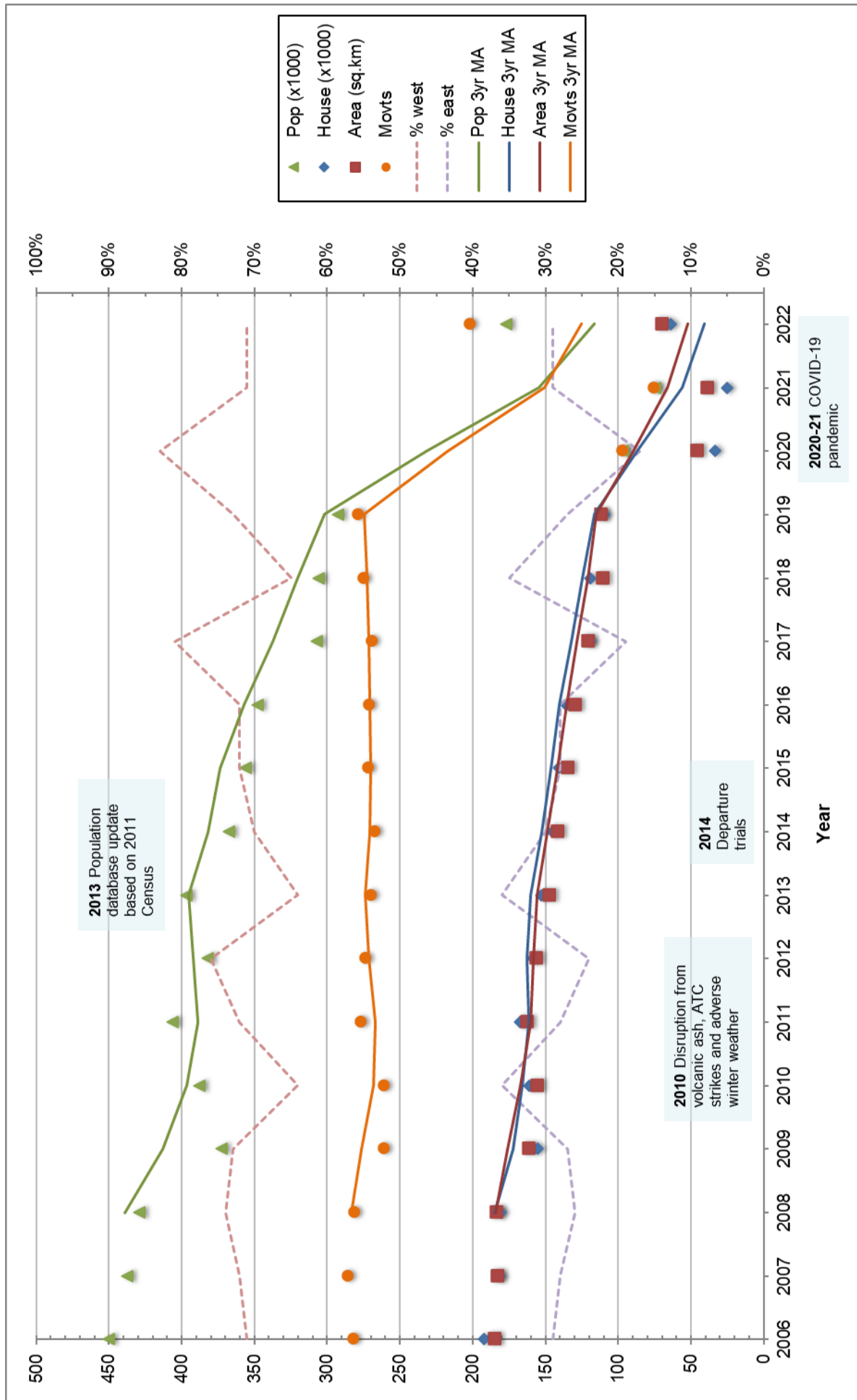


Figure B21 Heathrow 2006-2022 50 dB L_{night} contour area, population and household trends

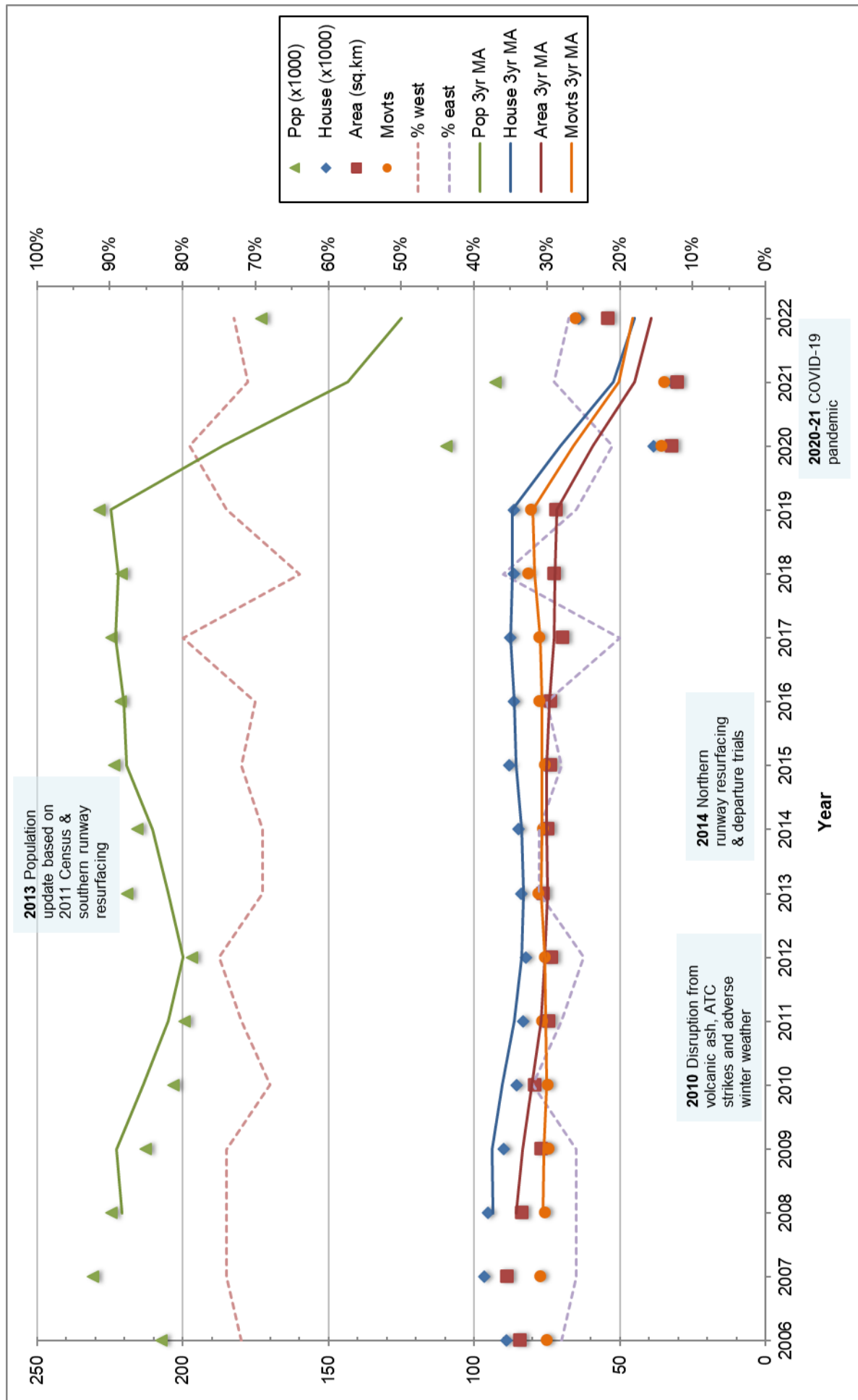


Figure B22 Heathrow 2006-2022 55 dB L_{den} contour area, population and household trends

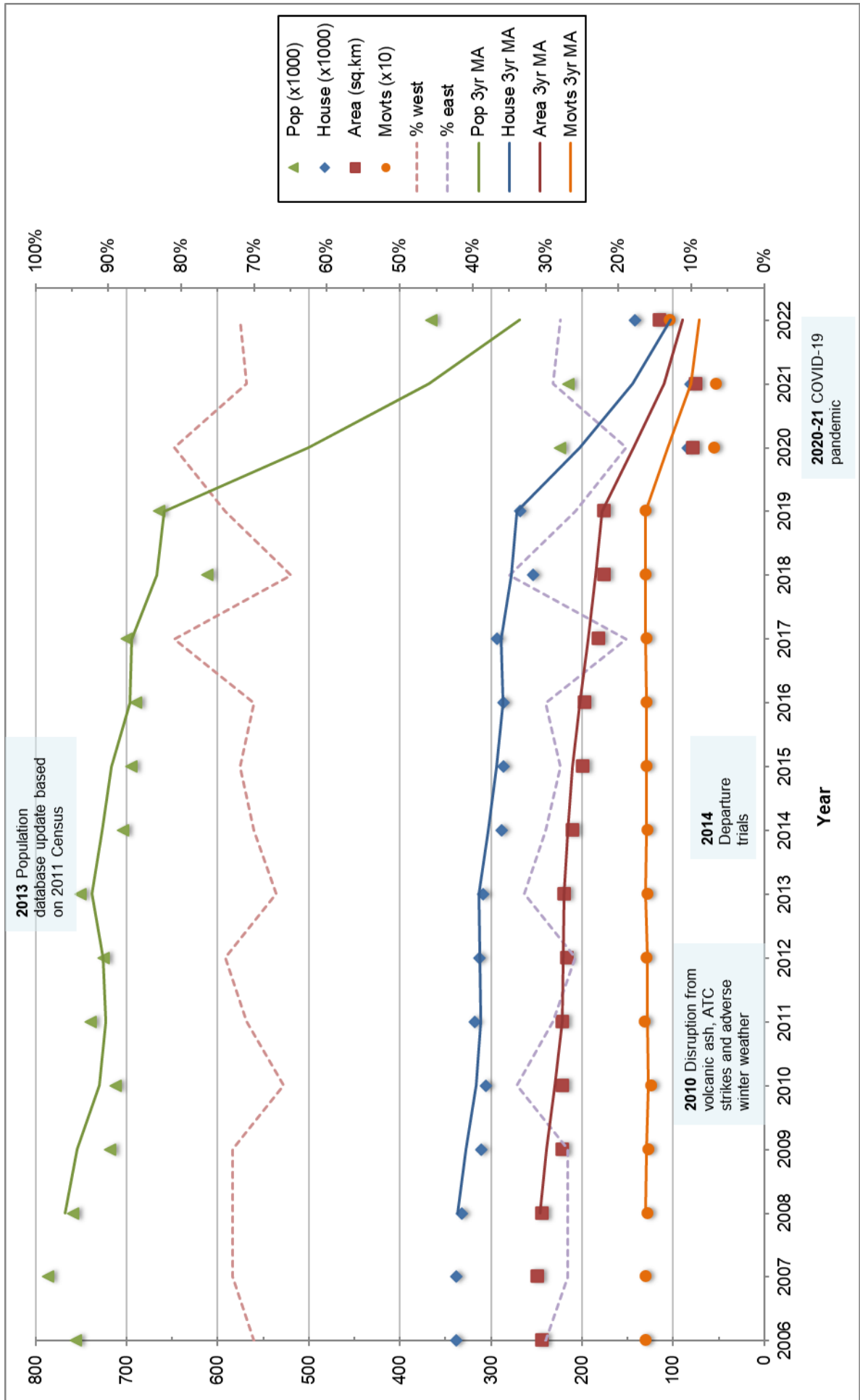


Figure B23 Heathrow 2006-2022 48 dB L_{Aeq,6.5h} night contour area, population and household trends

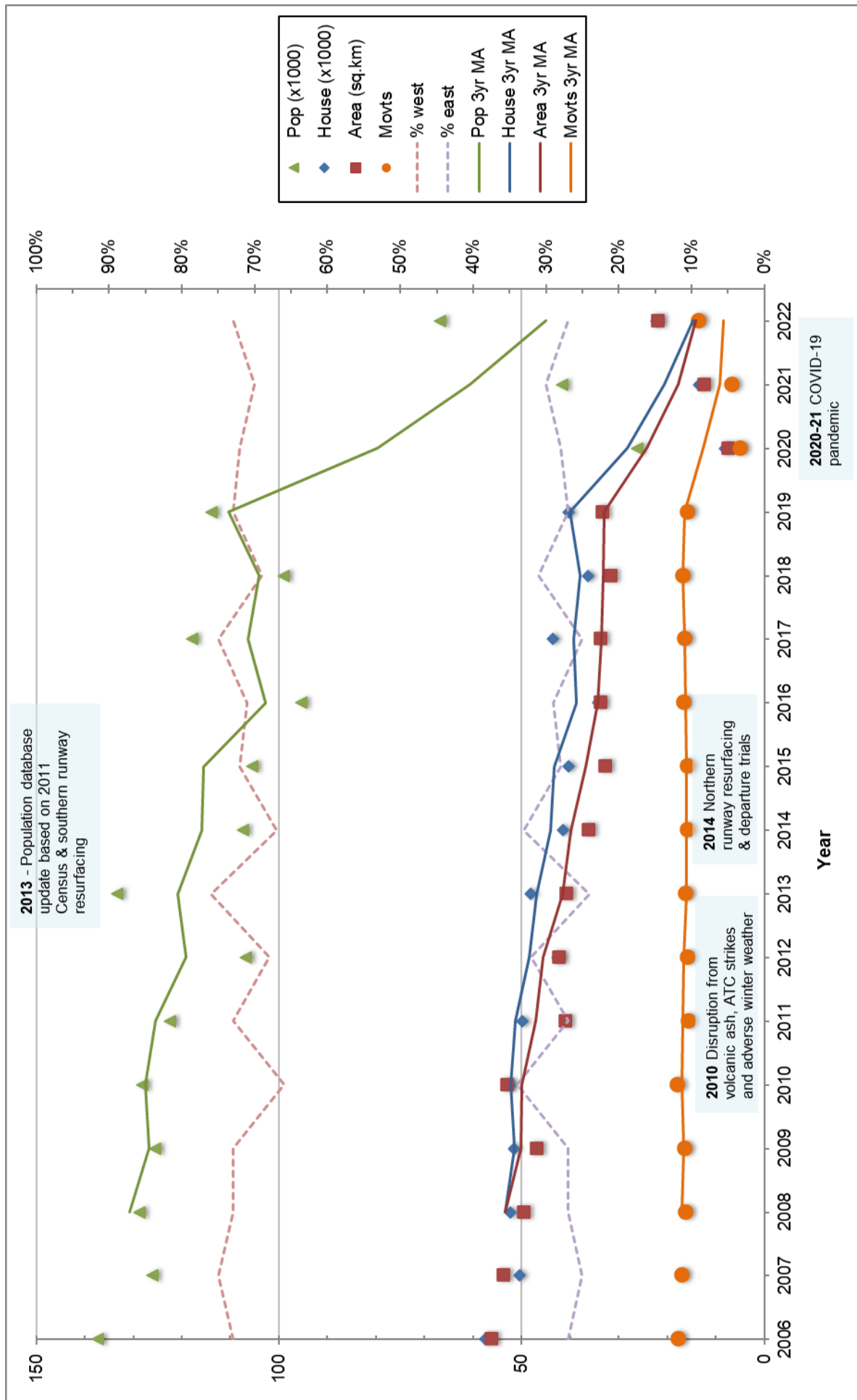
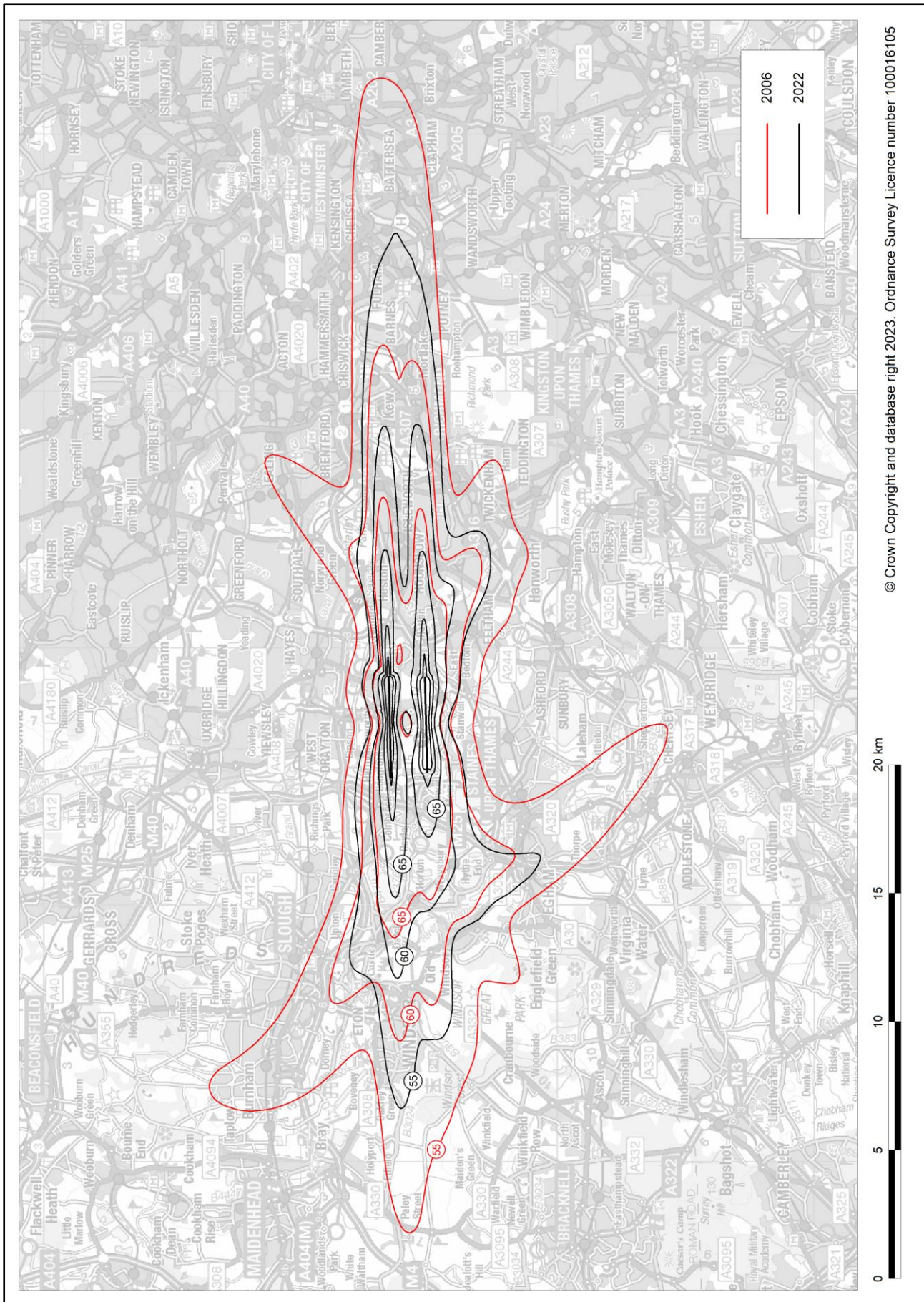
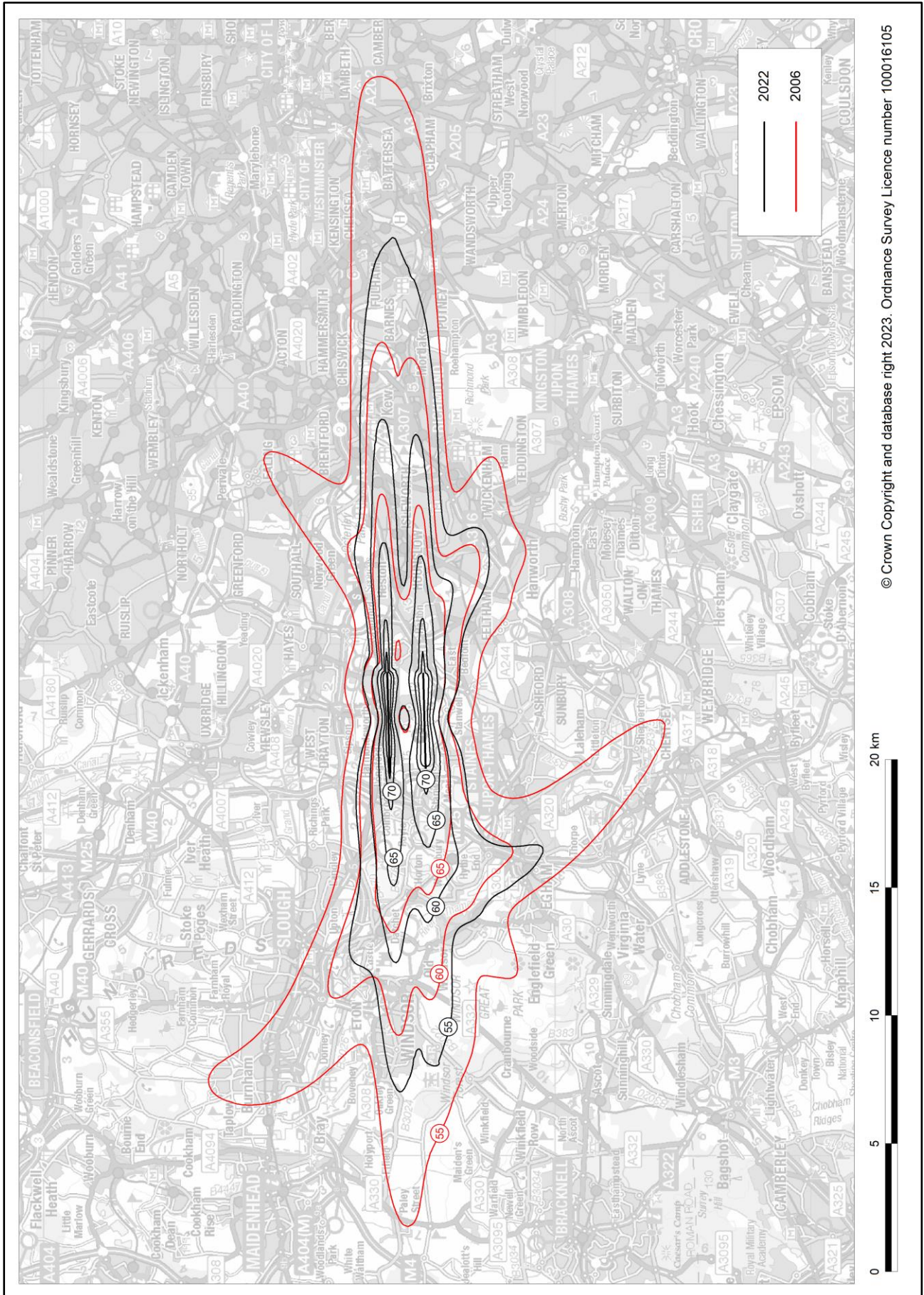


Figure B24 Heathrow 2022 and 2006 L_{den} noise contours



Note: the 2022 annual 24h actual modal split was 72% W / 28% E (2006: 70% W / 30% E).

Figure B25 Heathrow 2022 and 2006 L_{den} noise contours (assuming 2006 runway modal split and 2006 N-S runway usage)

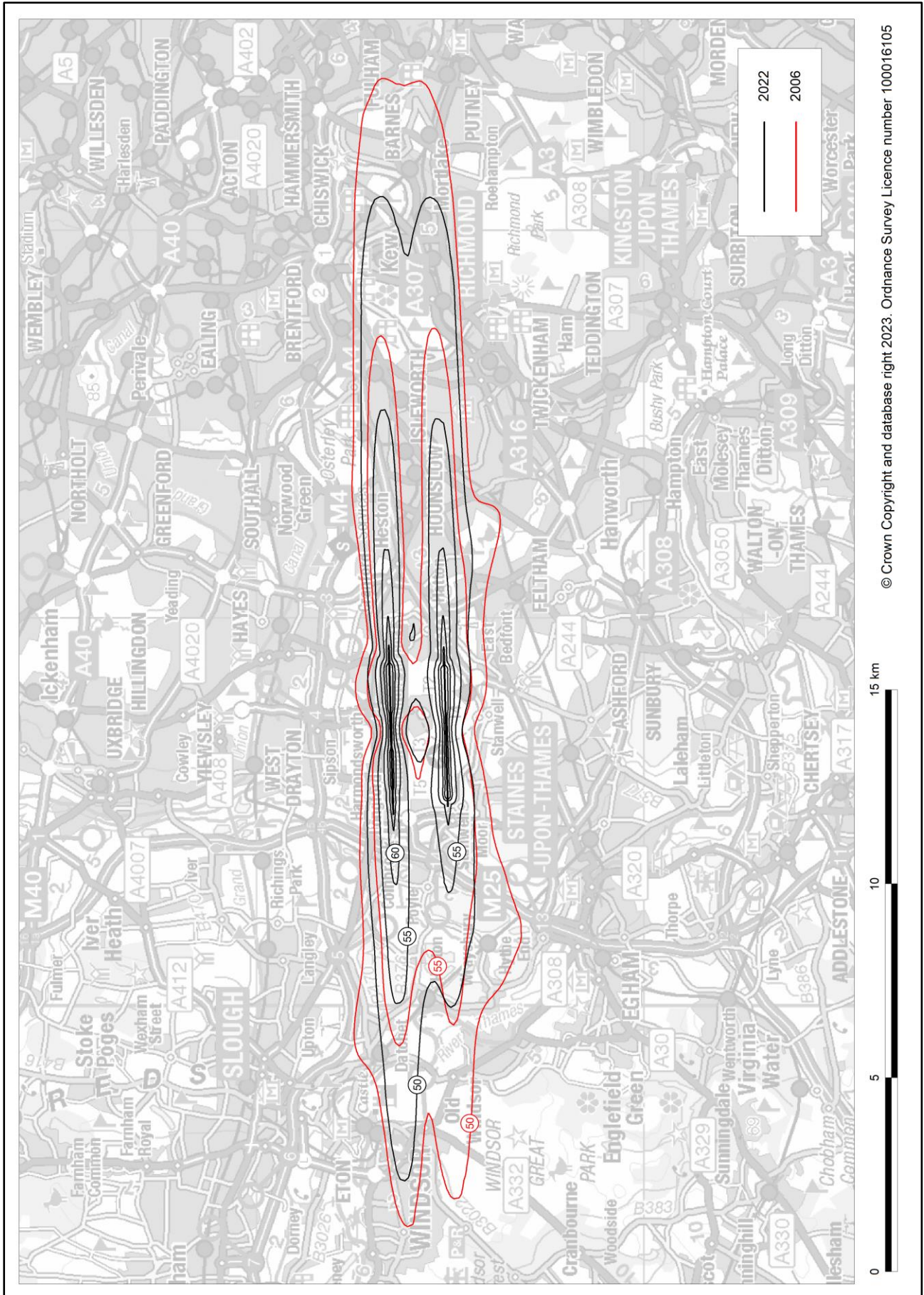


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Figure B26 Heathrow noise change map for 2022 vs 2006 L_{den} (assuming 2006 runway modal split and 2006 N-S runway usage)

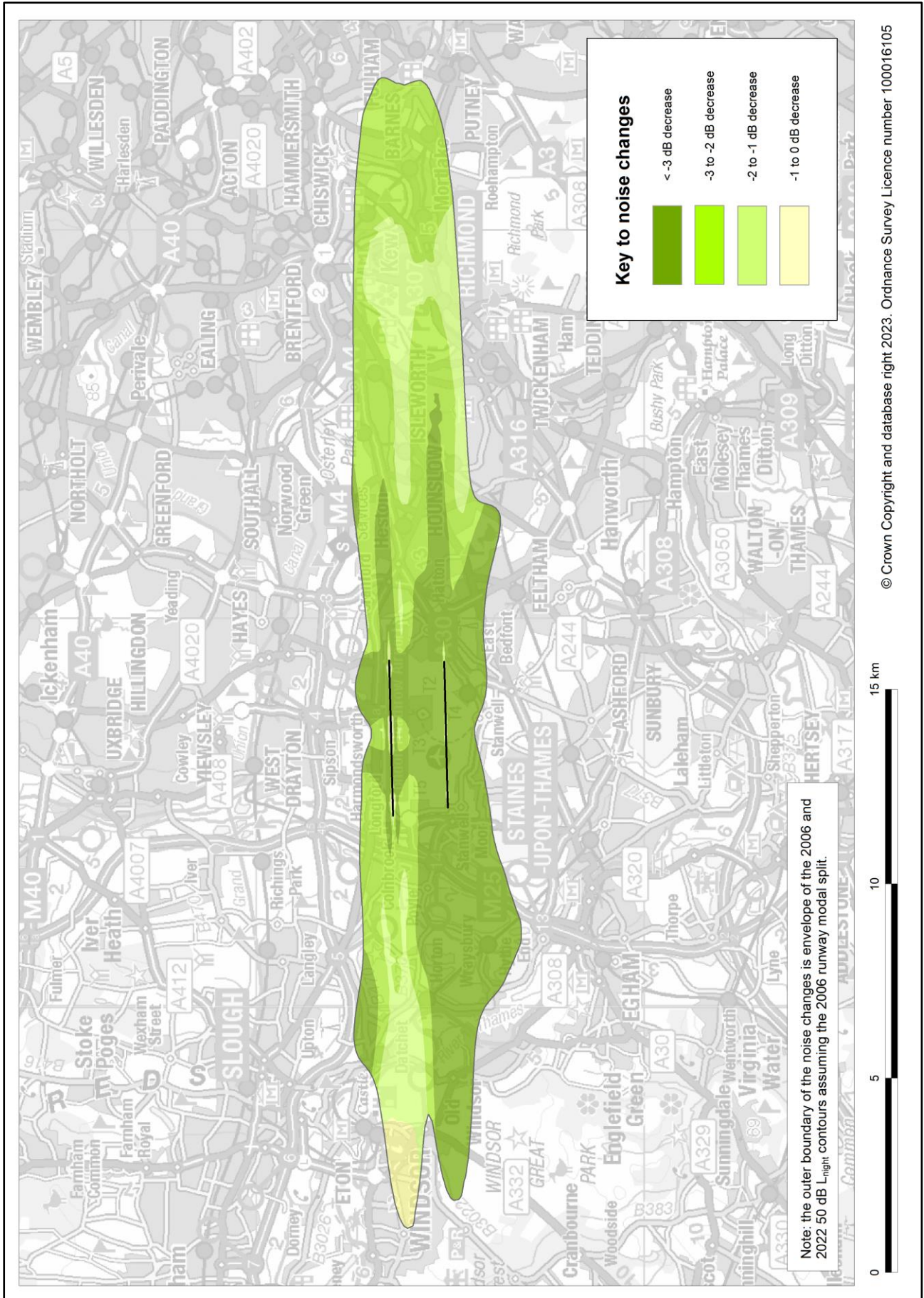


Figure B27 Heathrow 2022 and 2006 L_{night} noise contours



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Figure B28 Heathrow noise change map for 2022 vs 2006 L_{night} (assuming 2006 runway modal split)



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Figure B29 Heathrow 2022 and 2006 L_{night} 50-70 dB 100% W noise contours (assuming 2006 N-S runway usage)

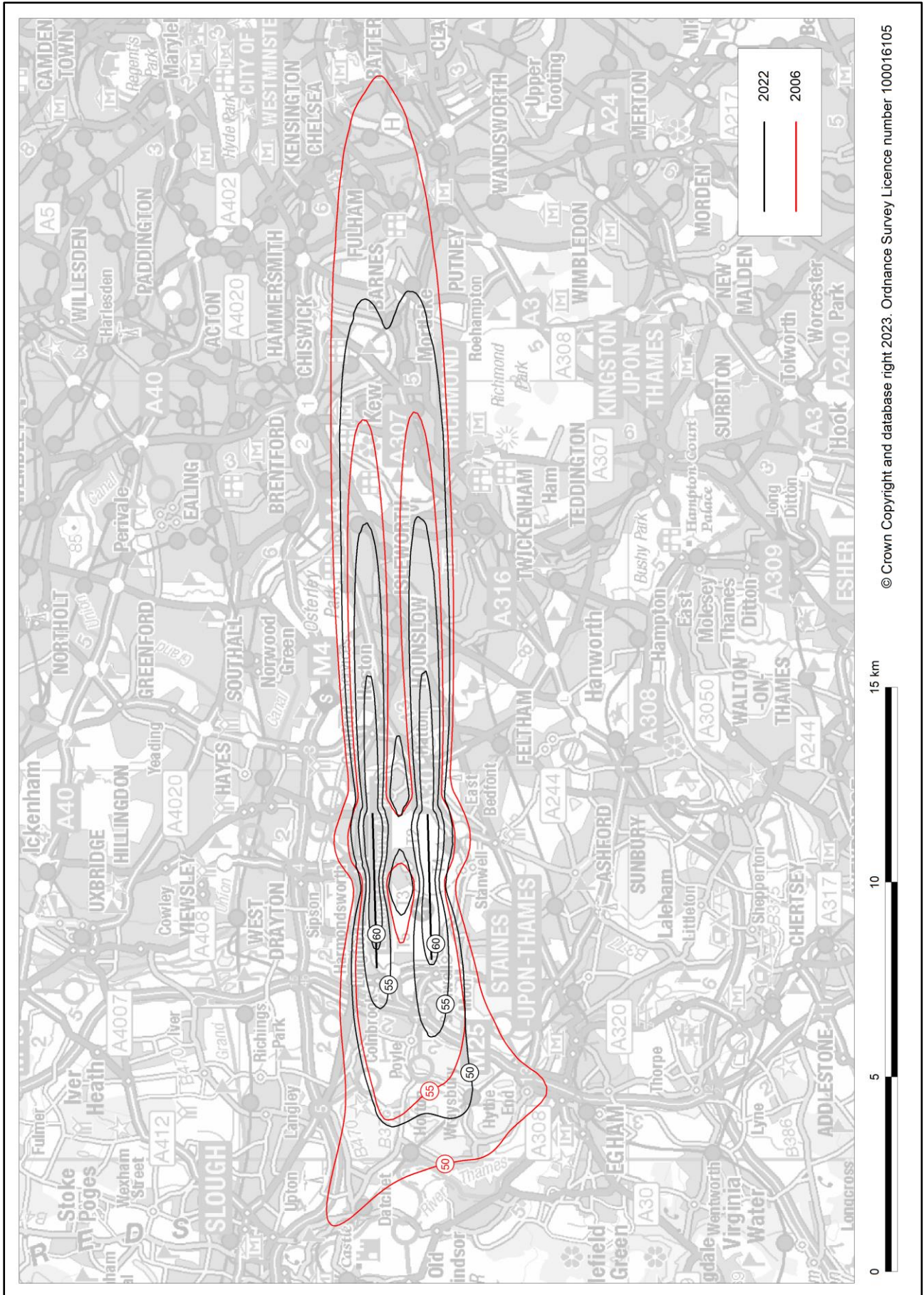


Figure B30 Heathrow 2022 and 2006 L_{night} 50-70 dB 100% E noise contours (assuming 2006 N-S runway usage)

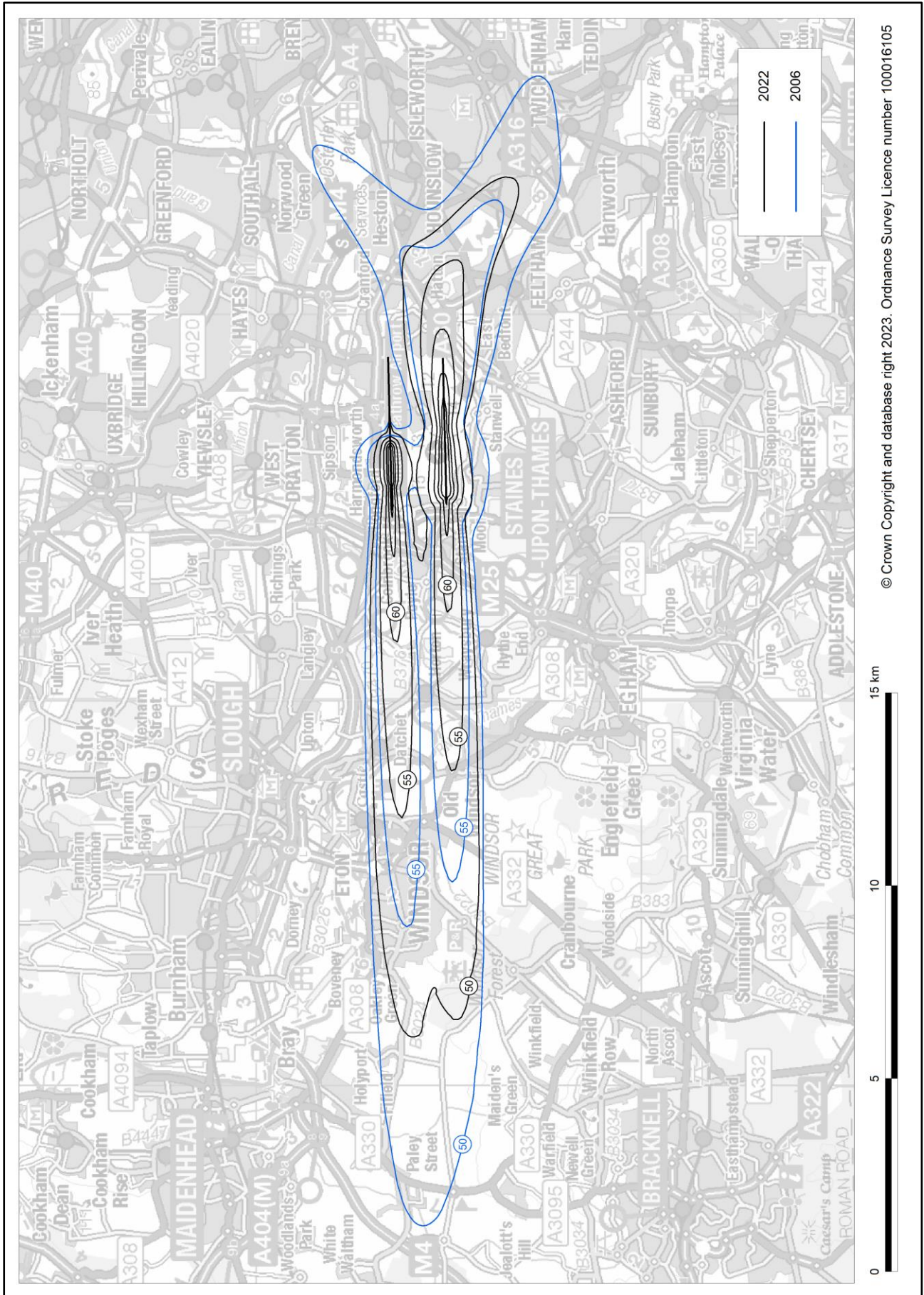


Figure B31 Heathrow 2022 and 2006 annual 16-hour day N65 contours

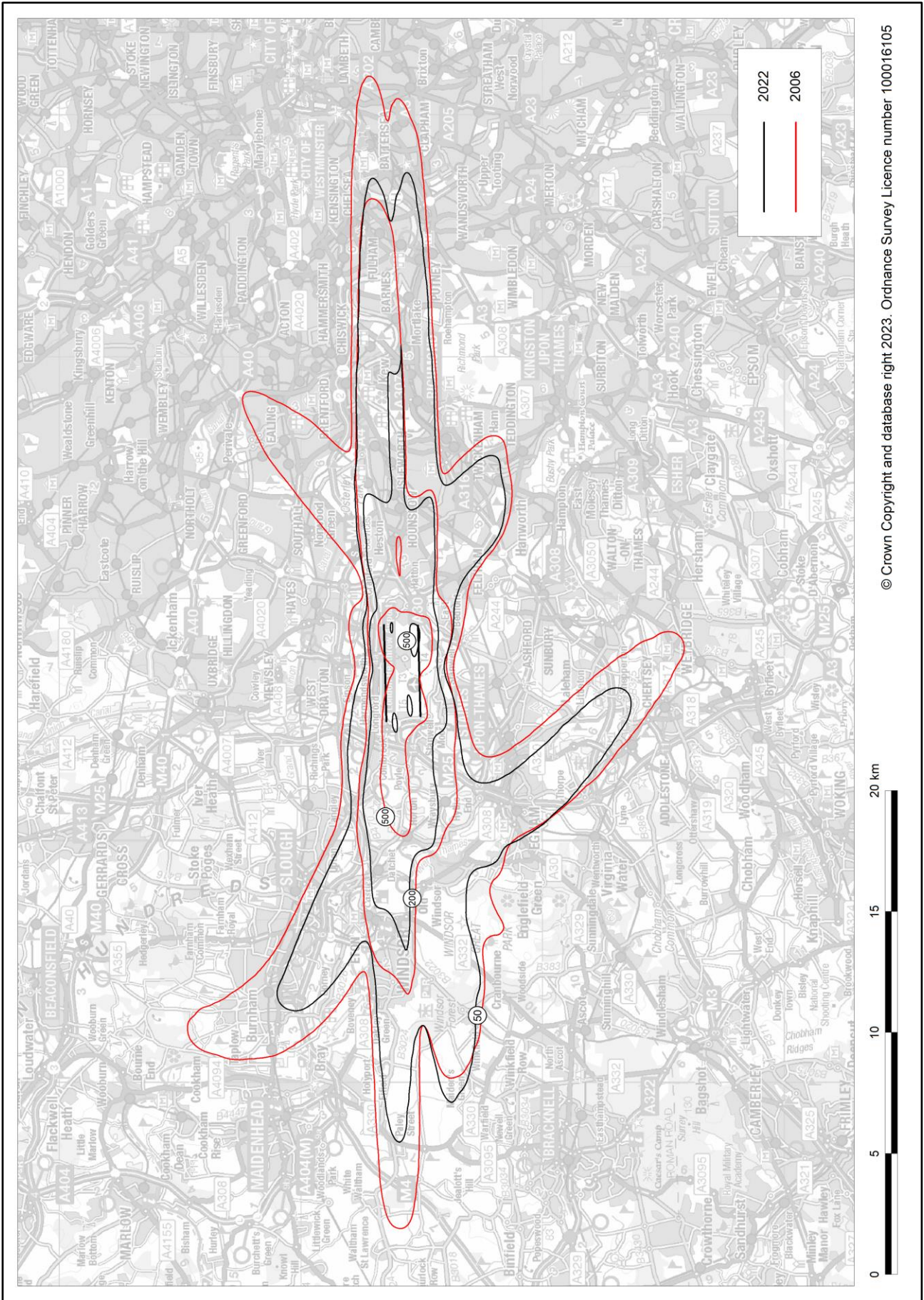


Figure B32 Heathrow change map for 2022 vs 2006 annual 16-hour day N65 (assuming 2006 runway modal split)

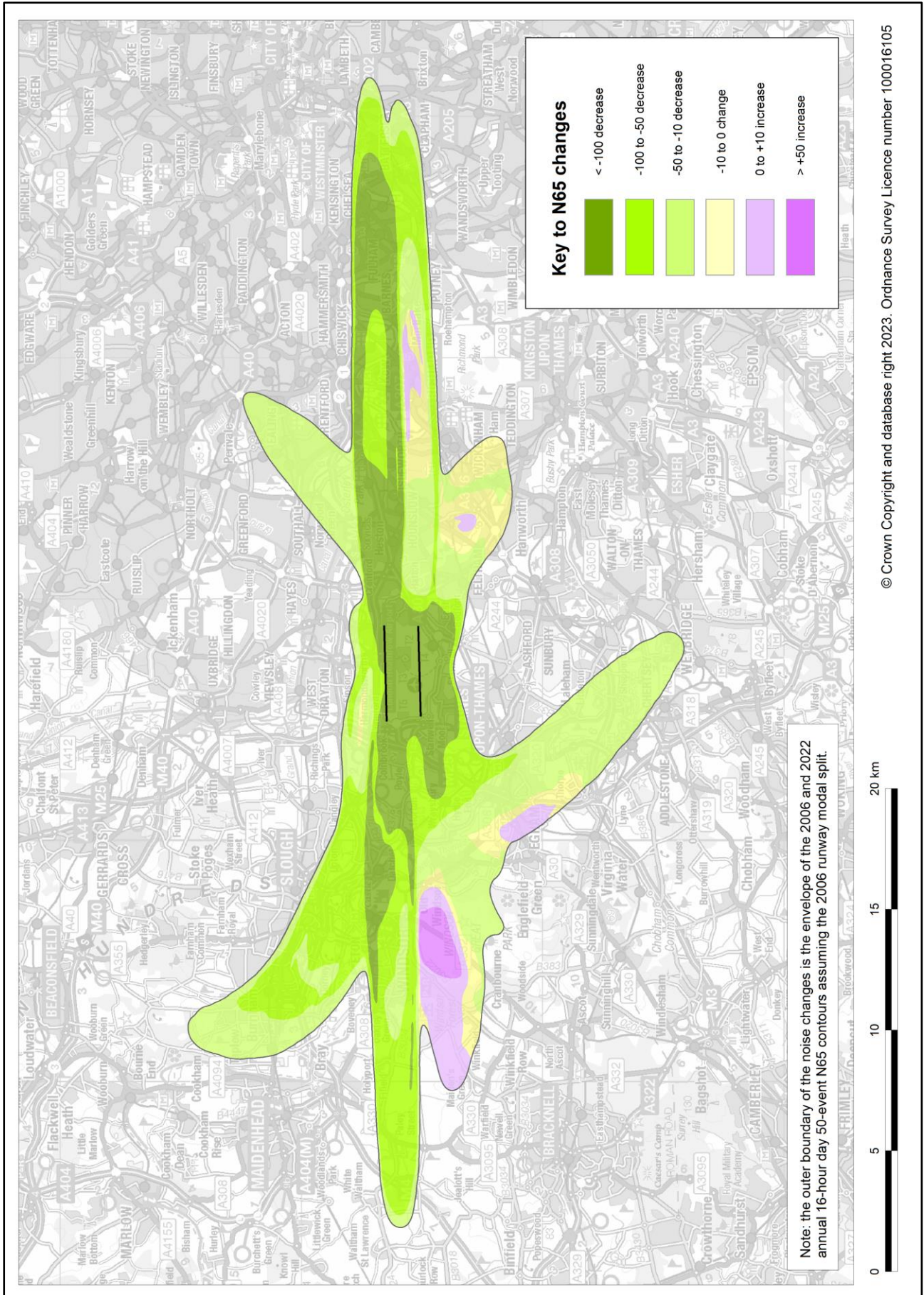


Figure B33 Heathrow 2022 and 2006 annual 16-hour day N70 contours

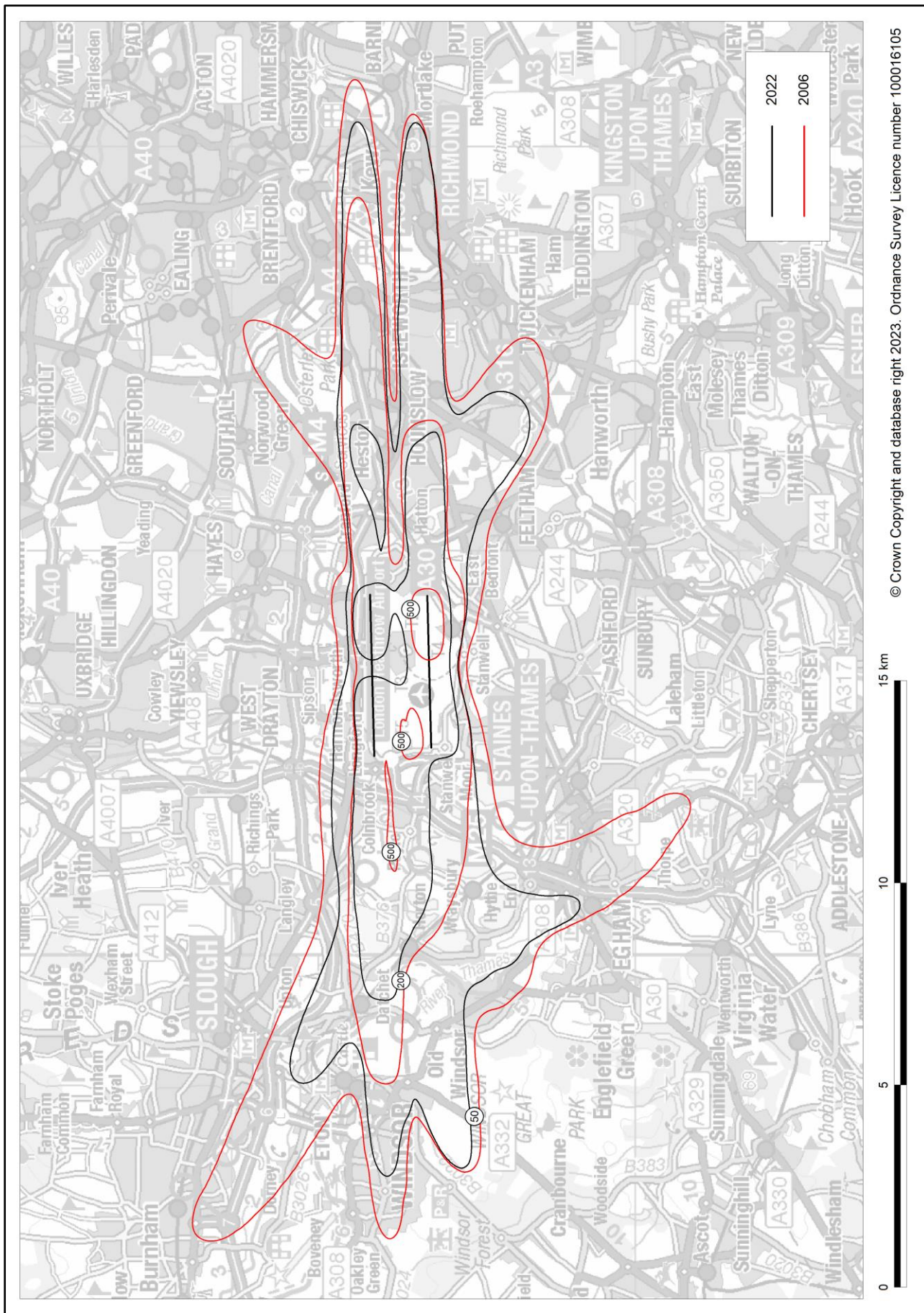


Figure B34 Heathrow 2022 and 2006 annual 16-hour day N70 contours (assuming 2006 modal split and 2006 N-S runway usage)

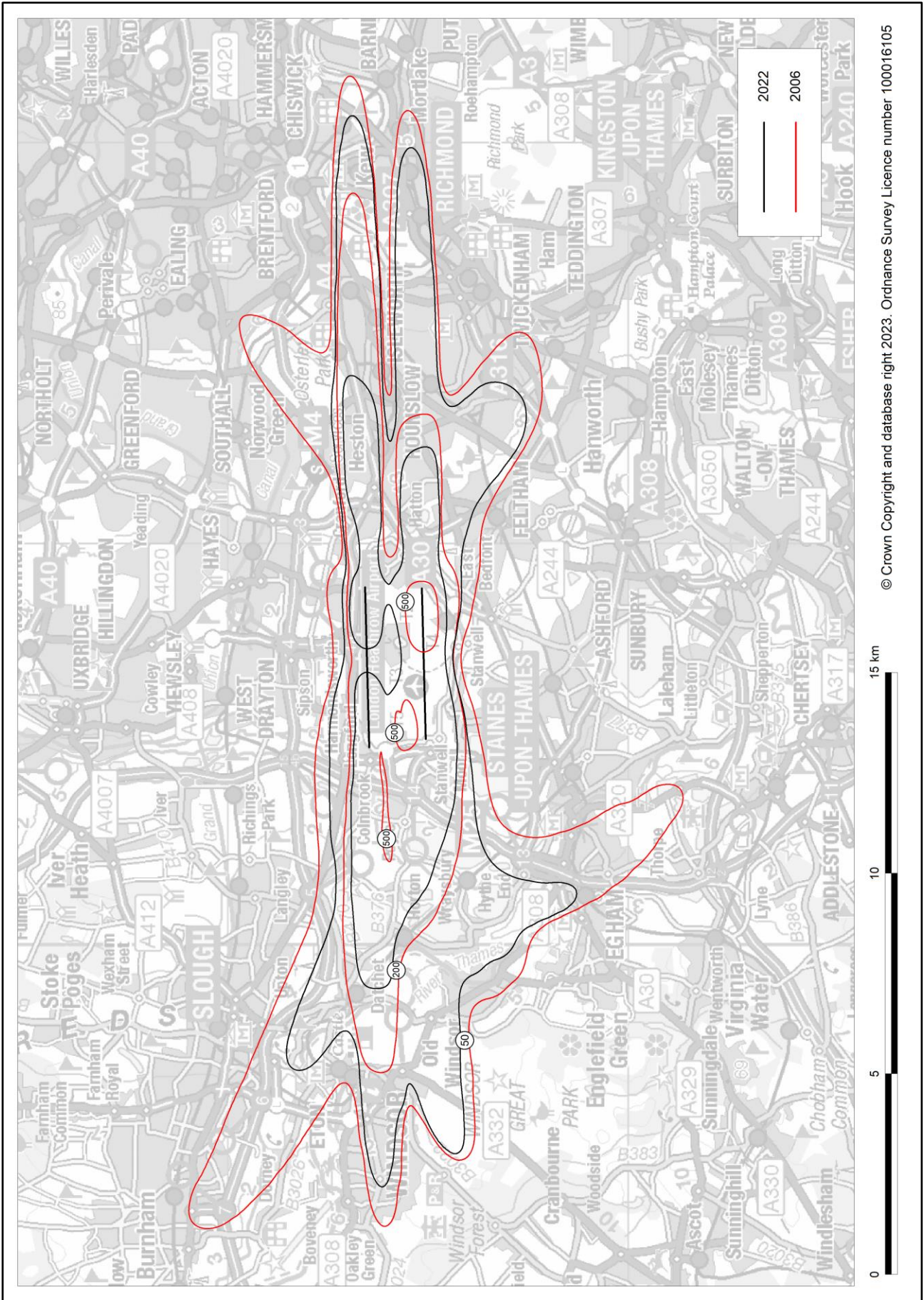


Figure B35 Heathrow change map for 2022 vs 2006 annual 16-hour day N70 (with 2006 runway modal split and 2006 N-S runway usage)

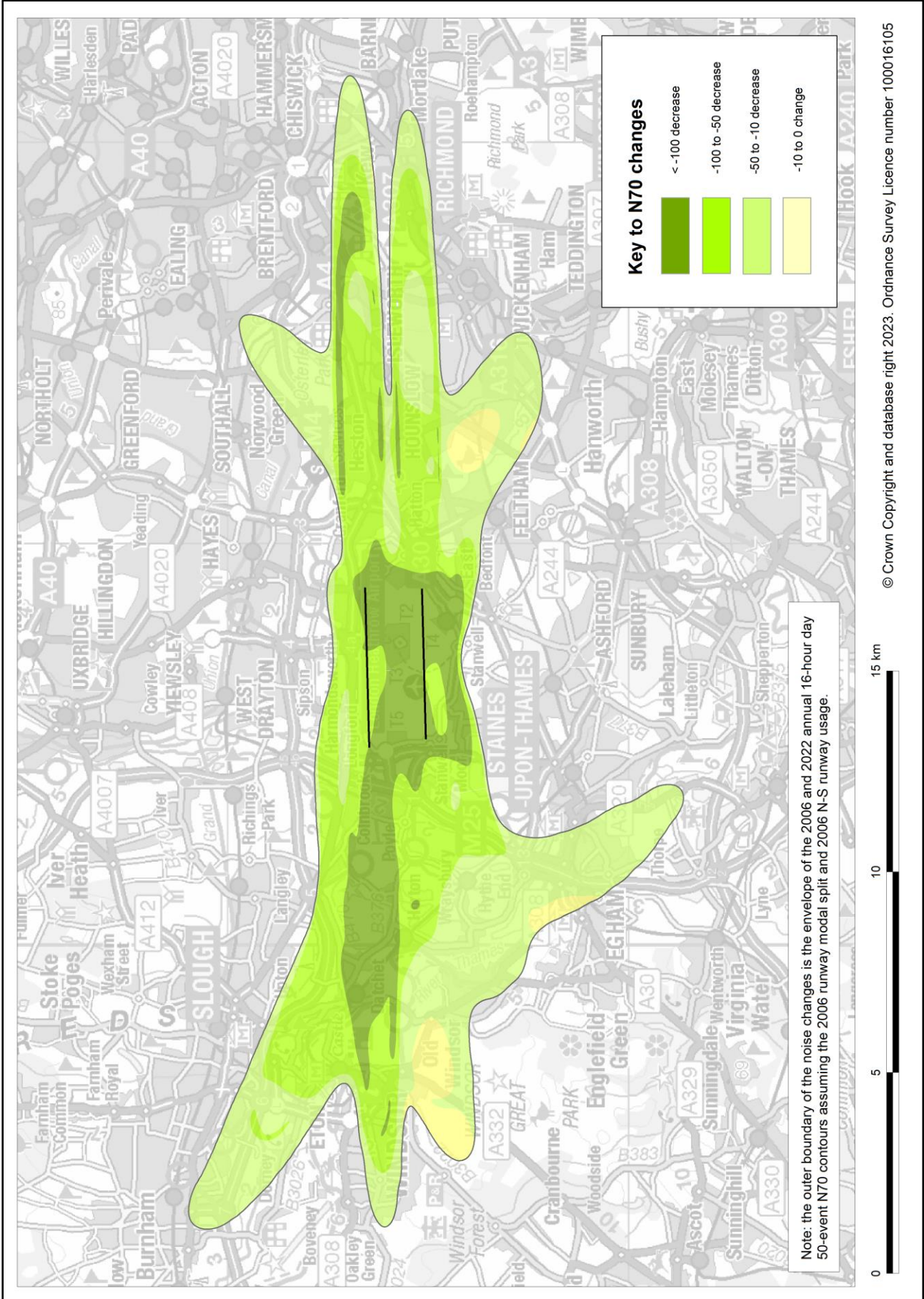


Figure B36 Heathrow 2022 and 2006 annual 16-hour day N70 100% W contours (assuming 2006 N-S runway usage)

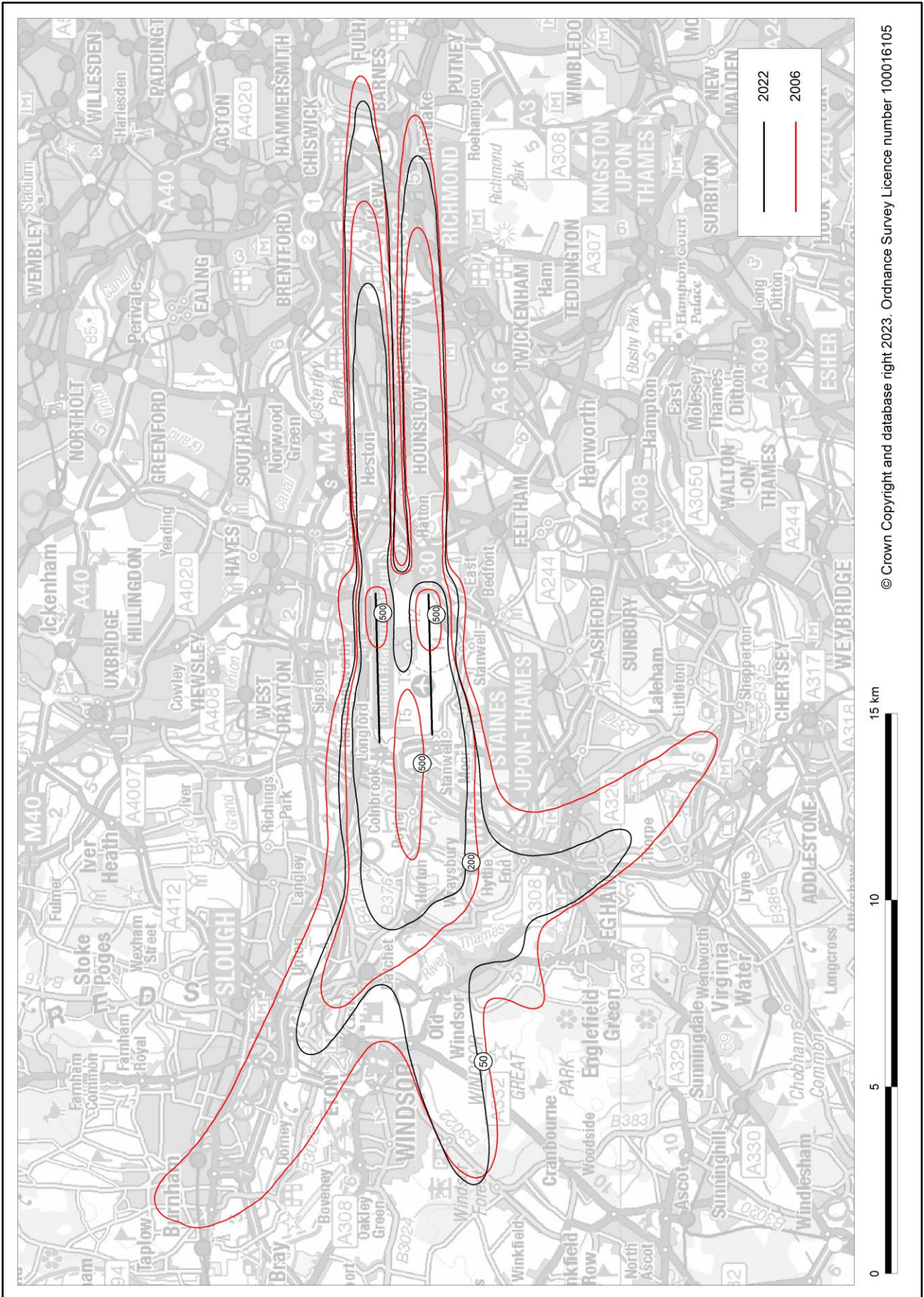


Figure B37 Heathrow 2022 and 2006 annual 16-hour day N70 100% E contours (assuming 2006 N-S runway usage)

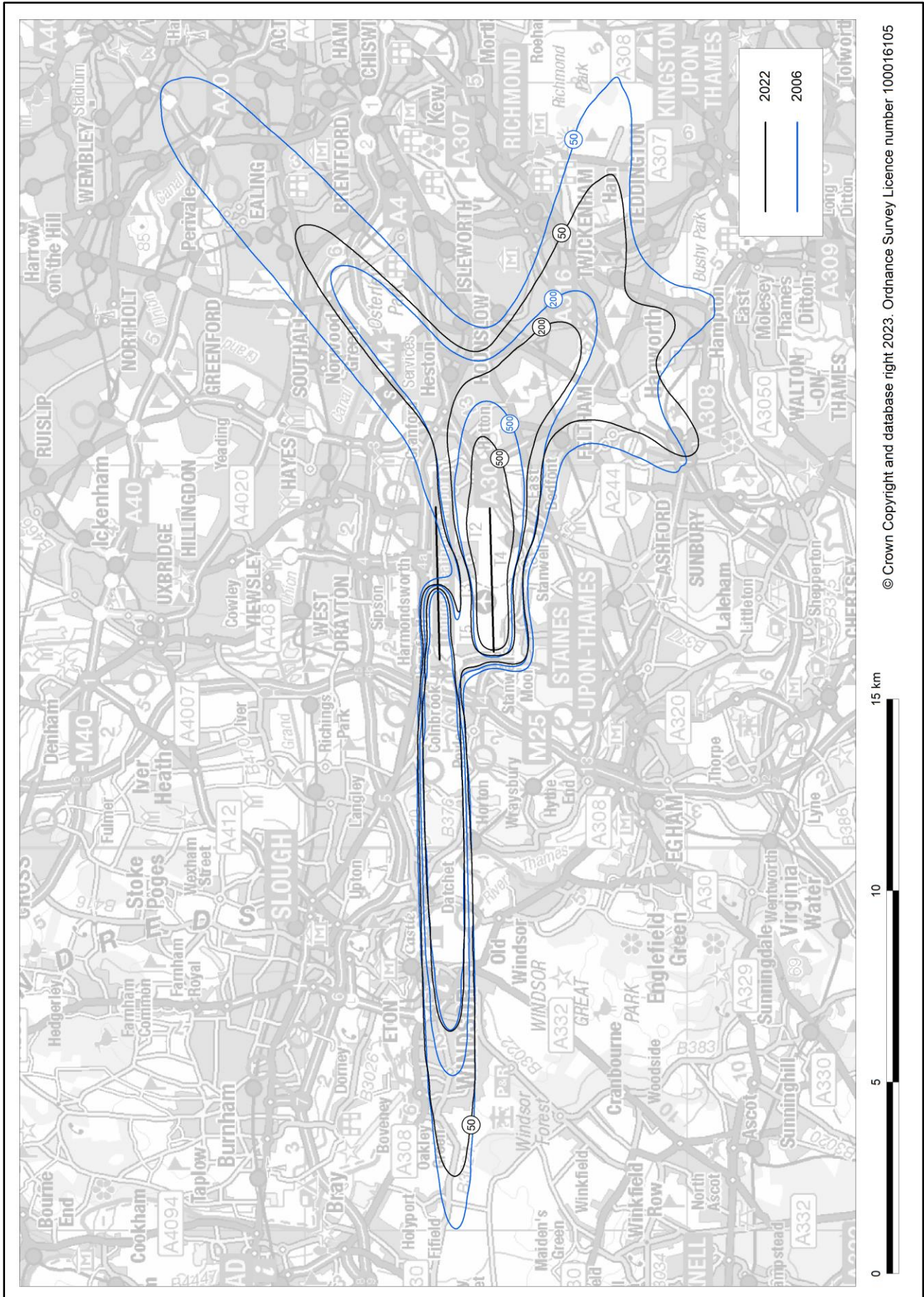


Figure B38 Heathrow 2022 and 2006 annual 8-hour night N60 contours

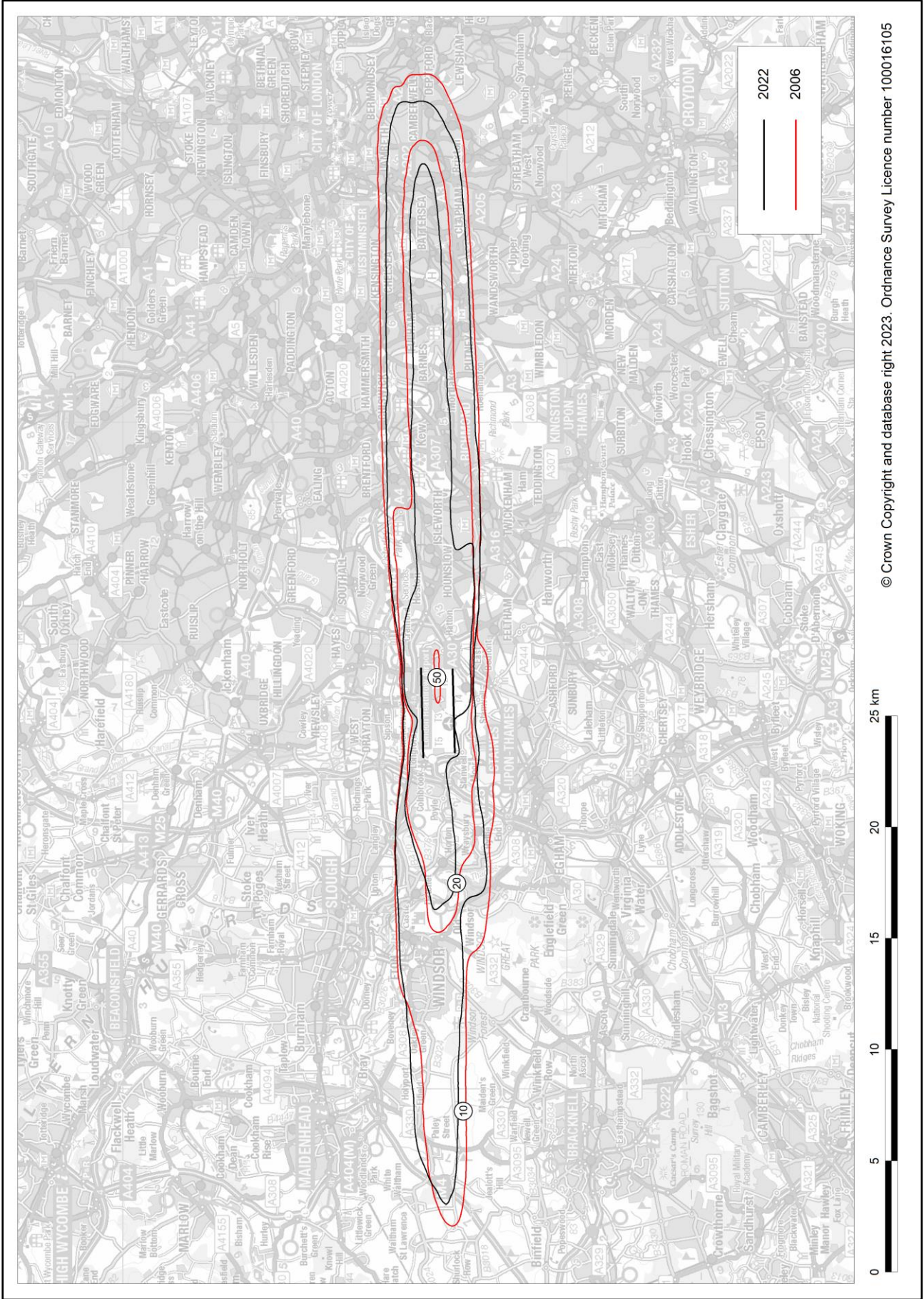
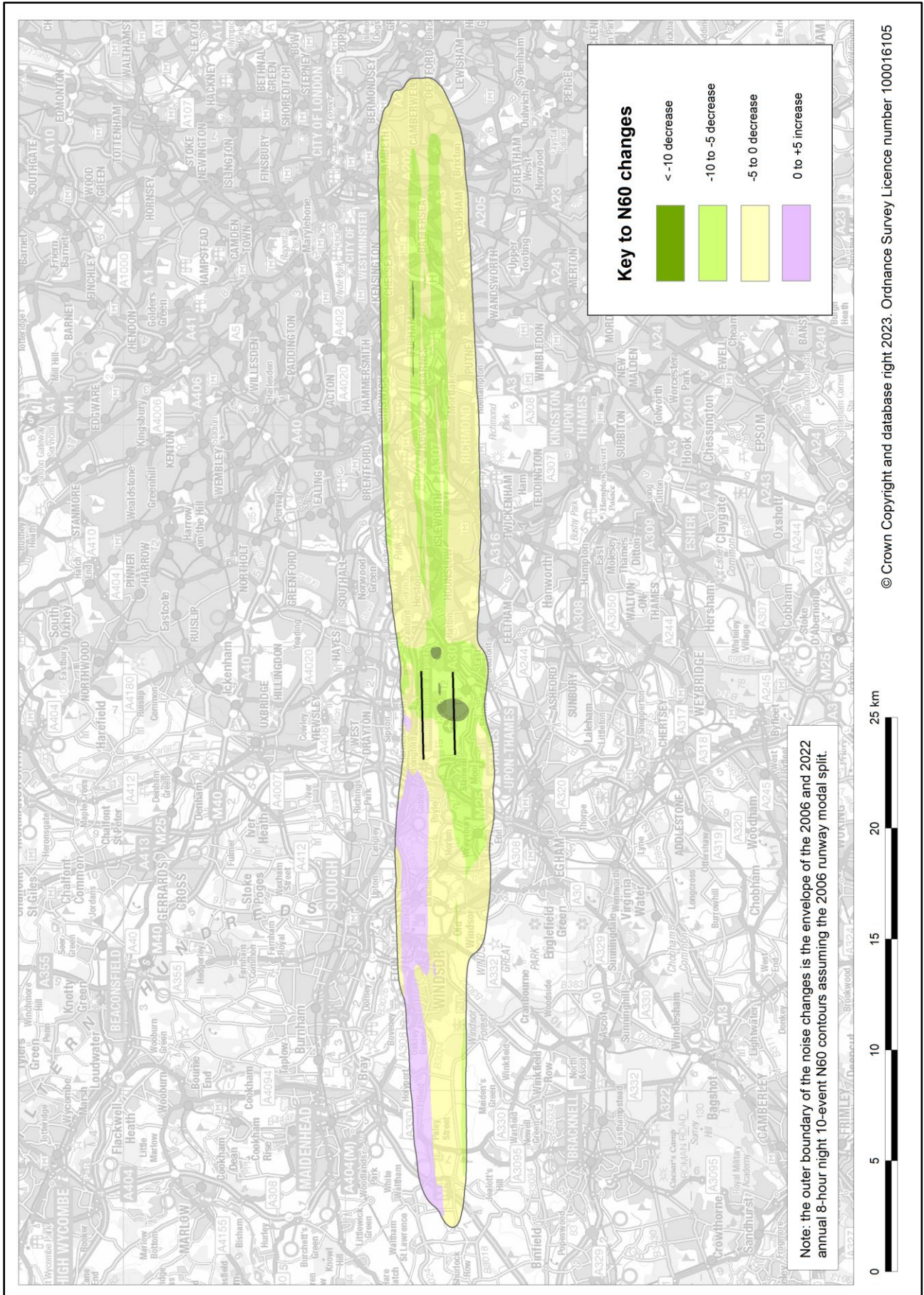


Figure B39 Heathrow change map for 2022 vs 2006 annual 8-hour night N60 (assuming 2006 runway modal split)



APPENDIX C Tables

Table C1 Heathrow 2021 and 2022 average summer 16-hour day movements by ANCON type

ANCON type	2021 dep.	2021 arrivals	2021 total	2022 dep.	2022 arrivals	2022 total	Change dep.	Change arrivals	Change total
B733	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B736	1.2	1.7	2.9	0.2	0.2	0.4	-1.0	-1.5	-2.5
B738	4.0	4.5	8.5	3.2	3.9	7.1	-0.8	-0.6	-1.4
B738MAX	3.3	3.3	6.6	5.3	5.4	10.7	+1.9	+2.1	+4.0
B739MAX	0.0	0.0	0.0	0.3	0.3	0.6	+0.3	+0.3	+0.6
B744G	0.8	0.8	1.5	0.0	0.0	0.0	-0.8	-0.8	-1.5
B744P	0.5	0.5	1.0	0.4	0.4	0.8	-0.1	-0.1	-0.2
B744R	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	-0.1
B747	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B748	0.3	0.3	0.6	0.1	0.1	0.2	-0.2	-0.2	-0.4
B753	0.1	0.1	0.2	0.6	0.6	1.2	+0.5	+0.5	+1.0
B757C	0.1	0.0	0.1	0.0	0.0	0.0	-0.1	0.0	-0.1
B757E	0.7	0.7	1.4	1.5	1.5	3.0	+0.8	+0.8	+1.6
B757P	0.0	0.0	0.1	0.1	0.0	0.2	+0.1	0.0	+0.1
B762	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B763G	1.8	1.8	3.6	1.3	1.4	2.7	-0.5	-0.4	-0.9
B763P	1.4	1.0	2.4	10.0	9.1	19.1	+8.6	+8.1	+16.7
B764	0.8	0.7	1.5	5.3	4.3	9.6	+4.6	+3.6	+8.1
B772G	4.4	2.9	7.4	14.2	9.7	23.9	+9.8	+6.8	+16.5
B772P	0.0	0.0	0.0	0.7	0.4	1.0	+0.7	+0.4	+1.0
B772R	7.7	6.7	14.4	14.0	10.1	24.1	+6.3	+3.4	+9.7
B773G	26.6	19.2	45.8	40.0	34.4	74.3	+13.4	+15.1	+28.5
B7810	5.0	4.2	9.2	3.4	2.4	5.8	-1.7	-1.7	-3.4
B788	10.6	9.2	19.8	20.8	19.3	40.2	+10.3	+10.1	+20.4
B789	30.0	23.4	53.4	50.7	46.2	96.9	+20.7	+22.9	+43.5
BA46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CRJ	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CRJ900	0.9	1.1	2.0	0.5	0.5	1.1	-0.3	-0.6	-0.9
E190E2	0.4	0.4	0.8	4.6	4.6	9.3	+4.2	+4.2	+8.5
EA221	0.9	0.9	1.8	1.8	1.9	3.8	+1.0	+1.0	+2.0
EA223	1.8	1.8	3.6	6.9	7.8	14.7	+5.1	+6.0	+11.1
EA30	2.3	2.6	4.9	1.4	2.2	3.6	-0.8	-0.5	-1.3

ANCON type	2021 dep.	2021 arrivals	2021 total	2022 dep.	2022 arrivals	2022 total	Change dep.	Change arrivals	Change total
EA318	1.1	1.2	2.2	1.1	1.1	2.2	0.0	-0.1	-0.1
EA319C	5.9	6.2	12.1	6.0	6.5	12.5	0.0	+0.4	+0.4
EA319V	25.6	25.5	51.1	43.3	43.4	86.7	+17.6	+17.9	+35.5
EA320C	10.9	12.4	23.3	30.9	33.3	64.2	+20.1	+20.9	+41.0
EA320NEO	31.8	33.6	65.4	63.3	65.1	128.4	+31.5	+31.5	+63.0
EA320V	43.8	44.5	88.3	90.5	90.2	180.7	+46.7	+45.7	+92.4
EA321C	1.1	1.4	2.5	4.2	4.6	8.8	+3.1	+3.2	+6.3
EA321NEO	17.1	17.2	34.3	27.8	27.8	55.6	+10.7	+10.7	+21.4
EA321V	1.9	1.9	3.8	17.7	17.5	35.2	+15.8	+15.6	+31.4
EA33	15.4	13.9	29.3	15.1	14.3	29.4	-0.3	+0.4	+0.1
EA33NEO	0.4	0.4	0.8	0.1	0.1	0.2	-0.3	-0.3	-0.7
EA34	0.1	0.1	0.3	0.1	0.1	0.1	-0.1	-0.1	-0.2
EA3510	10.8	6.7	17.5	13.3	9.4	22.7	+2.5	+2.7	+5.2
EA359	5.8	5.2	10.9	8.0	6.8	14.8	+2.2	+1.6	+3.8
EA38GP	0.4	0.4	0.8	6.0	5.3	11.3	+5.6	+5.0	+10.6
EA38R	1.5	1.3	2.8	11.1	7.8	18.9	+9.6	+6.5	+16.1
ERJ	2.6	2.6	5.3	0.1	0.1	0.1	-2.6	-2.6	-5.2
ERJ170	0.1	0.1	0.1	0.7	0.8	1.5	+0.7	+0.7	+1.4
ERJ190	1.7	1.8	3.4	1.0	1.0	2.1	-0.6	-0.8	-1.4
EXE3	0.5	0.5	1.0	0.7	0.6	1.3	+0.1	+0.1	+0.3
LTT	0.1	0.1	0.3	5.4	5.4	10.9	+5.3	+5.3	+10.6
STT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	284.2	264.7	548.9	533.6	507.9	1041.5	+249.4	+243.2	+492.6
							(+88%)	(+92%)	(+90%)

Note: All numbers are rounded to 1 decimal place. Movement changes have been calculated from unrounded numbers.

Table C2 Heathrow 2021 and 2022 average summer 8-hour night movements by ANCON type

ANCON type	2021 dep.	2021 arrivals	2021 total	2022 dep.	2022 arrivals	2022 total	Change dep.	Change arrivals	Change total
B736	0.4	0.0	0.4	0.0	0.0	0.0	-0.4	0.0	-0.4
B738	0.5	0.0	0.5	0.7	0.0	0.7	+0.2	0.0	+0.2
B738MAX	0.0	0.0	0.0	0.2	0.1	0.3	+0.2	+0.1	+0.3
B739MAX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B744G	0.0	0.1	0.1	0.0	0.0	0.0	0.0	-0.1	-0.1
B748	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B753	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B757C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B757E	0.0	0.1	0.1	0.1	0.0	0.1	+0.1	-0.1	0.0
B757P	0.0	0.0	0.0	0.0	0.1	0.1	0.0	+0.1	+0.1
B762	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B763G	0.0	0.0	0.0	0.1	0.0	0.1	+0.1	0.0	+0.1
B763P	0.0	0.5	0.5	0.0	1.0	1.0	0.0	+0.5	+0.5
B764	0.0	0.0	0.0	0.0	1.0	1.0	0.0	+1.0	+1.0
B772G	0.2	1.7	1.8	0.4	5.0	5.4	+0.3	+3.3	+3.6
B772P	0.0	0.0	0.0	0.0	0.3	0.3	0.0	+0.3	+0.3
B772R	0.1	1.1	1.2	0.5	4.4	4.9	+0.4	+3.3	+3.7
B773G	0.1	7.4	7.5	1.1	6.7	7.9	+1.0	-0.7	+0.3
B7810	0.0	0.8	0.8	0.0	0.9	1.0	+0.0	+0.1	+0.1
B788	0.1	1.5	1.6	1.4	2.9	4.3	+1.3	+1.4	+2.7
B789	0.1	6.7	6.8	2.7	7.1	9.8	+2.6	+0.4	+3.0
BA46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CRJ900	0.2	0.0	0.2	0.0	0.0	0.0	-0.2	0.0	-0.2
EA221	0.0	0.0	0.0	0.1	0.0	0.1	+0.1	0.0	+0.1
EA223	0.0	0.0	0.0	0.9	0.0	0.9	+0.9	0.0	+0.9
EA30	0.5	0.1	0.6	0.8	0.1	0.9	+0.4	0.0	+0.3
EA318	0.1	0.0	0.1	0.0	0.0	0.0	-0.1	0.0	-0.1
EA319C	0.3	0.1	0.4	0.6	0.1	0.7	+0.3	0.0	+0.3
EA319V	0.1	0.2	0.3	0.7	0.5	1.3	+0.6	+0.4	+1.0
EA320C	1.5	0.0	1.5	2.6	0.2	2.9	+1.1	+0.2	+1.3
EA320NEO	2.2	0.2	2.4	3.0	1.1	4.1	+0.8	+0.9	+1.7
EA320V	0.8	0.3	1.1	2.4	2.7	5.1	+1.6	+2.4	+4.0

ANCON type	2021 dep.	2021 arrivals	2021 total	2022 dep.	2022 arrivals	2022 total	Change dep.	Change arrivals	Change total
EA321C	0.3	0.0	0.3	0.4	0.0	0.4	+0.1	0.0	+0.1
EA321NEO	0.5	0.4	0.9	1.8	1.8	3.5	+1.3	+1.3	+2.6
EA321V	0.1	0.0	0.1	0.6	0.8	1.4	+0.6	+0.7	+1.3
EA33	0.2	1.7	2.0	1.0	1.8	2.8	+0.8	0.0	+0.8
EA33NEO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EA34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EA3510	0.0	4.1	4.1	0.8	4.7	5.5	+0.8	+0.6	+1.4
EA359	0.0	0.6	0.6	0.3	1.6	1.9	+0.3	+1.0	+1.3
EA38GP	0.0	0.0	0.0	0.6	1.2	1.8	+0.6	+1.2	+1.8
EA38R	0.0	0.3	0.3	0.1	3.4	3.5	+0.1	+3.2	+3.3
ERJ170	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ERJ190	0.1	0.0	0.1	0.0	0.0	0.0	-0.1	0.0	-0.1
EXE3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LTT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
STT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	8.6	28.0	36.6	24.1	49.6	73.7	15.6	21.6	37.1
							(+182%)	(+77%)	(+102%)

Note: All numbers are rounded to 1 decimal place. Movement changes have been calculated from unrounded numbers.

Table C3 Heathrow 2021 and 2022 annual 12-hour day movements by ANCON type

ANCON type	2021 dep.	2021 arrivals	2021 total	2022 dep.	2022 arrivals	2022 total	Change dep.	Change arrivals	Change total
B733	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B736	1.2	1.3	2.6	0.6	0.6	1.2	-0.7	-0.7	-1.4
B738	2.7	2.7	5.4	3.4	3.4	6.9	+0.8	+0.7	+1.5
B738MAX	1.5	1.8	3.3	3.3	3.2	6.5	+1.8	+1.3	+3.1
B739MAX	0.0	0.0	0.0	0.1	0.1	0.2	+0.1	+0.1	+0.2
B744G	0.5	0.5	1.0	0.1	0.1	0.2	-0.3	-0.4	-0.8
B744P	0.3	0.5	0.8	0.1	0.4	0.5	-0.1	-0.1	-0.3
B744R	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B747	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B748	0.1	0.2	0.4	0.1	0.2	0.2	0.0	-0.1	-0.1
B753	0.1	0.1	0.1	0.3	0.3	0.5	+0.2	+0.2	+0.4
B757C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B757E	0.4	0.4	0.8	0.6	0.4	1.0	+0.2	0.0	+0.2
B757P	0.0	0.0	0.1	0.1	0.0	0.1	+0.1	0.0	+0.1
B762	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B763G	1.5	1.6	3.0	1.0	1.4	2.4	-0.4	-0.1	-0.6
B763P	2.2	1.6	3.7	8.5	6.6	15.0	+6.3	+5.0	+11.3
B764	1.3	1.2	2.5	4.2	3.4	7.6	+2.9	+2.2	+5.1
B772G	4.5	3.7	8.2	12.5	8.4	20.9	+8.1	+4.7	+12.8
B772P	0.0	0.0	0.0	0.4	0.2	0.6	+0.4	+0.2	+0.6
B772R	8.0	6.9	14.9	11.0	9.1	20.1	+3.0	+2.2	+5.2
B773G	21.2	19.0	40.2	27.8	28.3	56.1	+6.6	+9.3	+15.9
B773R	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B7810	3.9	3.3	7.3	3.5	2.8	6.3	-0.4	-0.5	-0.9
B788	10.2	9.0	19.2	14.0	15.4	29.4	+3.9	+6.4	+10.3
B789	25.6	24.4	50.1	35.1	36.3	71.3	+9.4	+11.9	+21.3
BA46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CRJ	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CRJ900	0.2	0.3	0.5	0.2	0.3	0.5	0.0	0.0	0.0
E190E2	0.1	0.4	0.5	1.6	2.9	4.4	+1.5	+2.5	+3.9
EA221	0.8	1.0	1.7	1.4	1.6	3.0	+0.7	+0.6	+1.3
EA223	1.0	1.2	2.1	3.9	4.2	8.1	+2.9	+3.1	+6.0

ANCON type	2021 dep.	2021 arrivals	2021 total	2022 dep.	2022 arrivals	2022 total	Change dep.	Change arrivals	Change total
EA30	1.2	1.0	2.2	1.0	0.7	1.6	-0.2	-0.3	-0.5
EA31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EA318	1.0	1.0	1.9	0.9	0.9	1.8	-0.1	0.0	-0.1
EA319C	3.7	4.3	8.0	4.7	5.0	9.7	+1.0	+0.7	+1.7
EA319NEO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EA319V	16.9	16.8	33.7	36.5	36.9	73.4	+19.6	+20.2	+39.7
EA320C	8.1	8.8	16.9	18.5	20.8	39.3	+10.5	+11.9	+22.4
EA320NEO	24.6	22.9	47.5	50.7	51.5	102.2	+26.1	+28.6	+54.7
EA320V	31.9	27.8	59.7	70.0	65.9	135.9	+38.1	+38.1	+76.3
EA321C	0.9	1.1	2.0	2.9	2.9	5.8	+2.0	+1.8	+3.8
EA321NEO	12.7	11.2	23.9	21.5	18.2	39.8	+8.8	+7.0	+15.9
EA321V	1.1	1.1	2.2	9.2	7.4	16.6	+8.1	+6.3	+14.4
EA33	10.8	11.3	22.1	12.5	12.2	24.7	+1.7	+0.9	+2.6
EA33NEO	0.1	0.1	0.3	0.4	0.4	0.9	+0.3	+0.3	+0.6
EA34	0.2	0.3	0.5	0.0	0.0	0.1	-0.2	-0.2	-0.4
EA346	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EA3510	8.9	6.5	15.4	10.4	8.9	19.3	+1.5	+2.4	+3.9
EA359	3.7	4.9	8.6	3.6	5.2	8.7	-0.1	+0.2	+0.1
EA38GP	0.2	0.5	0.7	3.8	3.7	7.5	+3.6	+3.2	+6.7
EA38R	1.7	1.8	3.5	6.9	6.9	13.8	+5.2	+5.1	+10.3
ERJ	1.2	1.5	2.8	0.1	0.2	0.3	-1.1	-1.4	-2.4
ERJ170	0.0	0.0	0.1	0.2	0.2	0.4	+0.2	+0.2	+0.4
ERJ190	1.2	1.4	2.5	0.6	0.9	1.5	-0.6	-0.4	-1.0
EXE3	0.3	0.3	0.7	0.7	0.7	1.5	+0.4	+0.4	+0.8
L4P	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LTT	0.0	0.1	0.1	2.8	3.0	5.7	+2.7	+2.9	+5.6
STT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	217.7	206.1	423.7	391.7	382.4	774.1	+174.0	+176.3	+350.3
							(+80%)	(+86%)	(+83%)

Note: All numbers are rounded to 1 decimal place. Movement changes have been calculated from unrounded numbers.

Table C4 Heathrow 2021 and 2022 annual 4-hour evening movements by ANCON type

ANCON type	2021 dep.	2021 arrivals	2021 total	2022 dep.	2022 arrivals	2022 total	Change dep.	Change arrivals	Change total
B733	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B736	0.1	0.4	0.5	0.1	0.2	0.3	0.0	-0.2	-0.2
B738	0.3	0.5	0.8	0.2	0.9	1.2	0.0	+0.4	+0.4
B738MAX	0.6	0.2	0.8	1.0	1.3	2.3	+0.4	+1.0	+1.5
B739MAX	0.0	0.0	0.0	0.2	0.2	0.4	+0.2	+0.2	+0.4
B744G	0.1	0.0	0.2	0.0	0.0	0.0	-0.1	0.0	-0.1
B744P	0.4	0.1	0.5	0.3	0.1	0.4	0.0	0.0	-0.1
B744R	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B748	0.1	0.0	0.2	0.1	0.0	0.1	0.0	0.0	0.0
B753	0.0	0.0	0.0	0.1	0.1	0.2	+0.1	+0.1	+0.1
B757C	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	-0.1
B757E	0.2	0.2	0.4	0.4	0.6	1.0	+0.2	+0.4	+0.6
B757P	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
B762	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B763G	0.2	0.1	0.3	0.7	0.3	1.0	+0.5	+0.3	+0.8
B763P	0.0	0.0	0.1	0.1	0.8	0.9	+0.1	+0.8	+0.9
B764	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B772G	0.9	0.1	1.0	1.6	1.0	2.6	+0.6	+0.9	+1.6
B772P	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B772R	0.8	0.4	1.2	2.7	1.4	4.1	+1.9	+1.0	+2.9
B773G	6.7	2.0	8.6	9.4	2.3	11.7	+2.8	+0.3	+3.1
B7810	0.3	0.0	0.4	0.1	0.0	0.1	-0.2	0.0	-0.2
B788	1.6	0.9	2.5	4.7	1.6	6.3	+3.0	+0.7	+3.7
B789	6.5	1.6	8.1	11.4	3.2	14.5	+4.9	+1.5	+6.4
BA46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CRJ	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CRJ900	0.0	0.0	0.0	0.1	0.0	0.1	+0.1	0.0	+0.1
E190E2	0.3	0.0	0.3	1.9	0.5	2.4	+1.6	+0.5	+2.1
EA221	0.3	0.1	0.4	0.3	0.2	0.6	+0.1	+0.1	+0.2
EA223	0.3	0.2	0.5	1.4	1.6	3.0	+1.1	+1.4	+2.4
EA30	0.8	1.6	2.4	0.6	1.6	2.2	-0.2	0.0	-0.2
EA318	0.0	0.1	0.2	0.0	0.0	0.0	0.0	-0.1	-0.1

ANCON type	2021 dep.	2021 arrivals	2021 total	2022 dep.	2022 arrivals	2022 total	Change dep.	Change arrivals	Change total
EA319C	1.1	0.7	1.8	1.6	1.7	3.3	+0.5	+1.0	+1.5
EA319NEO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EA319V	2.3	2.4	4.7	9.7	9.5	19.2	+7.5	+7.0	+14.5
EA320C	1.6	1.8	3.4	6.5	6.2	12.7	+4.9	+4.4	+9.3
EA320NEO	3.0	6.0	9.0	14.7	16.7	31.4	+11.7	+10.7	+22.5
EA320V	3.0	7.9	10.9	18.0	22.6	40.5	+15.0	+14.7	+29.7
EA321C	0.2	0.2	0.4	0.6	0.8	1.4	+0.4	+0.6	+1.0
EA321NEO	1.3	2.9	4.1	4.5	7.8	12.3	+3.2	+4.9	+8.1
EA321V	0.1	0.1	0.2	1.6	3.4	5.0	+1.5	+3.3	+4.8
EA33	3.2	1.1	4.3	2.8	1.3	4.1	-0.4	+0.2	-0.1
EA33NEO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EA34	0.1	0.0	0.1	0.0	0.0	0.0	-0.1	0.0	-0.1
EA346	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EA3510	1.4	0.7	2.1	3.1	0.8	3.9	+1.7	0.0	+1.7
EA359	2.6	0.2	2.8	3.5	0.4	3.9	+0.9	+0.2	+1.1
EA38GP	0.5	0.2	0.7	1.6	0.9	2.5	+1.1	+0.7	+1.7
EA38R	0.7	0.1	0.9	3.1	0.6	3.7	+2.4	+0.4	+2.8
ERJ	0.6	0.3	0.9	0.0	0.0	0.1	-0.6	-0.3	-0.9
ERJ170	0.0	0.0	0.0	0.1	0.0	0.1	+0.1	0.0	+0.1
ERJ190	0.2	0.1	0.2	0.4	0.1	0.6	+0.3	+0.1	+0.3
EXE3	0.0	0.1	0.1	0.1	0.1	0.2	+0.1	0.0	+0.1
LTT	0.1	0.0	0.1	1.1	0.9	2.0	+1.0	+0.9	+1.9
Total	42.7	33.5	76.3	110.7	91.8	202.5	+68.0	+58.3	+126.2
							(+159%)	(+174%)	(+166%)

Note: All numbers are rounded to 1 decimal place. Movement changes have been calculated from unrounded numbers.

Table C5 Heathrow 2021 and 2022 annual 8-hour night movements by ANCON type

ANCON type	2021 dep.	2021 arrivals	2021 total	2022 dep.	2022 arrivals	2022 total	Change dep.	Change arrivals	Change total
B736	0.3	0.0	0.3	0.1	0.0	0.1	-0.2	0.0	-0.2
B738	0.4	0.0	0.4	0.7	0.0	0.7	+0.4	0.0	+0.4
B738MAX	0.0	0.0	0.0	0.2	0.1	0.3	+0.2	+0.1	+0.3
B739MAX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B744G	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
B744P	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B744R	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B748	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B753	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B757C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B757E	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0
B757P	0.0	0.0	0.0	0.0	0.1	0.1	0.0	+0.1	+0.1
B762	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B763G	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
B763P	0.0	0.6	0.6	0.0	1.2	1.2	0.0	+0.5	+0.5
B764	0.0	0.1	0.1	0.0	0.8	0.8	0.0	+0.7	+0.7
B772G	0.2	1.7	1.9	0.5	5.1	5.6	+0.3	+3.4	+3.7
B772P	0.0	0.0	0.0	0.0	0.2	0.2	0.0	+0.2	+0.2
B772R	0.1	1.6	1.7	0.4	3.6	4.0	+0.3	+2.0	+2.3
B773G	0.1	6.9	7.1	0.6	7.3	7.9	+0.5	+0.3	+0.8
B7810	0.0	0.9	0.9	0.0	0.8	0.8	0.0	-0.1	-0.1
B788	0.1	2.1	2.2	0.7	2.4	3.1	+0.6	+0.3	+1.0
B789	0.1	6.2	6.4	1.3	8.3	9.5	+1.1	+2.1	+3.2
BA46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CRJ900	0.1	0.0	0.1	0.0	0.0	0.0	-0.1	0.0	-0.1
EA221	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EA223	0.1	0.0	0.1	0.6	0.0	0.6	+0.5	0.0	+0.5
EA30	0.6	0.1	0.7	0.8	0.1	0.9	+0.2	0.0	+0.2
EA31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EA318	0.1	0.0	0.1	0.0	0.0	0.0	-0.1	0.0	-0.1
EA319C	0.3	0.1	0.4	0.5	0.1	0.6	+0.2	0.0	+0.2
EA319V	0.2	0.2	0.4	0.8	0.6	1.4	+0.6	+0.4	+1.0

ANCON type	2021 dep.	2021 arrivals	2021 total	2022 dep.	2022 arrivals	2022 total	Change dep.	Change arrivals	Change total
EA320C	1.0	0.0	1.0	2.1	0.1	2.2	+1.1	+0.1	+1.2
EA320NEO	1.5	0.2	1.7	3.4	0.6	4.0	+1.9	+0.4	+2.3
EA320V	0.9	0.2	1.1	2.2	1.8	4.0	+1.4	+1.6	+2.9
EA321C	0.2	0.0	0.2	0.2	0.0	0.2	0.0	0.0	0.0
EA321NEO	0.3	0.2	0.5	1.2	1.2	2.4	+0.9	+1.0	+1.9
EA321V	0.0	0.0	0.0	0.3	0.3	0.6	+0.3	+0.3	+0.6
EA33	0.2	1.7	1.8	0.5	2.1	2.6	+0.3	+0.5	+0.8
EA33NEO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EA34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EA3510	0.2	3.3	3.4	0.7	4.5	5.2	+0.5	+1.3	+1.8
EA359	0.0	1.1	1.2	0.2	1.6	1.7	+0.1	+0.4	+0.6
EA38GP	0.0	0.1	0.1	0.3	1.1	1.4	+0.2	+1.0	+1.3
EA38R	0.0	0.4	0.4	0.2	2.7	2.9	+0.2	+2.3	+2.5
ERJ	0.0	0.4	0.4	0.0	0.0	0.0	0.0	-0.4	-0.4
ERJ170	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ERJ190	0.1	0.0	0.1	0.0	0.0	0.0	-0.1	0.0	-0.1
EXE3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
LTT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
STT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	7.2	28.3	35.5	18.7	46.8	65.5	+11.5	+18.5	+30.0
							(+160%)	(+65%)	(+84%)

Note: All numbers are rounded to 1 decimal place. Movement changes have been calculated from unrounded numbers.

Table C6 Heathrow 2021 and 2022 annual 24-hour movements by ANCON type

ANCON type	2021 dep.	2021 arrivals	2021 total	2022 dep.	2022 arrivals	2022 total	Change dep.	Change arrivals	Change total
B733	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
B736	1.7	1.7	3.4	0.8	0.8	1.6	-0.9	-0.9	-1.8
B738	3.3	3.3	6.6	4.4	4.4	8.8	+1.1	+1.1	+2.2
B738MAX	2.1	2.1	4.1	4.5	4.5	9.0	+2.4	+2.4	+4.9
B739MAX	0.0	0.0	0.0	0.3	0.3	0.7	+0.3	+0.3	+0.6
B744G	0.6	0.6	1.2	0.1	0.1	0.3	-0.5	-0.5	-0.9
B744P	0.6	0.6	1.3	0.5	0.5	0.9	-0.2	-0.2	-0.4
B744R	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0
B747	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B748	0.3	0.3	0.5	0.2	0.2	0.4	-0.1	-0.1	-0.1
B753	0.1	0.1	0.2	0.3	0.3	0.7	+0.3	+0.3	+0.5
B757C	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	-0.1
B757E	0.6	0.6	1.2	1.0	1.0	2.1	+0.4	+0.4	+0.9
B757P	0.1	0.1	0.1	0.1	0.1	0.2	+0.1	+0.1	+0.1
B762	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B763G	1.7	1.7	3.3	1.8	1.8	3.5	+0.1	+0.1	+0.2
B763P	2.2	2.2	4.4	8.6	8.6	17.1	+6.3	+6.3	+12.7
B764	1.3	1.3	2.6	4.2	4.2	8.4	+2.9	+2.9	+5.8
B772G	5.6	5.6	11.1	14.6	14.6	29.1	+9.0	+9.0	+18.0
B772P	0.0	0.0	0.0	0.4	0.4	0.8	+0.4	+0.4	+0.8
B772R	8.9	8.9	17.8	14.1	14.1	28.2	+5.2	+5.2	+10.4
B773G	28.0	27.9	55.9	37.9	37.9	75.8	+9.9	+9.9	+19.9
B773R	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B7810	4.3	4.3	8.5	3.6	3.6	7.3	-0.6	-0.6	-1.2
B788	11.9	11.9	23.9	19.4	19.4	38.8	+7.5	+7.5	+15.0
B789	32.3	32.3	64.5	47.7	47.7	95.4	+15.4	+15.5	+30.9
BA46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CRJ	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CRJ900	0.3	0.3	0.6	0.3	0.3	0.6	0.0	0.0	0.0
E190E2	0.4	0.4	0.8	3.4	3.4	6.8	+3.0	+3.0	+6.0
EA221	1.0	1.0	2.1	1.8	1.8	3.6	+0.8	+0.8	+1.5
EA223	1.4	1.4	2.7	5.8	5.8	11.7	+4.5	+4.5	+9.0

ANCON type	2021 dep.	2021 arrivals	2021 total	2022 dep.	2022 arrivals	2022 total	Change dep.	Change arrivals	Change total
EA30	2.6	2.6	5.2	2.3	2.4	4.7	-0.3	-0.3	-0.5
EA31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EA318	1.1	1.1	2.2	0.9	0.9	1.9	-0.2	-0.2	-0.4
EA319C	5.1	5.1	10.2	6.8	6.8	13.6	+1.7	+1.7	+3.5
EA319NEO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EA319V	19.4	19.4	38.8	47.0	47.0	93.9	+27.6	+27.6	+55.2
EA320C	10.7	10.7	21.3	27.1	27.1	54.2	+16.4	+16.4	+32.9
EA320NEO	29.0	29.0	58.1	68.8	68.8	137.6	+39.8	+39.8	+79.5
EA320V	35.8	35.8	71.6	90.3	90.3	180.5	+54.5	+54.4	+108.9
EA321C	1.3	1.3	2.6	3.8	3.8	7.5	+2.4	+2.4	+4.9
EA321NEO	14.3	14.2	28.5	27.2	27.2	54.4	+13.0	+13.0	+25.9
EA321V	1.2	1.2	2.5	11.1	11.1	22.2	+9.9	+9.9	+19.8
EA33	14.1	14.1	28.2	15.7	15.7	31.4	+1.6	+1.6	+3.2
EA33NEO	0.2	0.2	0.3	0.5	0.5	0.9	+0.3	+0.3	+0.6
EA34	0.3	0.3	0.6	0.0	0.0	0.1	-0.2	-0.2	-0.5
EA346	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EA3510	10.5	10.5	21.0	14.2	14.2	28.4	+3.7	+3.7	+7.4
EA359	6.3	6.3	12.6	7.2	7.2	14.3	+0.9	+0.9	+1.7
EA38GP	0.8	0.8	1.6	5.6	5.6	11.3	+4.9	+4.9	+9.7
EA38R	2.4	2.4	4.8	10.2	10.2	20.4	+7.8	+7.8	+15.6
ERJ	1.8	1.8	3.7	0.2	0.2	0.4	-1.7	-1.7	-3.3
ERJ170	0.0	0.0	0.1	0.3	0.3	0.6	+0.3	+0.3	+0.5
ERJ190	1.4	1.4	2.9	1.0	1.0	2.1	-0.4	-0.4	-0.8
EXE3	0.4	0.4	0.8	0.9	0.9	1.8	+0.5	+0.5	+1.0
L4P	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LTT	0.1	0.1	0.3	3.9	3.9	7.8	+3.8	+3.8	+7.5
STT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	267.6	267.5	535.0	521.0	521.0	1042.0	+253.4	+253.5	+507.0
							(+95%)	(+95%)	(+95%)

Note: All numbers are rounded to 1 decimal place. Movement changes have been calculated from unrounded numbers.

Table C7 Heathrow 2021 and 2022 6.5-hour night movements by ANCON type

ANCON type	2021 dep.	2021 arrivals	2021 total	2022 dep.	2022 arrivals	2022 total	Change dep.	Change arrivals	Change total
B738	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B738MAX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B753	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B757E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B763G	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B763P	0.0	0.0	0.0	0.0	0.1	0.1	0.0	+0.1	+0.1
B772G	0.1	0.2	0.3	0.2	1.8	1.9	+0.1	+1.5	+1.6
B772P	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B772R	0.1	0.8	0.9	0.1	0.6	0.7	+0.1	-0.3	-0.2
B773G	0.0	2.3	2.4	0.2	1.9	2.1	+0.2	-0.4	-0.2
B7810	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B788	0.0	0.1	0.1	0.1	0.1	0.2	+0.1	0.0	+0.1
B789	0.0	1.1	1.1	0.4	2.9	3.3	+0.4	+1.8	+2.2
EA30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EA319C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EA319V	0.0	0.0	0.0	0.0	0.1	0.2	0.0	+0.1	+0.1
EA320C	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	+0.1
EA320NEO	0.0	0.0	0.0	0.1	0.2	0.3	+0.1	+0.1	+0.2
EA320V	0.0	0.1	0.1	0.2	0.4	0.6	+0.2	+0.3	+0.5
EA321NEO	0.0	0.0	0.0	0.1	0.4	0.5	+0.1	+0.4	+0.5
EA321V	0.0	0.0	0.0	0.1	0.1	0.2	+0.1	+0.1	+0.2
EA33	0.0	0.0	0.0	0.1	0.0	0.1	+0.1	0.0	+0.1
EA3510	0.0	1.3	1.4	0.2	1.2	1.4	+0.1	-0.1	0.0
EA359	0.0	0.2	0.2	0.0	0.7	0.8	0.0	+0.6	+0.6
EA38GP	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	+0.1
EA38R	0.0	0.3	0.3	0.1	1.0	1.1	+0.1	+0.7	+0.8
EXE3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LTT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	0.3	6.5	6.8	2.0	11.6	13.6	+1.7	+5.1	+6.8
							(+578%)	(+78%)	(+99%)

Note: All numbers are rounded to 1 decimal place. Movement changes have been calculated from unrounded numbers.

Table C8-a Heathrow L_{day} W-E departure and arrival runway modal splits by year

Year	West dep.	East dep.	West arrivals	East arrivals
2006	70%	30%	70%	30%
2007	73%	27%	73%	27%
2008	73%	27%	72%	28%
2009	74%	26%	73%	27%
2010	66%	34%	66%	34%
2011	71%	29%	71%	29%
2012	74%	26%	74%	26%
2013	67%	33%	67%	33%
2014	69%	31%	70%	30%
2015	72%	28%	72%	28%
2016	70%	30%	70%	30%
2017	81%	19%	81%	19%
2018	65%	35%	65%	35%
2019	74%	26%	74%	26%
2020	81%	19%	81%	19%
2021	71%	29%	71%	29%
2022	72%	28%	72%	28%

Table C8-b Heathrow Levening W-E departure and arrival runway modal splits by year

Year	West dep.	East dep.	West arrivals	East arrivals
2006	71%	29%	72%	28%
2007	72%	28%	72%	28%
2008	74%	26%	74%	26%
2009	72%	28%	73%	27%
2010	64%	36%	64%	36%
2011	72%	28%	72%	28%
2012	76%	24%	76%	24%
2013	64%	36%	64%	36%
2014	70%	30%	70%	30%
2015	72%	28%	73%	27%
2016	72%	28%	72%	28%
2017	81%	19%	81%	19%
2018	64%	36%	65%	35%
2019	73%	27%	73%	27%
2020	82%	18%	83%	17%
2021	71%	29%	71%	29%
2022	71%	29%	70%	30%

Table C8-c Heathrow L_{night} W-E departure and arrival runway modal splits by year

Year	West dep.	East dep.	West arrivals	East arrivals
2006	74%	26%	71%	29%
2007	74%	26%	75%	25%
2008	75%	25%	74%	26%
2009	72%	28%	74%	26%
2010	67%	33%	68%	32%
2011	73%	27%	71%	29%
2012	75%	25%	75%	25%
2013	66%	34%	69%	31%
2014	69%	31%	69%	31%
2015	72%	28%	73%	27%
2016	72%	28%	69%	31%
2017	80%	20%	80%	20%
2018	64%	36%	64%	36%
2019	73%	27%	74%	26%
2020	82%	18%	78%	22%
2021	71%	29%	71%	29%
2022	72%	28%	73%	27%

Table C8-d Heathrow L_{den} W-E departure and arrival runway modal splits by year

Year	West dep.	East dep.	West arrivals	East arrivals
2006	70%	30%	71%	29%
2007	73%	27%	73%	27%
2008	73%	27%	73%	27%
2009	73%	27%	73%	27%
2010	66%	34%	66%	34%
2011	71%	29%	71%	29%
2012	75%	25%	74%	26%
2013	66%	34%	67%	33%
2014	70%	30%	70%	30%
2015	72%	28%	72%	28%
2016	71%	29%	70%	30%
2017	81%	19%	81%	19%
2018	65%	35%	65%	35%
2019	74%	26%	74%	26%
2020	81%	19%	81%	19%
2021	71%	29%	71%	29%
2022	72%	28%	72%	28%

Table C8-e Heathrow L_{Aeq,6.5h} night W-E departure and arrival runway modal splits by year

Year	West dep.	East dep.	West arrivals	East arrivals
2006	77%	23%	72%	28%
2007	75%	25%	75%	25%
2008	68%	32%	73%	27%
2009	62%	38%	75%	25%
2010	57%	43%	67%	33%
2011	67%	33%	74%	26%
2012	67%	33%	68%	32%
2013	65%	35%	77%	23%
2014	70%	30%	67%	33%
2015	74%	26%	72%	28%
2016	83%	17%	69%	31%
2017	56%	44%	76%	24%
2018	72%	28%	69%	31%
2019	75%	25%	73%	27%
2020	65%	35%	72%	28%
2021	75%	25%	70%	30%
2022	72%	28%	73%	27%

Table C9 Heathrow 2006 & 2022 L_{day} cumulative contour area, population and household estimates

L _{day} (dB)	2006 area	2022 area	Change in area	2006 pop.	2022 pop.	Change in pop.	2006 house.	2022 house.	Change in house.
> 55	177.7	91.4	-49%	485.6	256.5	-47%	210.5	96.9	-54%
> 60	64.0	37.1	-42%	111.0	68.9	-38%	44.9	23.3	-48%
> 65	27.2	13.4	-51%	24.1	8.5	-65%	9.2	2.8	-70%
> 70	9.3	4.3	-54%	2.8	0.2	-93%	1.0	0.1	-90%
> 75	3.5	1.9	-46%	< 0.1	< 0.1	(n/a)	< 0.1	< 0.1	(n/a)
> 55				485.6	206.3	-58%	210.5	87.3	-59%
> 60				111.0	53.4	-52%	44.9	20.9	-53%
> 65				24.1	7.1	-71%	9.2	2.7	-71%
> 70				2.8	0.1	-96%	1.0	< 0.1	(n/a)
> 75				< 0.1	0.0	(n/a)	< 0.1	0.0	(n/a)

Table C10 Heathrow 2006 & 2022 L_{evening} cumulative contour area, population and household estimates

L _{evening} (dB)	2006 area	2022 area	Change in area	2006 pop.	2022 pop.	Change in pop.	2006 house.	2022 house.	Change in house.
> 55	185.6	70.5	-62%	450.5	176.9	-61%	192.6	63.7	-67%
> 60	66.1	28.5	-57%	106.3	36.8	-65%	42.4	12.3	-71%
> 65	28.1	9.4	-67%	20.5	3.2	-84%	7.9	1.1	-86%
> 70	10.0	3.3	-67%	2.4	< 0.1	(n/a)	1.0	< 0.1	(n/a)
> 75	3.8	1.5	-61%	< 0.1	< 0.1	(n/a)	< 0.1	< 0.1	(n/a)
> 55				450.5	136.4	-70%	192.6	55.6	-71%
> 60				106.3	28.5	-73%	42.4	11.1	-74%
> 65				20.5	2.6	-87%	7.9	1.0	-87%
> 70				2.4	< 0.1	(n/a)	1.0	< 0.1	(n/a)
> 75				< 0.1	0.0	(n/a)	< 0.1	0.0	(n/a)

Notes:

- Areas are given in km², and populations and households in thousands.
- The 2006 population/household counts are based on a 2006 CACI update of the 2001 Census.
- The 2022 population/household counts are based on a 2022 CACI update of the 2011 Census.
- **Estimates for 2022 using the 2006 population database are shown in blue.**

Table C11 Heathrow 2006 & 2022 L_{night} cumulative contour area, population and household estimates

L _{night} (dB)	2006 area	2022 area	Change in area	2006 pop.	2022 pop.	Change in pop.	2006 house.	2022 house.	Change in house.
> 50	84.4	54.2	-36%	207.2	173.2	-16%	88.9	64.1	-28%
> 55	34.2	16.6	-51%	62.0	43.5	-30%	24.1	14.2	-41%
> 60	11.9	5.0	-58%	16.3	3.2	-80%	6.0	0.9	-85%
> 65	4.5	1.9	-58%	1.7	< 0.1	(n/a)	0.6	< 0.1	(n/a)
> 70	1.8	0.8	-56%	< 0.1	0.0	(n/a)	< 0.1	0.0	(n/a)
> 50				207.2	135.8	-34%	88.9	56.9	-36%
> 55				62.0	33.4	-46%	24.1	12.8	-47%
> 60				16.3	2.7	-83%	6.0	0.9	-85%
> 65				1.7	< 0.1	(n/a)	0.6	< 0.1	(n/a)
> 70				< 0.1	0.0	(n/a)	< 0.1	0.0	(n/a)

Table C12 Heathrow 2006 & 2022 L_{den} cumulative contour area, population and household estimates

L _{den} (dB)	2006 area	2022 area	Change in area	2006 pop.	2022 pop.	Change in pop.	2006 house.	2022 house.	Change in house.
> 55	244.7	115.6	-53%	756.1	366.5	-52%	338.5	142.2	-58%
> 60	92.7	48.7	-47%	194.6	118.1	-39%	81.6	41.2	-50%
> 65	37.1	17.4	-53%	54.3	24.0	-56%	21.4	7.7	-64%
> 70	13.7	5.3	-61%	9.6	1.8	-81%	3.5	0.5	-86%
> 75	5.0	2.1	-58%	0.7	< 0.1	(n/a)	0.3	< 0.1	(n/a)
> 55				756.1	309.1	-59%	338.5	133.1	-61%
> 60				194.6	89.0	-54%	81.6	35.5	-56%
> 65				54.3	18.5	-66%	21.4	7.0	-67%
> 70				9.6	1.4	-85%	3.5	0.5	-86%
> 75				0.7	< 0.1	(n/a)	0.3	< 0.1	(n/a)

Notes:

- Areas are given in km², and populations and households in thousands.
- The 2006 population/household counts are based on a 2006 CACI update of the 2001 Census.
- The 2022 population/household counts are based on a 2022 CACI update of the 2011 Census.
- **Estimates for 2022 using the 2006 population database are shown in blue.**

Table C13 Heathrow 2006 & 2022 $L_{Aeq,6.5h}$ night cumulative contour area, population and household estimates

$L_{Aeq,6.5h}$ (dB)	2006 area	2022 area	Change in area	2006 pop.	2022 pop.	Change in pop.	2006 house.	2022 house.	Change in house.
> 48	56.4	22.1	-61%	137.4	66.9	-51%	57.5	22.3	-61%
> 48				137.4	49.9	-64%	57.5	19.1	-67%

Notes:

- Areas are given in km², and populations and households in thousands.
- The 2006 population/household counts are based on a 2006 CACI update of the 2001 Census.
- The 2022 population/household counts are based on a 2022 CACI update of the 2011 Census.
- **Estimates for 2022 using the 2006 population database are shown in blue.**
- The 2006 results were based on data recorded over the 2006 calendar year. The 2022 results were based on data recorded from 27 March 2022 to 26 March 2023.

Table C14 Heathrow 2006 & 2022 L_{den} cumulative contour area, population and household estimates – assuming 2006 W/E runway modal split and 2006 N/S runway usage

L_{den} (dB)	2006 area	2022 area	Change in area	2006 pop.	2022 pop.	Change in pop.	2006 house.	2022 house.	Change in house.
> 55	244.7	116.2	-53%	756.1	363.8	-52%	338.5	141.1	-58%
> 60	92.7	48.3	-48%	194.6	113.0	-42%	81.6	38.9	-52%
> 65	37.1	17.2	-54%	54.3	23.6	-57%	21.4	7.6	-64%
> 70	13.7	5.2	-62%	9.6	1.8	-81%	3.5	0.5	-86%
> 75	5	2.1	-58%	0.7	< 0.1	(n/a)	0.3	< 0.1	(n/a)

Notes:

- Areas are given in km², and populations and households in thousands.
- The 2006 population/household counts are based on a 2006 CACI update of the 2001 Census.
- The 2022 population/household counts are based on a 2022 CACI update of the 2011 Census.

APPENDIX D

ANCON type descriptions

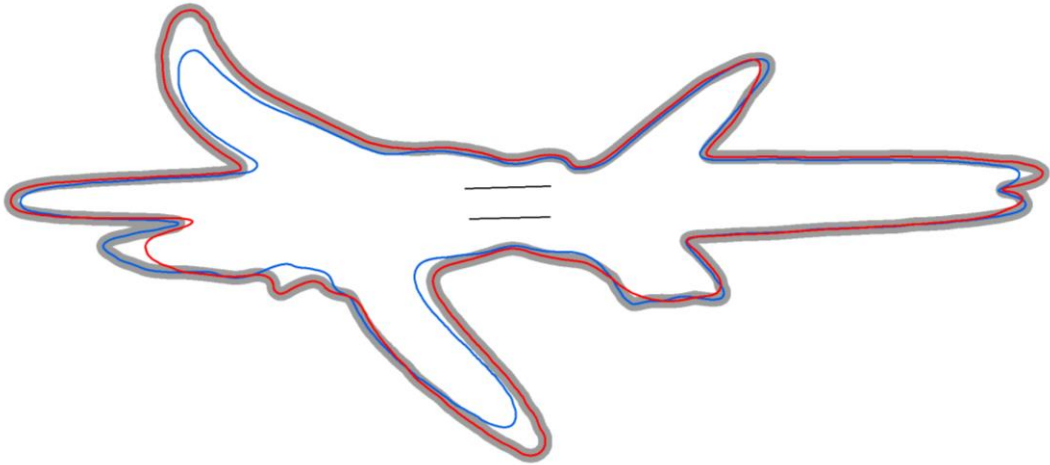
Table D1 ANCON type descriptions

ANCON type	Description
B717	Boeing 717
B727	Boeing 727 (Chapter 2&3)
B732	Boeing 737-200 (Chapter 2&3)
B733	Boeing 737-300/400/500
B736	Boeing 737-600/700
B738	Boeing 737-800/900
B738MAX	Boeing 737 MAX 8
B739MAX	Boeing 737 MAX 9
B747	Boeing 747-100 & 200/300 series (certificated to Chapter 3)
B744G	Boeing 747-400 with General Electric CF6-80F engines
B744P	Boeing 747-400 with Pratt & Whitney PW4000 engines
B744R	Boeing 747-400 with Rolls-Royce RB211 engines
B747SP	Boeing 747SP
B748	Boeing 747-8
B753	Boeing 757-300
B757C	Boeing 757-200 with Rolls-Royce RB211-535C engines
B757E	Boeing 757-200 with Rolls-Royce RB211-535E4/E4B engines
B757P	Boeing 757-200 with Pratt & Whitney PW2037/2040 engines
B762	Boeing 767-200
B763G	Boeing 767-300 with General Electric CF6-80 engines
B763P	Boeing 767-300 with Pratt & Whitney PW4000 engines
B763R	Boeing 767-300 with Rolls-Royce RB211 engines
B764	Boeing 767-400
B772G	Boeing 777-200 with General Electric GE90 engines
B772P	Boeing 777-200 with Pratt & Whitney PW4000 engines
B772R	Boeing 777-200 with Rolls-Royce Trent 800 engines
B773G	Boeing 777-200LR/300ER with General Electric GE90 engines
B773P	Boeing 777-300 with Pratt & Whitney PW4000 engines
B773R	Boeing 777-300 with Rolls-Royce Trent 800 engines
B788	Boeing 787-8
B789	Boeing 787-9
B7810	Boeing 787-10
BA46	BAe 146/Avro RJ series

ANCON type	Description
CRJ	Bombardier CRJ100/200 series
CRJ700	Bombardier CRJ700 series
CRJ900	Bombardier CRJ900 series
DC10	McDonnell Douglas DC-10
E190E2	Embraer E190-E2
EA221	Airbus A220-100 (previously Bombardier CS100 until July 2018)
EA223	Airbus A220-300 (previously Bombardier CS300 until July 2018)
EA30	Airbus A300
EA31	Airbus A310
EA318	Airbus A318
EA319C	Airbus A319 with CFM56 engines
EA319V	Airbus A319 with IAE V2500 engines
EA320C	Airbus A320 with CFM56 engines
EA320NEO	Airbus A320neo
EA320V	Airbus A320 with IAE V2500 engines
EA321C	Airbus A321 with CFM56 engines
EA321NEO	Airbus A321neo
EA321V	Airbus A321 with IAE V2500 engines
EA33	Airbus A330
EA33NEO	Airbus A330neo
EA34	Airbus A340-200/300
EA346	Airbus A340-500/600
EA359	Airbus A350-900
EA3510	Airbus A350-1000
EA38GP	Airbus A380 with Engine Alliance GP7000 engines
EA38R	Airbus A380 with Rolls-Royce Trent 900 engines
ERJ	Embraer ERJ 135/145
ERJ170	Embraer E-170/175
ERJ190	Embraer E-190/195
EXE2	Chapter 2 executive jets
EXE3	Chapter 3 executive jets
FK10	Fokker 70/100
L101	Lockheed L-1011 TriStar

ANCON type	Description
L4P	Large four-engine propeller
LTT	Large twin-turboprop
MD11	McDonnell Douglas MD-11
MD80	McDonnell Douglas MD-80 series
SP	Single propeller
STP	Small twin-piston
STT	Small twin-turboprop
TU54	Tupolev Tu-154

Glossary

Glossary	
ANCON	The UK civil aircraft noise contour model, developed and maintained by ERCD.
CAA	Civil Aviation Authority
dB	Decibel units describing sound level or changes of sound level.
dBA	Units of sound level on the A-weighted scale, which incorporates a frequency weighting approximating the characteristics of human hearing.
DfT	Department for Transport (UK Government)
Envelope	<p>A boundary defining the assessment area of noise changes, which is derived from the outermost extents of the two sets of contours being compared. As an example, in the diagram below, the 'envelope' is shown in grey, whilst the two sets of underlying contours are indicated by the red and blue lines.</p> 
ERCD	Environmental Research and Consultancy Department
L_{Aeq}	Equivalent sound level of aircraft noise in dBA, often called 'equivalent continuous sound level'.
$L_{Aeq,16h}$	Equivalent sound level of aircraft noise in dBA for the average 16-hour day period (07:00-23:00 local time).
$L_{Aeq,6.5h}$	Equivalent sound level of aircraft noise in dBA for the average 6.5-hour night quota period (23:30-06:00 local time).

Glossary	
$L_{Aeq,8h}$	Equivalent sound level of aircraft noise in dBA for the average 8-hour night period (23:00-07:00 local time).
L_{Amax}	Maximum sound level of a noise event in dBA.
L_{day}	Equivalent sound level of aircraft noise in dBA for the annual average 12-hour day period (07:00-19:00 local time).
L_{den}	Equivalent sound level of aircraft noise in dBA for the annual average 24-hour period with 5 dB weightings for $L_{evening}$ and 10 dB weightings for L_{night} .
$L_{evening}$	Equivalent sound level of aircraft noise in dBA for the annual average 4-hour evening period (19:00-23:00 local time).
L_{night}	Equivalent sound level of aircraft noise in dBA for the annual average 8-hour night period (23:00-07:00 local time).
MA	Moving average
NTK	Noise and Track Keeping monitoring system.
SEL	Sound Exposure Level in dBA.
SoNA	Survey of Noise Attitudes