Environmental Research and Consultancy Department

Civil Aviation Authority

Heathrow Airport 2020 Summer and Noise Action Plan Contours

ERCD REPORT 2101

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Population data used in this report are based on 2011 Census data (updated for 2020) supplied by CACI Limited.

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Summary

1. This report presents the Heathrow 2020 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.

2. The COVID-19 pandemic had an unprecedented effect on aircraft movement numbers at Heathrow. Average summer 16-hour day movements in 2020 (399.9) decreased by 68% from 2019 (1260.4). Average summer 8-hour night movements in 2020 (22.5) reduced by 74% from 2019 (86.7). Annual 24-hour period movements reduced by 57% from 1312.9 in 2019 to 559.4 in 2020.

3. The 54 dB $L_{Aeq,16h}$ contour area for the 2020 average summer day (actual runway modal split 83% W / 17% E) was 50.4 km^2, 68% smaller than in 2019 (156.1 km^2). Contour areas were up to 75% smaller in 2020 compared to 2019. These area decreases can be attributed to the substantial reductions in movements in 2020. The 54 dB population count was 122,500, a decrease of 75% from 2019 (492,700).

4. The standard modal split (80% W / 20% E) 54 dB $L_{Aeq,16h}$ contour area for 2020 was 50.1 km^2, 68% smaller than in 2019 (156.1 km^2). Contour areas were up to 75% smaller in 2020 compared to 2019. The 54 dB population count was 119,500, a decrease of 76% from 2019 (492,700).

5. The 2020 average summer night 48 dB $L_{Aeq,8h}$ contour area based on the actual runway modal split (83% W / 17% E) was 26.7 km^2, a 75% decrease from 2019 (105.4 km^2). Night-time $L_{Aeq,8h}$ contour areas were up to 89% smaller in 2020 compared to 2019. The 48 dB population count was 96,100, a decrease of 78% from 2019 (428,500).

6. The 2020 55 dB L_{den} contour area reduced by 55% from 176.2 km^2 in 2019 to 79.1 km^2. The 2020 50 dB L_{night} contour reduced in area by 55% to 32.4 km^2 (2019: 72.2 km^2). The 48 dB $L_{Aeq,6.5h}$ night contour area reduced by 77% from 33.4 km^2 in 2019 to 7.6 km^2 in 2020.

Chapter 1

Introduction

1.1 This report presents the 2020 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 (v2.4), 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 $L_{Aeq,16h}$ (0700-2300 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 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 $L_{Aeq,6.5h}$ night (for the summer and winter seasons combined[1]).

[1] 30 March 2020 to 28 March 2021.

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 2020 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 2020 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 type[2], 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.

[2] 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 winds[3].
- 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.[4]
- 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.

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

[4] *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 2020 were as follows:

- B773G – around 1.5 to 2 dB quieter on departure at most distances from start of roll.
- B789 – around 1 to 1.5 dB quieter on departure at most distances from start of roll.
- EA319V – around 0.5 to 1 dB quieter on departure at distances between 5 and 12 km from start of roll.

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 2020. Similar reductions in L_{Amax} departure noise were observed for the above three ANCON types.

Traffic data

2.12 The contours were calculated using 2020 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 (0700-2300 local time) and night (2300-0700 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 an unprecedented effect on traffic levels at Heathrow. The average number of daily movements at Heathrow over the 2020 summer day period (399.9) was 68% lower than the previous year (2019: 1260.4). Average summer night movements fell by 74% in 2020 to 22.5 (2019: 86.7).

2.14 Annual 2020 24-hour average[5] movements were 559.4, a reduction of 57% from 2019 (1312.9). Annual average 12-hour day, 4-hour evening and 8-hour night movements fell by 55%, 65% and 55% respectively. Movements over the

[5] 2020 was a leap year, so total calendar year movements were divided by 366.

6.5-hour night period fell by 68%. 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 2020 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:

- Noise Class C4 = B738MAX, 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.[6] 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 2020 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 2020, this is the 20-year period from 2001 to 2020. Using the standard modal split enables year-on-year comparisons without the runway usage significantly affecting the contour shape.

2.18 The 2019 and 2020 runway modal splits for the day and night summer periods are summarised in **Table 1**.

[6] 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 2019 and 2020 summer and annual runway modal splits

Time period	2019 actual split (W/E percentage)	2020 actual split (W/E percentage)	2019 standard split (W/E percentage)	2020 standard split (W/E percentage)
Summer 16h day	80 / 20	83 / 17	80 / 20	80 / 20
Summer 8h night	80 / 20	83 / 17		
Annual 12h day	74 / 26	81 / 19		
Annual 4h evening	73 / 27	83 / 17		
Annual 8h night	74 / 26	79 / 21		
Annual 24h day	74 / 26	81 / 19		
Annual 6.5h night	73 / 27	72 / 28		

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 2020 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 and 2009-2020.

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 2020 contours are a 2020 update of the latest 2011 Census supplied by CACI Limited.[7] 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 2019 actual 54 dB $L_{Aeq,16h}$ contour[8], the population count was 0.7% higher with the 2020 population database compared to the 2019 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.

[7] www.caci.co.uk

[8] The 2019 contour is used for this population database comparison as the 2020 contour is atypically small.

Chapter 3
Results

2020 summer day actual $L_{Aeq,16h}$ contours

3.1 The 2020 summer day $L_{Aeq,16h}$ noise contours generated with the actual runway modal split (83% west / 17% east) are shown in **Figure B3** of **Appendix B**. The contours are plotted from 54 to 66 dB at 3 dB intervals and overlaid onto the 2019 contours plotted at the 54 and 57 dB levels only (**Ref 8**).

3.2 Cumulative estimates of the areas, populations and households within the 2020 contours are provided in **Table 2**, along with the figures from 2019.

Table 2 Heathrow 2019 and 2020 summer day actual modal split $L_{Aeq,16h}$ contours – area, population and household estimates

$L_{Aeq,16h}$ (dB)	Area (km^2)			Population			Households		
	2019	**2020**	change	2019	**2020**	change	2019	**2020**	change
> 54	156.1	50.4	-68%	492.7	122.5	-75%	193.4	42.7	-78%
> 57	86.3	28.5	-67%	213.9	53.5	-75%	79.1	17.8	-77%
> 60	48.0	14.5	-70%	100.3	16.1	-84%	34.6	5.1	-85%
> 63	27.9	7.0	-75%	37.9	3.6	-91%	12.7	1.1	-91%
> 66	15.5	3.8	-75%	9.9	0.8	-92%	3.3	0.2	-94%
> 69	7.7	2.3	-70%	2.5	0.0	-100%	0.8	0.0	-100%
> 72	4.2	1.4	-67%	0.0	0.0	(n/a)	0.0	0.0	(n/a)

Note: Populations and households are given in thousands. The 2019 and 2020 population/household counts are based on 2019 and 2020 CACI updates of the 2011 Census respectively.

3.3 The 2020 summer day actual 54 dB $L_{Aeq,16h}$ contour enclosed an area of 50.4 km^2 and a population of 122,500. This area was 68% smaller than in 2019 (156.1 km^2), and the population count was 75% lower (2019: 492,700).

3.4 The contour area reductions can be attributed primarily to the substantial reductions in traffic following the COVID-19 pandemic.

2020 summer day standard $L_{Aeq,16h}$ contours

3.5 The 2020 summer day $L_{Aeq,16h}$ noise contours generated with the standard runway modal split (80% west / 20% east) are shown in **Figure B4**. The contours are plotted from 54 to 66 dB at 3 dB intervals and overlaid onto the 2019 contours plotted at the 54 and 57 dB levels only.

3.6 Cumulative estimates of the areas, populations and households within the 2020 contours are provided in **Table 3**, along with the figures from 2019.

Table 3 Heathrow 2019 and 2020 summer day standard modal split $L_{Aeq,16h}$ contours – area, population and household estimates

$L_{Aeq,16h}$ (dB)	Area (km^2)			Population			Households		
	2019	**2020**	change	2019	**2020**	change	2019	**2020**	change
> 54	156.1	50.1	-68%	492.7	119.5	-76%	193.4	41.5	-79%
> 57	86.3	28.5	-67%	213.9	51.9	-76%	79.1	17.2	-78%
> 60	48.0	14.4	-70%	100.3	15.2	-85%	34.6	4.9	-86%
> 63	27.9	6.9	-75%	37.9	3.3	-91%	12.7	1.0	-92%
> 66	15.5	3.8	-75%	9.9	0.7	-93%	3.3	0.2	-94%
> 69	7.7	2.3	-70%	2.5	0.0	-100%	0.8	0.0	-100%
> 72	4.2	1.4	-67%	0.0	0.0	(n/a)	0.0	0.0	(n/a)

Note: Populations and households are given in thousands. The 2019 and 2020 population/household counts are based on 2019 and 2020 CACI updates of the 2011 Census respectively.

3.7 The 2020 summer day standard 54 dB $L_{Aeq,16h}$ contour enclosed an area of 50.1 km^2 and a population of 119,500. This area was 68% smaller than in 2019 (156.1 km^2), whilst the population count was 76% lower (2019: 492,700).

2020 summer night actual $L_{Aeq,8h}$ contours

3.8 The 2020 summer night $L_{Aeq,8h}$ noise contours generated with the actual runway modal split (83% west / 17% east) are shown in **Figure B5**. The contours are plotted from 48 to 57 dB at 3 dB intervals and overlaid onto the 2019 contours plotted at the 48 and 51 dB levels only.

3.9 Cumulative estimates of the areas, populations and households within the 2020 contours are provided in **Table 4**, along with the figures from 2019.

Table 4 Heathrow 2019 and 2020 summer night actual modal split $L_{Aeq,8h}$ contours – area, population and household estimates

$L_{Aeq,8h}$ (dB)	Area (km^2)			Population			Households		
	2019	**2020**	change	2019	**2020**	change	2019	**2020**	change
> 48	105.4	26.7	-75%	428.5	96.1	-78%	172.4	33.3	-81%
> 51	63.7	13.4	-79%	201.8	48.5	-76%	75.2	15.8	-79%
> 54	35.1	6.7	-81%	97.3	18.3	-81%	33.9	5.6	-83%
> 57	17.3	3.2	-82%	46.3	5.3	-89%	15.2	1.5	-90%
> 60	8.8	1.7	-81%	16.6	1.6	-90%	5.1	0.4	-92%
> 63	4.6	0.9	-80%	2.7	0.0	-100%	0.8	0.0	-100%
> 66	2.5	0.4	-84%	0.6	0.0	-100%	0.2	0.0	-100%
> 69	1.5	0.2	-87%	0.0	0.0	(n/a)	0.0	0.0	(n/a)
> 72	0.9	0.1	-89%	0.0	0.0	(n/a)	0.0	0.0	(n/a)

Note: Populations and households are given in thousands. The 2019 and 2020 population/household counts are based on 2019 and 2020 CACI updates of the 2011 Census respectively.

3.10 The 2020 night actual 48 dB $L_{Aeq,8h}$ contour enclosed an area of 26.7 km^2 and a population of 96,100. The 48 dB area was 75% smaller than in 2019 (105.4 km^2), whilst the population count was 78% lower (2019: 428,500).

2020 L_{day} contours

3.11 The 2020 annual L_{day} noise contours generated with the actual runway modal split (81% west / 19% east) are shown in **Figure B6**. The contours are plotted from 55 to 75 dB at 5 dB intervals and overlaid onto the 2019 55 dB L_{day} contour.

3.12 Cumulative estimates of the areas, populations and households within the 2020 contours are provided in **Table 5**, along with the figures from 2019.

Table 5 Heathrow 2020 L_{day} contours - area, population and household estimates

L_{day} (dB)	Area (km^2)			Population			Households		
	2019	**2020**	change	2019	**2020**	change	2019	**2020**	change
> 55	129.1	62.7	-51%	357.9	156.8	-56%	136.9	56.1	-59%
> 60	49.1	24.5	-50%	104.6	38.5	-63%	36.0	12.7	-65%
> 65	20.2	7.4	-63%	17.4	2.9	-83%	5.7	0.9	-84%
> 70	6.4	2.7	-58%	1.3	< 0.1	(n/a)	0.5	< 0.1	(n/a)
> 75	2.5	1.2	-52%	0.0	0.0	(n/a)	0.0	0.0	(n/a)

Note: Populations and households are given in thousands. The 2019 and 2020 population/household counts are based on 2019 and 2020 CACI updates of the 2011 Census respectively.

3.13 The 2020 55 dB L_{day} contour enclosed an area of 62.7 km^2 and a population of 156,800. This area was 51% smaller than in 2019 (129.1 km^2), whilst the population count was 56% lower (2019: 357,900).

2020 $L_{evening}$ contours

3.14 The 2020 annual $L_{evening}$ noise contours generated with the actual runway modal split (83% west / 17% east) are shown in **Figure B7**. The contours are plotted from 55 to 75 dB at 5 dB intervals and overlaid onto the 2019 55 dB $L_{evening}$ contour.

3.15 Cumulative estimates of the areas, populations and households within the 2020 contours are provided in **Table 6**, along with the figures from 2019.

Table 6 Heathrow 2020 $L_{evening}$ contours - area, population and household estimates

$L_{evening}$ (dB)	Area (km^2)			Population			Households		
	2019	**2020**	change	2019	**2020**	change	2019	**2020**	change
> 55	112.5	46.5	-59%	292.5	97.0	-67%	110.0	33.3	-70%
> 60	42.6	18.8	-56%	77.0	14.8	-81%	26.3	4.9	-81%
> 65	17.2	5.7	-67%	9.0	1.1	-88%	3.1	0.3	-90%
> 70	5.5	2.3	-58%	0.6	0.0	-100%	0.2	0.0	-100%
> 75	2.2	1.1	-50%	0.0	0.0	(n/a)	0.0	0.0	(n/a)

Note: Populations and households are given in thousands. The 2019 and 2020 population/household counts are based on 2019 and 2020 CACI updates of the 2011 Census respectively.

3.16 The 2020 55 dB $L_{evening}$ contour enclosed an area of 46.5 km^2 and a population of 97,000. This area was 59% smaller than in 2019 (112.5 km^2), whilst the population count was 67% lower (2019: 292,500).

2020 L_{night} contours

3.17 The 2020 annual L_{night} noise contours generated with the actual runway modal split (79% west / 21% east) are shown in **Figure B8**. The contours are plotted from 50 to 60 dB at 5 dB intervals and overlaid onto the 2019 50 dB L_{night} contour.

3.18 Cumulative estimates of the areas, populations and households within the 2020 contours are provided in **Table 7**, along with the figures from 2019.

Table 7 Heathrow 2020 L_{night} contours - area, population and household estimates

L_{night} (dB)	Area (km^2)			Population			Households		
	2019	**2020**	change	2019	**2020**	change	2019	**2020**	Change
> 50	72.2	32.4	-55%	228.5	109.4	-52%	86.5	38.3	-56%
> 55	24.2	9.9	-59%	70.6	31.5	-55%	23.7	10.0	-58%
> 60	7.8	3.0	-62%	13.7	2.4	-82%	4.2	0.7	-83%
> 65	2.7	1.1	-59%	1.4	< 0.1	(n/a)	0.4	< 0.1	(n/a)
> 70	1.1	0.3	-73%	0.0	0.0	(n/a)	0.0	0.0	(n/a)

Note: Populations and households are given in thousands. The 2019 and 2020 population/household counts are based on 2019 and 2020 CACI updates of the 2011 Census respectively.

3.19 The 2020 50 dB L_{night} contour enclosed an area of 32.4 km^2 and a population of 109,400. This area was 55% smaller than in 2019 (72.2 km^2), whilst the population count was 52% lower (2019: 228,500).

2020 L_{den} contours

3.20 The 2020 annual L_{den} noise contours generated with the actual runway modal split (81% west / 19% east) are shown in **Figure B9**. The contours are plotted from 55 to 75 dB at 5 dB intervals and overlaid onto the 2019 55 dB L_{den} contour.

3.21 Cumulative estimates of the areas, populations and households within the contours are provided in **Table 8**, along with the figures from 2019.

Table 8 Heathrow 2020 L_{den} contours - area, population and household estimates

L_{den} (dB)	Area (km^2)			Population			Households		
	2019	**2020**	change	2019	**2020**	change	2019	**2020**	change
> 55	176.2	79.1	-55%	664.3	224.6	-66%	268.4	84.4	-69%
> 60	69.0	31.8	-54%	186.6	72.9	-61%	68.8	24.6	-64%
> 65	26.4	9.8	-63%	46.4	11.1	-76%	15.5	3.4	-78%
> 70	8.5	3.3	-61%	4.8	0.8	-83%	1.5	0.2	-87%
> 75	3.1	1.4	-55%	0.0	0.0	(n/a)	0.0	0.0	(n/a)

Note: Populations and households are given in thousands. The 2019 and 2020 population/household counts are based on 2019 and 2020 CACI updates of the 2011 Census respectively.

3.22 The 2020 55 dB L_{den} contour enclosed an area of 79.1 km^2 and a population of 224,600. This area was 55% smaller than in 2019 (176.2 km^2), whilst the population count was 66% lower (2019: 664,300).

2020 $L_{Aeq,6.5h}$ night contours

3.23 The 2020 annual $L_{Aeq,6.5h}$ night 48 dB contour generated with the actual runway modal split (72% west / 28% east) is shown in **Figure B10** and overlaid onto the 2019 48 dB $L_{Aeq,6.5h}$ contour.

3.24 Cumulative estimates of the areas, populations and households within the contours are provided in **Table 9**, along with the figures from 2019.

Table 9 Heathrow 2020 $L_{Aeq,6.5h}$ night contour - area, population and household estimates

$L_{Aeq,6.5h}$ (dB)	Area (km^2)			Population			Households		
	2019	**2020**	change	2019	**2020**	Change	2019	**2020**	change
> 48	33.4	7.6	-77%	114.0	26.3	-77%	40.4	8.2	-80%

Note: Populations and households are given in thousands. The 2019 and 2020 population/household counts are based on 2019 and 2020 CACI updates of the 2011 Census respectively.

3.25 The 2020 48 dB $L_{Aeq,6.5h}$ night contour enclosed an area of 7.6 km^2 and a population of 26,300. This area was 77% smaller than in 2019 (33.4 km^2), whilst the population count was 77% lower (2019: 114,000).

Long-term contour trends

3.26 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 B11-B15** respectively. The trends are for the lowest contour level plotted, for years 2006 and 2009-2020. The response to the COVID-19 pandemic caused significant reductions in the area, population and household statistics for 2020, which are clearly evident in the trend charts.

Chapter 4

Conclusions

4.1 Year 2020 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 The 2020 contours were significantly affected by the COVID-19 pandemic. In 2020, there were an average of 399.9 summer 16-hour day movements at Heathrow, 68% lower than in 2019 (1260.4). The area of the average summer day 54 dB $L_{Aeq,16h}$ actual modal split (83% west / 17% east) contour was 50.4 km^2, 68% smaller than in 2019 (156.1 km^2). The population count within this contour fell by 75% to 122,500 (2019: 492,700).

4.3 The 54 dB $L_{Aeq,16h}$ standard modal split (80% west / 20% east) contour area decreased by 68% to 50.1 km^2 (2019: 156.1 km^2), and the population fell by 76% to 119,500 (2019: 492,700).

4.4 The 2020 average summer 8-hour night movement total (22.5) was 74% lower than in 2019 (86.7). The area of the 48 dB $L_{Aeq,8h}$ night actual modal split (83% west / 17% east) contour decreased by 75% to 26.7 km^2 (2019: 105.4 km^2), and the population count fell by 78% to 96,100 (2019: 428,500).

4.5 The 2020 55 dB L_{den} contour area fell by 55% to 79.1 km^2 (2019: 176.2 km^2) and the population count of 224,600 was 66% lower. The 2020 50 dB L_{night} contour reduced in area by 55% to 32.4 km^2 (2019: 72.2 km^2) and the population count fell by 52% to 109,400 (2019: 228,500). The 48 dB $L_{Aeq,6.5h}$ night contour area reduced by 77% from 33.4 km^2 in 2019 to 7.6 km^2 in 2020.

APPENDIX A

References

1. Critchley J B, Ollerhead J B, *The Use of Leq as an Aircraft Noise Index*, DORA Report 9023, September 1990.
2. Civil Aviation Authority, *Survey of Noise Attitudes (2014): Aircraft*, CAP 1506, February 2017.
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4. Civil Aviation Authority, *The UK Civil Aircraft Noise Contour Model ANCON: Improvements in Version 2*, R&D Report 9842, June 1999.
5. European Civil Aviation Conference, *Report on Standard Method of Computing Noise Contours around Civil Airports*, ECAC.CEAC Doc 29, Fourth edition, December 2016.
6. Civil Aviation Authority, *Noise Monitor Positions at Heathrow, Gatwick and Stansted Airports*, CAP 1149, Sixth edition, March 2020.
7. ISO 20906:2009 *Acoustics - Unattended monitoring of aircraft sound in the vicinity of airports*.
8. Civil Aviation Authority, *Heathrow Airport 2019 Summer Noise Contours and Noise Action Plan Contours*, ERCD Report 2001, November 2021.

APPENDIX B

Figures

Figure B1 Heathrow NPR/SID routes

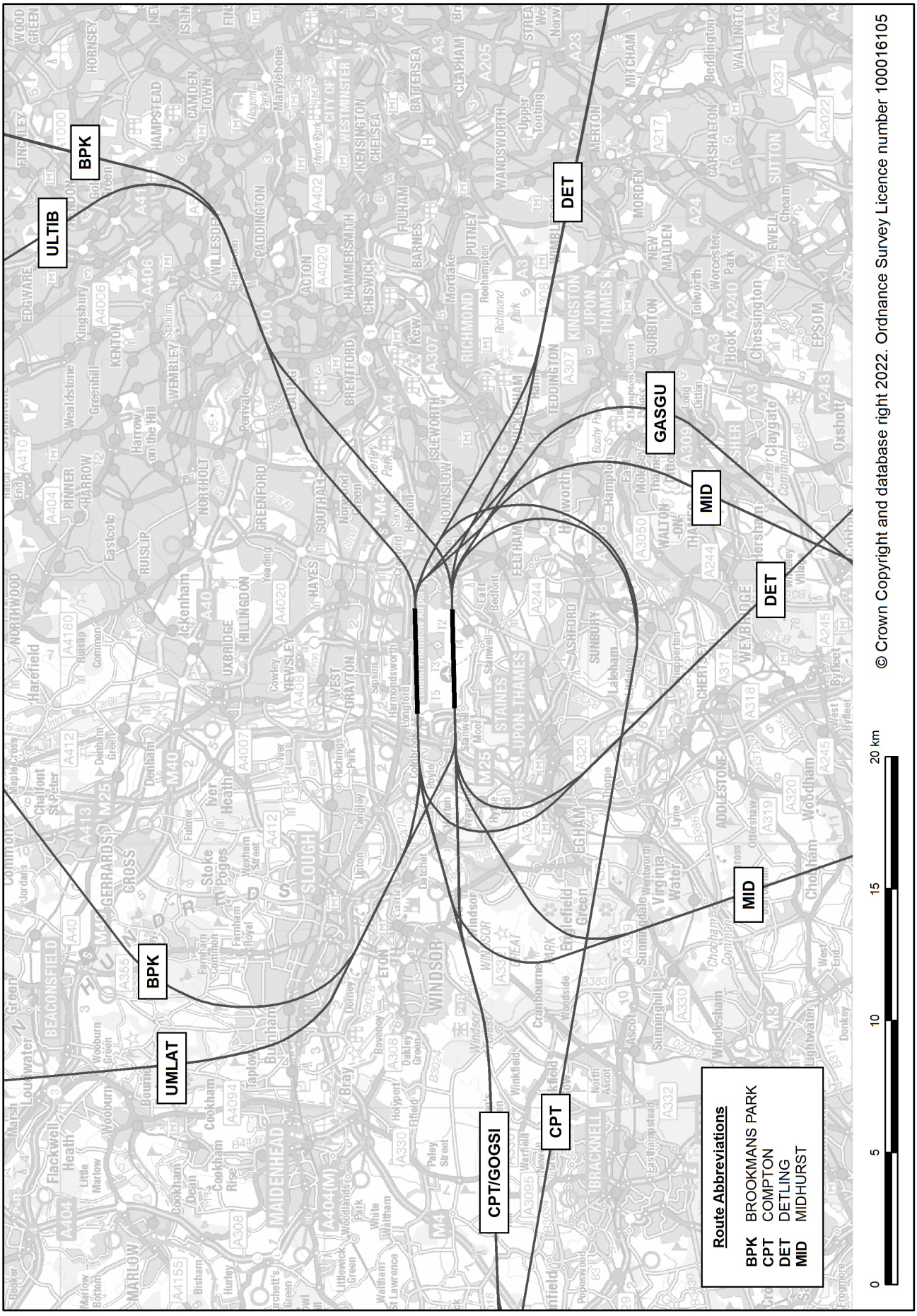
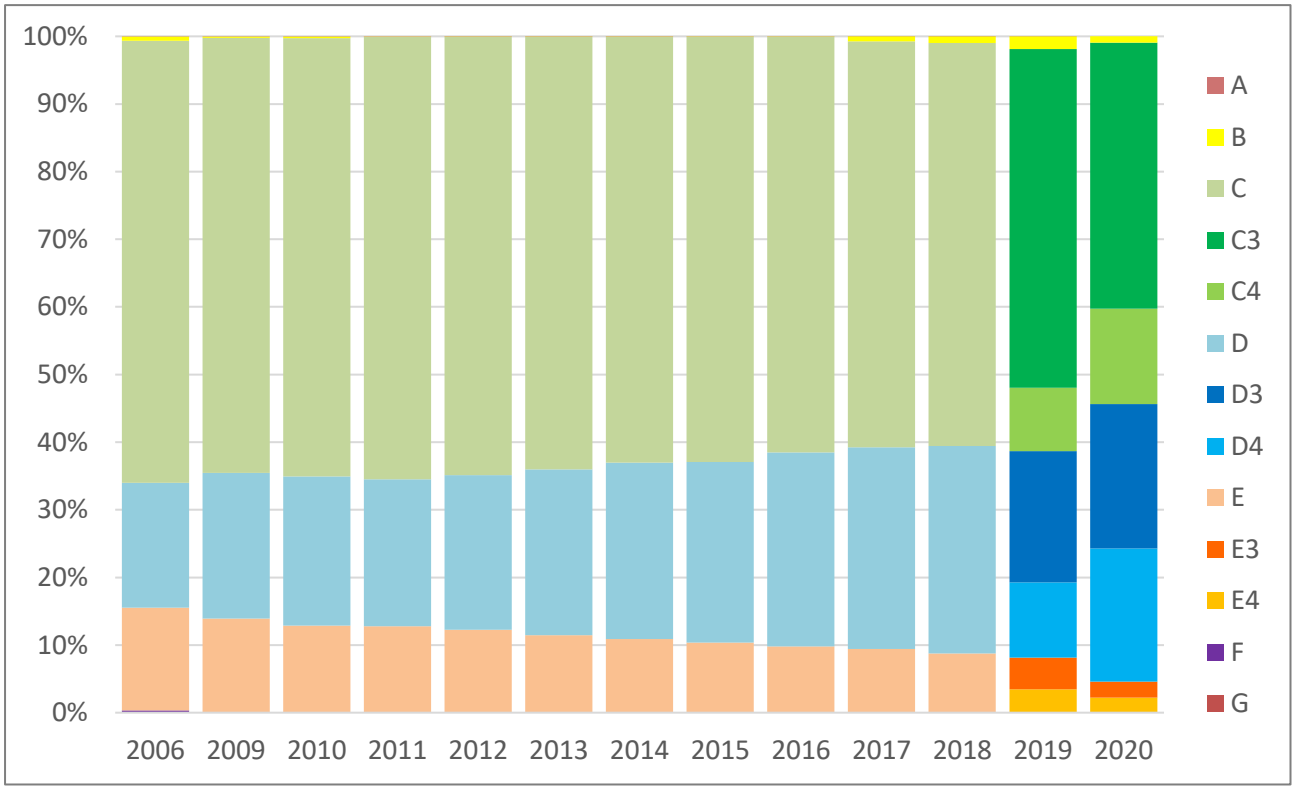


Figure B2 Heathrow annual average 24-hour movements by Noise Class



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

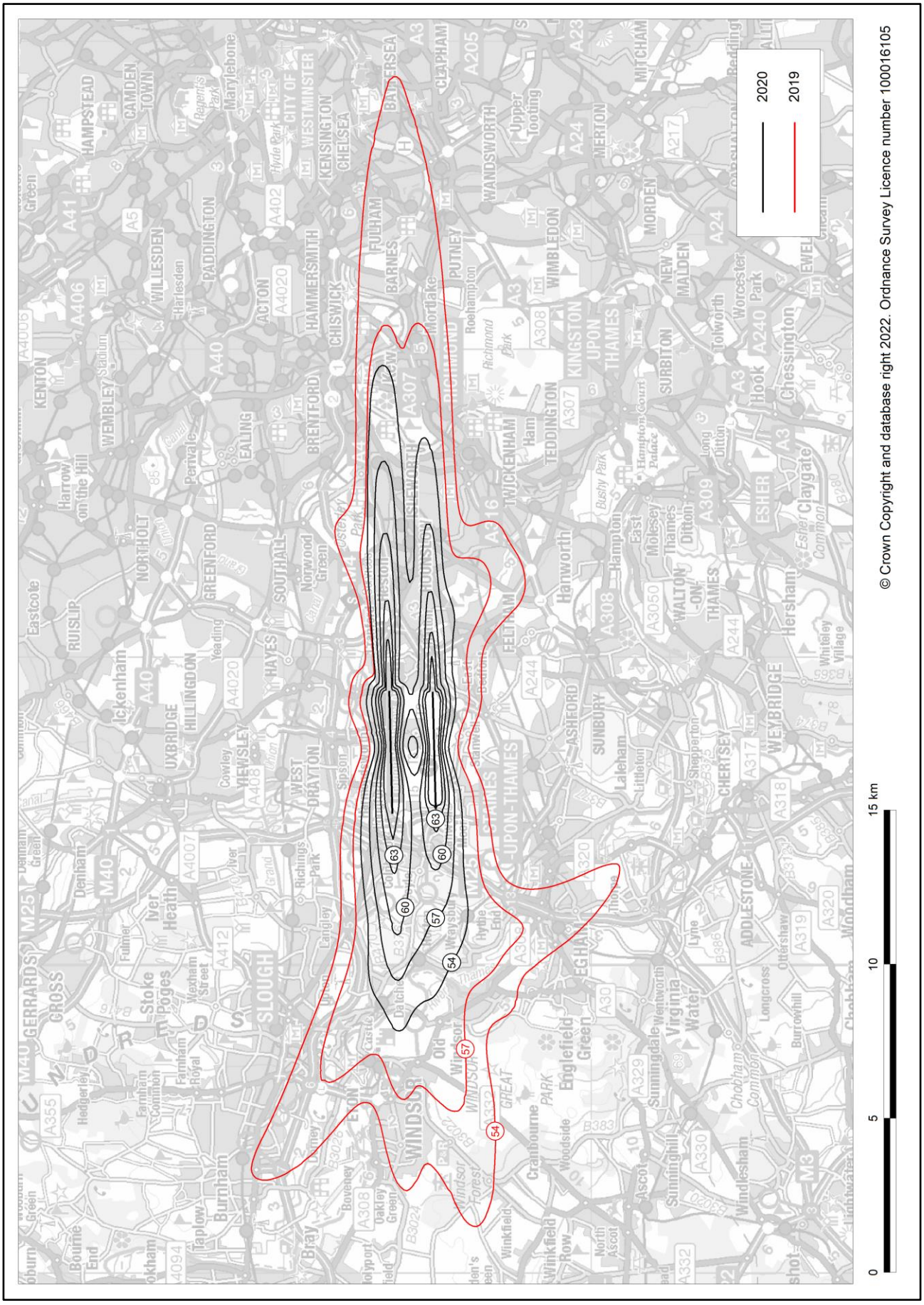
C Narrow-body aircraft (up to 2018), e.g. Airbus A319, Boeing 737-800
C3 3rd generation narrow-body aircraft (from 2019), e.g. Airbus A319, Boeing 737-800
C4 4th generation narrow-body aircraft (from 2019), e.g. Airbus A320neo, Boeing 737 MAX 8

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

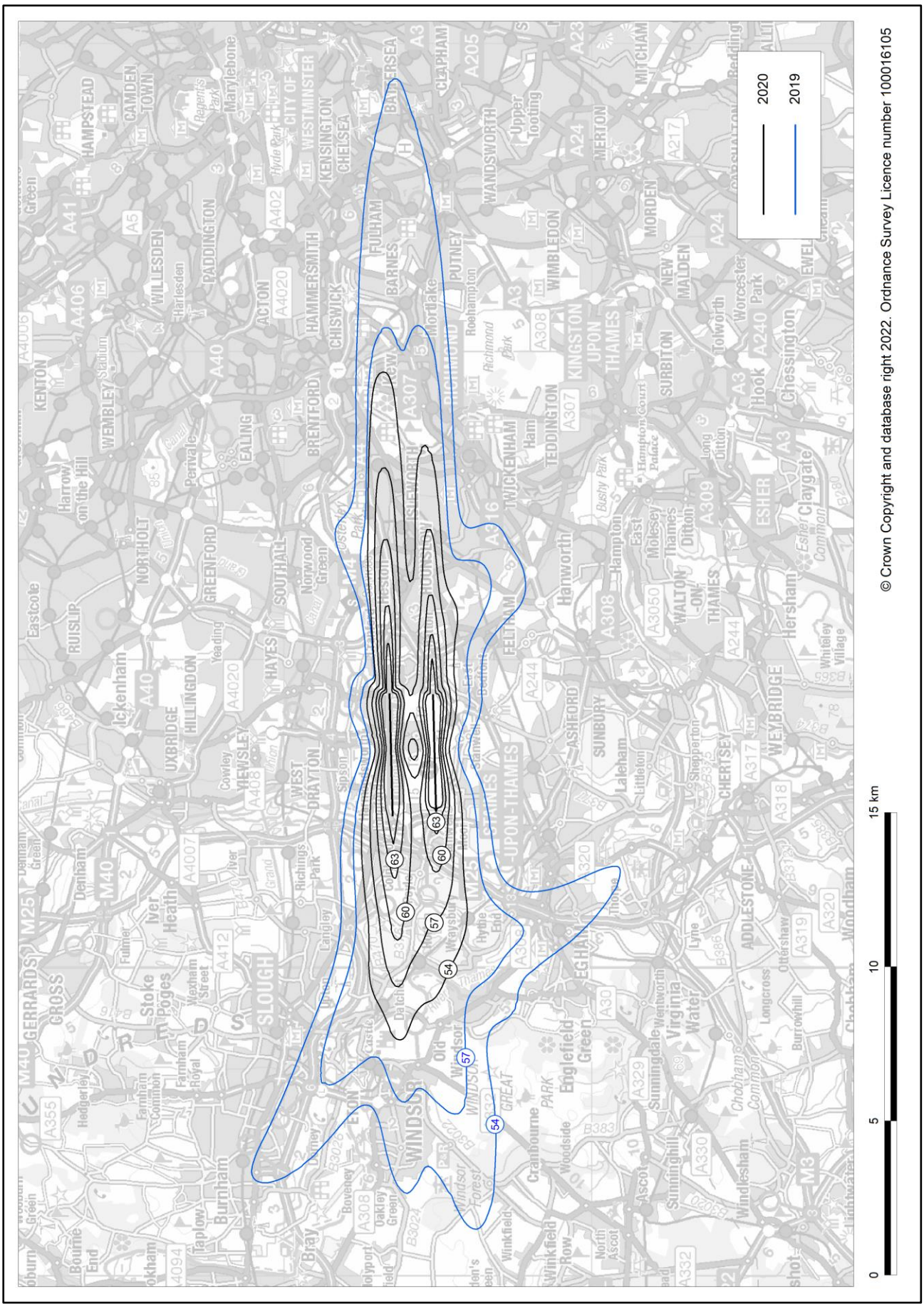
F 1st generation wide-body 3 or 4-engine aircraft, e.g. Boeing 747-200
G 2nd generation narrow-body twins (including Ch.2 and hush-kitted versions), e.g. Boeing 737-200
H 1st generation narrow-body 3 or 4-engine aircraft (including hush-kitted versions), e.g. Boeing 707

Figure B3 Heathrow 2020 and 2019 average summer day 54-72 dB actual modal split $L_{Aeq,16h}$ noise contours



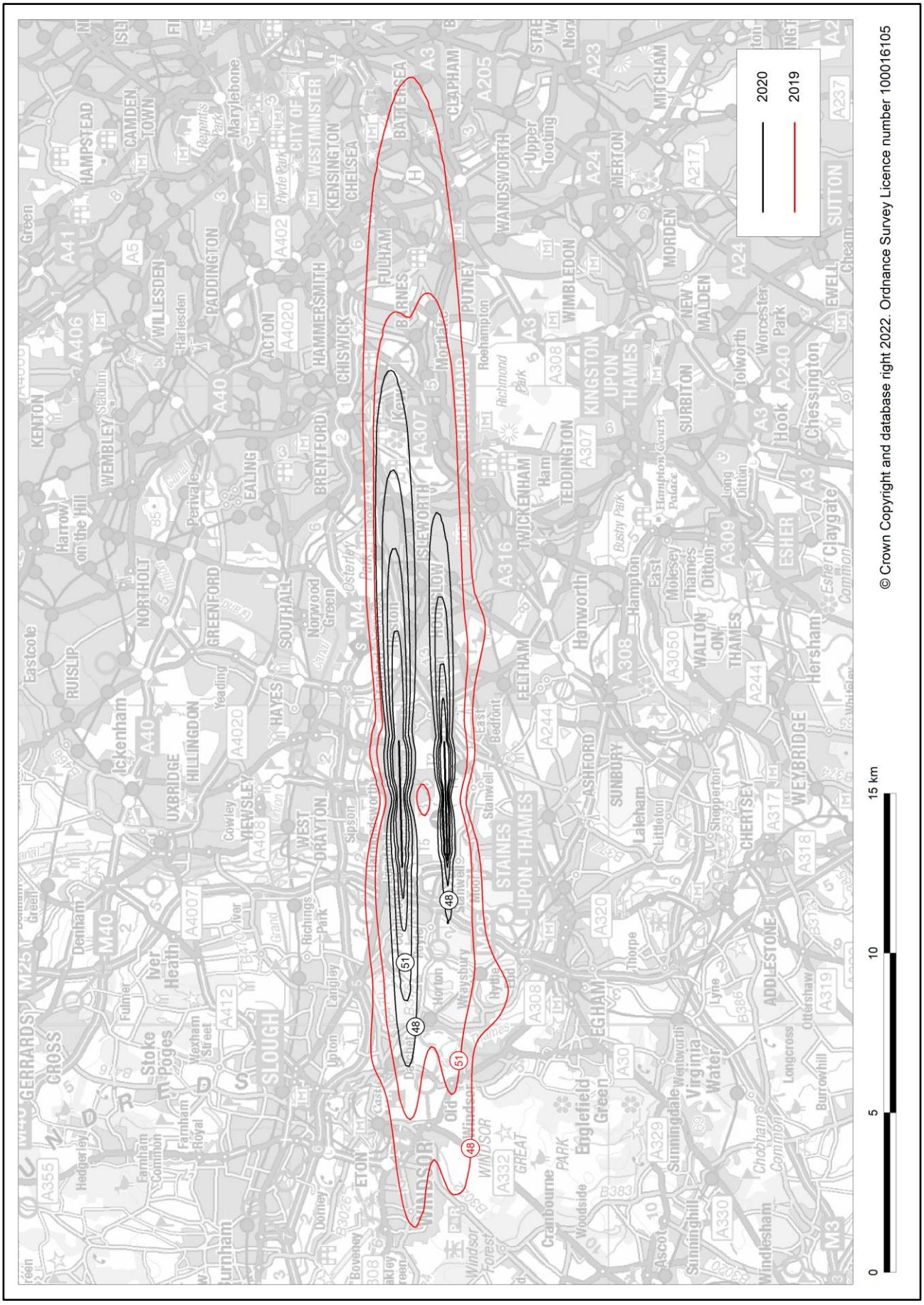
Note: the 2020 summer day actual modal split was 83% W / 17% E (2019: 80% W / 20%).

Figure B4 Heathrow 2020 and 2019 average summer day 54-72 dB standard modal split $L_{Aeq,16h}$ noise contours



Note: the 2020 summer day standard modal split was 80% W / 20% E (2019: 80% W./ 20% E).

Figure B5 Heathrow 2020 and 2019 average summer night 48-66 dB actual modal split $L_{Aeq,8h}$ noise contours



Note: the 2020 summer night actual modal split was 83% W / 17% E (2019: 80% W / 20% E).

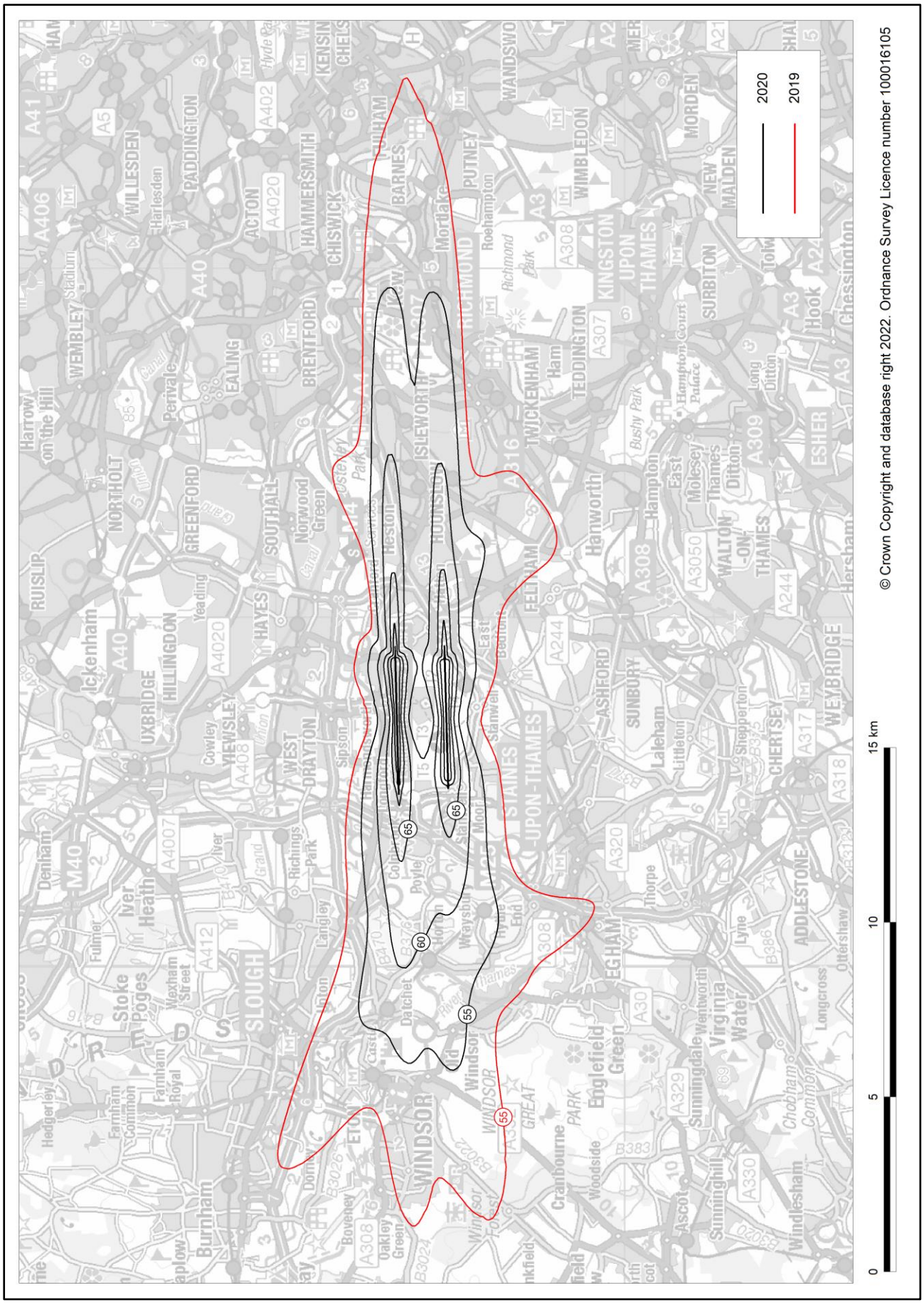


Figure B6 Heathrow 2020 and 2019 L_{day} noise contours

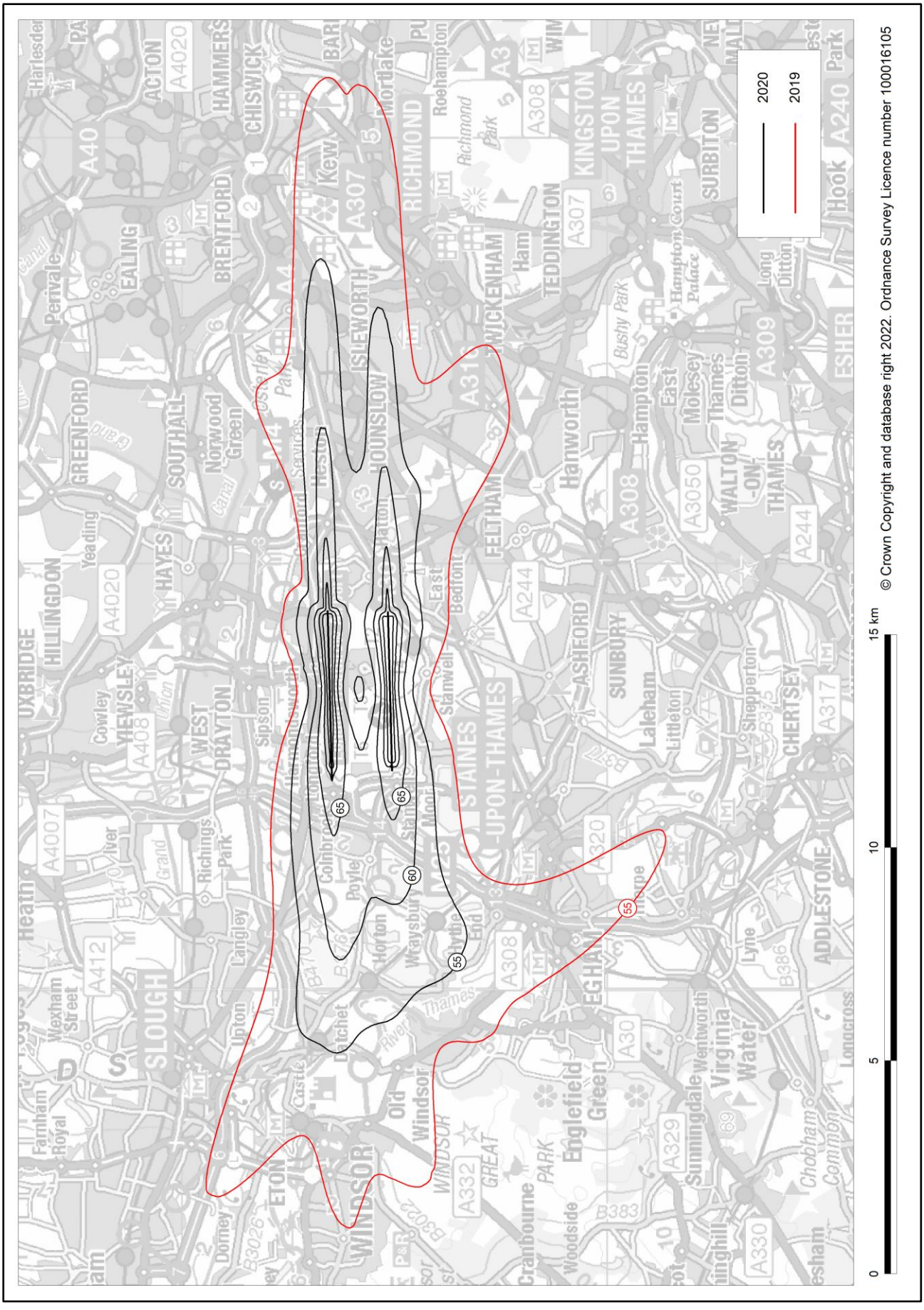


Figure B7 Heathrow 2020 and 2019 $L_{evening}$ noise contours

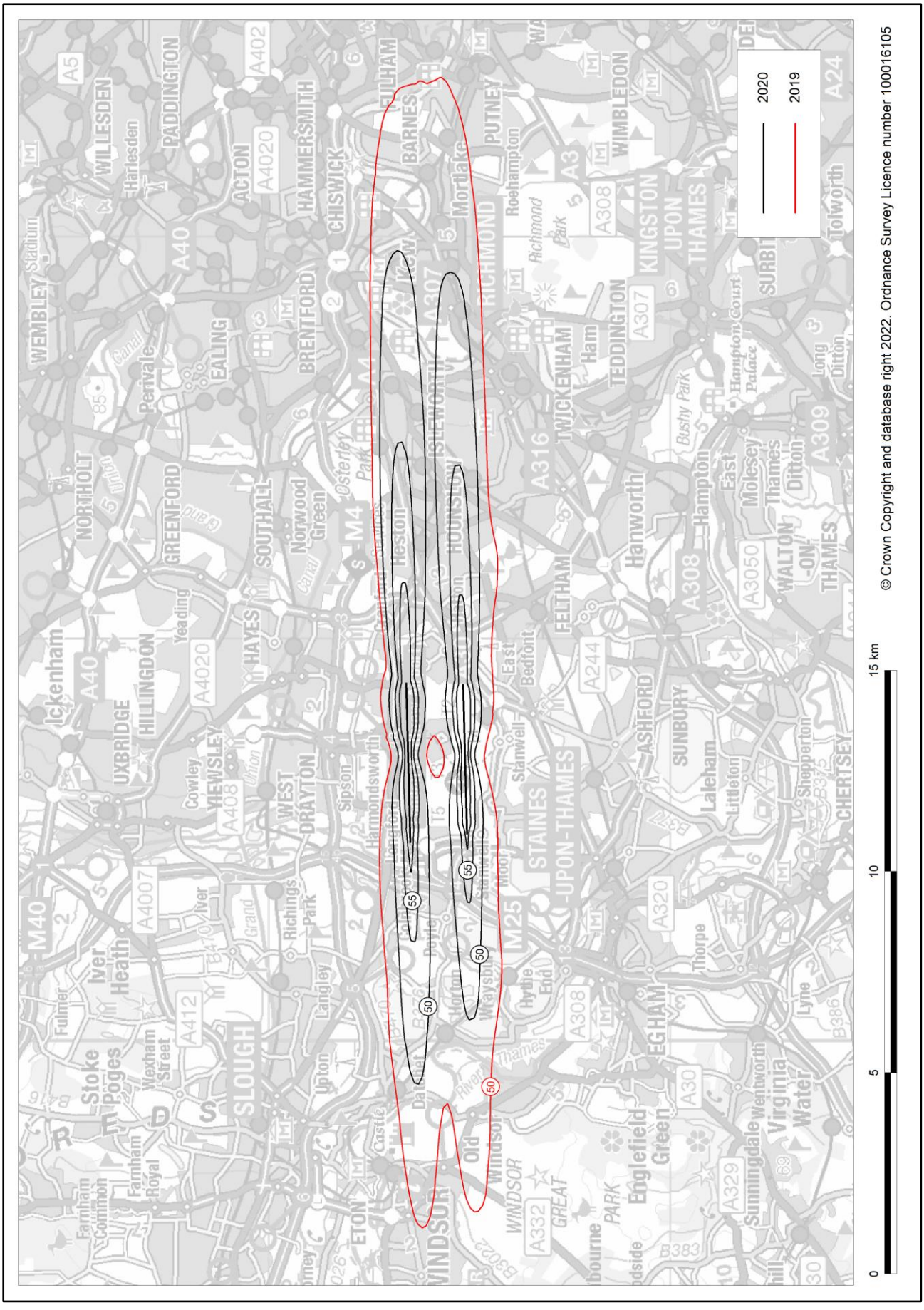


Figure B8 Heathrow 2020 and 2019 L_{night} noise contours

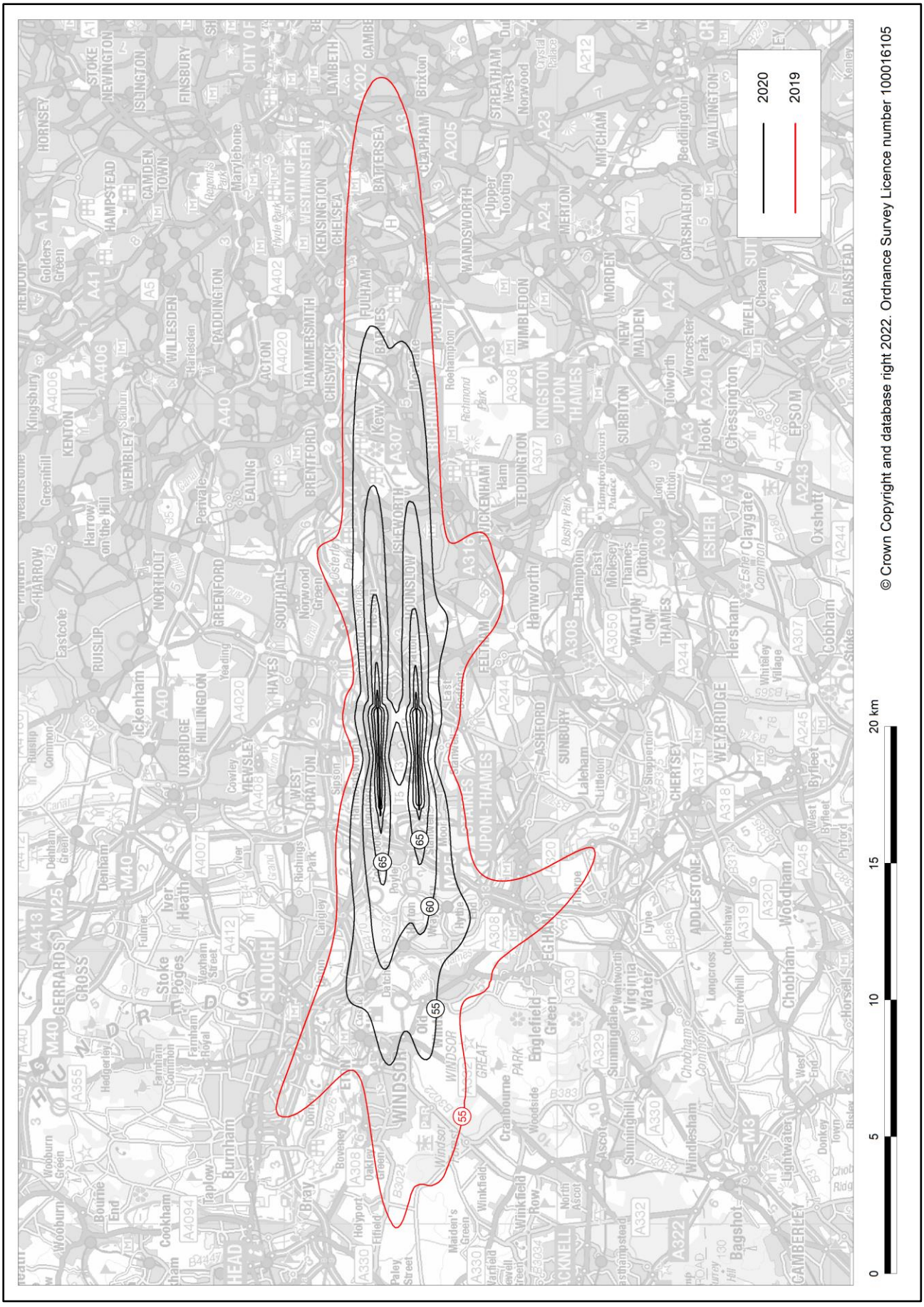


Figure B9 Heathrow 2020 and 2019 L_{den} noise contours

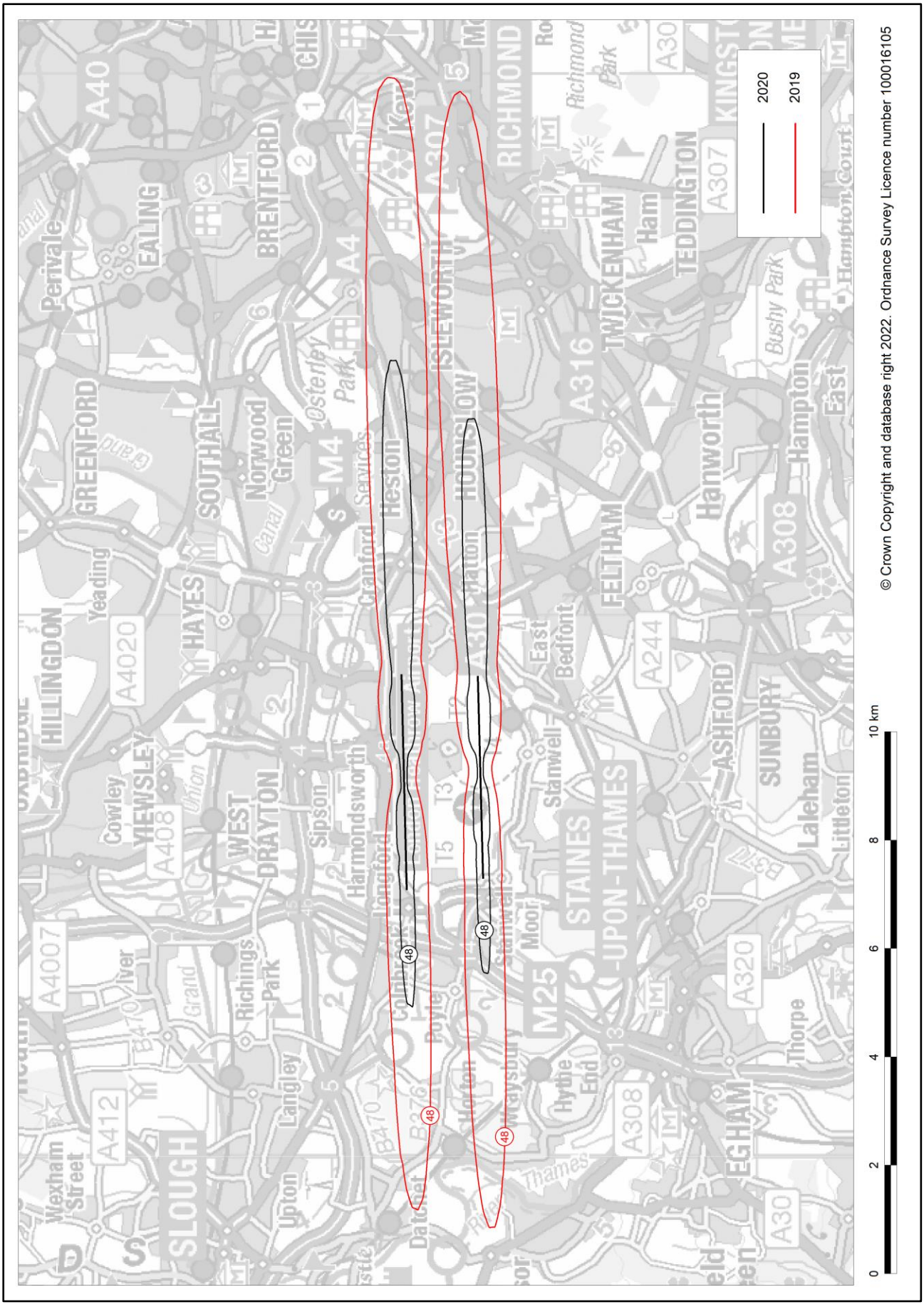
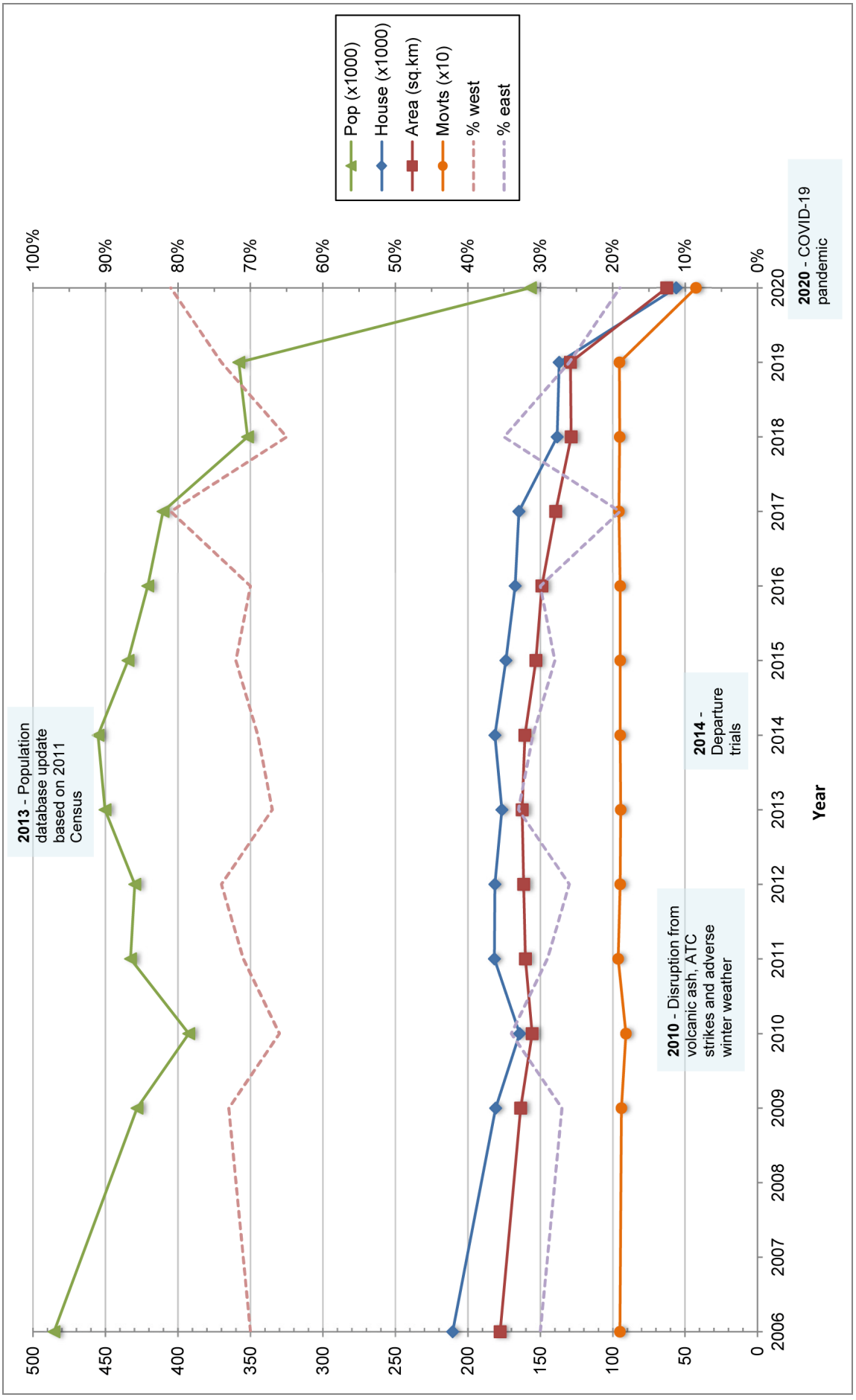


Figure B10 Heathrow 2020 and 2019 $L_{Aeq,6.5h}$ night noise contours

Figure B11 Heathrow 2006-2020 55 dB L_{day} contour area, population and household trends



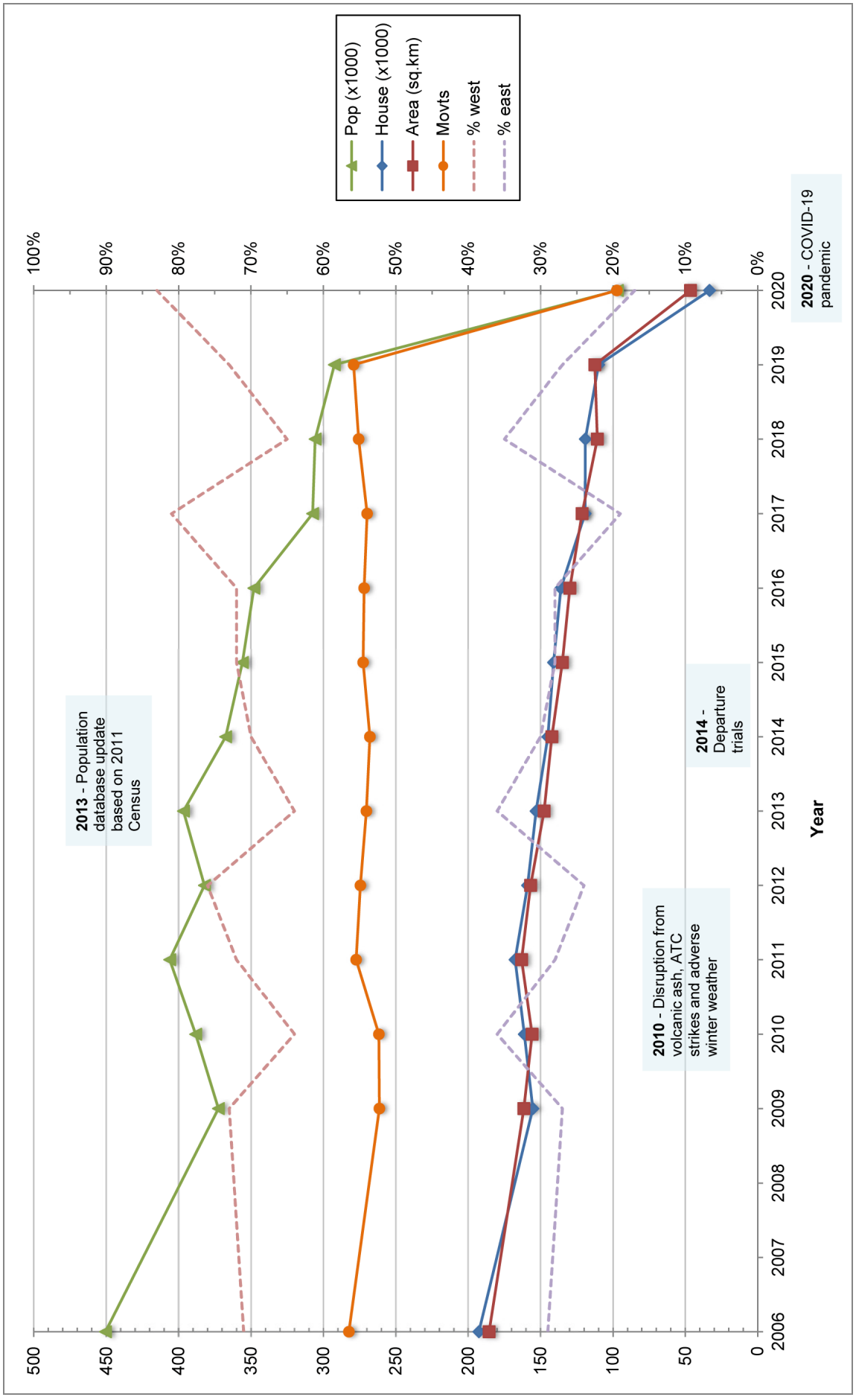


Figure B12 Heathrow 2006-2020 55 dB $L_{evening}$ contour area, population and household trends

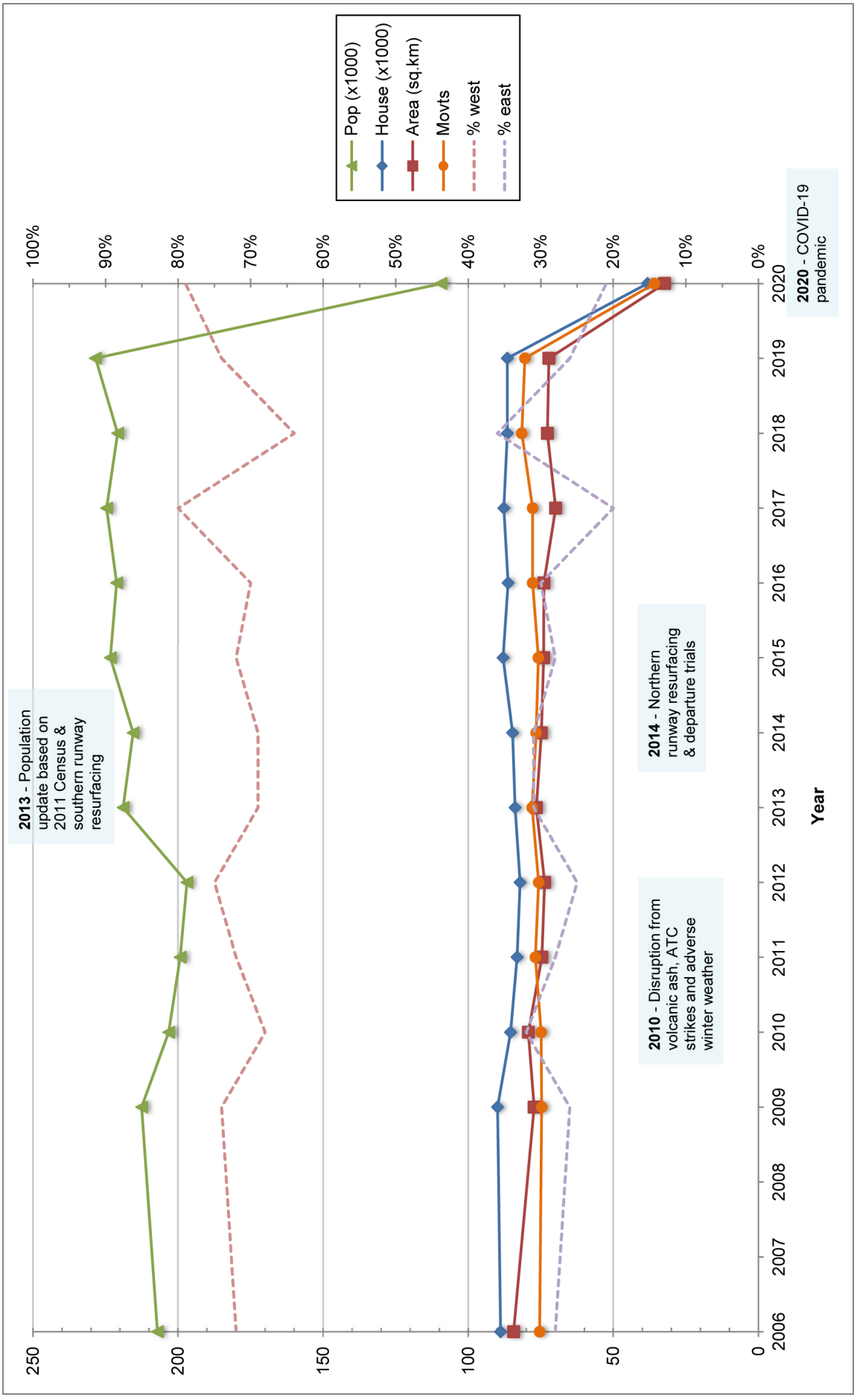


Figure B13 Heathrow 2006-2020 50 dB L_{night} contour area, population and household trends

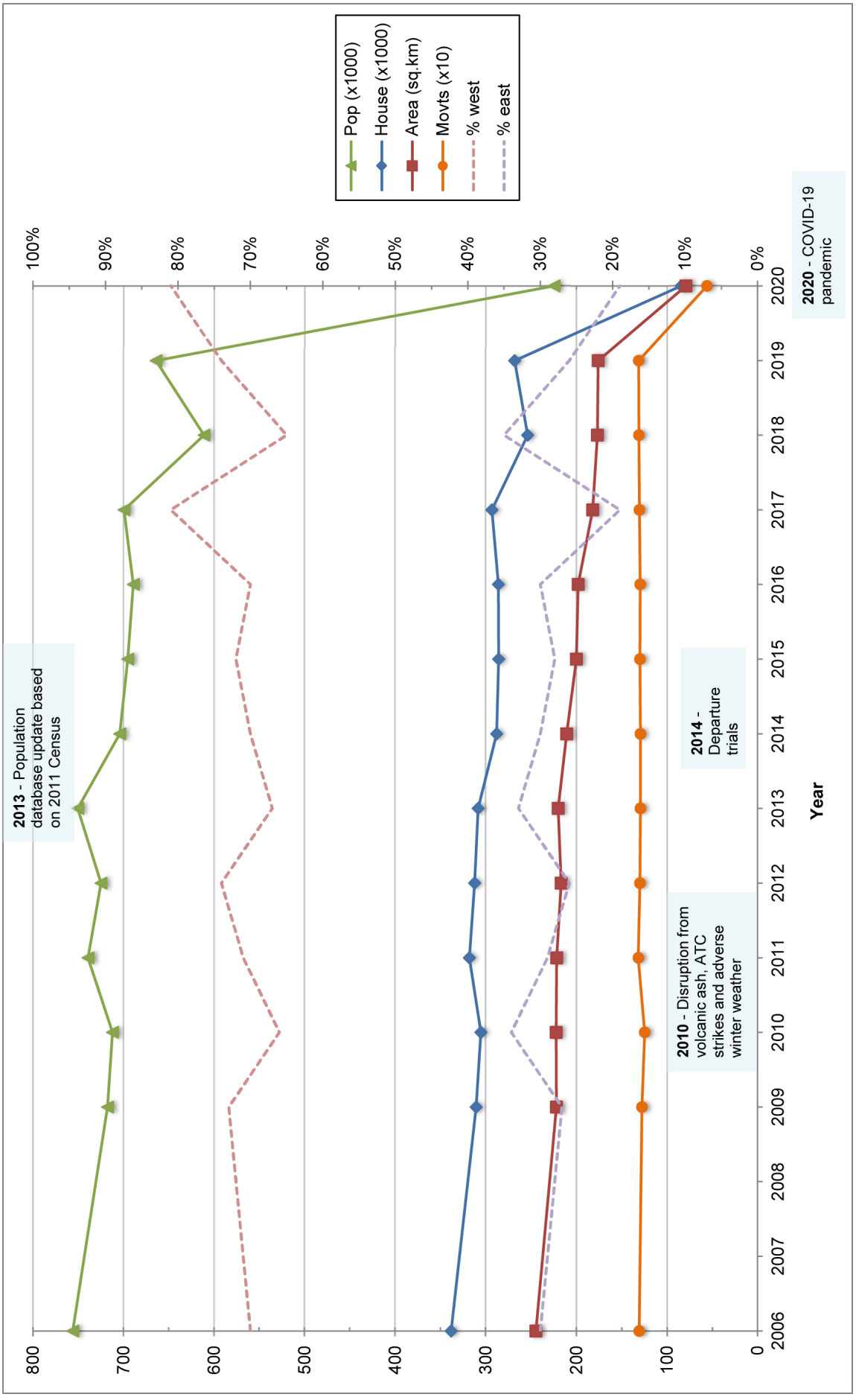


Figure B14 Heathrow 2006-2020 55 dB L_{den} contour area, population and household trends

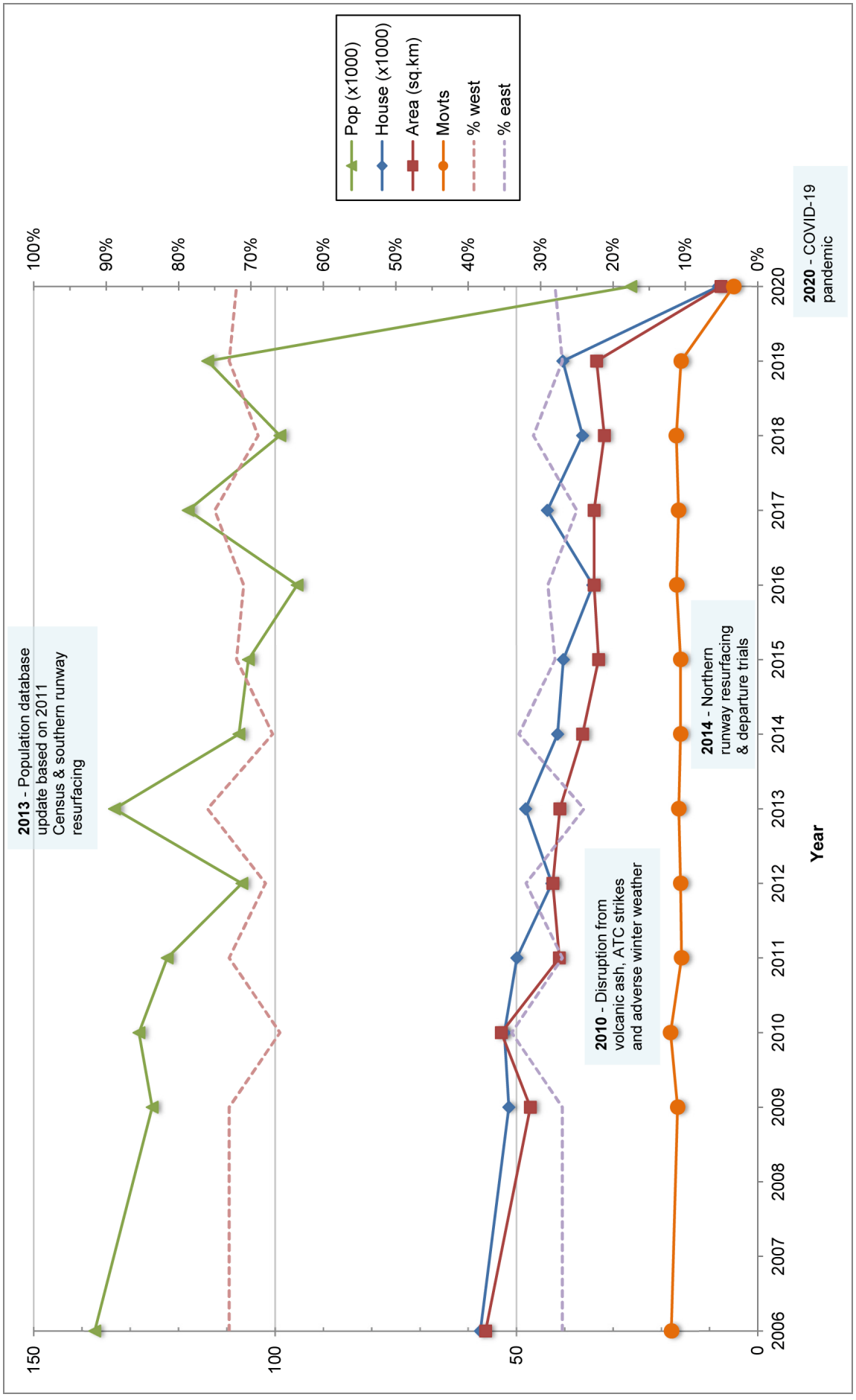


Figure B15 Heathrow 2006-2020 48 dB $L_{Aeq,6.5h}$ night contour area, population and household trends

APPENDIX C

Tables

Table C1 Heathrow 2019 and 2020 average summer 16-hour day movements by ANCON type

ANCON type	2019 dep.	2019 arrivals	2019 total	2020 dep.	2020 arrivals	2020 total	Change dep.	Change arrivals	Change total
B733	0.3	0.3	0.5	0.0	0.0	0.0	-0.2	-0.3	-0.5
B736	3.2	3.4	6.6	2.1	2.1	4.2	-1.2	-1.3	-2.4
B738	7.8	8.7	16.5	2.6	3.0	5.6	-5.2	-5.7	-10.9
B744G	0.1	0.1	0.2	0.1	0.1	0.2	0.0	0.0	+0.1
B744P	0.4	0.5	0.9	0.5	0.5	1.0	+0.1	+0.1	+0.2
B744R	24.7	15.1	39.8	0.1	0.0	0.1	-24.6	-15.1	-39.7
B748	0.4	0.4	0.8	0.1	0.1	0.2	-0.3	-0.3	-0.6
B753	0.1	0.1	0.2	0.0	0.0	0.0	-0.1	-0.1	-0.2
B757C	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	-0.1
B757E	3.0	3.0	6.0	0.6	0.6	1.3	-2.3	-2.3	-4.7
B757P	0.1	0.1	0.3	0.0	0.0	0.0	-0.1	-0.1	-0.3
B763G	4.2	3.4	7.6	1.1	1.0	2.0	-3.1	-2.4	-5.5
B763P	8.9	7.0	15.9	0.2	0.2	0.3	-8.8	-6.8	-15.6
B764	0.7	0.7	1.4	0.5	0.2	0.7	-0.2	-0.5	-0.7
B772G	18.0	14.9	32.9	1.6	1.1	2.7	-16.4	-13.8	-30.2
B772P	2.0	1.3	3.3	0.0	0.0	0.0	-2.0	-1.3	-3.3
B772R	15.8	14.0	29.8	3.5	2.7	6.2	-12.3	-11.3	-23.6
B773G	42.8	35.1	77.9	22.4	18.2	40.6	-20.4	-16.9	-37.3
B773R	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B7810	0.0	0.0	0.1	3.5	2.8	6.4	+3.5	+2.8	+6.3
B788	23.0	22.0	45.0	8.3	5.8	14.1	-14.7	-16.2	-30.9
B789	41.0	33.0	74.0	22.2	17.4	39.7	-18.8	-15.5	-34.3
CRJ	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	+0.1
CRJ900	0.2	0.2	0.4	0.0	0.0	0.0	-0.2	-0.2	-0.3
EA221	0.9	0.9	1.7	1.6	1.6	3.2	+0.7	+0.7	+1.4
EA223	4.6	4.6	9.3	1.4	1.4	2.7	-3.3	-3.3	-6.6
EA30	1.3	2.2	3.5	2.2	2.7	5.0	+1.0	+0.5	+1.5
EA31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EA318	1.3	1.3	2.5	0.5	0.5	0.9	-0.8	-0.8	-1.6
EA319C	15.9	16.6	32.5	5.0	5.4	10.4	-10.9	-11.1	-22.1
EA319NEO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EA319V	84.9	84.8	169.7	26.0	25.9	51.8	-58.9	-58.9	-117.8

ANCON type	2019 dep.	2019 arrivals	2019 total	2020 dep.	2020 arrivals	2020 total	Change dep.	Change arrivals	Change total
EA320C	50.9	53.0	103.9	11.8	12.0	23.8	-39.1	-41.0	-80.1
EA320NEO	42.7	43.7	86.4	22.6	23.3	45.9	-20.1	-20.3	-40.4
EA320V	97.1	97.8	194.9	26.4	26.8	53.2	-70.7	-71.0	-141.8
EA321C	8.8	11.7	20.4	2.1	2.2	4.3	-6.6	-9.5	-16.1
EA321NEO	12.7	12.9	25.6	11.7	11.9	23.6	-1.0	-1.0	-2.0
EA321V	41.9	43.1	85.0	1.9	2.0	3.9	-40.0	-41.1	-81.1
EA33	30.2	26.0	56.2	6.2	5.6	11.8	-24.0	-20.4	-44.4
EA33NEO	0.5	0.3	0.8	0.0	0.0	0.0	-0.5	-0.3	-0.8
EA34	1.2	0.5	1.7	0.2	0.3	0.5	-0.9	-0.3	-1.2
EA346	4.7	4.7	9.4	0.0	0.0	0.0	-4.7	-4.7	-9.4
EA3510	1.4	1.4	2.7	8.0	6.6	14.6	+6.6	+5.2	+11.9
EA359	7.5	6.7	14.2	6.3	4.2	10.5	-1.2	-2.5	-3.7
EA38GP	11.0	10.5	21.5	0.0	0.0	0.0	-11.0	-10.5	-21.5
EA38R	11.9	6.3	18.2	1.5	1.5	3.0	-10.4	-4.8	-15.2
ERJ	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	+0.1
ERJ170	0.4	0.4	0.8	0.2	0.2	0.4	-0.2	-0.2	-0.4
ERJ190	4.8	5.4	10.2	1.8	1.9	3.6	-3.1	-3.5	-6.6
EXE3	0.4	0.3	0.7	0.5	0.5	1.0	+0.1	+0.2	+0.3
LTT	13.8	14.6	28.4	0.1	0.1	0.2	-13.8	-14.5	-28.3
MD80	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	**647.3**	**613.0**	**1260.4**	**207.4**	**192.5**	**399.9**	**-439.9**	**-420.6**	**-860.5**
							(-68%)	(-69%)	(-68%)

Note: Changes and totals have been calculated *before* rounding.

Table C2 Heathrow 2019 and 2020 average summer 8-hour night movements by ANCON type

ANCON type	2019 dep.	2019 arrivals	2019 total	2020 dep.	2020 arrivals	2020 total	Change dep.	Change arrivals	Change total
B733	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	-0.1
B736	0.2	0.0	0.2	0.1	0.0	0.1	-0.1	0.0	-0.2
B738	0.9	0.0	0.9	0.3	0.0	0.3	-0.5	0.0	-0.5
B744G	0.0	0.0	0.0	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	0.2	9.8	10.0	0.0	0.0	0.0	-0.2	-9.8	-10.0
B748	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B757P	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B763G	0.0	0.8	0.8	0.0	0.1	0.1	0.0	-0.7	-0.7
B763P	0.0	2.0	2.0	0.0	0.0	0.0	0.0	-2.0	-2.0
B764	0.0	0.0	0.0	0.0	0.3	0.3	0.0	+0.3	+0.3
B772G	1.1	4.2	5.3	0.0	0.5	0.5	-1.1	-3.7	-4.8
B772P	0.0	0.7	0.7	0.0	0.0	0.0	0.0	-0.7	-0.7
B772R	1.0	2.7	3.7	0.0	0.8	0.9	-0.9	-1.9	-2.8
B773G	1.8	9.5	11.3	0.0	4.2	4.2	-1.8	-5.3	-7.1
B773R	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B7810	0.0	0.0	0.0	0.0	0.7	0.7	0.0	+0.7	+0.7
B788	1.2	2.2	3.3	0.1	2.6	2.7	-1.1	+0.4	-0.7
B789	1.5	9.5	11.0	0.0	4.8	4.8	-1.4	-4.7	-6.2
EA30	1.1	0.0	1.1	0.5	0.0	0.5	-0.5	0.0	-0.5
EA318	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EA319C	0.8	0.0	0.8	0.5	0.1	0.6	-0.3	0.0	-0.2
EA319V	1.0	1.0	2.0	0.0	0.3	0.3	-0.9	-0.7	-1.7
EA320C	2.6	0.5	3.0	0.3	0.2	0.5	-2.2	-0.3	-2.5
EA320NEO	1.5	0.6	2.0	0.7	0.0	0.7	-0.8	-0.6	-1.3
EA320V	2.4	1.6	4.0	0.2	0.2	0.4	-2.1	-1.5	-3.6
EA321C	3.0	0.1	3.1	0.1	0.0	0.1	-2.9	-0.1	-3.0
EA321NEO	0.7	0.4	1.1	0.3	0.0	0.3	-0.4	-0.4	-0.8
EA321V	1.9	0.7	2.7	0.0	0.0	0.0	-1.9	-0.7	-2.6
EA33	0.7	4.8	5.5	0.1	0.6	0.7	-0.6	-4.2	-4.8

ANCON type	2019 dep.	2019 arrivals	2019 total	2020 dep.	2020 arrivals	2020 total	Change dep.	Change arrivals	Change total
EA33NEO	0.0	0.1	0.1	0.0	0.0	0.0	0.0	-0.1	-0.1
EA34	0.0	0.6	0.6	0.0	0.0	0.0	0.0	-0.6	-0.6
EA346	0.2	0.2	0.4	0.0	0.0	0.0	-0.2	-0.2	-0.4
EA3510	0.1	0.1	0.3	0.0	1.4	1.4	-0.1	+1.3	+1.2
EA359	0.7	1.5	2.3	0.0	2.1	2.2	-0.7	+0.6	-0.1
EA38GP	0.3	0.8	1.1	0.0	0.0	0.0	-0.3	-0.8	-1.1
EA38R	0.1	5.7	5.9	0.0	0.0	0.0	-0.1	-5.7	-5.8
ERJ190	0.6	0.0	0.6	0.1	0.0	0.1	-0.5	0.0	-0.5
EXE3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LTT	0.8	0.0	0.8	0.0	0.0	0.0	-0.8	0.0	-0.8
STT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	**26.3**	**60.4**	**86.7**	**3.6**	**19.0**	**22.5**	**-22.7**	**-41.5**	**-64.2**
							(-86%)	(-69%)	(-74%)

Note: Changes and totals have been calculated *before* rounding.

Table C3 Heathrow 2019 and 2020 annual 12-hour day movements by ANCON type

ANCON type	2019 dep.	2019 arrivals	2019 total	2020 dep.	2020 arrivals	2020 total	Change dep.	Change arrivals	Change total
B733	0.1	0.1	0.2	0.0	0.0	0.0	-0.1	-0.1	-0.1
B736	2.1	2.8	4.9	1.6	1.7	3.2	-0.6	-1.1	-1.7
B738	7.5	8.0	15.5	3.5	3.7	7.3	-3.9	-4.2	-8.2
B738MAX	0.6	0.5	1.1	0.0	0.0	0.0	-0.6	-0.5	-1.1
B744G	0.0	0.1	0.1	0.2	0.2	0.3	0.1	0.1	0.2
B744P	0.1	0.3	0.4	0.1	0.4	0.5	0.0	0.1	0.1
B744R	21.5	14.5	36.0	4.5	3.1	7.6	-17.0	-11.4	-28.3
B748	0.1	0.5	0.6	0.0	0.1	0.2	0.0	-0.4	-0.4
B753	0.2	0.2	0.3	0.0	0.0	0.1	-0.1	-0.1	-0.3
B757C	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
B757E	1.7	1.5	3.1	0.6	0.6	1.2	-1.0	-0.9	-1.9
B757P	0.1	0.1	0.1	0.0	0.0	0.1	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	3.3	2.9	6.2	1.2	1.2	2.3	-2.1	-1.7	-3.9
B763P	7.5	5.0	12.5	2.0	1.3	3.3	-5.5	-3.7	-9.2
B763R	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B764	1.6	0.9	2.4	1.6	1.0	2.5	0.0	0.1	0.1
B772G	14.5	12.8	27.3	4.4	3.3	7.8	-10.0	-9.5	-19.6
B772P	2.4	1.5	4.0	0.7	0.4	1.1	-1.8	-1.1	-2.9
B772R	12.5	13.1	25.6	6.2	5.6	11.8	-6.3	-7.5	-13.8
B773G	27.7	29.4	57.1	17.9	19.5	37.4	-9.8	-9.9	-19.7
B773R	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B7810	0.0	0.0	0.0	2.4	1.9	4.4	2.4	1.9	4.3
B788	18.0	19.4	37.4	9.7	8.9	18.6	-8.3	-10.5	-18.8
B789	27.8	28.3	56.1	19.6	19.4	39.1	-8.1	-8.9	-17.0
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
CRJ700	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CRJ900	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0
EA221	0.5	0.6	1.0	0.6	0.7	1.4	0.2	0.2	0.3
EA223	3.8	3.8	7.5	1.5	1.6	3.0	-2.3	-2.2	-4.5
EA30	0.7	0.6	1.3	0.9	0.8	1.7	0.2	0.2	0.4

ANCON type	2019 dep.	2019 arrivals	2019 total	2020 dep.	2020 arrivals	2020 total	Change dep.	Change arrivals	Change total
EA31	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.2
EA318	0.9	1.0	1.9	0.5	0.6	1.1	-0.4	-0.5	-0.8
EA319C	10.2	13.4	23.6	4.1	5.0	9.1	-6.1	-8.4	-14.5
EA319NEO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EA319V	66.6	62.9	129.5	26.9	24.6	51.5	-39.7	-38.3	-78.0
EA320C	39.2	40.7	80.0	12.5	13.9	26.4	-26.7	-26.8	-53.6
EA320NEO	32.7	31.0	63.7	21.5	19.3	40.8	-11.2	-11.7	-22.9
EA320V	77.6	69.3	146.9	30.0	24.2	54.2	-47.5	-45.1	-92.7
EA321C	7.6	8.1	15.8	2.7	2.9	5.6	-4.9	-5.2	-10.2
EA321NEO	9.5	7.5	17.0	9.8	8.0	17.8	0.3	0.5	0.8
EA321V	33.2	28.8	62.0	6.6	6.0	12.6	-26.6	-22.8	-49.4
EA33	22.9	20.8	43.6	7.2	7.9	15.1	-15.7	-12.9	-28.5
EA33NEO	0.2	0.2	0.4	0.0	0.0	0.0	-0.2	-0.1	-0.3
EA34	0.9	0.7	1.6	0.2	0.1	0.3	-0.7	-0.6	-1.3
EA346	2.1	2.8	4.9	0.2	0.2	0.4	-1.9	-2.6	-4.5
EA3510	1.9	1.3	3.2	7.2	5.7	12.9	5.3	4.4	9.7
EA359	2.6	4.5	7.1	3.5	3.5	7.1	0.9	-0.9	0.0
EA38GP	6.5	7.9	14.4	1.4	1.5	2.9	-5.1	-6.4	-11.5
EA38R	6.1	5.5	11.7	2.1	2.2	4.3	-4.0	-3.3	-7.3
ERJ	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.1
ERJ170	0.2	0.3	0.5	0.2	0.2	0.4	0.0	-0.1	-0.1
ERJ190	2.3	3.5	5.8	1.6	1.7	3.3	-0.7	-1.8	-2.5
EXE3	0.4	0.4	0.8	0.4	0.4	0.8	0.0	0.0	0.0
FK10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LTT	8.9	9.2	18.1	1.9	1.9	3.8	-7.0	-7.3	-14.3
MD80	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	**486.5**	**466.9**	**953.3**	**220.3**	**205.8**	**426.1**	**-266.2**	**-261.1**	**-527.2**
							(-55%)	(-56%)	(-55%)

Note: Changes and totals have been calculated *before* rounding.

Table C4 Heathrow 2019 and 2020 annual 4-hour evening movements by ANCON type

ANCON type	2019 dep.	2019 arrivals	2019 total	2020 dep.	2020 arrivals	2020 total	Change dep.	Change arrivals	Change total
B733	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	-0.1
B736	1.1	0.6	1.7	0.2	0.2	0.4	-0.9	-0.4	-1.3
B738	2.0	2.4	4.4	0.6	1.0	1.6	-1.4	-1.5	-2.9
B738MAX	0.1	0.2	0.3	0.0	0.0	0.0	-0.1	-0.2	-0.3
B744G	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
B744P	0.3	0.2	0.5	0.4	0.1	0.5	0.0	-0.1	0.0
B744R	3.2	1.0	4.2	0.7	0.3	1.0	-2.4	-0.7	-3.2
B748	0.5	0.1	0.6	0.1	0.0	0.1	-0.4	0.0	-0.4
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	1.0	1.3	2.3	0.3	0.4	0.7	-0.8	-0.9	-1.6
B757P	0.1	0.1	0.2	0.0	0.0	0.0	-0.1	-0.1	-0.2
B762	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B763G	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0
B763P	0.1	0.5	0.6	0.0	0.2	0.2	-0.1	-0.3	-0.3
B764	0.0	0.5	0.6	0.0	0.0	0.0	0.0	-0.5	-0.6
B772G	4.0	1.1	5.1	1.1	0.3	1.4	-2.9	-0.8	-3.7
B772P	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B772R	4.3	1.5	5.9	1.8	0.6	2.4	-2.6	-1.0	-3.5
B773G	15.6	5.9	21.5	9.2	2.6	11.8	-6.4	-3.3	-9.7
B7810	0.0	0.0	0.0	0.3	0.0	0.3	+0.2	0.0	+0.3
B788	5.3	2.4	7.7	2.3	0.7	3.0	-3.0	-1.7	-4.7
B789	10.0	1.6	11.6	6.1	0.9	7.0	-3.9	-0.7	-4.6
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
CRJ700	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	0.0	0.0	0.0	0.0	0.0	0.0
EA221	0.2	0.1	0.3	0.1	0.0	0.2	0.0	0.0	-0.1
EA223	1.2	1.1	2.3	0.4	0.3	0.6	-0.8	-0.9	-1.7
EA30	0.6	1.6	2.2	0.9	1.6	2.5	+0.3	0.0	+0.2
EA31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EA318	0.2	0.0	0.2	0.1	0.1	0.2	-0.1	+0.1	0.0

ANCON type	2019 dep.	2019 arrivals	2019 total	2020 dep.	2020 arrivals	2020 total	Change dep.	Change arrivals	Change total
EA319C	5.0	2.6	7.6	1.3	0.8	2.1	-3.6	-1.9	-5.5
EA319NEO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EA319V	14.6	18.8	33.4	3.5	6.0	9.4	-11.1	-12.8	-24.0
EA320C	13.0	14.0	27.0	3.7	2.8	6.5	-9.3	-11.2	-20.5
EA320NEO	8.4	11.5	19.9	2.9	6.0	8.9	-5.6	-5.5	-11.1
EA320V	18.2	27.7	45.8	3.4	9.7	13.2	-14.7	-17.9	-32.7
EA321C	1.9	3.1	5.0	0.6	0.6	1.1	-1.4	-2.5	-3.9
EA321NEO	2.1	4.4	6.5	1.3	3.3	4.6	-0.8	-1.1	-1.9
EA321V	8.2	13.2	21.4	1.2	1.8	2.9	-7.0	-11.5	-18.5
EA33	6.0	3.5	9.5	3.3	1.3	4.7	-2.7	-2.2	-4.9
EA33NEO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EA34	0.3	0.0	0.4	0.0	0.0	0.1	-0.3	0.0	-0.3
EA346	2.2	1.1	3.3	0.2	0.0	0.3	-1.9	-1.0	-3.0
EA3510	0.6	0.6	1.2	0.9	0.8	1.7	+0.2	+0.2	+0.5
EA359	4.7	1.7	6.5	2.6	0.8	3.4	-2.2	-0.9	-3.1
EA38GP	3.9	1.1	5.0	0.8	0.2	1.1	-3.1	-0.9	-3.9
EA38R	5.2	0.1	5.3	1.7	0.1	1.8	-3.5	0.0	-3.5
ERJ	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ERJ170	0.2	0.0	0.2	0.0	0.0	0.0	-0.2	0.0	-0.2
ERJ190	1.9	0.9	2.8	0.2	0.1	0.4	-1.7	-0.7	-2.4
EXE3	0.1	0.1	0.2	0.0	0.1	0.1	0.0	0.0	-0.1
FK10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LTT	2.7	3.0	5.7	0.5	0.6	1.1	-2.2	-2.4	-4.6
MD80	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	**149.4**	**129.7**	**279.1**	**53.0**	**44.4**	**97.4**	**-96.4**	**-85.3**	**-181.7**
							(-64%)	(-66%)	(-65%)

Note: Changes and totals have been calculated *before* rounding.

Table C5 Heathrow 2019 and 2020 annual 8-hour night movements by ANCON type

ANCON type	2019 dep.	2019 arrivals	2019 total	2020 dep.	2020 arrivals	2020 total	Change dep.	Change arrivals	Change total
B733	0.1	0.0	0.1	0.0	0.0	0.0	-0.1	0.0	-0.1
B736	0.2	0.0	0.2	0.1	0.0	0.1	-0.1	0.0	-0.1
B738	0.9	0.0	1.0	0.6	0.0	0.6	-0.4	0.0	-0.4
B738MAX	0.1	0.1	0.2	0.0	0.0	0.0	-0.1	-0.1	-0.2
B744G	0.0	0.0	0.0	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	0.1	9.3	9.4	0.0	1.8	1.8	-0.1	-7.5	-7.6
B748	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B757P	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B763G	0.0	0.4	0.4	0.0	0.1	0.1	0.0	-0.4	-0.4
B763P	0.0	2.2	2.2	0.0	0.6	0.6	0.0	-1.7	-1.7
B764	0.0	0.2	0.2	0.0	0.6	0.6	0.0	0.4	0.4
B772G	0.7	5.2	5.9	0.1	1.9	2.0	-0.6	-3.2	-3.8
B772P	0.0	0.9	0.9	0.0	0.2	0.2	0.0	-0.7	-0.7
B772R	0.6	2.7	3.3	0.1	2.0	2.1	-0.4	-0.8	-1.2
B773G	1.0	9.0	10.0	0.2	5.3	5.4	-0.8	-3.7	-4.6
B773R	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B7810	0.0	0.0	0.0	0.0	0.7	0.7	0.0	0.7	0.7
B788	0.6	2.1	2.7	0.1	2.5	2.6	-0.5	0.4	-0.1
B789	0.7	8.6	9.3	0.1	5.6	5.7	-0.6	-3.0	-3.6
EA221	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EA223	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EA30	0.9	0.0	0.9	0.5	0.0	0.6	-0.4	0.0	-0.3
EA318	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.1
EA319C	1.0	0.0	1.1	0.3	0.0	0.3	-0.7	0.0	-0.7
EA319V	1.1	0.7	1.8	0.5	0.3	0.7	-0.7	-0.4	-1.1
EA320C	2.9	0.4	3.3	0.7	0.2	0.9	-2.2	-0.2	-2.5
EA320NEO	1.7	0.3	2.0	0.9	0.0	1.0	-0.7	-0.3	-1.0
EA320V	2.1	0.8	2.9	0.6	0.1	0.8	-1.5	-0.7	-2.1
EA321C	1.8	0.1	1.8	0.3	0.0	0.3	-1.5	-0.1	-1.6

ANCON type	2019 dep.	2019 arrivals	2019 total	2020 dep.	2020 arrivals	2020 total	Change dep.	Change arrivals	Change total
EA321NEO	0.5	0.2	0.7	0.3	0.1	0.4	-0.2	-0.1	-0.3
EA321V	1.4	0.7	2.1	0.2	0.1	0.3	-1.2	-0.6	-1.8
EA33	0.4	5.0	5.4	0.1	1.4	1.5	-0.3	-3.6	-3.9
EA33NEO	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
EA34	0.0	0.5	0.5	0.0	0.1	0.1	0.0	-0.4	-0.4
EA346	0.2	0.5	0.7	0.0	0.1	0.1	-0.2	-0.4	-0.6
EA3510	0.1	0.8	0.8	0.1	1.7	1.8	0.0	0.9	1.0
EA359	0.4	1.6	2.0	0.0	1.8	1.8	-0.4	0.2	-0.2
EA38GP	0.2	1.5	1.6	0.0	0.5	0.5	-0.1	-1.0	-1.1
EA38R	0.1	5.8	6.0	0.1	1.6	1.7	-0.1	-4.2	-4.3
ERJ190	0.2	0.0	0.2	0.1	0.0	0.1	-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	0.5	0.0	0.5	0.1	0.0	0.1	-0.4	0.0	-0.4
STP	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	**20.6**	**59.9**	**80.5**	**6.3**	**29.6**	**35.9**	**-14.3**	**-30.3**	**-44.7**
							(-69%)	(-51%)	(-55%)

Note: Changes and totals have been calculated *before* rounding.

Table C6 Heathrow 2019 and 2020 annual 24-hour movements by ANCON type

ANCON type	2019 dep.	2019 arrivals	2019 total	2020 dep.	2020 arrivals	2020 total	Change dep.	Change arrivals	Change total
B733	0.2	0.2	0.3	0.0	0.0	0.0	-0.1	-0.1	-0.3
B736	3.4	3.4	6.8	1.9	1.9	3.8	-1.5	-1.5	-3.0
B738	10.4	10.4	20.9	4.7	4.7	9.4	-5.7	-5.7	-11.4
B738MAX	0.8	0.8	1.6	0.0	0.0	0.0	-0.8	-0.8	-1.6
B744G	0.1	0.1	0.2	0.2	0.2	0.4	+0.1	+0.1	+0.2
B744P	0.5	0.5	1.0	0.5	0.5	1.0	0.0	0.0	+0.1
B744R	24.8	24.8	49.5	5.2	5.2	10.5	-19.5	-19.5	-39.1
B748	0.6	0.6	1.1	0.1	0.1	0.3	-0.4	-0.4	-0.9
B753	0.2	0.2	0.3	0.0	0.0	0.1	-0.1	-0.1	-0.2
B757C	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
B757E	2.7	2.7	5.5	0.9	0.9	1.9	-1.8	-1.8	-3.6
B757P	0.1	0.1	0.3	0.0	0.0	0.1	-0.1	-0.1	-0.2
B762	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B763G	3.4	3.4	6.7	1.3	1.3	2.5	-2.1	-2.1	-4.2
B763P	7.7	7.7	15.3	2.1	2.1	4.1	-5.6	-5.6	-11.2
B763R	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B764	1.6	1.6	3.2	1.6	1.6	3.1	0.0	0.0	-0.1
B772G	19.1	19.1	38.3	5.6	5.6	11.2	-13.5	-13.5	-27.1
B772P	2.4	2.4	4.9	0.7	0.7	1.3	-1.8	-1.8	-3.6
B772R	17.4	17.4	34.7	8.1	8.1	16.2	-9.2	-9.2	-18.5
B773G	44.3	44.3	88.6	27.3	27.3	54.6	-17.0	-17.0	-34.0
B773R	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B7810	0.0	0.0	0.0	2.7	2.7	5.4	+2.7	+2.7	+5.3
B788	23.9	23.9	47.8	12.1	12.1	24.2	-11.8	-11.8	-23.6
B789	38.5	38.5	76.9	25.9	25.9	51.8	-12.6	-12.6	-25.2
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
CRJ700	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CRJ900	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0
EA221	0.6	0.6	1.3	0.8	0.8	1.5	+0.1	+0.1	+0.2
EA223	4.9	4.9	9.8	1.8	1.8	3.7	-3.1	-3.1	-6.2
EA30	2.2	2.2	4.4	2.4	2.4	4.7	+0.2	+0.2	+0.3

ANCON type	2019 dep.	2019 arrivals	2019 total	2020 dep.	2020 arrivals	2020 total	Change dep.	Change arrivals	Change total
EA31	0.0	0.0	0.0	0.1	0.1	0.2	+0.1	+0.1	+0.2
EA318	1.1	1.1	2.1	0.7	0.7	1.4	-0.3	-0.3	-0.7
EA319C	16.2	16.1	32.3	5.8	5.8	11.5	-10.4	-10.4	-20.7
EA319NEO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EA319V	82.4	82.4	164.8	30.8	30.9	61.7	-51.5	-51.5	-103.1
EA320C	55.1	55.1	110.3	16.9	16.9	33.7	-38.2	-38.3	-76.5
EA320NEO	42.8	42.9	85.7	25.3	25.3	50.7	-17.5	-17.5	-35.0
EA320V	97.8	97.8	195.6	34.1	34.1	68.2	-63.8	-63.7	-127.5
EA321C	11.3	11.3	22.6	3.5	3.5	7.0	-7.8	-7.8	-15.6
EA321NEO	12.1	12.1	24.2	11.4	11.4	22.9	-0.7	-0.7	-1.4
EA321V	42.8	42.8	85.6	7.9	7.9	15.8	-34.9	-34.9	-69.8
EA33	29.3	29.3	58.6	10.7	10.7	21.3	-18.6	-18.6	-37.3
EA33NEO	0.2	0.2	0.4	0.0	0.0	0.1	-0.2	-0.2	-0.4
EA34	1.2	1.2	2.4	0.2	0.2	0.5	-1.0	-1.0	-1.9
EA346	4.5	4.5	8.9	0.4	0.4	0.8	-4.0	-4.0	-8.1
EA3510	2.6	2.6	5.2	8.2	8.2	16.4	+5.6	+5.6	+11.2
EA359	7.8	7.8	15.6	6.2	6.2	12.3	-1.6	-1.6	-3.3
EA38GP	10.5	10.5	21.0	2.2	2.2	4.5	-8.3	-8.3	-16.6
EA38R	11.5	11.5	22.9	3.9	3.9	7.8	-7.6	-7.6	-15.1
ERJ	0.0	0.0	0.1	0.1	0.1	0.2	+0.1	+0.1	+0.1
ERJ170	0.3	0.3	0.7	0.2	0.2	0.4	-0.1	-0.1	-0.3
ERJ190	4.4	4.4	8.8	1.9	1.9	3.8	-2.5	-2.5	-5.0
EXE3	0.5	0.5	1.0	0.4	0.5	0.9	0.0	0.0	-0.1
FK10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LTT	12.2	12.2	24.3	2.5	2.5	5.1	-9.6	-9.6	-19.3
MD80	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
STP	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	**656.5**	**656.4**	**1312.9**	**279.6**	**279.7**	**559.4**	**-376.8**	**-376.7**	**-753.6**
							(-57%)	(-57%)	(-57%)

Note: Changes and totals have been calculated *before* rounding.

Table C7 Heathrow 2019 and 2020 6.5-hour night movements by ANCON type

ANCON type	2019 dep.	2019 arrivals	2019 total	2020 dep.	2020 arrivals	2020 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
B738	0.0	0.0	0.0	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	2.0	2.0	0.0	0.0	0.0	0.0	-2.0	-2.0
B748	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
B757P	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	0.9	0.9	0.0	0.0	0.0	0.0	-0.9	-0.9
B772G	0.1	0.6	0.7	0.0	0.2	0.2	-0.1	-0.4	-0.5
B772P	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B772R	0.1	0.1	0.1	0.0	0.2	0.3	-0.1	+0.2	+0.1
B773G	0.3	2.9	3.1	0.0	1.6	1.6	-0.2	-1.3	-1.5
B788	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0
B789	0.1	3.2	3.3	0.0	1.0	1.0	-0.1	-2.2	-2.3
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	0.1	0.1	0.0	0.0	0.0	0.0	-0.1	-0.1
EA320C	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	-0.1
EA320NEO	0.0	0.1	0.1	0.0	0.0	0.0	0.0	-0.1	-0.1
EA320V	0.0	0.3	0.3	0.0	0.0	0.0	0.0	-0.3	-0.3
EA321C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EA321NEO	0.0	0.1	0.1	0.0	0.0	0.0	0.0	-0.1	-0.1
EA321V	0.1	0.1	0.2	0.0	0.0	0.0	-0.1	-0.1	-0.2
EA33	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	0.0	0.1	0.1	0.0	0.9	0.9	0.0	+0.8	+0.8
EA359	0.1	0.8	0.8	0.0	0.9	0.9	0.0	+0.1	0.0
EA38GP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EA38R	0.0	3.4	3.4	0.0	0.0	0.0	0.0	-3.4	-3.4
ERJ190	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EXE3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

ANCON type	2019 dep.	2019 arrivals	2019 total	2020 dep.	2020 arrivals	2020 total	Change dep.	Change arrivals	Change total
STP	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	**1.1**	**14.8**	**15.9**	**0.1**	**4.9**	**5.0**	**-1.0**	**-9.9**	**-10.9**
							(-89%)	(-67%)	(-68%)

Note: Changes and totals have been calculated *before* rounding.

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%
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%

Table C8-b Heathrow $L_{evening}$ W-E departure and arrival runway modal splits by year

Year	West dep.	East dep.	West arrivals	East arrivals
2006	71%	29%	72%	28%
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%

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%
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%

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%
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%

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%
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%

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
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
CRJ	Bombardier CRJ100/200 series

ANCON type	Description
CRJ700	Bombardier CRJ700 series
CRJ900	Bombardier CRJ900 series
DC10	McDonnell Douglas DC-10
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
L4P	Large four-engine propeller
LTT	Large twin-turboprop

ANCON type	Description
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)
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 (0700-2300 local time).
$L_{Aeq,6.5h}$	Equivalent sound level of aircraft noise in dBA for the average 6.5-hour night quota period (2330-0600 local time).
$L_{Aeq,8h}$	Equivalent sound level of aircraft noise in dBA for the average 8-hour night period (2300-0700 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 (0700-1900 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 (1900-2300 local time).
L_{night}	Equivalent sound level of aircraft noise in dBA for the annual average 8-hour night period (2300-0700 local time).
NTK	Noise and Track Keeping monitoring system.
SEL	Sound Exposure Level in dBA.
SoNA	Survey of Noise Attitudes