

Guidance Note for Heathrow Airport 2016 Noise Action Plan Contours and 2016 Summer Contours

The guide is provided to assist the reader of the report: *Heathrow Airport 2016 Summer Noise Contours and Noise Action Plan Contours* (ERCD Report 1701). The report presents the 2016 noise exposure contours that were generated by the Environmental Research and Consultancy Department (ERCD) of the Civil Aviation Authority (CAA).

A layout of the main noise-data figures and tables is provided further below. For a glossary of terms see Page 164 of the report.

Headlines

- This report covers Summer Leq contours and annual Noise Action Plan contours for 2016, as well as a broad range of supplementary metrics, some for the first time, including overflight track density diagrams and single mode contours. Much of this content was developed in response to community requests resulting in the most comprehensive noise contour report ever produced by Heathrow.
- The Leq 16hr 57dBA area was 101.5 km² (p. 22), the smallest area since tracking started in 1974. Similarly, the 2016 Lden 55dBA had an area of 198 km², 19% smaller than in 2006, the first year of Environmental Noise Directive mapping (p. 158).
- Summer night contours in 2016 were approximately 5% larger in area than in 2015 (p. 26). This increase was due to storm disruption in June that caused flight delays and around 140 late running departures that month.

Scope of Report

The report brings together two formerly-separate reports:

- The 2016 average summer 16-hour day and 8-hour night Leq contours. The 16-hour day contours have been reported at Heathrow since 1974.
- The 2016 Strategic Noise Mapping contours (L_{day} , $L_{evening}$, L_{night} , and L_{den}) are required for the EU Environmental Noise Directive (END) and the update of the Heathrow Noise Action Plan (NAP) for the period 2019-2023. The old and the current NAP were based on 2006 and 2011 noise mapping, respectively. Although only required every 5 years, Heathrow has reported these contours every year since 2009. The $L_{6.5hr\ night}$ are used by Government for reviewing night restrictions.

The report includes analysis of a wide range of supplementary metrics – some reported in previous years, some presented here for the first time. A full list of the figures and tables in the report is contained in the tables at the end of this reader's guide.

- Trends in contour area, houses and population since 2006 (p. 89-93).
- Change diagrams (L_{den} and L_{night} , day N65 and N70, and night N60) showing changes between two different years (2016 / 2015 and 2016 /2006) (~p. 97-116).
- Overflight contours (average summer day and night) (p. 29, 68, 70, 72 and 80)
- Track density diagrams (2016, 2015 and 2006, average summer day and night, with 2 different angles of view) (~p. 69-83)
- Westerly and Easterly Single mode contours – summer $L_{day\ 16hr}$ and $L_{night\ 8hr}$, whole year L_{night} and N70 (16hr day), 2016 and 2006. (p. 24-28, 63-67, 103-113)
- Pie charts of the route distributions – arrival and departure for L_{den} and L_{night} periods for the years 2006 through 2016. (p. 141)

Key Points to Note

2016 Summer Day and Night levels

- The summer day actual Leq 57 dBA contour area was 101.5 km²; this is the smallest area since this metric started to be tracked in 1974.
- The summer night contours for 2016 were about 5% larger than for 2015 due to a 6% increase in night time movements. This was the result of stormy weather in June 2016 causing a spike of 140 late running departures that month.

2016 Strategic Noise Maps

- The EU Environmental Noise Directive (END) requires that Heathrow produces strategic noise maps every 5 years. This was done in 2006 and 2011, and now in 2016. These L_{day}, L_{evening}, L_{night} and L_{den} contours will be the basis for developing Heathrow's third Noise Action Plan for 2019-2023.
- To better track progress, Heathrow has produced these contours every year since 2009.

2016 compared with 2015

- Total annual aircraft movements in 2016 were 0.24% higher than in 2015 (p. 16). While evening flights decreased 0.3%, night flights increased 2.6% (p. 124-127).
- The areas of the 2016 L_{den} contours were typically 0 to 3% less than for 2015. This can be attributed to increases in the numbers of quieter, newer aircraft such as A380 and B787. (p. 35)
- The percentage figures for reductions in population and households within the contours were generally more than the area reductions. (Table 15 p. 35)

Trends, changes and wind effects.

- Many figures compare individual years such as 2016 and 2015 or 2016 and 2006. To understand the patterns of change over the past decade, look at the trends plots in Figures B19 – B23 (p. 89-93). Also see the discussion on p. 37-38.
- Over the decade, despite up to around 20% reductions in contour area, changes in population and households within contours were much smaller, around 8% or less or sometimes actual increases. This was due to the increase of new households in noise affected areas. See Table C19 and Figure B24 on Pages 158 and 94.
- Wind predominance and the resulting westerly-easterly (W-E) modal usage can impact the area, population and houses within the contours. North-south (N-S) runway splits can also skew the results. These effects can be compensated for in the noise change maps by re-calculating contours from different years using the same N-S and W-E modal split (e.g. see p. 94-95).
- Change diagrams show the differences in a noise metric between two sample years. For example, Figure B26 (p. 96) compares the L_{den} in 2016 and 2006 (see discussion on p. 42) and indicates that approximately 95% of the area is quieter than in 2006. This should not be interpreted as necessarily indicating a linear trend.
- Tables C8a through B8i contain the route distributions for arrivals and departures for the years 2006 and 2009-2016. This information is displayed graphically in pie charts on Page 141. Arrivals are presented for the L_{den} and L_{night} periods show the proportions on each of the four runway options namely, 09L, 09R, 27L and 27R. Departures are further divided by westerly (09L/09R) and easterly operations (27L/27R) and show the proportion of flights using the 6 SIDs – BPK, BUZ, CPT, DET, MID and SAM.
- The CAA uses the CACI population database which is slightly different to the Office of National Statistics (June 2015) data used by DEFRA for the EU END reporting (which includes road and rail noise). (See p. 30 and 158).

Figures and Tables	Noise Metrics								
	Year and Information	Leq 16hr summer day				Leq 8hr summer night			
West-east runway usage		Actual 86/14	Standard 79/21	Westerly 100/0	Easterly 0/100	Actual 85/15	Standard 79/21	Westerly 100/0	Easterly 0/100
2016 and 2015: Contours	Figures	B3 p. 61	B4 p. 62			B7 p. 65			
2016 and 2006: Contours	Figures			B5 p. 63	B6 p. 64			B8 p. 66	B9 p. 67
2016 and 2015: area, population, houses (cumulative)	Tables:	5 p. 22	6 p. 23			9 p. 26			
2016 and 2006: area, population, houses (cumulative)	Tables:			7 p. 24	8 p.25			10 p. 27	11 p. 28
2016 and 2015: Overflights Contours (48.5 deg)	Figures	B10 p. 68				B12 p. 70			
Overflight track density diagrams (2006, 2015, 2016) 48.5 deg	Figures	B10a-c p. 69-71				B12a-c p. 77-79			
2016 and 2015: Overflights Contours (60 deg)	Figures	B11 p. 72				B13 p. 80			
Overflight track density diagrams (2006, 2015, 2016) 60 deg	Figures	B11a-c p. 73-75				B13a-c p. 81-83			

Year and Information		Annual Route Distribution
2006 - 2016	Table C8	p. 132 - 140
	Pie Charts	p. 141

Noise Action Plan Contours and Supplementary Metrics – Whole calendar year										
Year and Information		L _{day} 07-19h	Levening 19-23h	L _{night} 23-07h	L _{den}	L _{den} 2006 N/S & W/E (70/30)	L _{6.5hrs} night	N65 16h day	N70 16h day	N60 8h night
<u>2016 and 2015:</u> Contours	Figures:	B14 p. 84	B15 p. 85	B16 p. 86	B17 p. 87		B18 p. 88			
2016 and 2015: area, population, houses	Tables:	12 p. 31	13 p. 33	14 p. 34	15 p. 35		16 p. 36			
2016 and 2015: area, population, houses (cumulative)	Tables:	C11 p. 154	C12 p. 154	C13 p. 154	C14 p. 155		C15 p. 155			
Change in levels between 2016 and 2015	Figures:			B31 p. 101	B28 (^{'15} 72/28) p. 98			B36 p. 106	B41 p. 111	B46 p. 116
<u>2016 and 2006:</u> Contours	Figures:			B29 p. 99	B24 p. 94	B25 p. 95		B34 p. 104	B37 p. 107	B44 p. 114
2016 and 2006: area, population, houses (cumulative)	Tables:	C16 p. 156	C17 p. 156	C18 p. 157	C19 p. 158	C21 p. 160	C20 p. 159	20 p. 46	21 p. 48	25 p. 51
Change in levels between 2016 and 2006	Figures:			B30 (72/28) p. 100	B26 (70/30) p. 96	B27 p. 97		B35 p. 105	B39 p. 109	B45 p. 115
2006 and '09-'16 Trends: area, population, houses	Figures:	B19 p. 89	B20 p. 90	B21 p. 91	B22 p. 92		B23 p. 93			



Year and Information		L _{night} 23-07h					N70 16h day			
		Actual splits	2006 night split (72/28%)	2015 night split (66/31%)	Westerly 100/0	Easterly 0/100	Actual splits	2006 Day split 70/30	Westerly 100/0	Easterly 0/100
2016 and 2006: Contours	Figures:	B29 p. 99			B32 p. 102	B33 p. 103	B37 p. 107	B38 p. 108	B42 p. 112	B43 p. 113
2016 and 2006: area, population, houses (cumulative)	Tables:	C18 p. 157			18 p. 45	19 p. 45	21 p. 48	22 p. 48	23 p. 50	24 p. 50
Change in levels bet 2016 and 2006	Figures:		B30 p. 100				B39 p. 109	B40 p. 110		
Change in levels bet 2016 and 2015	Figures:			B31 p. 101			B41 p. 111			