Heathrow

EASTERLY ALTERNATION INFRASTRUCTURE PROJECT

Environmental Impact Assessment
Environmental Statement, Volume III
Appendix 7.3: Noise and Vibration Baseline Conditions

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October 2024

Heathrow

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1. Introduction

1.1.1 This Appendix supports the noise and vibration assessments presented in **Chapter 7: Noise and Vibration, Volume II** of the Environmental Statement.

1.1.2 This appendix presents the baseline conditions, pertinent to the Proposed Development in respect of the following noise sources:

- construction noise;
- operational aircraft 'air' noise - noise from aircraft on the runway and in the landing and take-off (LTO) cycle; and,
- operational aircraft 'ground' noise - noise from aircraft operating on the ground i.e. whilst at stand, holding or traversing the airfield.

1.1.3 Future baseline conditions have also been calculated and are presented, where appropriate, in the following appendices:

- **Appendix 7.5: Air Noise, Volume III** of the Environmental Statement; and
- **Appendix 7.6: Ground Noise, Volume III** of the Environmental Statement.

1.1.4 In respect of noise and vibration, baseline conditions can be relatively dynamic over the short term (diurnally and from day to day), and also subject to longer term trends. Baseline conditions are therefore necessarily defined temporally and spatially, requiring a definition of assessment years and study areas, respectively.

1.1.5 A different spatial scope is adopted for each of the noise sources assessed, sufficient to identify potentially significant noise effects. Whilst the aircraft 'air' noise and 'ground' noise are considered separately for the purposes of mitigation design, the two are combined for the purposes of assessment, in areas where combination of both is appreciable.

1.1.6 The temporal scope for the assessment of construction noise is anticipated to be (approximately):

- Summer 2025 – Summer 2027.

1.1.7 The temporal scope for the assessment of operational noise is:

- Baseline year – 2019; and
- Assessment year – 2028.

1.1.8 A baseline year of 2019 has been adopted representing the final calendar year of normal airport operations before the COVID-19 global pandemic. This approach has been adopted by a number of airport Environmental Statements (ES) and also supported by Defra

Guidance[1] in respect of preparation of Noise Action Plans (NAPs). In 2019 there were just under 478,000 aircraft movements at the Airport handling around 80.9 million passengers.

1.1.9 In respect of the assessment year of 2028, based upon the scoping response, the operational noise modelling reflects the 480,000 annual movements limit at the Airport, imposed by the Terminal 5 planning permission.

1.1.10 Notably due to the nature of the Proposed Development additional operational assessment years have not been considered necessary. Any future assessment years would only mirror the same patterns of noise change in relative terms albeit with absolute levels of noise exposure reduced due to continued modernisation, and improvements in aircraft noise emissions. Therefore, the adopted assessment year of 2028 is considered to represent a worst case in absolute noise exposure terms.

1.2 Airspace modernisation

1.2.1 Separately from the Proposed Development, Heathrow is sponsoring an Airspace Change Proposal (ACP) for the modernisation of the airspace design at and around Heathrow airport ("the Heathrow ACP")[2]. This is being progressed under the separate regulatory process for approval of changes to the design of UK airspace administered by the Civil Aviation Authority (CAA). The CAA has the statutory function of deciding whether to approve changes to airspace design and has published guidance on this regulatory process in CAP 1616[3].

1.2.2 The Heathrow airspace modernisation ACP was initiated in July 2021 and forms part of a wider programme to redesign and modernise airspace across the South East of England, called the Future Airspace Strategy Implementation (FASI). FASI is a subset of the wider Airspace Modernisation Strategy which is co-sponsored by the Department for Transport and the CAA. The Airspace Modernisation Strategy sets out a strategic plan for modernising UK airspace with the aim of delivering "*quicker, quieter and cleaner journeys and more capacity for the benefit of those who use and are affected by UK airspace*." A single coordinated masterplan for the interdependent Airspace Change Proposals is being created by the Airspace Change Organising Group (ACOG)[4]. The masterplan will identify where airspace changes are required to support the delivery of the Airspace Modernisation Strategy. .

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[1] Department for Environment Food & Rural Affairs (2022). *Guidance for Airport Operators on how to revise Noise Action Plans under the Environmental Noise (England) Regulations 2006 (as amended)*. London: Defra.

[2] Further information can be found at https://www.heathrow.com/company/local-community/noise/airspace-modernisation (Accessed 5 August 2024).

[3] Civil Aviation Authority (2023). *CAP1616: The Process for Changing the Notified Airspace Design.* [online]. Available at: https://www.caa.co.uk/our-work/publications/documents/content/cap1616/ (Accessed 17 July 2024).

[4] ACOG, (n.d.)., 'Airspace Masterplan' Available at: https://www.acog.aero/airspace-masterplan/masterplan/ (Accessed: 02 October 2024)

1.2.3 The Heathrow airspace modernisation ACP involves the redesign of the airspace around Heathrow based on a two runway operation, including the introduction of Performance Based Navigation. The Heathrow airspace modernisation ACP may incorporate changes to flight paths and procedures for Heathrow as a whole, including its operation during easterly operations.

1.2.4 The Heathrow airspace modernisation ACP is at an early stage of the CAP 1616 process with a multitude of early design options for individual components parts of the airspace system still under consideration. Those airspace design options have not yet have been assembled into system-wide options which will need to undergo further appraisal, environmental assessment and public consultation, and are dependent on what other airports and NATS propose as part of their ACPs. Consequently, the outcome of the Heathrow airspace modernisation ACP and the wider FASI modernisation will not be known during the consideration of the planning application for the Proposed Development. As the proposals for the Heathrow airspace modernisation ACP develop, they will be subject to their own process of consultation and environmental assessment as detailed in CAP 1616.

1.2.5 Therefore, whilst long term future airspace may change, recognising the significant uncertainties about what the future airspace design might be, the Environmental Impact Assessment is based on the existing airspace design which is already established for the purposes of easterly operations. The current airspace design provides a good representation of airspace for the purposes of assessing the effects of easterly alternation.

1.2.6 Heathrow will follow the necessary regulatory process to demonstrate the impact of increased use of Runway 09L (northern runway) for departures and Runway 09R (southern runway) for arrivals during easterly alternation within the current notified airspace. In other words, the existing flight paths would not change as a result of easterly alternation, and therefore provide a reliable basis for the environmental assessment which accompanies this planning application.

1.3 Factors influencing existing baseline noise exposure

1.3.1 As a result of its operation, airport related development and access to major transport modes, existing receptors in the area are currently exposed to varying levels of noise from the following sources:

- Aircraft ‘air’ noise – including noise produced by aircraft operations on the runway and in the landing and take-off cycle (LTO), caused by airflow around the aircraft fuselage and wings as well as from the aircraft engines;
- Aircraft ‘ground’ noise – including aircraft taxiing to and from stand and runway, aircraft holding (where aircraft are stationary at designated hold points or intersections, including following pushback) and aircraft emissions at stand (including the running of Auxiliary Power Units (APUs)[5]; and

[5] Aircraft ‘ground’ noise also includes engine testing, mobile ground power units (GPU), ground vehicles used at the airport and fixed plant and equipment airside including at the terminal buildings. These sources

- Surface access transport noise (road and rail).

1.3.2 The existing airfield operations at Heathrow Airport are described in **Section 2** including air traffic movements, easterly/westerly modal split, historic noise contours and the evolution of noise mitigation and management at Heathrow.

1.3.3 The construction noise baseline is described in **Section 3** with reference to existing air noise, road traffic noise and measured baseline noise levels within the construction noise study area.

1.3.4 **Section 4** describes the aircraft 'air' noise baseline and outlines the approach to establishing the future baseline.

1.3.5 Finally, **Section 5** describes the aircraft 'ground' noise baseline and outlines the approach to establishing the future baseline.

1.4 Baseline noise management and mitigation measures

1.4.1 A range of noise management and mitigation measures are in place at Heathrow Airport and are inherent in day-to-day operations at the airport. These measures range from encouraging the use of quieter planes, quieter operating procedures, operating restrictions, land-use planning and noise insulation schemes, and community and stakeholder engagement.

1.4.2 Since 2006, under the Environmental Noise (England) Regulations (as amended), Heathrow has, every five-years, prepared a Noise Action Plan which sets out the noise mitigation measures currently implemented at the airport and new actions that will be introduced or developed to help manage and mitigate aircraft noise.

1.4.3 A brief overview of the current noise mitigation measures is provided in Section 2.5 with more detail provided in **Appendix 7.2: Noise Management and Mitigation at Heathrow Airport, Volume III** of the Environmental Statement, the 2019 to 2023 Heathrow Noise Action Plan[6] and the Heathrow Noise Action Plan 2024 - 2028[7].

1.4.4 Where appropriate, embedded mitigation associated with the Proposed Development are discussed in the **Chapter 7: Noise and Vibration, Volume II** of the Environmental Statement and relevant Appendices (**Volume III** of the Environmental Statement).

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of aircraft 'ground' noise will not be affected by the Proposed Development and therefore have not been included in the assessment.

[6] Heathrow Airport Limited (2019). *Heathrow Noise Action Plan 2019-2023.* [online] Available at: https://www.heathrow.com/company/local-community/noise/making-heathrow-quieter/noise-action-plan (Accessed 23 July 2024).

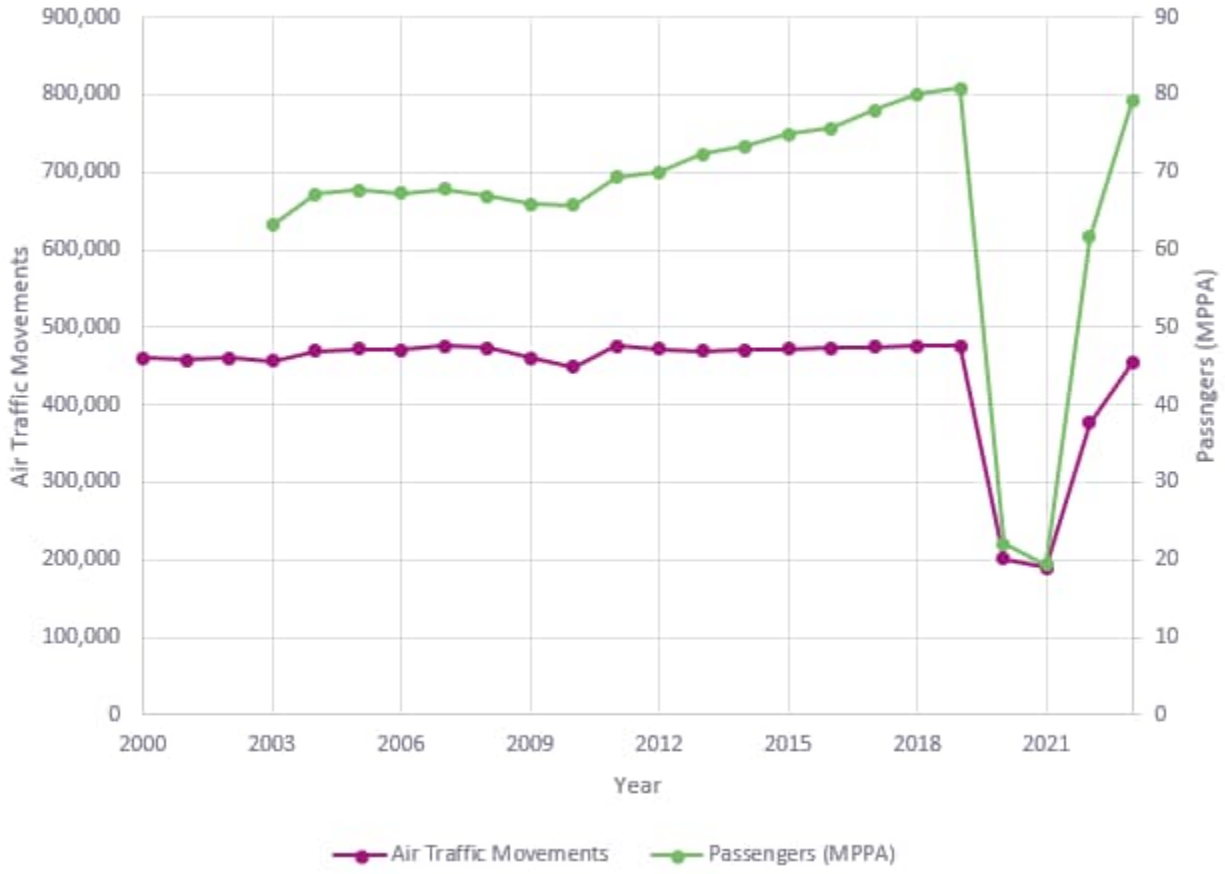
[7] Heathrow Airport Limited (2024). *About the Noise Action Plan 2024 – 2028.* [online] Available at: https://www.heathrow.com/company/about-heathrow/consultation/heathrow-noise-action-plan-consultation/About-the-Noise-Action-Plan-2023-2028 (Accessed 5 August 2028).

2. General Baseline

2.1 Air traffic movements and passengers

2.1.1 **Graphic A7.3.1** presents a chart of aircraft movements and passenger number over time. It can be seen that aircraft movements have remained reasonably consistent in relation to 480,000 annual movements limit at the Airport. Notably passenger numbers have increased over time, due to higher load factors (the percentage of available seating capacity that has been filled with passengers) and aircraft with higher seating capacity. The effects of the COVID-19 global pandemic on air traffic movements and passenger travel can be seen in 2020 and 2021.

Graphic A7.3.1 Chart of air traffic movements and passengers over time



Sources: Air traffic movement data[8]; passenger data[9]

2.2 Quota count

2.2.1 The Quota Count (QC) system was introduced at Heathrow Airport in 1993[10] and comprises a count of aircraft movements against a noise quota in respect of limiting noise impacts from night flights (between 23:00 and 06:00). QC classifications are based on the ICAO certified noise levels with newer quieter aircraft given a lower rating than older, noisier aircraft. At Heathrow, there is a QC limit along with a movement limit for night flying.

2.2.2 Older, noisier aircraft will use a larger proportion of the QC limit than newer quieter aircraft, therefore incentivising the scheduling of quieter aircraft at night. Additionally, the tightening of the QC rules has resulted in an effective ban on some older, noisier aircraft at night. The combination of the QC limit and movements limit encourages the use of the quietest aircraft whilst limiting the total number of flights allowed.

2.2.3 At Heathrow, the current movement limit is 3,250 in the summer season and 2,550 in the winter season. Up to 10% of the limit can be carried over to the following season under specific circumstances. There is often carry over from summer into winter, but rarely carry over from winter into summer. Likewise, up to 10% of the following season's limit can be anticipated in the event of an overrun.

2.2.4 **Graphic A7.3.2** and **Graphic A7.3.3** present the summer and winter movement limits[11], respectively. The winter movement limits include carry over from the summer period, where this information is available.

2.2.5 **Graphic A7.3.4** and **Graphic A7.3.5** present the summer and winter quota count limits, respectively. The winter quota count limits include carry over from the summer period. Notably QC categories were expanded to include QC 0.25 and 0.125 in 2007 and 2018, respectively. From winter 2019, the quota counts were reduced.

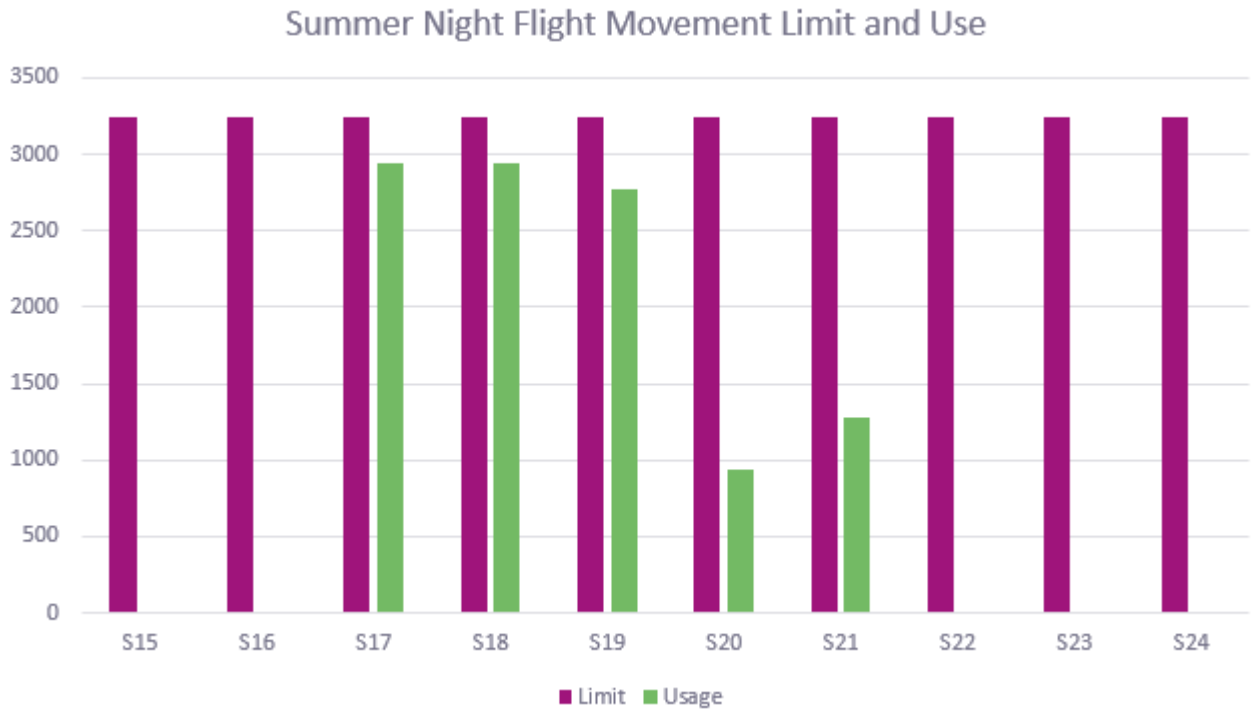
[8] *Heathrow Noise and Airspace Operational Data.* [online] Available at: https://www.heathrow.com/company/local-community/noise/data/operational-data (Accessed 6 August 2024).

[9] *Heathrow Investor Centre Traffic Statistics* [online]. Available at: https://www.heathrow.com/company/investor-centre/reports/traffic-statistics (Accessed 6 August 2024).

[10] Further information on Night Flights and the Quota Count system can be found at: https://www.heathrow.com/company/local-community/noise/operations/night-flights (Accessed 7 August 2024).

[11] The summer season runs from the last Sunday in March until the last Sunday in October. The winter season runs from the last Sunday in October until the last Sunday in March.

Graphic A7.3.2 Summer night flight movement limit



Sources: Limits[12,13,14]; Usage data[15]

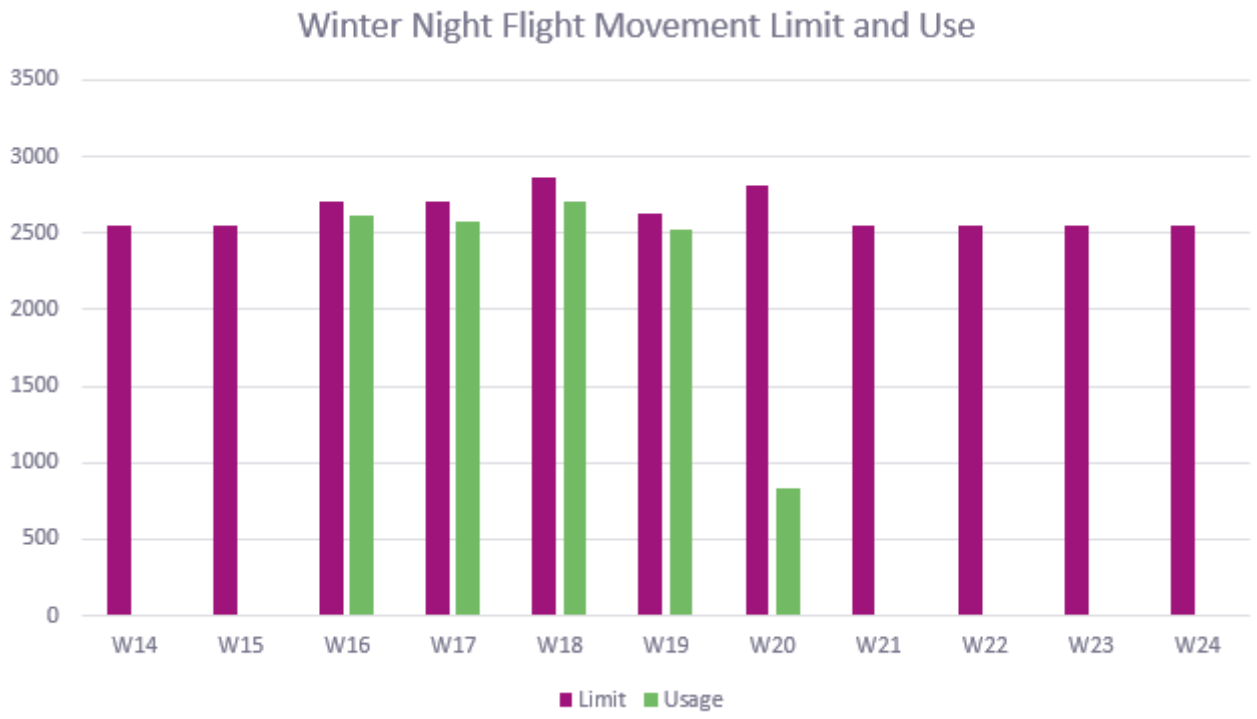
[12] Department for Transport (2017). *Night flight restrictions at Heathrow, Gatwick and Stansted – Decision Document.* [online] Available at: https://assets.publishing.service.gov.uk/media/5a81d891ed915d74e34005e7/night-flight-restrictions-at-heathrow-gatwick-and-stansted-decision-document.pdf (Accessed 6 August 2024).

[13] Department for Transport (2021). *Night Flight Restrictions at Heathrow, Gatwick and Stansted – Decision Document.* [online] Available at: https://assets.publishing.service.gov.uk/media/60f6b8dcd3bf7f568dc8a594/night-flight-restrictions-at-heathrow-gatwick-and-stansted-decision-document.pdf (Accessed 6 August 2024).

[14] Department for Transport (2024). *Night flight restrictions: Heathrow, Gatwick and Stansted airports from October 2025 (Closed consultation).* [online] Available at: https://www.gov.uk/government/consultations/night-flight-restrictions-heathrow-gatwick-and-stansted-airports-from-october-2025/night-flight-restrictions-heathrow-gatwick-and-stansted-airports-from-october-2025 (Accessed 6 August 2024).

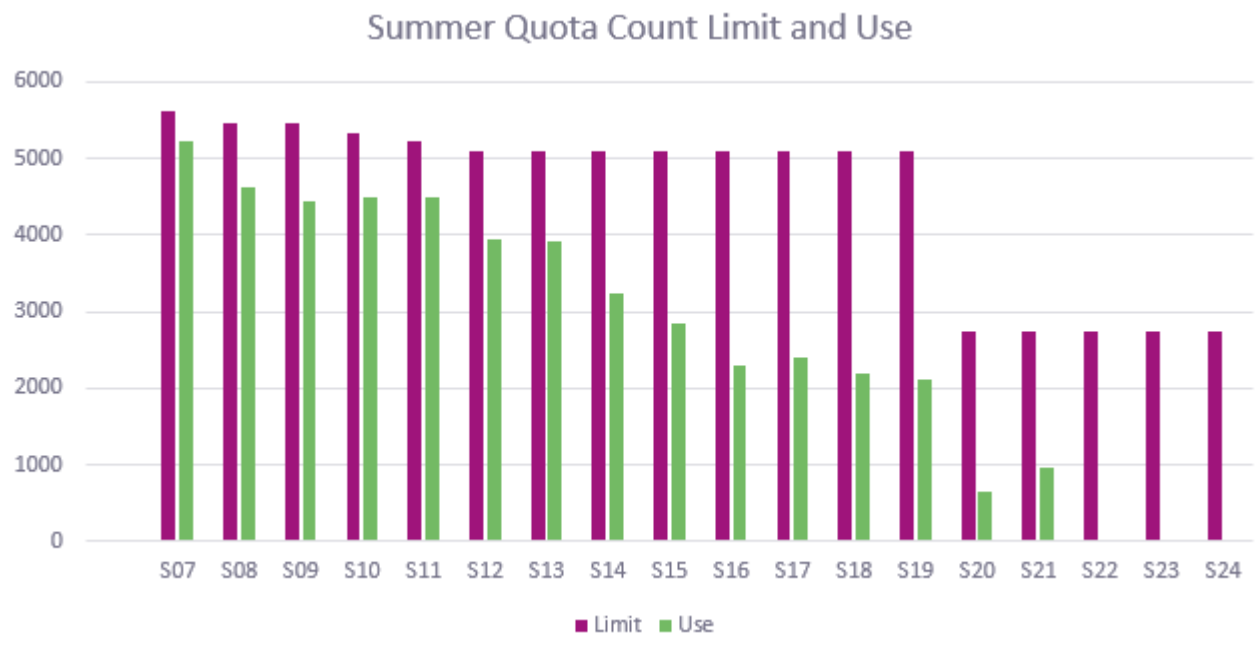
[15] Heathrow Airport Limited (2021). Airspace Noise and ATM Performance Annual Report 2021. [online] Available at: https://www.heathrow.com/content/dam/heathrow/web/common/documents/company/local-community/noise/reports-and-statistics/reports/airspace-and-noise-performance-reports/annual-reports/Heathrow_ANATMT_Annual_Report_2021.pdf (Accessed 6 August 2024).

Graphic A7.3.3: Winter night flight movement limit



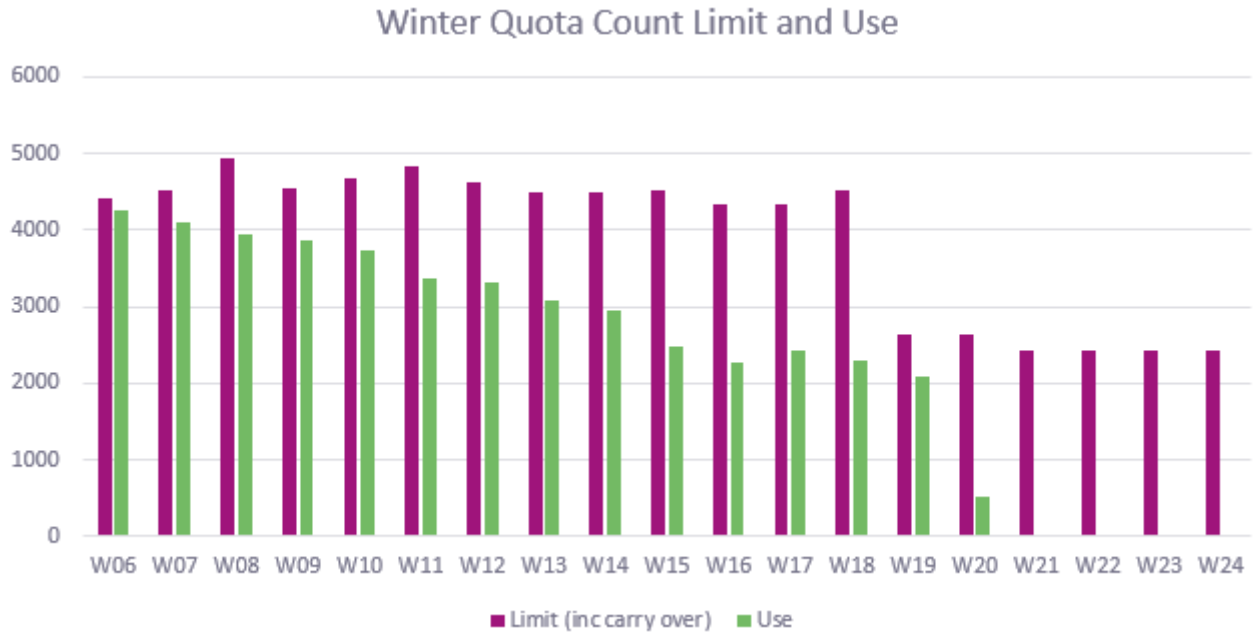
Sources: Limits[12,13,14]; Usage Data[15]

Graphic A7.3.4: Summer quota count limit



Sources: 2007 to 2017 limits and usage[16]; 2017 to 2021 limits and usage[15]; 2022 to 2024 limits[13]

Graphic A7.3.5: Winter quota count limit



Sources: 2007 to 2017 limits and usage[16]; 2017 to 2021 limits and usage[15]; 2022 to 2024 limits[13]

2.2.6 Whilst movements have remained relatively stable, the QC usage has dropped such that the QC limits have been reduced in response. The QC per movement has been decreasing over time and is likely to continue in this manner with incentives in place at Heathrow to encourage to the progressive adoption of quieter planes by airlines.

2.3 Runway modal split

2.3.1 To maximise lift, aircraft aim to take off and land into a headwind. However, the wind direction is variable and will influence which runway is used. Heathrow operates a westerly preference which reflects the prevailing wind conditions in the UK as well as a preference to continue westerly operations even in light easterly wind conditions. Over a period of time, the ratio of westerly and easterly operations is referred to as the runway modal split.

2.3.2 'Actual modal split' reflects the actual runway usage over the relevant time period for a given year. 'Standard modal split' is the long-term modal split calculated from rolling average. This is usually 10 – 20 years.

[16] Heathrow Airport Limited (2018). *The Quiet Night Charter 2018.* [online] Available at: https://www.heathrow.com/content/dam/heathrow/web/common/documents/company/local-community/noise/reports-and-statistics/reports/other-reports/The%20Quiet%20Night%20Charter%202018.pdf (Accessed 6 August 2024).

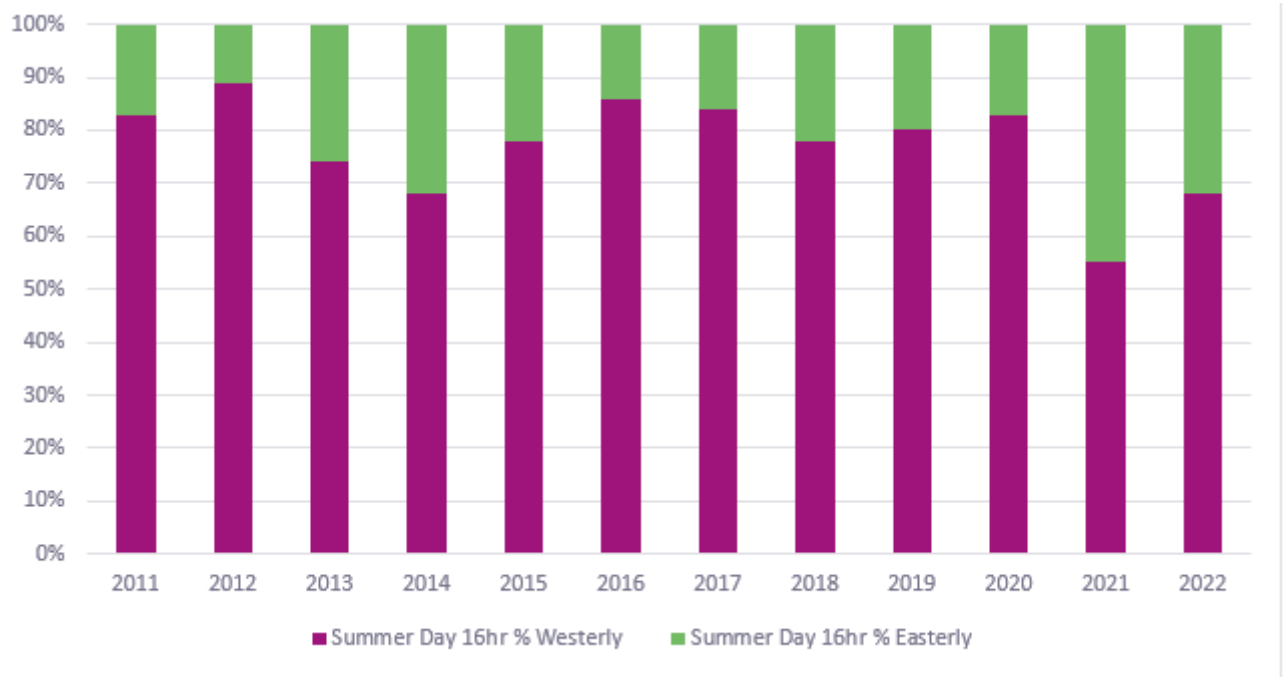
2.3.3 **Graphic A7.3.6** and **Graphic A7.3.7** present the changing actual modal split between easterly and westerly aircraft movements over time, on an annual (24-hour) basis and for the 92-day (16-hour) summer period. Notably at night, the modal split can be different to the daytime.

Graphic A7.3.6 Easterly/Westerly modal split over time (annual)

Source: Various Heathrow Airport Summer Noise Contours and Noise Action Plan Contours[17]

[17] *Heathrow Airport Summer Noise Contours and Noise Action Plan Contours.* [online] Available at: https://www.heathrow.com/company/local-community/noise/data/reports (Accessed 6 August 2024).

Graphic A7.3.7 Easterly/Westerly modal split over time (92-day summer period)



Source: Various Heathrow Airport Summer Noise Contours and Noise Action Plan Contours[17]

2.3.4 The modal split demonstrates a greater proportion of westerly operations over easterly operations. This means that more aircraft arrive at Heathrow from the east, over London, and depart from Heathrow to the west of the airport. Consequently, noise exposure and noise contours are not symmetrical. Importantly the population density to the east of the Airport is higher than to the west.

2.3.5 Noise generated from departing aircraft is generally higher than for arriving aircraft due to the levels of engine thrust required. Departing aircraft climb relatively steeply upon take-off, reducing noise exposure on the ground, whereas arriving aircraft are usually lower for longer.

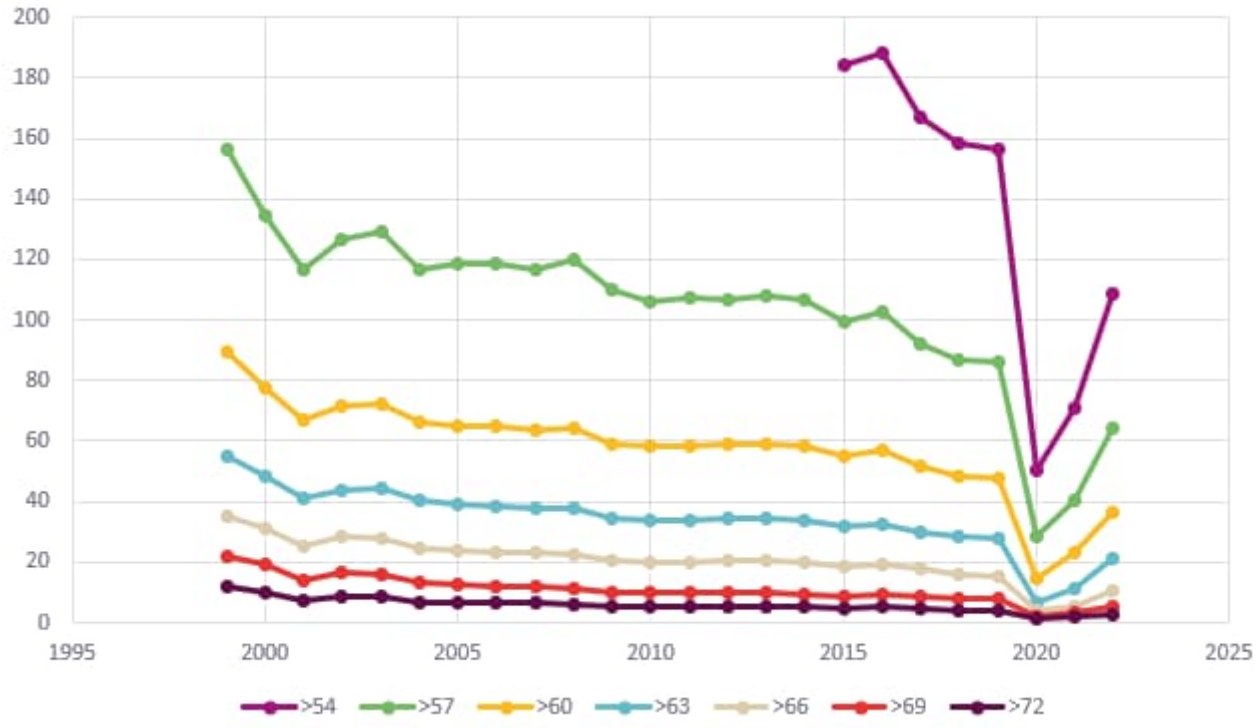
2.3.6 For the purposes of reporting noise exposure, the standard modal split is commonly used to provide consistent comparisons, by accounting for the impact of annual variation in runway usage upon the contour shape.

2.4 Noise contour areas

2.4.1 **Graphic A7.3.8** and **Graphic A7.3.9** present the summer 92-day $L_{Aeq,16hr}$ noise contour areas and summer night $L_{Aeq,8hr}$ noise contour areas over time, respectively.

2.4.2 **Graphic A7.3.10** and **Graphic A7.3.11** present the annual L_{den} noise contour areas and L_{night} noise contour areas over time, respectively.

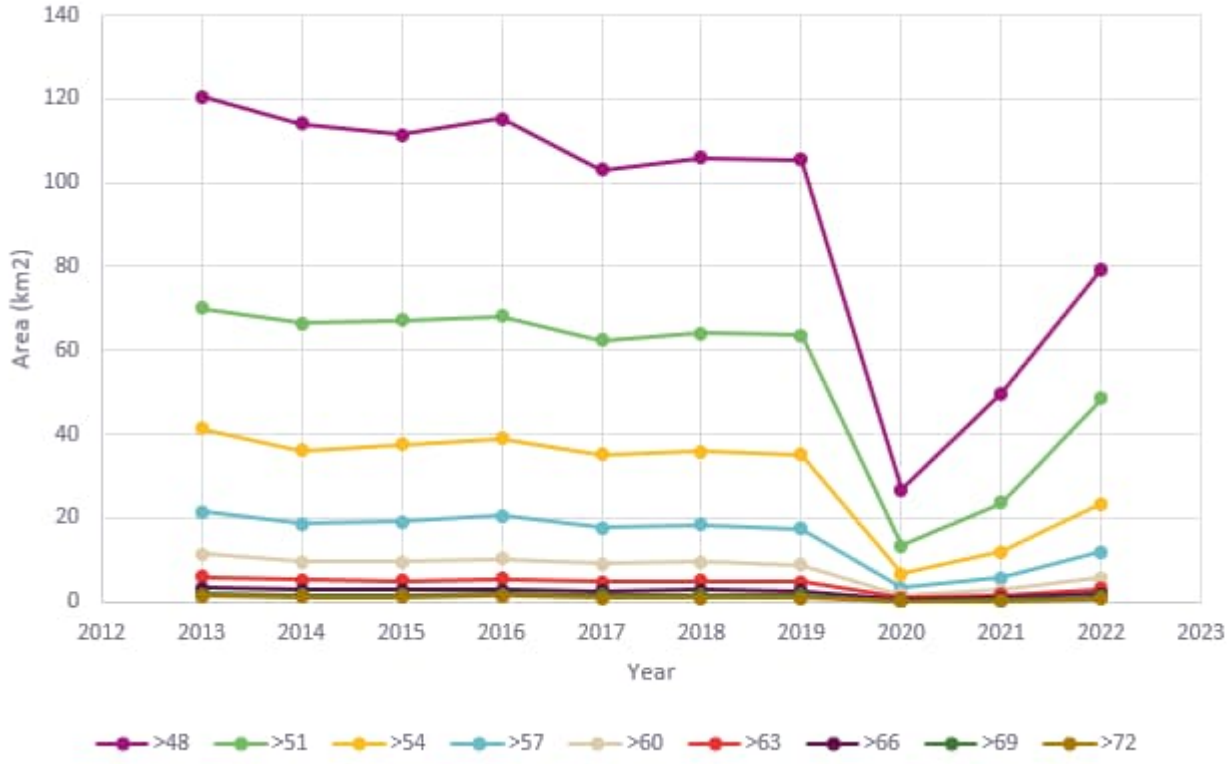
Graphic A7.3.8 Chart of $L_{Aeq,16hr}$ noise contour areas over time (summer day standard modal split)



Sources: Summer Day Contours: 1999 to 2015[18]; 2012 to 2022[17]

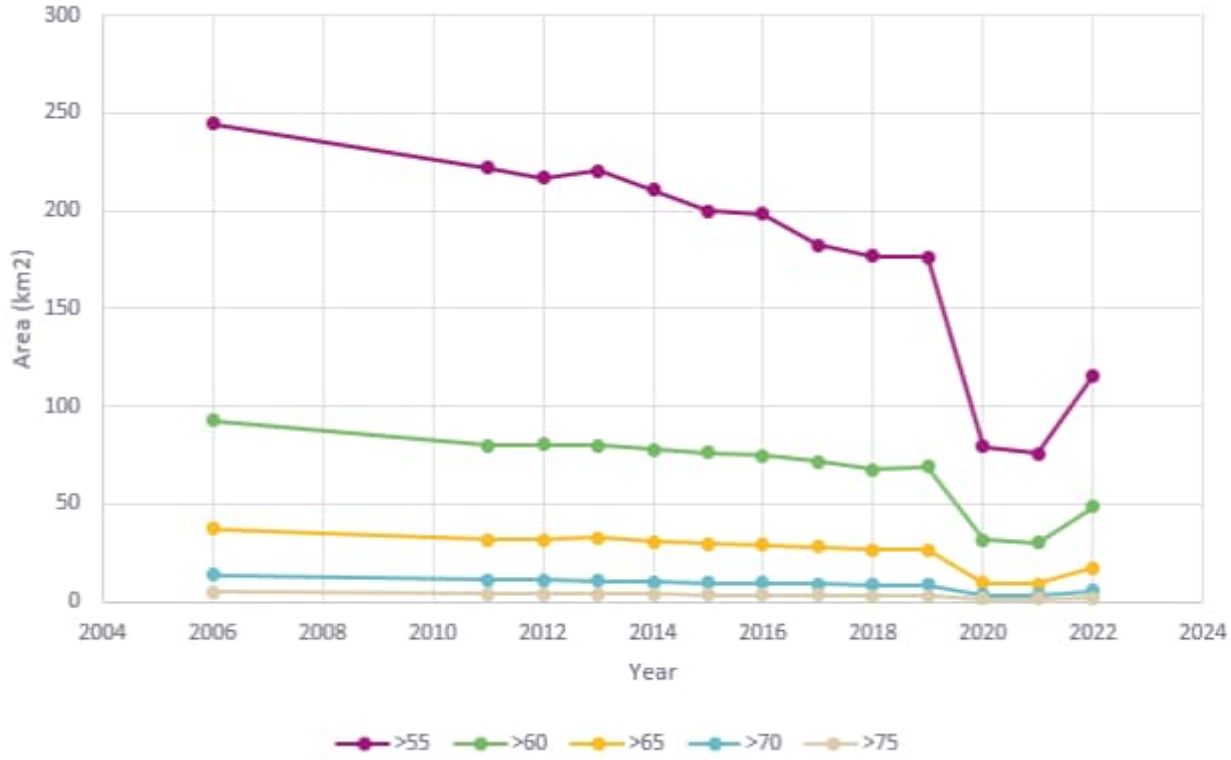
[18] Department for Transport (2017). *Noise exposure contours around London airports.* [online] Available at: https://www.gov.uk/government/publications/noise-exposure-contours-around-london-airports (Accessed 6 August 2024).

Graphic A7.3.9 Chart of $L_{Aeq,8hr}$ noise contour areas over time (summer night standard modal split)



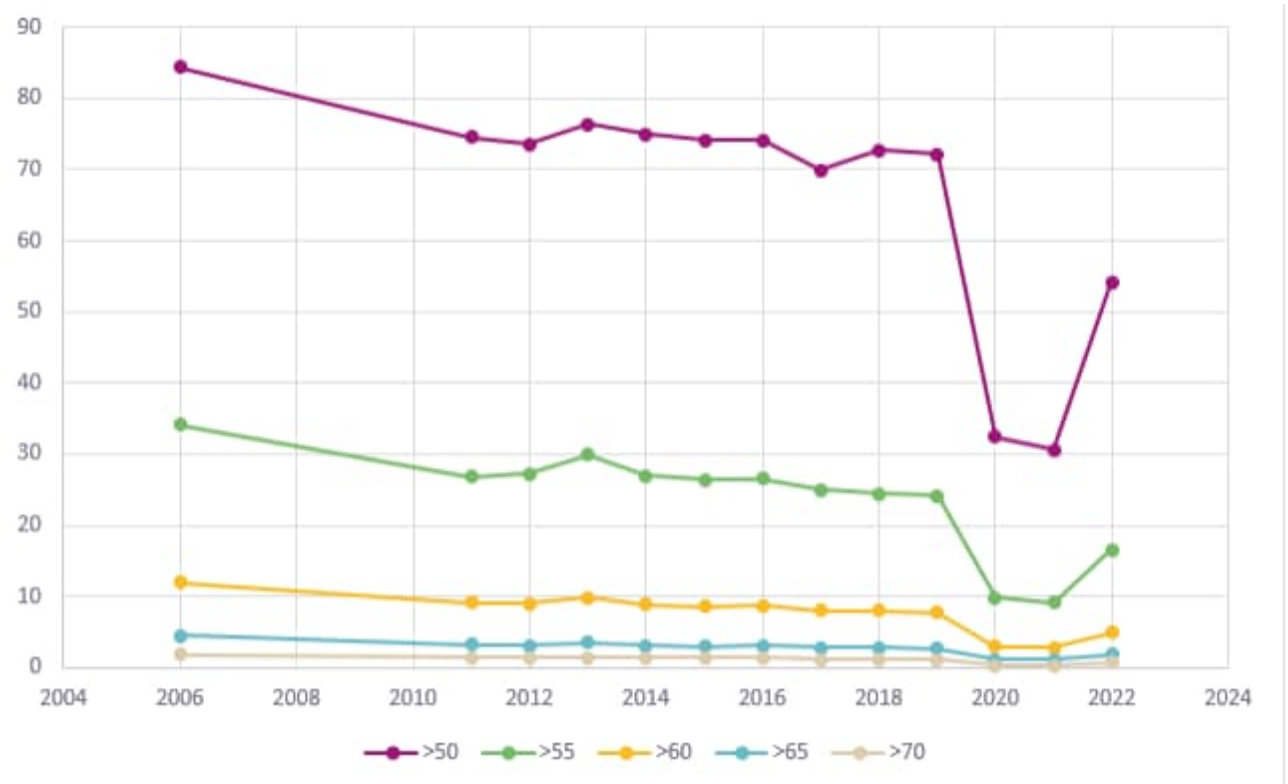
Sources: Summer Night-time Contours: 2013 to 2022[17]

Graphic A7.3.10 Chart of L_{den} noise contours over time (annual actual modal split)



Sources: Noise Action Plan Contours[17]

Graphic A7.3.11 Chart of L_{night} noise contours over time (annual actual modal split)



Sources: Noise Action Plan Contours[17]

2.4.3 The above graphics show that noise contour areas have been reducing over time to 2019. The effect is most pronounced in the 54 and 57 dB $L_{Aeq,16hr}$ and 55 dB L_{den} noise contours. The impact of the COVID-19 global pandemic and the corresponding trend towards recovery can be seen from 2020 onwards.

2.4.4 It can be deduced that the areas immediately around Heathrow were previously exposed to much higher levels of noise than the current (2019) operations generate, as well as some areas further afield which are no longer within certain noise contours.

2.5 Noise mitigation measures

2.5.1 Noise mitigation measures have been in place at Heathrow since the 1950s and have evolved and developed in accordance with regulation, policy, legal agreements and voluntary measures. A complete overview of the noise mitigation and noise management framework in place at Heathrow Airport is provided in **Appendix 7.2: Noise Management and Mitigation at Heathrow Airport** and the Heathrow Noise Action Plan[6]. It provides a summary of the Noise Action Plan for the period 2024 to 2028[7] as well as a description of the latest noise insulation scheme, the Quieter Neighbourhood Scheme which commenced in June 2024.

2.5.2 The Cranford Agreement[19] was an early form of noise mitigation. In the 1950s, Cranford was the nearest and largest centre of population to the runways at Heathrow and aircraft taking off from Heathrow would fly very low over Cranford, exposing the population to the highest levels of aircraft noise.

2.5.3 Since the introduction of the Cranford Agreement, a number of other mitigation measures[20] have been introduced or developed including:

- The introduction of quieter aircraft;
- Reductions in departure noise through changes in aircraft technology and the ability of aircraft to make steeper climbs away from the airport;
- Runway extensions to the west of the airport meaning that aircraft are at higher altitude by the time they fly over Cranford;
- The introduction of westerly and night-time alternation providing respite to the most affected communities;
- Night flight restrictions;

[19] Further information on the Cranford Agreement and Easterly Alternation can be found at: https://www.heathrow.com/company/local-community/noise/operations/easterly-alternation (Accessed 07 August 2024).

[20] Further information on "Our Noise Strategy" can be found at: https://www.heathrow.com/company/local-community/noise/making-heathrow-quieter/our-noise-strategy (Accessed 07 August 2024).

- Noise insulation schemes providing financial support to protect the most affected properties from aircraft noise; and

2.5.4 Additionally, over time, a number of noise barriers have been constructed in key areas around the airfield to address specific issues such as to reduce ground noise. The existing noise barriers are summarised in Section 2 of **Appendix 7.6: Ground Noise, Volume III** of the Environmental Statement.

2.5.5 Since 2001, the ICAO balanced approach[21] to aircraft noise management requires member nations to manage aircraft noise though:

- Reduction at source (quieter aircraft);
- Land-use planning and management;
- Noise abatement operational procedures (optimising how aircraft are flown and the routes they follow to limit the noise impacts); and
- Operating restrictions (preventing certain noisier types of aircraft from flying at certain times or at any time).

[21] International Civil Aviation Organization (n.d.). *Balanced Approach to Aircraft Noise Management.* [online] Available at: https://www.icao.int/environmental-protection/Pages/noise.aspx (Accessed 07 August 2024).

3. Construction Noise and Vibration

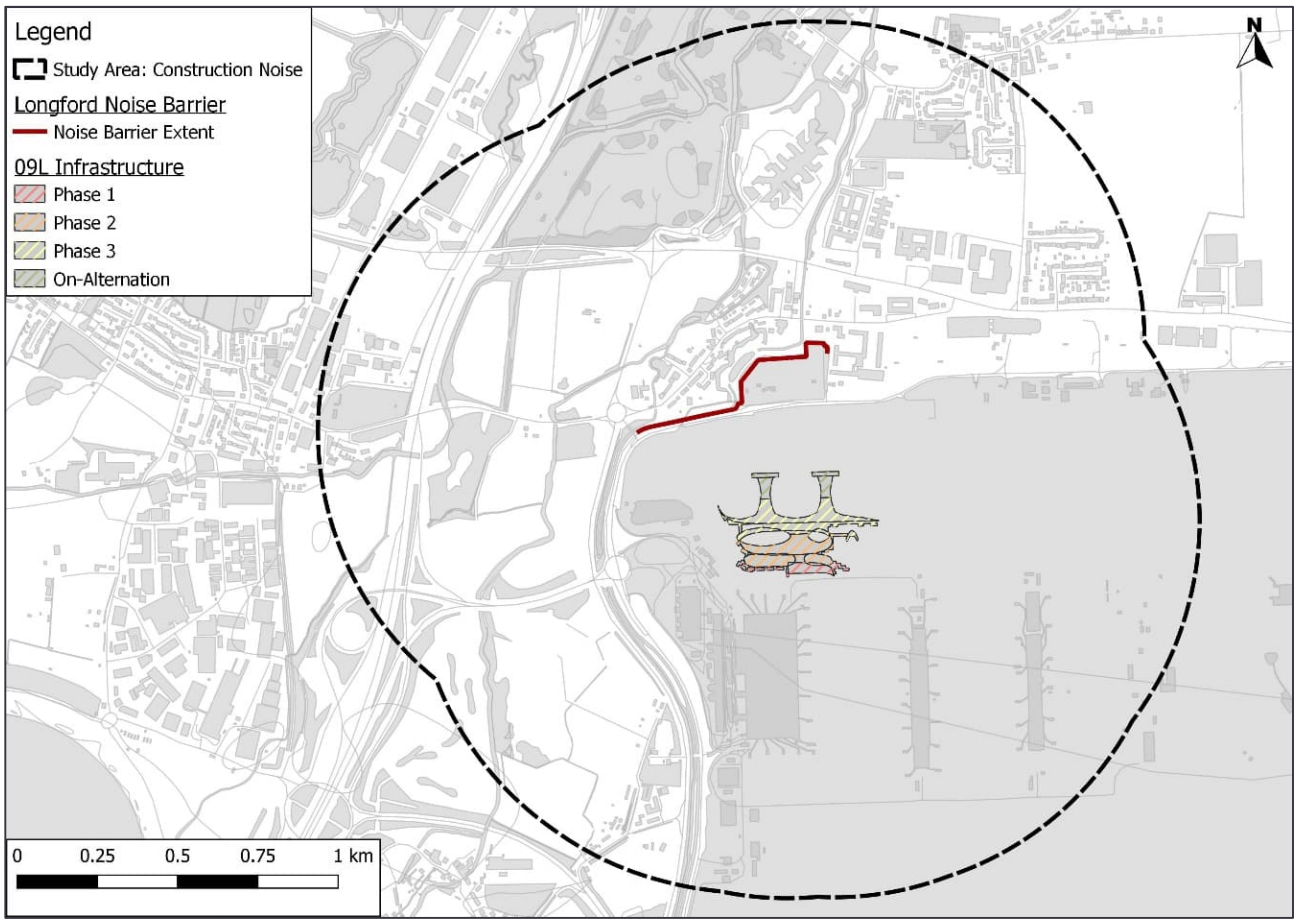
3.1 Spatial scope

3.1.1 The construction noise assessment study areas for the different sources of noise are defined as:

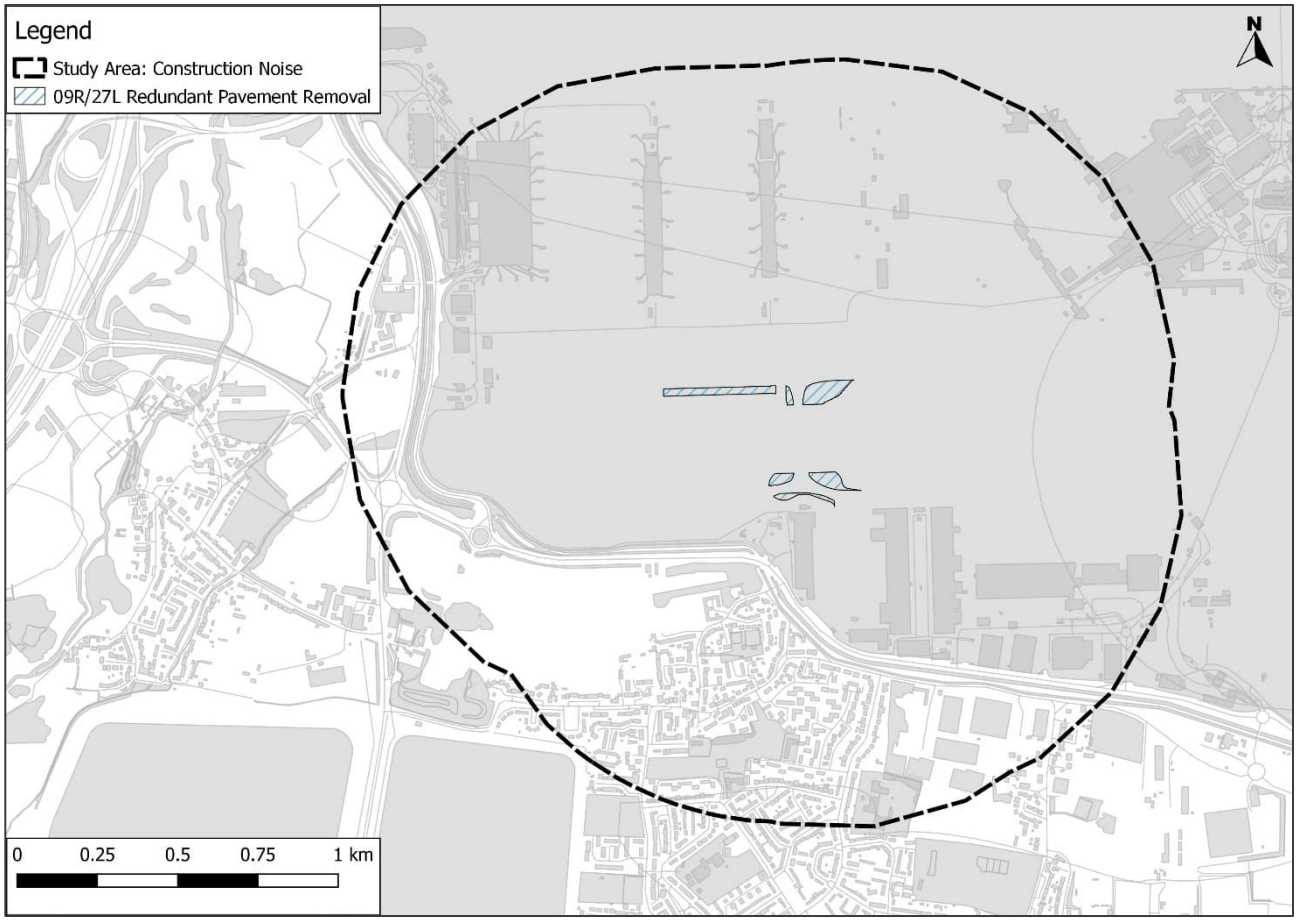
- Construction noise: This is scoped in up to 1km from any construction works to capture likely significant noise effects.
  - **Graphic A7.3.12** presents the study area for noise barrier works and 09L airfield infrastructure.
  - **Graphic A7.3.13** presents the study area for the 09R/27L redundant pavement removal.
- Construction vibration: The study area is up to 100m from any construction works to capture likely significant vibration effects.
  - **Graphic A7.3.14** presents the study areas for noise barrier works and 09L airfield infrastructure.
    - Importantly, in respect of the 09L airfield infrastructure construction works, there are no receptors within the study area.
    - In respect of the noise barrier construction works, likely significant effects are not anticipated. This is described in detail in **Appendix 7.4: Construction Noise and Vibration**.
  - **Graphic A7.3.15** presents the study area for the 09R/27L redundant pavement removal.
    - Importantly, there are no receptors within the study area, therefore likely significant effects are not anticipated as described in **Appendix 7.4: Construction Noise and Vibration**.

3.1.2 The combined spatial study areas for noise barrier and 09L airfield infrastructure construction noise and vibration are also presented in **Figure 7.3.1** (**Volume IV** of the Environmental Statement).

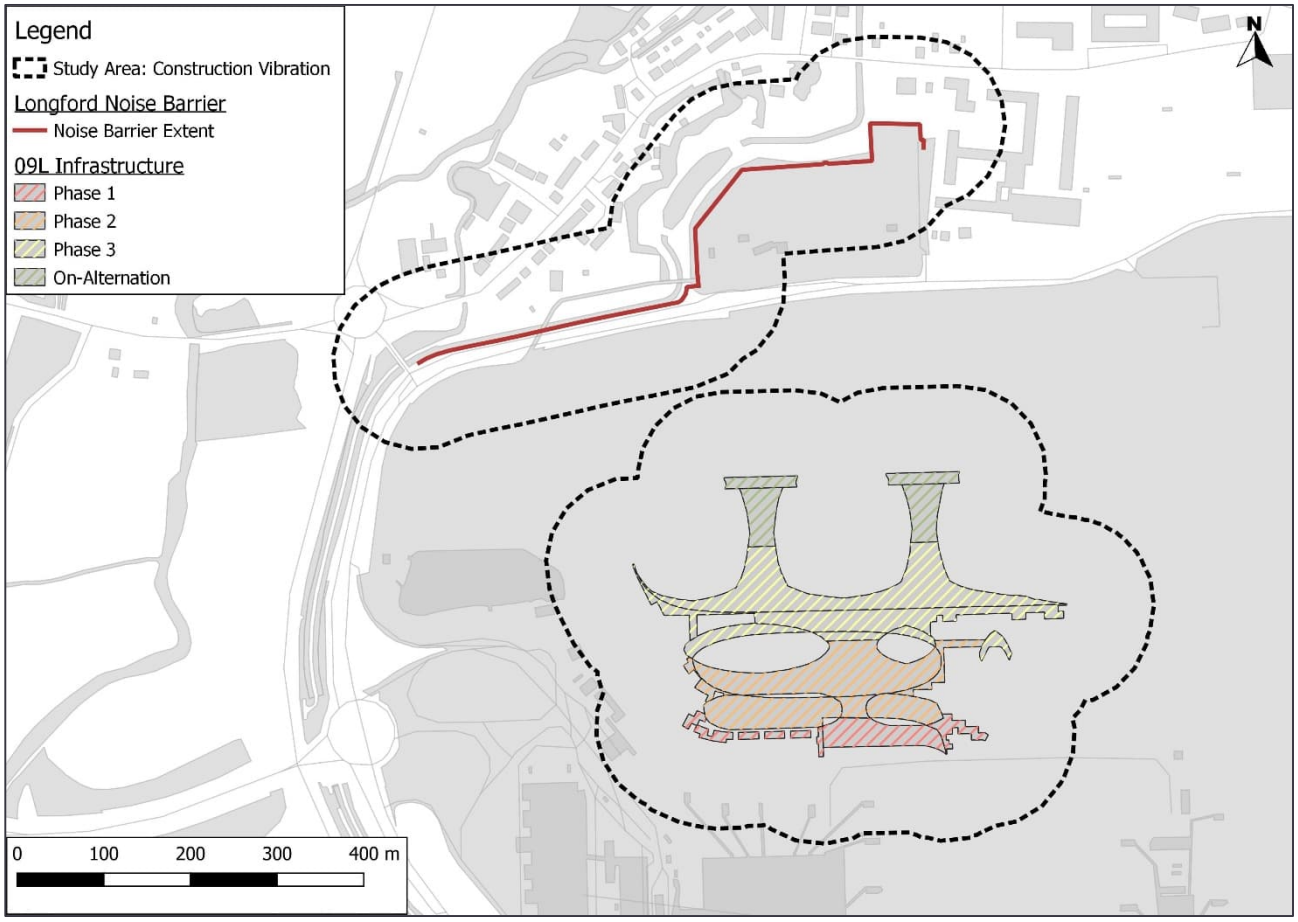
Graphic A7.3.12 Spatial study area for construction noise (noise barrier and 09L airfield infrastructure)



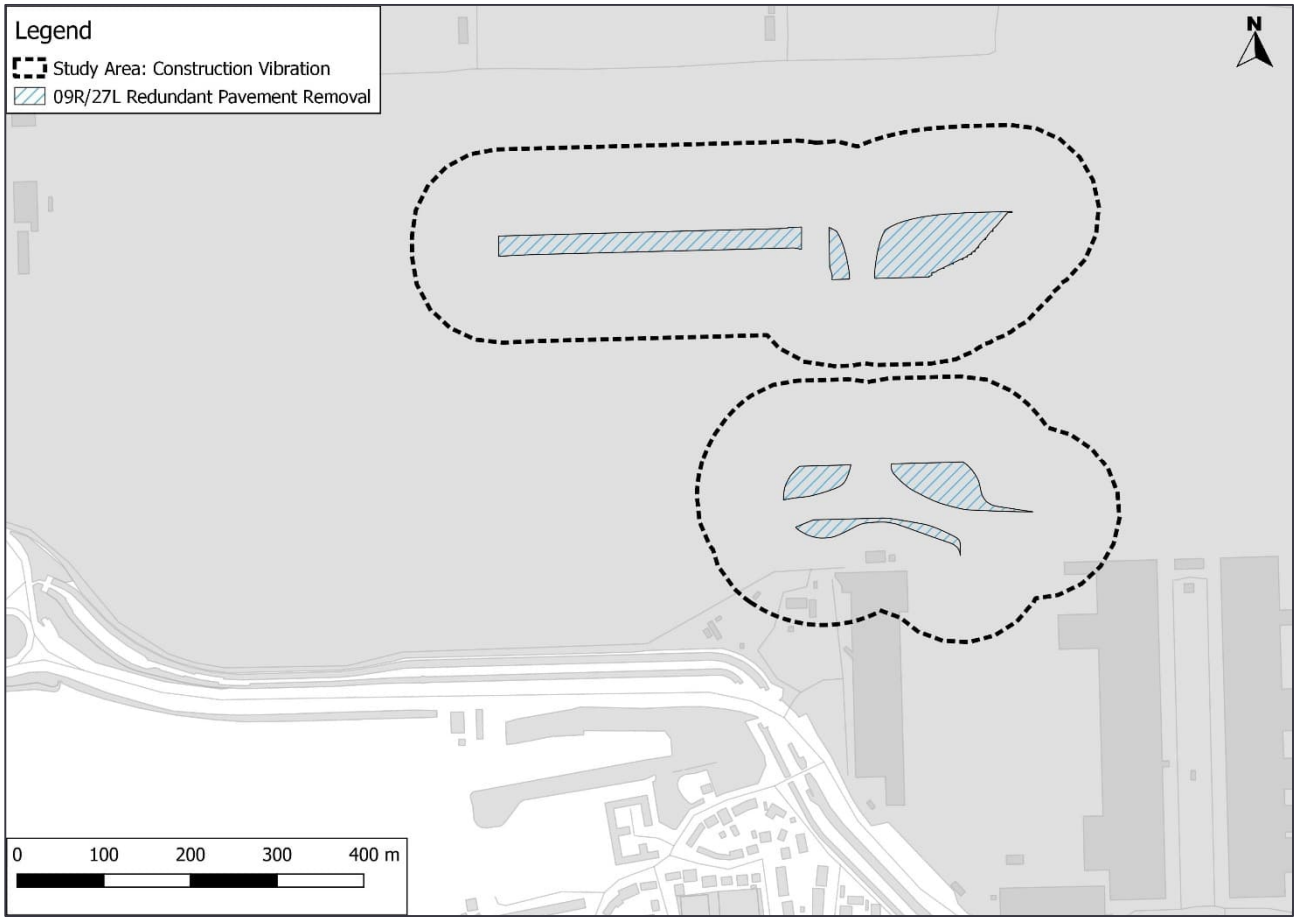
Graphic A7.3.13 Spatial study area for construction noise (09R/27L redundant pavement removal)



Graphic A7.3.14 Spatial study area for construction vibration (noise barrier and 09L airfield infrastructure)



Graphic A7.3.15 Spatial study area for construction vibration (09R/27L redundant pavement removal)



3.1.3 To inform the construction and operational noise assessment, 165 receptors locations have been digitised around the perimeter of the airfield representing key noise sensitive receptors (NSRs). The construction noise and vibration assessment focusses on twelve of those receptors (NSRs 4 to 15) located to the north of Runway 09L in Longford which will experience the greatest impact of construction noise as well as benefit from the noise barrier. To the south of Runway 09R/27L, ten receptors (NSRs 134 to 143) in Stanwell will experience the greatest impact of construction noise from the redundant pavement removal.

3.2 Data gathering

3.2.1 The information used to define the baseline was obtained in two rounds of data gathering exercises. Round one gathered information from a variety of existing sources across the construction noise study area. This information was reviewed to identify locations requiring further assessment due to a lack of existing information, or where more detailed information was required. These areas were subject to a further round of baseline data gathering where increasing baseline detail was collected through baseline noise measurements.

Round one: Construction noise baseline data collection

3.2.2 Round one baseline data collection comprised a review of publicly available measurement and prediction data such as:

- Aircraft 'air' noise contours and exposure data published by Heathrow (**Figure 7.3.2** and **Figure 7.3.3** (**Volume IV** of the Environmental Statement)); and
- The results of noise mapping published by the Department for the Environment, Food and Rural Affairs (Defra).

3.2.3 The data sources used for Round one baseline collection are set out in **Table A7.3.1**.

Table A7.3.1 Round one baseline data sources

Origin	Title(s)	Dates	Content and Metrics
Heathrow Modelling (Environmental Research and Consultancy Department (ERCD), CAA)	Summer and Noise Action Plan Contours for Heathrow	Representative year 2019	The published ERCD Report 2001[22] presents noise exposure contours and noise exposure statistics for the 'annual average' and 'average summers day' situation in 2019. The 'average summers day' situation is presented for the $L_{Aeq,16hr}$ and $L_{Aeq,8hr}$ metrics, with the 'annual average' situation presented for the L_{day}, $L_{evening}$, L_{night}, L_{den} and $L_{Aeq,6.5h}$ metrics.
Defra Round 3 Noise Mapping	Strategic noise mapping (2017)[23]	2017	Road traffic and railway noise contours modelled on 10m-by-10m grids at 4m above ground level. Includes major roads with a bi-directional flow of 3 million vehicle passages or more a year, major railways with a flow threshold of 30,000 vehicle passages per year, motorways, A-roads and mainline railways within agglomerations with population in excess of 100,000 persons and population density of at least 500 people per km^2.
Planning applications	Spelthorne District Council planning applications	2021-2022	A review of publicly available planning application documents for noise assessment reports carried out in the vicinity of specific noise sensitive

[22] Civil Aviation Authority (2021). *ERCD Report 2001 Heathrow Airport 2019 Summer Noise Contours and Noise Action Plan Contours.* [online] Available at: https://www.heathrow.com/content/dam/heathrow/web/common/documents/company/local-community/noise/reports-and-statistics/reports/noise-action-plan-contours/LHR_2019_contour_report.pdf (Accessed 22 April 2024).

[23] Department for Environment, Food & Rural Affairs (2019). *Strategic Noise Mapping (2017).* [online] Available at: https://www.gov.uk/government/publications/strategic-noise-mapping-2019 (Accessed 07 August 2024).

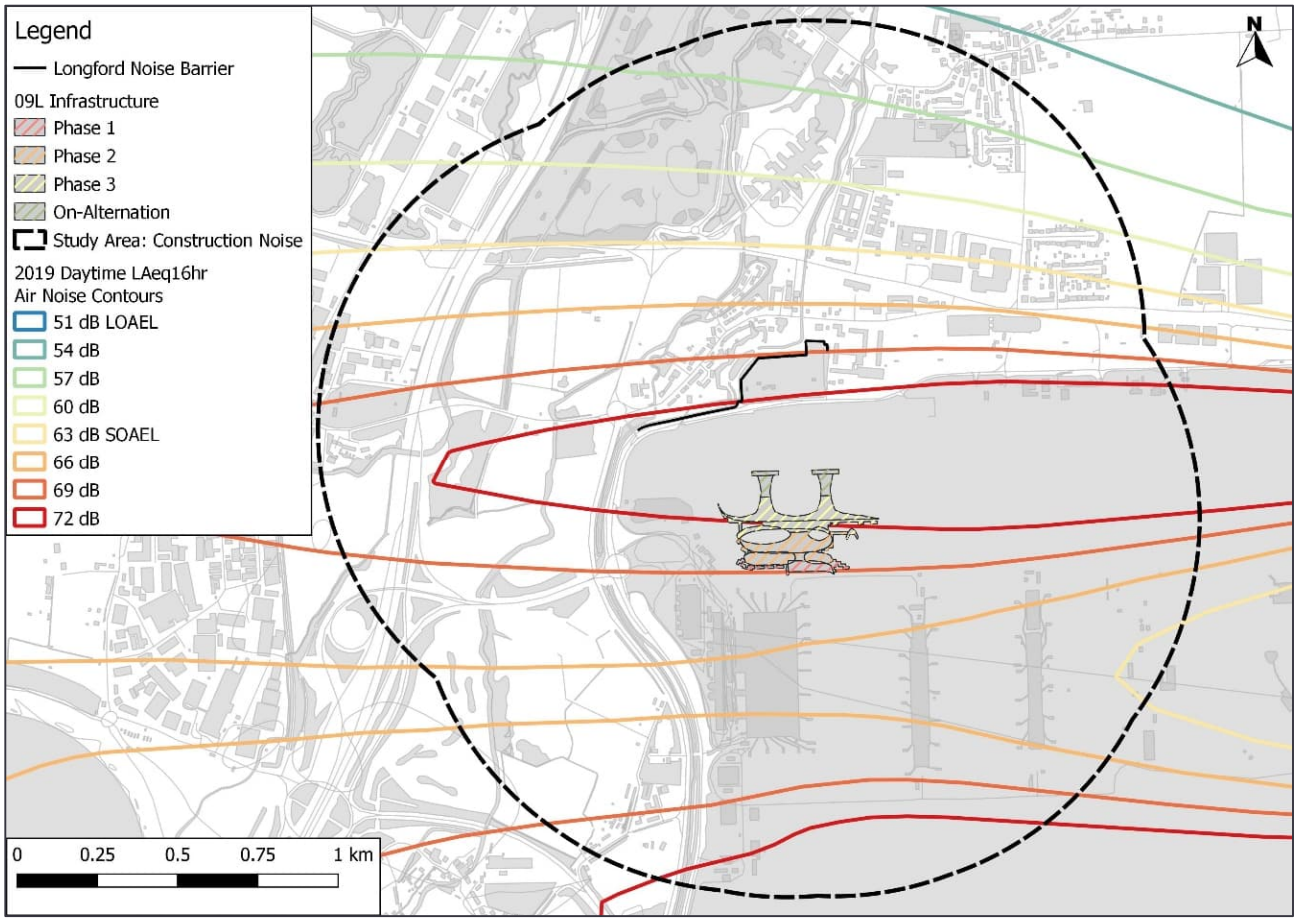
Origin	Title(s)	Dates	Content and Metrics
			receptors to inform an understanding of the prevailing baseline conditions.

Heathrow Airport 2019 summer noise contours

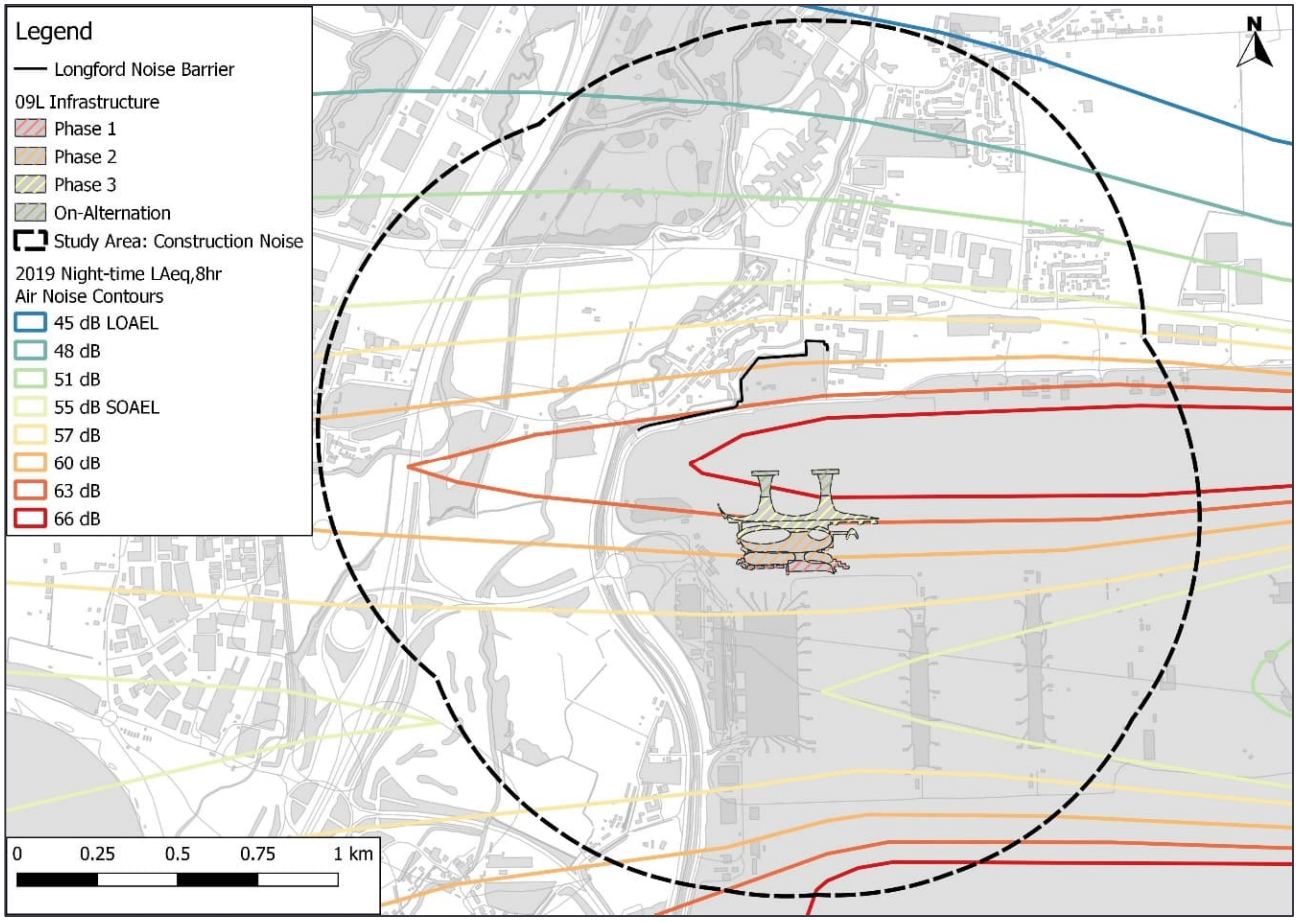
3.2.4 With reference to **Table A7.3.1, Figure 7.3.2** and **Figure 7.3.3** (**Volume IV** of the Environmental Statement) present the full sized, full coverage aircraft 'air' noise contours for the 2019 summer period.

3.2.5 **Graphic A7.3.16** and **Graphic A7.3.17** present the 2019 summer noise contours for the daytime ($L_{Aeq,16hr}$) and night-time ($L_{Aeq,8hr}$), respectively. The graphics are focused on Longford; the group of NSRs that will be most affected by construction noise (NSRs 4 to 15 of the 165 receptors digitised).

Graphic A7.3.16 2019 $L_{Aeq,16hr}$ aircraft 'air' noise contours (summer day actual modal split) (Longford)

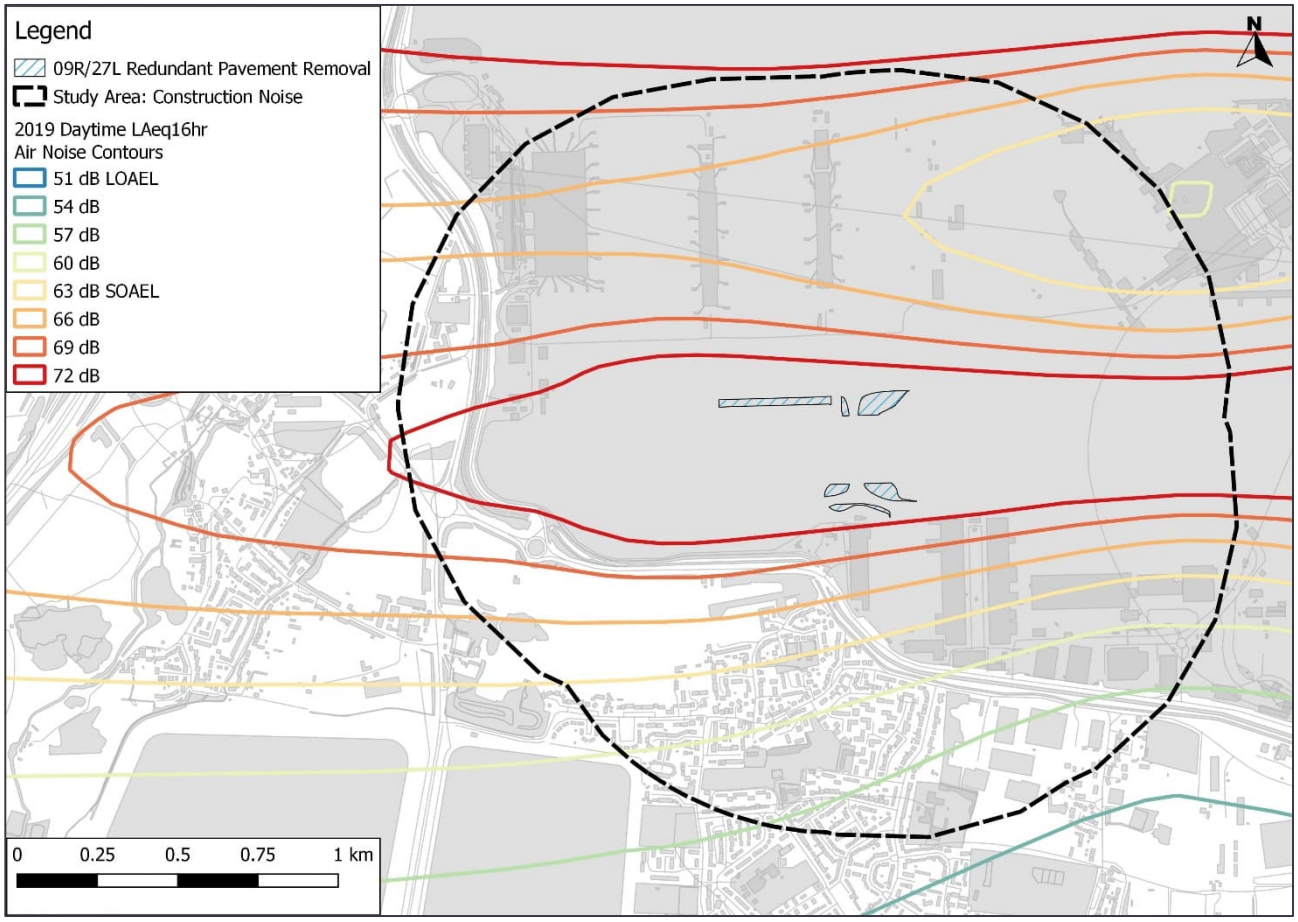


Graphic A7.3.17 2019 $L_{Aeq,8hr}$ air noise contours (summer night actual modal split) (Longford)

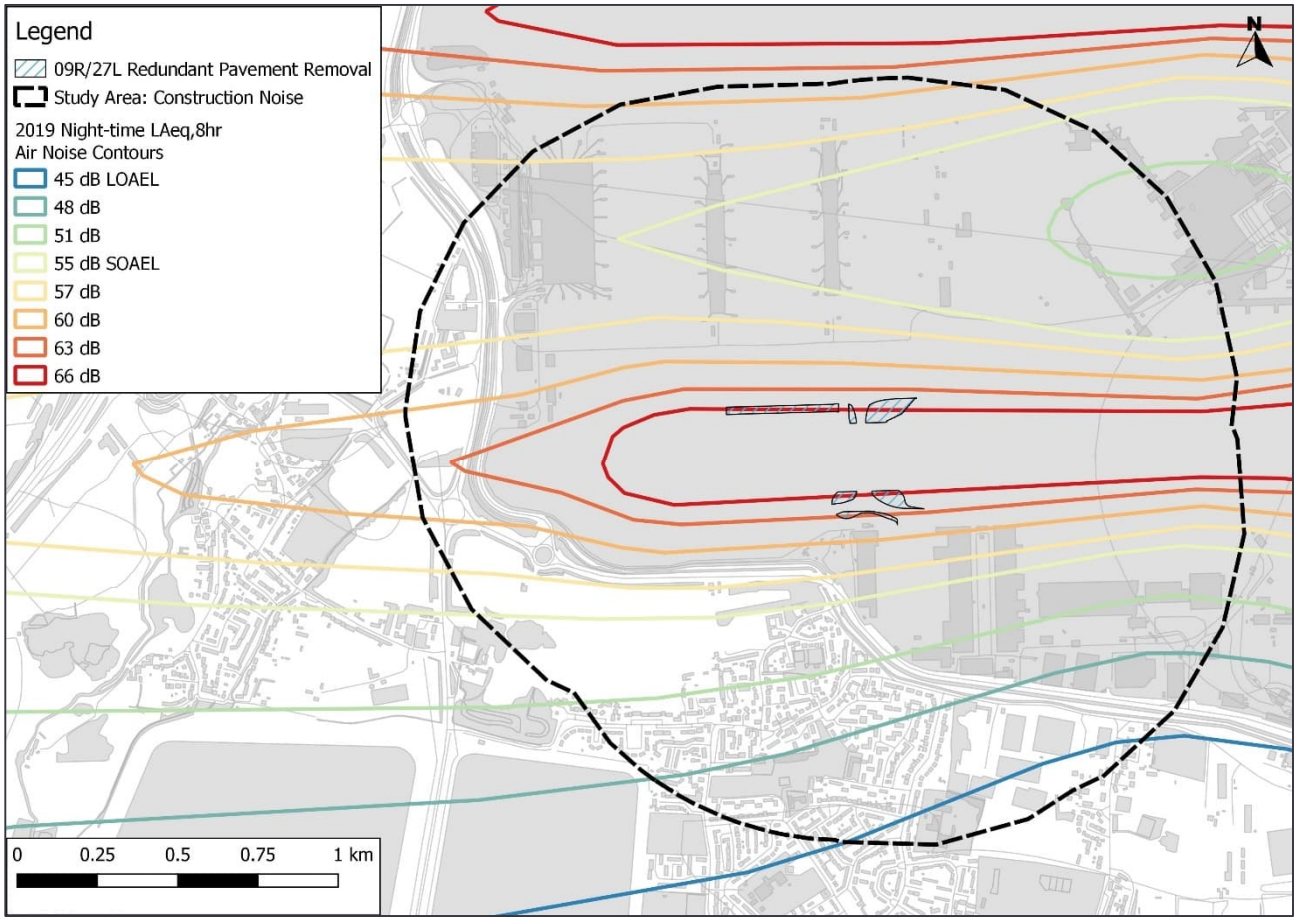


3.2.6 **Graphic A7.3.18** and **Graphic A7.3.19** present the 2019 summer noise contours for the daytime ($L_{Aeq,16hr}$) and night-time ($L_{Aeq,8hr}$), respectively. The graphics are focused on the receptors in Stanwell.

Graphic A7.3.18 2019 $L_{Aeq,16hr}$ aircraft 'air' noise contours (summer day actual modal split) (Stanwell)



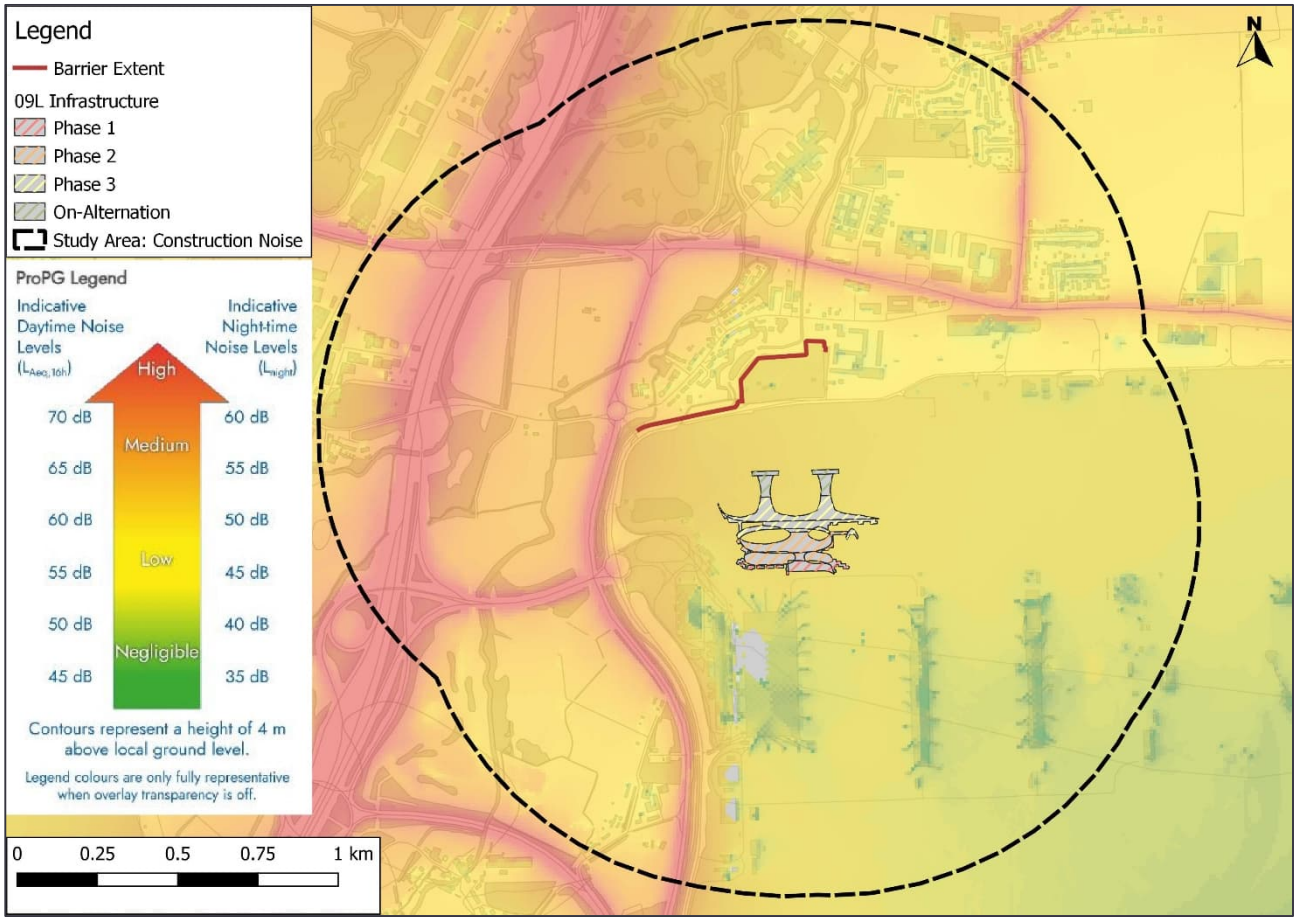
Graphic A7.3.19 2019 $L_{Aeq,8hr}$ air noise contours (summer night actual modal split) (Stanwell)



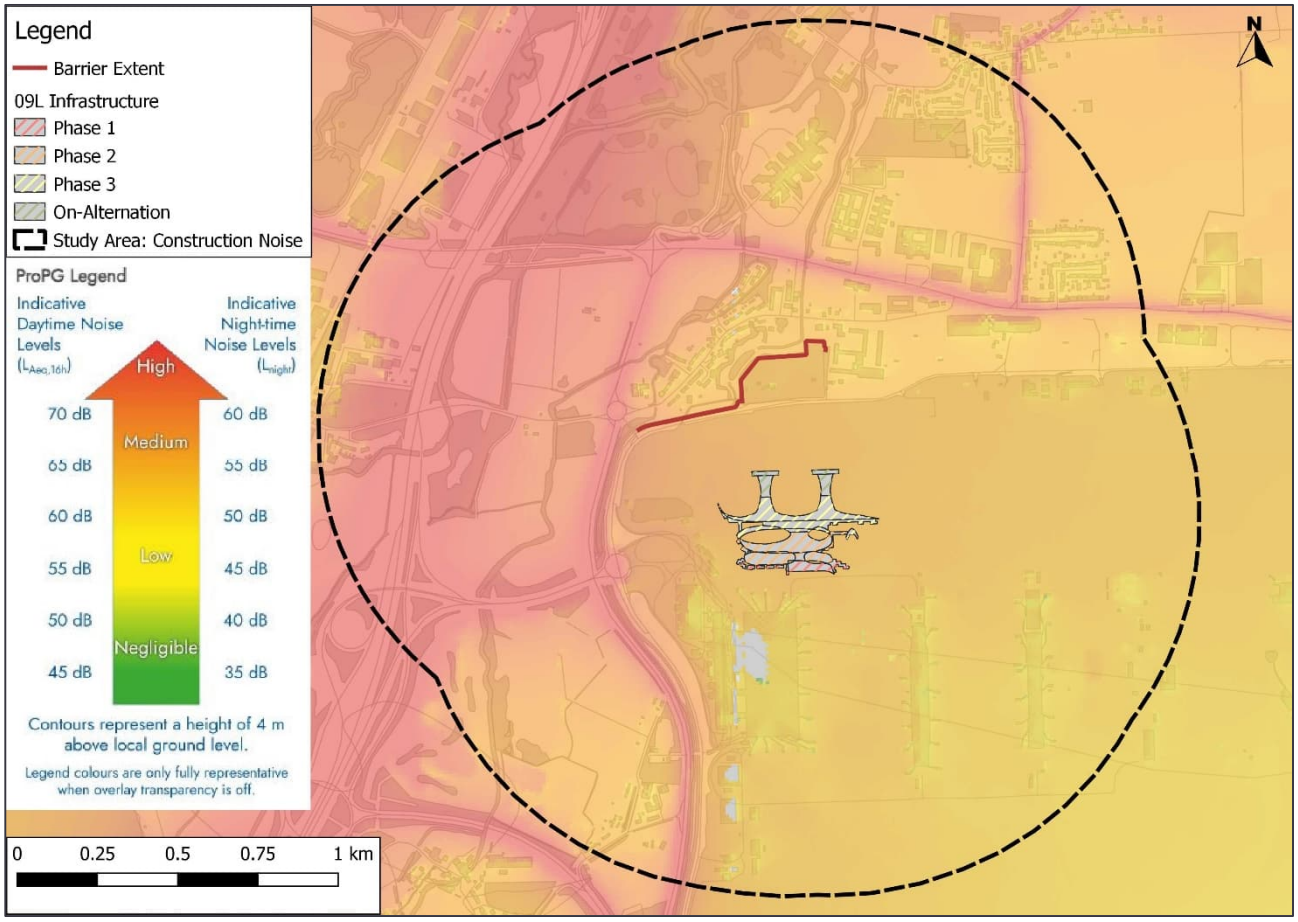
Strategic noise mapping 2017

3.2.7 With reference to **Table A7.3.1**, **Graphic A7.3.20** and **Graphic A7.3.21** present the Round 3 Strategic Noise Mapping road traffic and railway noise levels for the daytime ($L_{Aeq,16hr}$) and night-time ($L_{Aeq,8hr}$), respectively. The graphics are focused on Longford; the group of NSRs that will be most affected by construction noise.

Graphic A7.3.20 2017 $L_{Aeq,16hr}$ strategic noise mapping daytime road traffic and railway noise contours (Longford)

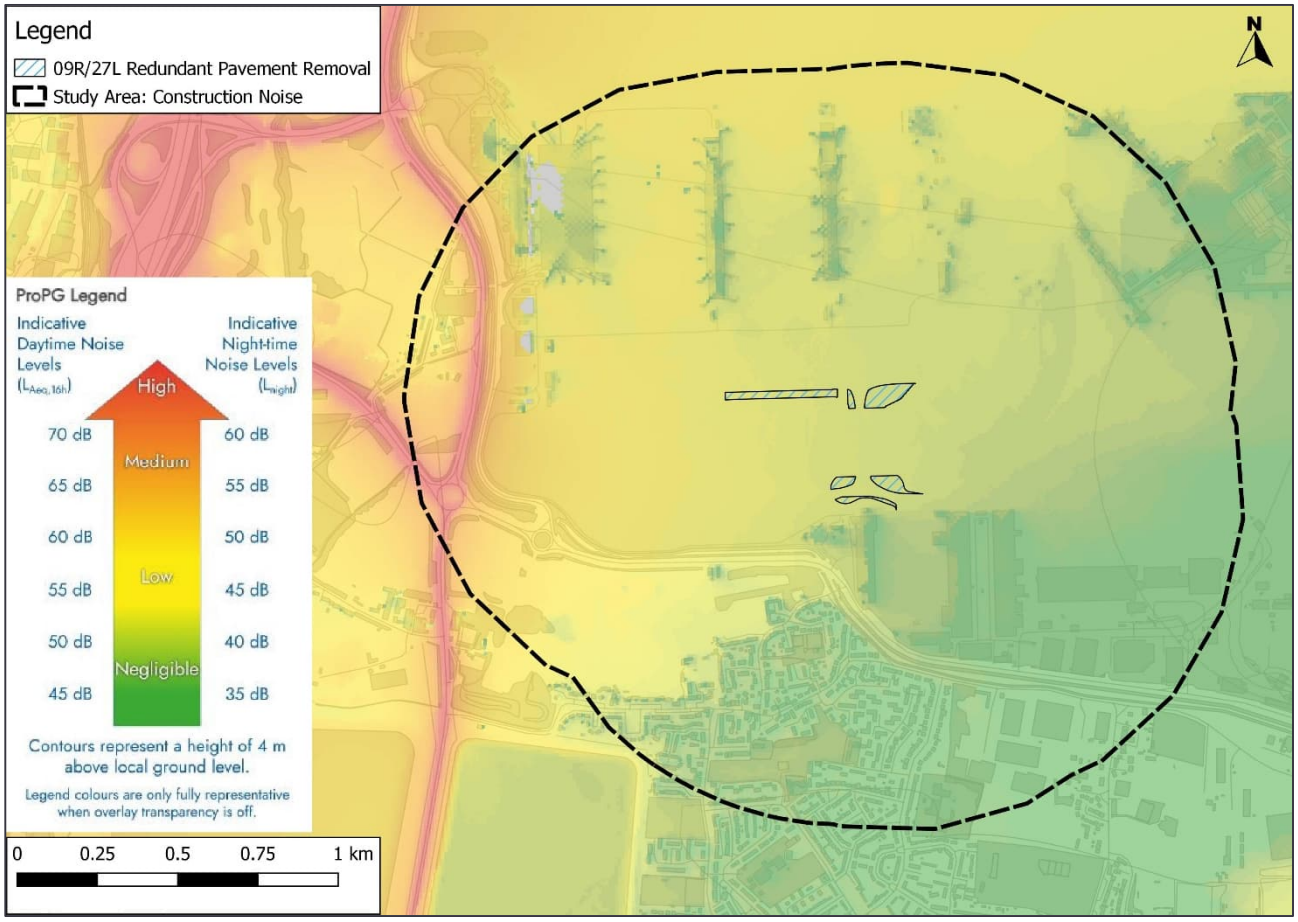


Graphic A7.3.21 2017 $L_{Aeq,8hr}$ strategic noise mapping night-time road traffic and railway noise contours (Longford)

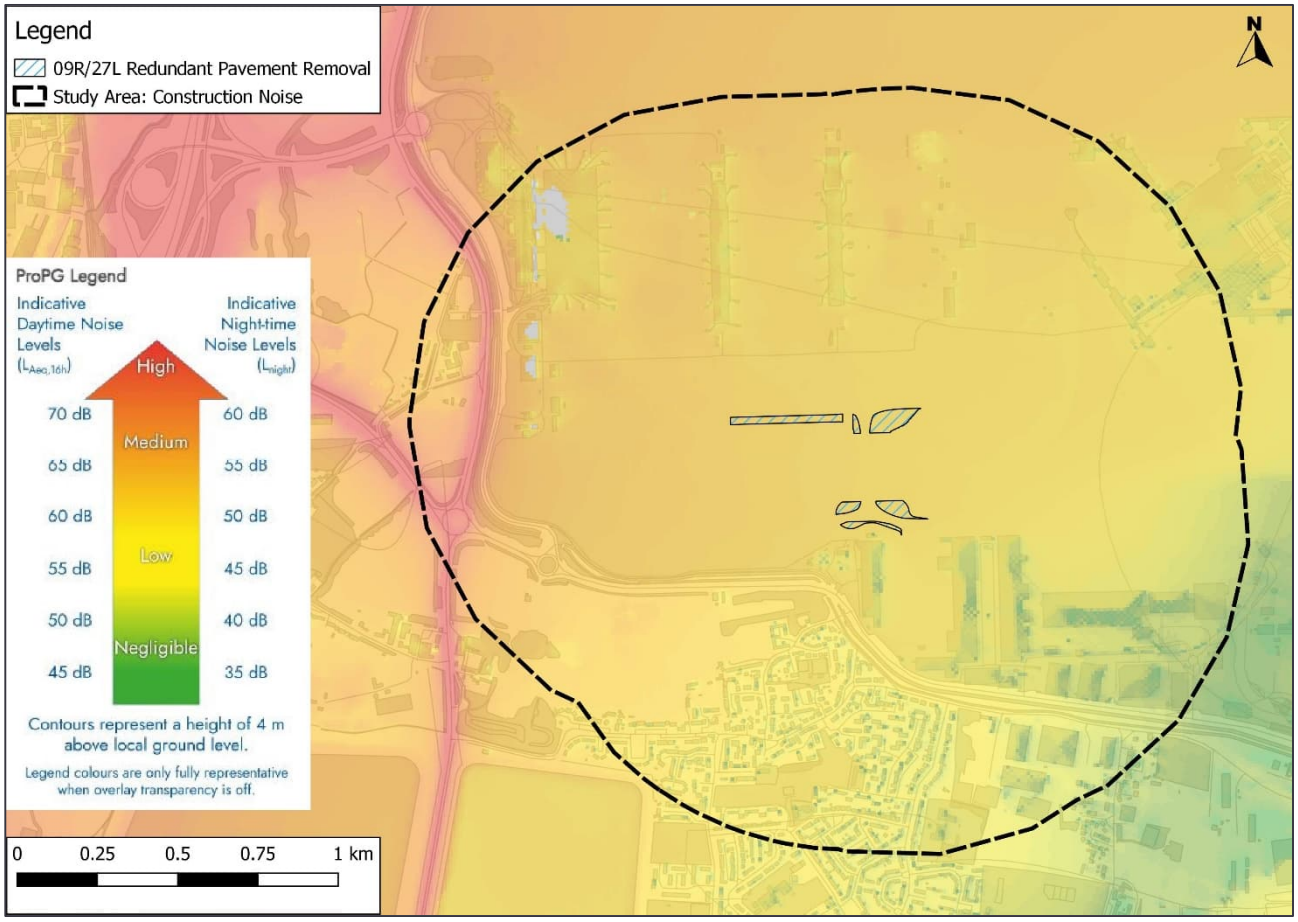


3.2.8 **Graphic A7.3.22** and **Graphic A7.3.23** present the Round 3 Strategic Noise Mapping road traffic and railway noise levels for the daytime ($L_{Aeq,16hr}$) and night-time ($L_{Aeq,8hr}$), respectively. The graphics are focused on the receptors in Stanwell.

Graphic A7.3.22 2017 $L_{Aeq,16hr}$ strategic noise mapping daytime road traffic and railway noise contours (Stanwell)



Graphic A7.3.23 2017 $L_{Aeq,8hr}$ strategic noise mapping night-time road traffic and railway noise contours (Stanwell)



Review of planning applications

3.2.9 With respect to receptors to the south of the 09R/27L "redundant pavement removal works", a review of two nearby planning applications[24] has been carried out. Both planning applications included baseline noise measurements which were carried out in December 2021 and February 2022 when the UK was emerging from COVID-19 pandemic restrictions and aircraft activity at Heathrow Airport was subdued compared to 2019.

3.2.10 In summary, the measured baseline noise levels around NSR 137 were 66 dB $L_{Aeq,16hr}$ and 56 dB $L_{Aeq,8hr}$. The measured baseline noise levels in the vicinity of NSR 143 were 63 dB $L_{Aeq,16hr}$ and 53 dB $L_{Aeq,8hr}$. It is reasonable to assume that night-time aircraft activity was generally subdued at the time of these surveys and that road traffic noise levels were likely to be marginally lower than under current conditions. Therefore, it is considered that these measured night-time noise levels are representative of the night-time conditions between 23:00 and 04:30hrs.

[24] Spelthorne planning references 22/01637/OUT Gleneagles Close and 22/01090/FUL 106 Oaks Road.

Review of Round one baseline data gathering

3.2.11 The nearest NSRs (4 to 15) to the noise barrier and 09L infrastructure construction worksites are located in Longford village immediately to the north of the proposed noise barrier. Further information on the NSRs is provided in the construction noise assessment presented in **Appendix 7.4: Construction Noise and Vibration, Volume III** of the Environmental Statement.

3.2.12 With reference to **Graphic A7.3.16**, daytime noise levels in Longford as a result of aircraft 'air' noise are approximately 66 dB to 72 dB $L_{Aeq,16hr}$. Road traffic noise levels, with reference to **Graphic A7.3.20**, are in the region of 50 dB to 60 dB $L_{Aeq,16hr}$ in Longford. It can be identified that aircraft noise typically dominates the noise environment at the nearest NSRs in Longford during the daytime. Notably, daytime construction works will be carried out between 07:30 and 17:30 hrs. Overall, the baseline conditions at these NSRs is approximately 66 dB to 72 dB $L_{Aeq,10hr}$ during the daytime.

3.2.13 With reference to **Graphic A7.3.17** and **Graphic A7.3.21**, it can also be identified that aircraft noise dominates the noise environment at the nearest NSRs in Longford at night, when considered over the whole 8-hour period (23:00 - 07:00hrs). Notably, night-time construction works will be carried out between 23:00 and 04:30hrs. Importantly, aircraft noise is generally subdued within that period, therefore, road traffic noise will typically dominate. Overall, the baseline conditions at these NSRs for 2019 is approximately 45 dB to 55 dB $L_{Aeq,5.5hr}$ during the night-time.

3.2.14 However, due to the ambient noise levels from road traffic also being variable over the 8-hour night-time period, and sensitivities in relation to potential construction activities impacting upon Longford village, it was considered necessary to conduct a baseline noise survey to better characterise the noise climate as part of the Round two baseline data collection process.

3.2.15 The NSRs (134 to 143) to the 09R/27L redundant pavement removal works are located in Stanwell, immediately the south of the airfield.

3.2.16 With reference to **Graphic A7.3.18**, daytime noise levels in Stanwell as a result of aircraft 'air' noise are approximately 63 dB to 66 dB $L_{Aeq,16hr}$. Road traffic noise levels, with reference to **Graphic A7.3.22**, are in the region of 50 dB to 55 dB $L_{Aeq,16hr}$ in Stanwell. It can be identified that aircraft noise typically dominates the noise environment at the nearest NSRs in Stanwell during the daytime. This is supported by the baseline measurement data found in planning applications for Stanwell. Overall, the baseline conditions at these NSRs is approximately 63 dB to 66 dB $L_{Aeq,16hr}$.

3.2.17 With reference to **Graphic A7.3.19** and **Graphic A7.3.23**, it can also be identified that aircraft noise dominates the noise environment at the nearest NSRs in Stanwell at night, when considered over the whole 8-hour period (23:00 to 07:00hrs). Notably, night-time construction works will generally be carried out between 23:00 and 04:30 hrs. Importantly, aircraft noise is generally subdued within that period, therefore, road traffic noise will typically dominate. This is supported by the baseline measurement data found in planning applications for Stanwell. Overall, the baseline conditions at these NSRs are considered to be approximately 50 dB to 55 dB $L_{Aeq,5.5hr}$ during the night-time.

Round two: Construction noise baseline data collection

Construction noise baseline noise survey methodology

3.2.18 Due to the potential for adverse noise effects during night-time noise barrier construction works which occur in close proximity to NSRs in Longford, it was considered appropriate to conduct a baseline noise survey. The night-time baseline noise levels established from **Graphic A7.3.17** and **Graphic A7.3.21** place the noise sensitive receptors (NSRs) in Longford within a range of noise levels. For the assessment of night-time noise barrier construction works, this results in different assessment outcomes based on whether the lower limit or upper limit of the range is used.

3.2.19 Notably, noise levels during the night-time are variable. During the period during which construction activities will be undertaken (23:00 to 04:30hrs), aircraft noise is typically subdued, therefore, road traffic noise is expected to be the dominant source of noise for most parts of the night-time construction period. However, road traffic noise will also vary throughout the night-time even in close proximity to the M25 motorway.

3.2.20 The baseline noise survey was carried out from 1 May 2024 to 8 May 2024. Three unattended noise monitors were installed in the Terminal 5 Pod Parking car park at the locations shown in **Graphic A7.3.24** to continuously log noise levels over the measurement period. All noise measurements were conducted, where possible, in accordance with BS 7445-1:2003[25]. Noise monitoring equipment was field calibrated before and after the measurement period with no significant (<0.1 dB) drift in calibration recorded.

[25] British Standards Institution (2003). *BS 7445-1:2003 Description and measurement environmental noise – Guide to quantities and procedures.* London: BSI.

Graphic A7.3.24 Baseline noise monitoring locations

Google Satellite ©2024 Airbus, Maxar Technologies, Map data ©2024

3.2.21 **Table A7.3.2** summarises the baseline noise monitoring locations and equipment used.

Table A7.3.2 Noise monitoring locations

Monitoring Location	Description	Equipment	Serial Number / Laboratory Calibration
NML1	Close to the entrance of Pod Parking car park, representative of NSRs on Bath Road which are at the western end and closest to the Longford Noise Barrier. (NSRs 4 to 7)	Svantek SV 971A	121089 22 June 2022
NML2	North-westerly most corner of car park, representative of NSRs between approximately 535 and 575 Bath Road. (NSRs 8 to 11)	Rion NL-52	00687044 14 March 2024
NML3	North-easterly most corner of car park, representative of residential and non-residential receptors which are at the eastern end and closest to the Longford Noise Barrier (NSRs 12 to 15)	Rion NL-52	01276546 14 March 2024

3.2.22 Meteorological conditions were generally suitable for noise measurement across most of the seven-day period. Noise data measured during thunderstorms from approximately 03:00 hrs on 2 May 2024 has been excluded from the analysis.

3.2.23 Analysis of the night-time noise measurement data (23:00 to 04:30 hrs) has excluded noise contributions from late running aircraft and early arrivals in order to represent baseline noise conditions in the absence of aircraft noise and at the most sensitive times of the night.

3.2.24 For the daytime period (07:30 to 17:30 hrs), due to the variation in runway operations, which included an approximately equal mix between westerly and easterly operations across the survey period, daytime noise levels have been analysed for periods of 100% westerly and 100% easterly operations. These have then been on-time corrected and combined to represent an 80/20 westerly/easterly modal split.

3.2.25 **Table A7.3.3** summarises the results of the baseline noise results for daytime and night-time at the three noise measurement locations.

Table A7.3.3: Summary of noise measurement results

Period	Noise Exposure ($L_{Aeq,T}$)		
	NML1	NML2	NML3
Daytime (07:30 to 17:30hrs)	72.1	70.5	69.8
Night-time (23:00 to 04:30hrs)	51.1	48.3	48.5

3.3 Adopted baseline

Daytime construction period (07:30 to 17:30 hrs)

3.3.1 With reference to **Graphic A7.3.16** and **Graphic A7.3.20** for receptors in Longford, it was identified that aircraft noise typically dominates the noise environment at the nearest NSRs in Longford during the day. The aircraft noise contours (**Graphic A7.3.16**) indicates that the daytime baseline conditions at the NSRs is approximately 66 dB to 72 dB $L_{Aeq,T}$. These values are broadly confirmed by the baseline survey which found levels to be approximately 70 dB to 72 dB $L_{Aeq,10hr}$ during the proposed daytime construction operating hours.

3.3.2 Research into measured baseline noise levels for receptors in Stanwell demonstrates that daytime noise levels are equivalent to the aircraft noise contours (**Graphic A7.3.18**) with noise levels ranging between 63 dB and 66 dB $L_{Aeq,16hr}$.

Night-time construction period (23:00 to 04:30 hrs)

3.3.3 With reference to **Graphic A7.3.17** and **Graphic A7.3.21**, it was identified that aircraft noise dominates the noise environment at the nearest NSRs in Longford at night, when considered over the whole 8-hour period (23:00 - 07:00hrs). Notably, night-time construction works will be carried out between 23:00 and 04:30hrs. Importantly, aircraft noise is generally subdued within that period, therefore, road traffic noise will typically dominate. The road traffic noise contours (**Graphic A7.3.21**) indicates that the night-time baseline conditions at

the NSRs is approximately 45 dB to 55 dB $L_{Aeq,T}$. These values are broadly confirmed by the baseline survey which found levels, in the absence of aircraft noise, to be approximately 48 dB to 51 dB $L_{Aeq,5.5hr}$.

3.3.4 Research into measured baseline noise levels for receptors in Stanwell demonstrates that night-time noise levels are in the region of 50 – 55 dB $L_{Aeq,8hr}$ which reflects the road traffic noise contours (**Graphic A7.3.23**).

Summary

3.3.5 In summary, the measured baseline noise levels have been used in the construction noise assessment for receptors in Longford. **Table A7.3.4** summarises the baseline noise levels utilised for the construction noise receptors in Longford.

Table A7.3.4: Baseline noise levels at construction NSRs

Receptor	Representative Noise Monitoring Location	Daytime $L_{Aeq,10hr}$ (dB)	Night-time $L_{Aeq,5.5hr}$ (dB)
4, 5, 6, 7	NML1	72	51
8, 9, 10	NML2	71	48
11, 12, 13, 14, 15	NML3	70	49

3.4 Evolution of baseline

3.4.1 In respect of the daytime period ambient noise exposure from aircraft noise is considered to dominate. This is likely to reduce marginally over time as a result of continued modernisation, and improvements in aircraft noise emissions. The numbers of aircraft will not significantly increase over the adopted baseline due to the air traffic movements cap.

3.4.2 In respect of the night-time core construction period, ambient noise exposure is dominated by local and distant road traffic noise. This is considered to remain unchanged over the medium term.

3.5 Adopted future baseline

3.5.1 The future baseline conditions immediately before the start of the construction works are expected to be the equivalent to the current measured baseline conditions.

4. Operational Noise – Aircraft ‘Air’ Noise

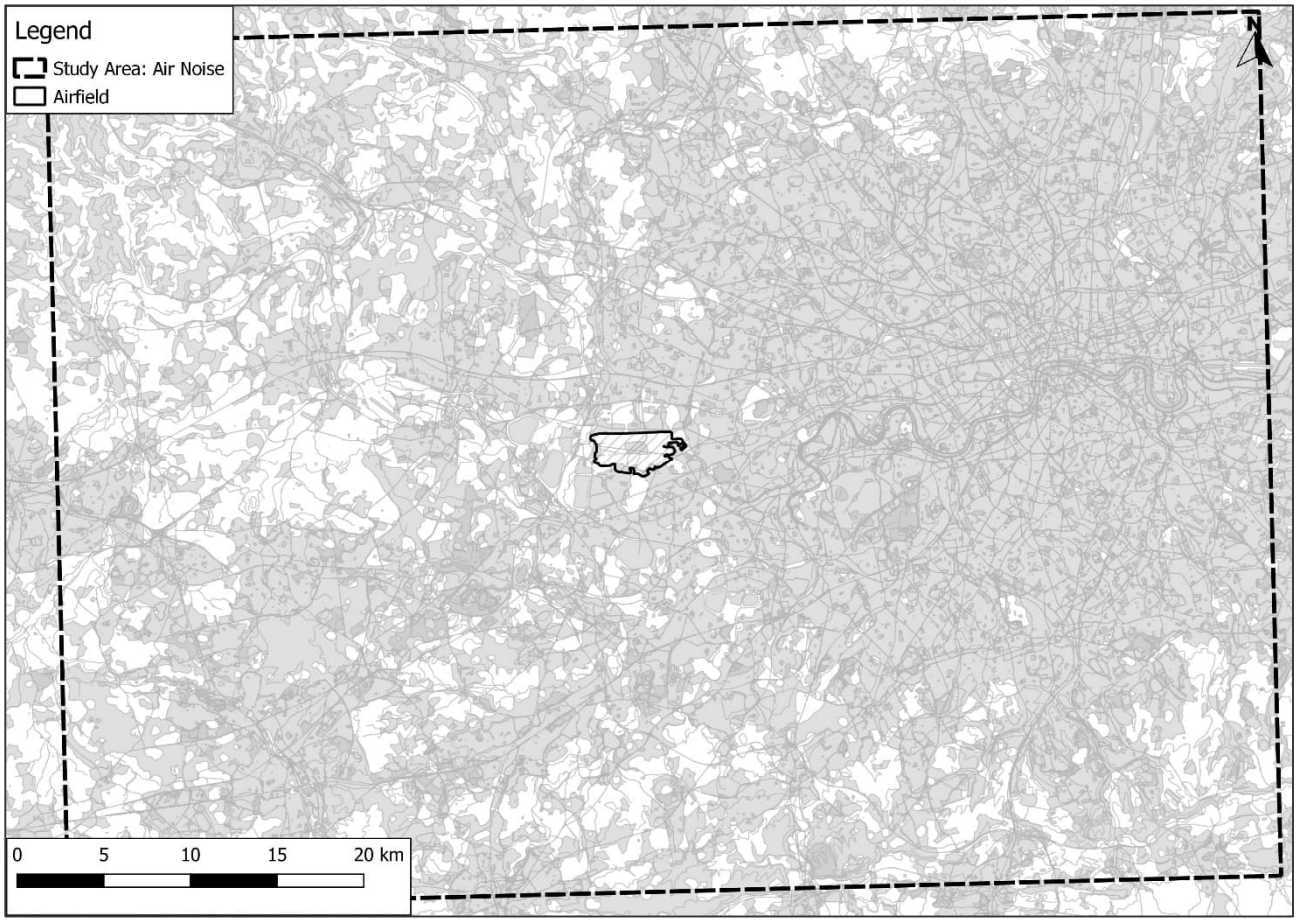
4.1 Spatial scope

4.1.1 The operational noise assessment study areas for the different sources of noise are defined as:

- Aircraft ‘air’ noise (from Heathrow operations): Based on consideration of today’s operation and the current understanding of the future operation, the study area will be defined by the extent of the daytime and night-time LOAELs. This results in an area of approximately 40 nautical miles west-east and approximately 20 nautical miles north-south, centred on the airport (shown in **Graphic A7.3.25**).

4.1.2 The spatial study area for aircraft ‘air’ noise is also presented in **Figure 7.5.1** (**Volume IV**).

Graphic A7.3.25 Aircraft ‘air’ noise study area



4.1.3 To inform the aircraft ‘air’ noise assessment in respect of residential properties, the household and population dataset obtained from CACI Ltd has been used. In respect of non-residential receptors, the Ordnance Survey ‘AddressBase Plus’ dataset has been used to characterise receptors and identify their locations.

4.1.4 Whist 165 receptors locations have been digitised around the perimeter of the airfield the aircraft 'air' noise assessment does not rely upon them to inform the assessment.

4.2 Data gathering

4.2.1 The information used to define the baseline was obtained in two rounds of data gathering exercises. Round one gathered information from a variety of existing sources across the air noise study area. This information was reviewed to identify any requirements for additional information. Where identified, additional baseline information was gathered or produced as part of Round two of the baseline data gathering.

Round one: Aircraft 'air' noise baseline data collection

4.2.2 Round one baseline data collection comprised a review of publicly available measurement and prediction data such as:

- Aircraft 'air' noise contours and exposure data published by Heathrow (**Figure 7.3.2** and **Figure 7.3.3** (**Volume IV** of the Environmental Statement)); and
- Noise monitoring data from Heathrow.

4.2.3 The data sources used for Round one baseline collection are set out in **Table A7.3.5.**

Table A7.3.5 Round one baseline data sources

Origin	Title(s)	Dates	Content and Metrics
Heathrow Modelling (Environmental Research and Consultancy Department (ERCD), CAA)	Summer and Noise Action Plan Contours for Heathrow	From 2006, Representative year 2019	The published ERCD Report 2001[22] presents noise exposure contours and noise exposure statistics for the 'annual average' and 'average summers day' situation in 2019. The 'average summers day' situation is presented for the $L_{Aeq,16hr}$ and $L_{Aeq,8hr}$ metrics, with the 'annual average' situation presented for the L_{day}, $L_{evening}$, L_{night}, L_{den} and $L_{Aeq,6.5h}$ metrics.
Community monitoring (Heathrow)	Heathrow Fixed and Mobile Noise Monitoring Data[26]	2007 onwards	L_{Aeq}, SEL, L_{Amax}, L_{A90}, L_{A10}
Community monitoring (Heathrow)	Heathrow WebTrak[27]	2008 onwards	Instantaneous Sound Pressure Level, historic data for previous 12 months

[26] Further information on noise monitoring around Heathrow Airport can be found at: https://www.heathrow.com/company/local-community/noise/nacf/noise-monitors (Accessed 07 August 2024).

[27] Envirosuite (2024). WebTrak 6. [online] Available at: https://webtrak.emsbk.com/lhr (Accessed 07 August 2024).

Round two: Aircraft 'air' noise baseline data collection

4.2.4 Heathrow is designated a major airport for the purposes of the Environmental Noise (England) Regulations (as amended)[28].

4.2.5 The most recent published noise exposure data available for Heathrow is for 2022 and is published in ERCD Report 2301[29]. However, aircraft operations in 2021 at Heathrow were significantly affected by the COVID-19 global pandemic with aircraft operations starting to recover in 2022. **Table A7.3.6** presents a summary of noise exposure statistics for Heathrow over the period 2018 to 2022 taken from the historic noise contours[17]. Total Aircraft Movements for each year are also presented for context. It should be noted that the future baseline will reflect what is likely to occur, taking into account the impact the COVID-19 global pandemic may have had on any baseline information collected.

Table A7.3.6 Summer day and summer night noise exposure statistics for Heathrow Airport over the period 2018 to 2022

Year	Total Aircraft Movements	Summer Day 'Standard' ($L_{Aeq,16hr}$) >54 dB			Summer Night 'Actual' ($L_{Aeq,8hr}$) >48 dB		
		Area (km^2)	Population (thousands)	Households (thousands)	Area (km^2)	Population (thousands)	Households (thousands)
2018	477,604	158.5	501.8	204.6	106.6	417.5	174.2
2019	478,059	156.1	492.7	193.4	105.4	428.5	172.4
2020	204,730	50.1	119.5	41.5	26.7	96.1	33.3
2021	195,336	70.9	182.6	66.9	49.7	148.6	54.7
2022	380,305	108.5	296.5	113.5	79.5	250.6	95.8

4.2.6 The noise metrics presented in **Table A7.3.6** for daytime 'standard' summer and the nighttime summer 'actual' are 3 dB higher than the daytime and night-time LOAEL values of 51dB $L_{Aeq,16hr}$ and 45dB $L_{Aeq,8hr}$ respectively, as set out in the Air Navigation Guidance 2017 and adopted by the CAA as part of the airspace change process. The ERCD reports are used to monitor changes in annual noise exposure at Heathrow do not currently report to these values. These higher values are used to the approximate onset of significant community annoyance rather than the point at which adverse effects begin, as defined by the LOAEL.

4.2.7 There are many operational factors which affect aircraft noise baseline conditions. These include: the proportion of westerly and easterly operations which is determined by the prevailing wind direction, along with the 'westerly preference' measure; runway alternation;

[28] *The Environmental Noise (England) Regulations 2006 No. 2238.* [online] Available at: https://www.legislation.gov.uk/uksi/2006/2238/contents (Accessed 17 July 2024).

[29] Civil Aviation Authority (2023). *ERCD Report 2301 Heathrow Airport 2022 Summer and Noise Action Plan Contours.* [online] Available at: https://www.heathrow.com/content/dam/heathrow/web/common/documents/company/local-community/noise/reports-and-statistics/reports/noise-action-plan-contours/LHR_2022_Summer_and_NAP_Contours.pdf (Accessed 07 August 2024).

the use and bias of scheduled operations on Heathrow's departure routes; the point at which aircraft join the final approach, and operating restrictions on night flights. These operational parameters will not change as a result of the Proposed Development. The Proposed Development seeks only to introduce enabling infrastructure to allow easterly alternation. All other operational measures will remain unchanged.

4.3 Adopted baseline

4.3.1 An existing baseline scenario is not required for the assessment of air noise.

4.3.2 However, understanding recent trends in aircraft noise exposure is considered informative.

4.3.3 Importantly, in respect of air noise a baseline year of 2019 has been adopted representing the final calendar year of normal airport operations before the COVID-19 global pandemic. This approach has been adopted other recent airport Environmental Statements (ES) and is also supported by Defra Guidance[1] in respect of preparation of Noise Action Plans (NAPs). In 2019 there were just under 478,000 aircraft movements at the Airport handling around 80.9 million passengers.

4.3.4 The summer day ($L_{Aeq,16hr}$) and summer night ($L_{Aeq,8hr}$) aircraft 'air' noise contours for 2019 can be found in **Figure 7.3.2** and **Figure 7.3.3** (**Volume IV** of the Environmental Statement) respectively. **Table A7.3.7** summarises the 2019 summer day $L_{Aeq,16hr}$ statistics and **Table A7.3.7** presents the 2019 summer night $L_{Aeq,8hr}$ statistics. Additionally, **Table A7.3.8** presents the 'noise action plan' statistics as L_{day}, $L_{evening}$, L_{night} and L_{den} for 2019.

Table A7.3.7 Summer day aircraft 'air' noise statistics for 2019 (actual modal split 80W/20E)

$L_{Aeq,16hr}$ (dB)	Area (km^2)	Population (thousands)	Households (thousands)
>54	156.1	492.7	193.4
>57	86.3	213.9	79.1
>60	48.0	100.3	34.6
>63	27.9	37.9	12.7
>66	15.5	9.9	3.3
>69	7.7	2.5	0.8
>72	4.2	0.0	0.0

Table A7.3.8 Summer night aircraft 'air' noise statistics for 2019 (actual modal split 80W/20E)

$L_{Aeq,8hr}$ (dB)	Area (km^2)	Population (thousands)	Households (thousands)
>48	105.4	428.5	172.4
>51	63.7	201.8	75.2
>54	35.1	97.3	33.9
>57	17.3	46.3	15.2
>60	8.8	16.6	5.1
>63	4.6	2.7	0.8
>66	2.5	0.6	0.2
>69	1.5	0.0	0.0
>72	0.9	0.0	0.0

Table A7.3.9 Noise action plan statistics for 2019

Noise Level (dB)	L_{day}			$L_{evening}$			L_{night}			L_{den}		
	Area (km^2)	Pop. (thousands)	Households (thousands)	Area (km^2)	Pop. (thousands)	Households (thousands)	Area (km^2)	Pop. (thousands)	Households (thousands)	Area (km^2)	Pop. (thousands)	Households (thousands)
>50	-	-	-	-	-	-	72.2	228.5	86.5	-	-	-
>55	129.1	357.9	136.9	112.5	292.5	110.0	24.2	70.6	23.7	176.2	664.3	268.4
>60	49.1	104.6	36.0	42.6	77.0	26.3	7.8	13.7	4.2	69.0	186.6	68.8
>65	20.2	17.4	5.7	17.2	9.0	3.1	2.7	1.4	0.4	26.4	46.4	15.5
>70	6.4	1.3	0.5	5.5	0.6	0.2	1.1	0.0	0.0	8.5	4.8	1.5
>75	2.5	0.0	0.0	2.2	0.0	0.0	-	-	-	3.1	0.0	0.0

4.4 Evolution of baseline

4.4.1 Aircraft 'air' noise is likely to reduce marginally over time because of continued fleet modernisation, and improvements in aircraft noise emissions. The numbers of aircraft will not significantly increase over the adopted baseline due to Heathrow's 480,000 air traffic movements cap.

4.5 Adopted future baseline

4.5.1 Future baseline scenarios have been calculated using the methodology advised in in **Appendix 7.5: Air Noise**. The future baseline scenario represents the aircraft 'air' noise conditions for the assessment year of 2028 in the absence of the Proposed Development.

4.5.2 The future baseline conditions are reported as Figures in **Volume IV** of the Environmental Statement. Notably, **Figure 7.5.2-WoD** presents the daytime 2028 $L_{Aeq,16hr}$ contours without the Proposed Development and **Figure 7.5.3-WoD** presents the night-time 2028 $L_{Aeq,8hr}$ contours without the Proposed Development.

5. Operational Noise – Aircraft 'Ground' Noise

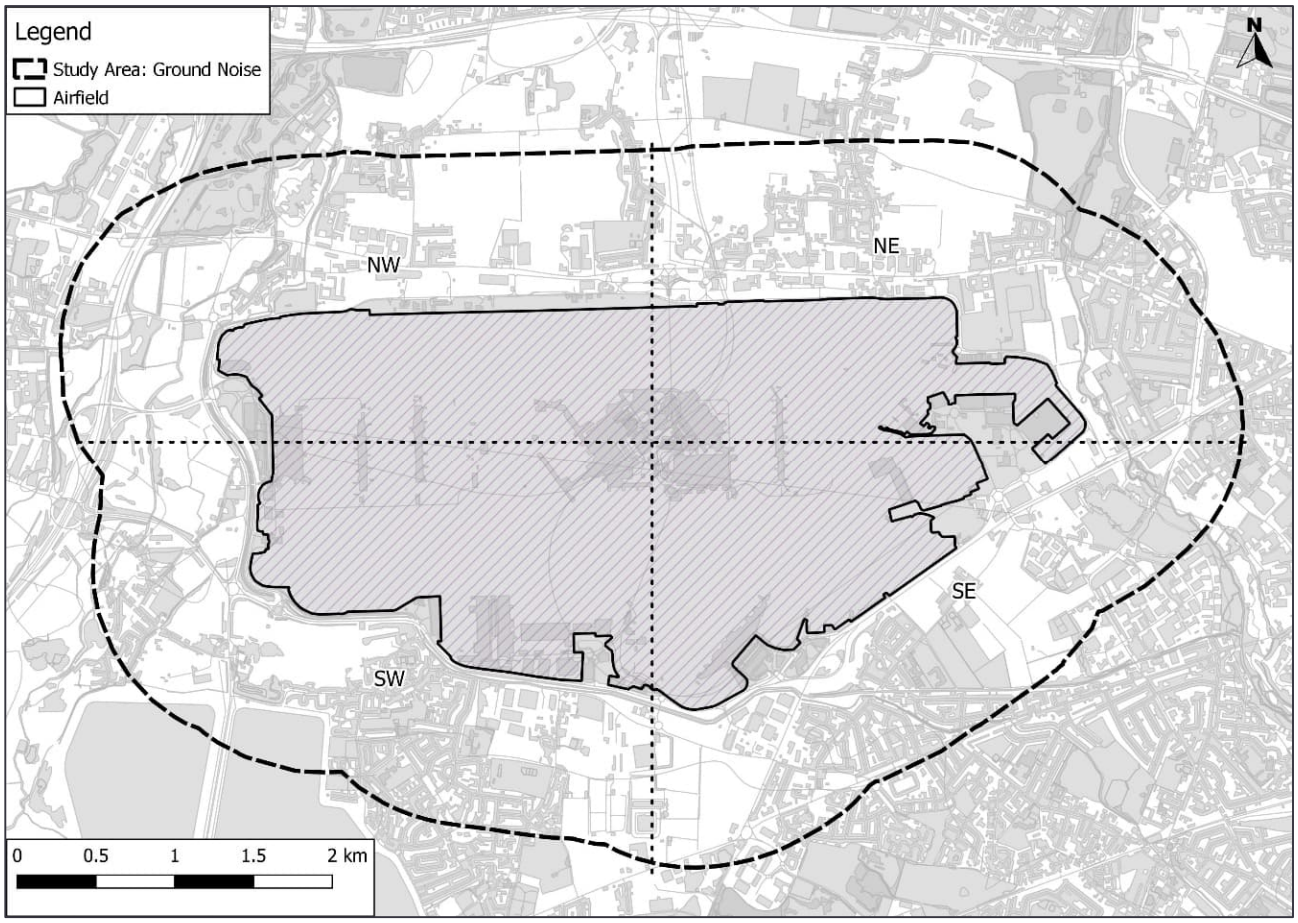
5.1 Spatial scope

5.1.1 The operational noise assessment study areas for the different sources of noise are defined as:

- Aircraft 'ground' noise: This is scoped in up to 1km from any aircraft 'ground' operations (shown in **Graphic A7.3.26**).

5.1.2 The spatial study area for aircraft 'ground' noise is also presented in **Figure 7.3.4 (Volume IV** of the Environmental Statement).

Graphic A7.3.26 Aircraft 'ground' noise study area



5.1.3 To inform the construction and operational noise assessment, 165 receptors locations have been digitised around the perimeter of the airfield representing key noise sensitive receptors (NSRs). The aircraft 'ground' noise assessment encompasses all the receptors (NSRs 1 to 165).

5.2 Data Gathering

5.2.1 The information used to define the baseline was obtained in two rounds of data gathering exercises. Round one gathered information from a variety of existing sources across the air noise study area. This information was reviewed to identify locations requiring further assessment because there is a lack of existing information, or where more detailed information is required. These areas were subject to a further round of baseline data gathering where increasing baseline detail was collected in Round two.

Round one: Aircraft 'ground' noise baseline data collection

5.2.2 Round one baseline data collection comprised a review of publicly available measurement and prediction data such as:

- Aircraft 'air' noise contours and exposure data published by Heathrow (**Figure 7.3.2** and **Figure 7.3.3** (**Volume IV** of the Environmental Statement)); and
- Noise monitoring data from Heathrow; and
- The results of noise mapping published by the Department for the Environment, Food and Rural Affairs (Defra).

5.2.3 The data sources used for Round one baseline collection are set out in **Table A7.3.10**.

Table A7.3.10 Round one baseline data sources

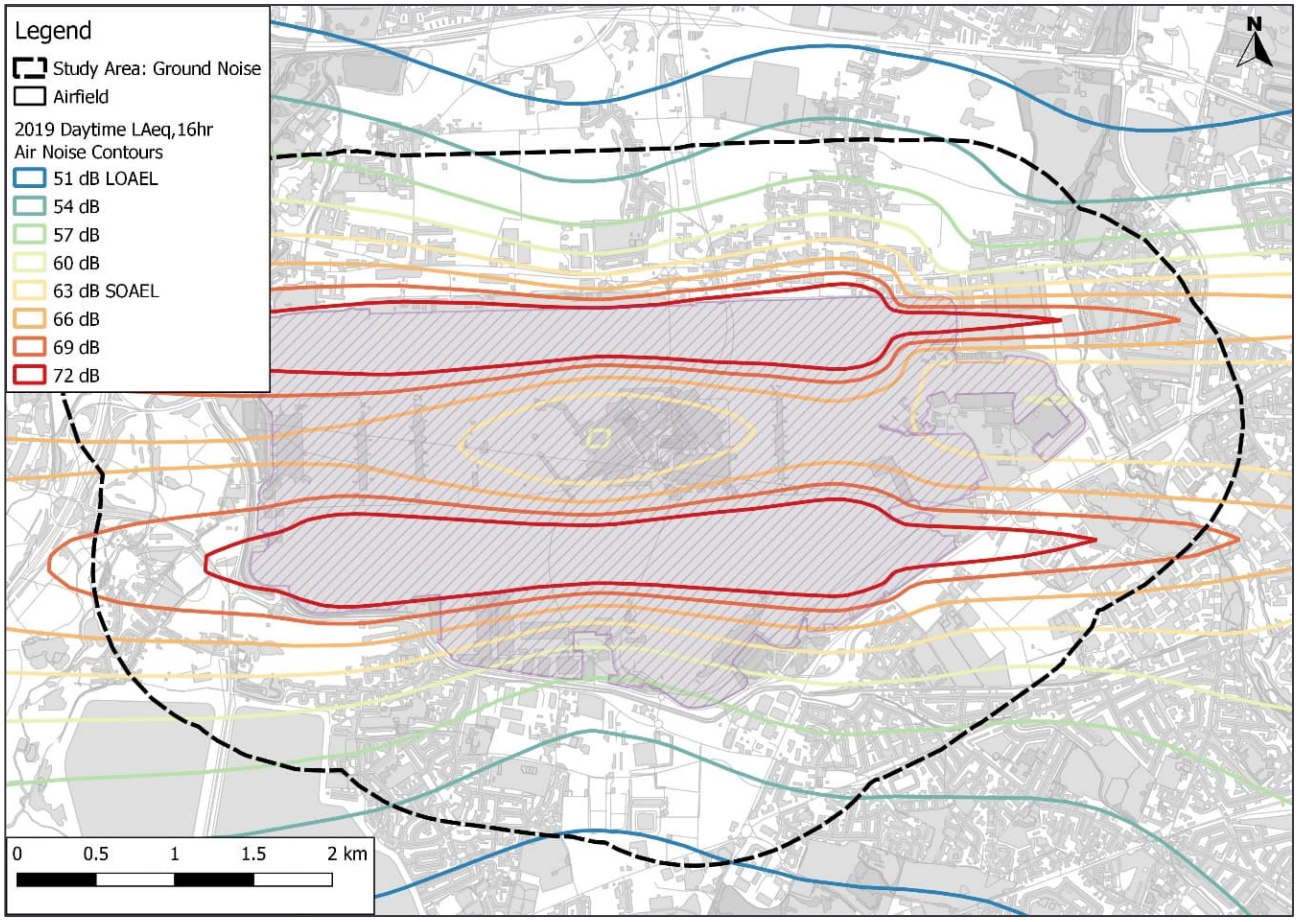
Origin	Title(s)	Dates	Content and Metrics
Heathrow Modelling (Environmental Research and Consultancy Department (ERCD), CAA)	Summer and Noise Action Plan Contours for Heathrow	From 2006, Representative year 2019	The published ERCD Report 2001[22] presents noise exposure contours and noise exposure statistics for the 'annual average' and 'average summers day' situation in 2019. The 'average summers day' situation is presented for the $L_{Aeq,16hr}$ and $L_{Aeq,8hr}$ metrics, with the 'annual average' situation presented for the L_{day}, $L_{evening}$, L_{night}, L_{den} and $L_{Aeq,6.5h}$ metrics.
Community monitoring (Heathrow)	Heathrow Fixed and Mobile Noise Monitoring Data[26]	2007 onwards	L_{Aeq}, SEL, L_{Amax}, L_{A90}, L_{A10}
Community monitoring (Heathrow)	Heathrow WebTrak[27]	2008 onwards	Instantaneous Sound Pressure Level, historic data for previous 12 months
Defra Round 3 Noise Mapping	Strategic noise mapping (2017)[23]	2017	Road traffic and railway noise contours modelled on 10m-by-10m grids at 4m above ground level. Includes major roads with a bi-directional flow of 3 million vehicle passages or more a year, major railways with a flow threshold of 30,000 vehicle passages per year, motorways, A-roads and mainline railways within agglomerations with population in excess of 100,000 persons and population density of at least 500 people per km^2.

Heathrow Airport 2019 summer noise contours

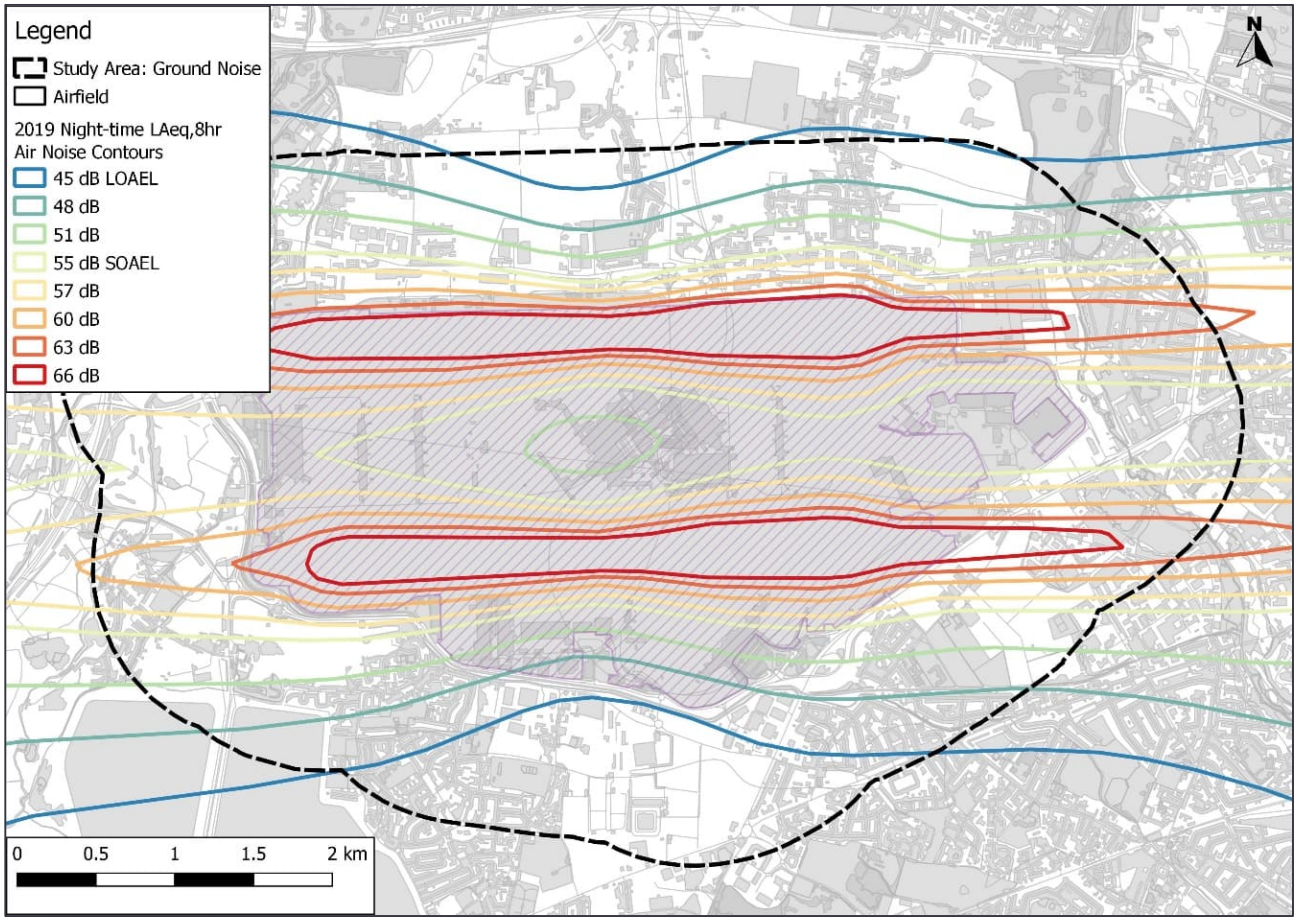
5.2.4 With reference to **Table A7.3.10**, **Graphic A7.3.27** and **Graphic A7.3.28** present the 2019 summer noise contours for the daytime ($L_{Aeq,16hr}$) and night-time ($L_{Aeq,8hr}$), respectively

5.2.5 The graphics are focused on the aircraft 'ground' noise study area. **Figure 7.3.2** and **Figure 7.3.3** (**Volume IV** of the Environmental Statement) present the full sized, full coverage aircraft 'air' noise contours for the 2019 summer period.

Graphic A7.3.27 2019 $L_{Aeq,16hr}$ aircraft 'air' noise contours (summer day actual modal split).



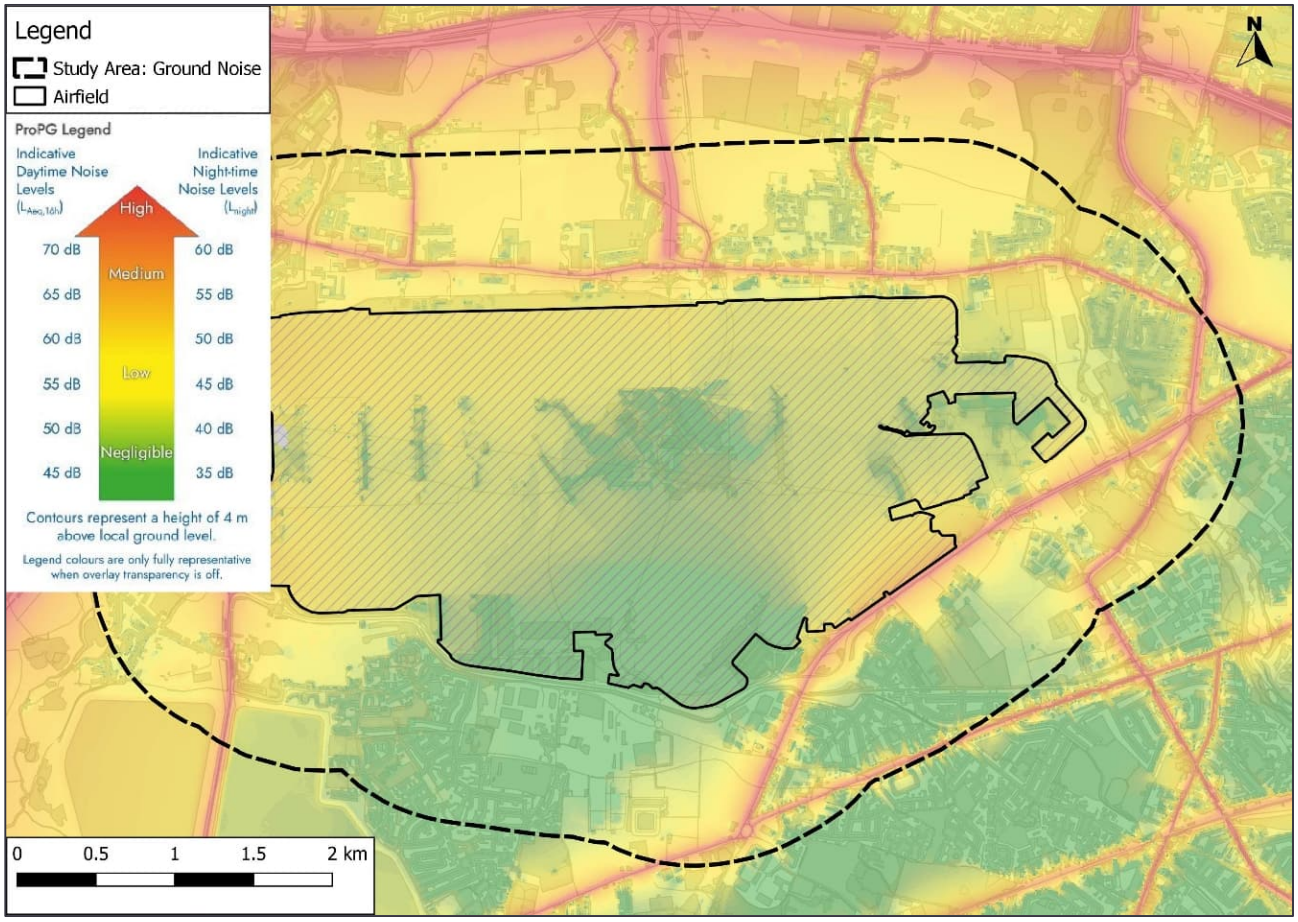
Graphic A7.3.28 2019 $L_{Aeq,8hr}$ air noise contours (summer night actual modal split)



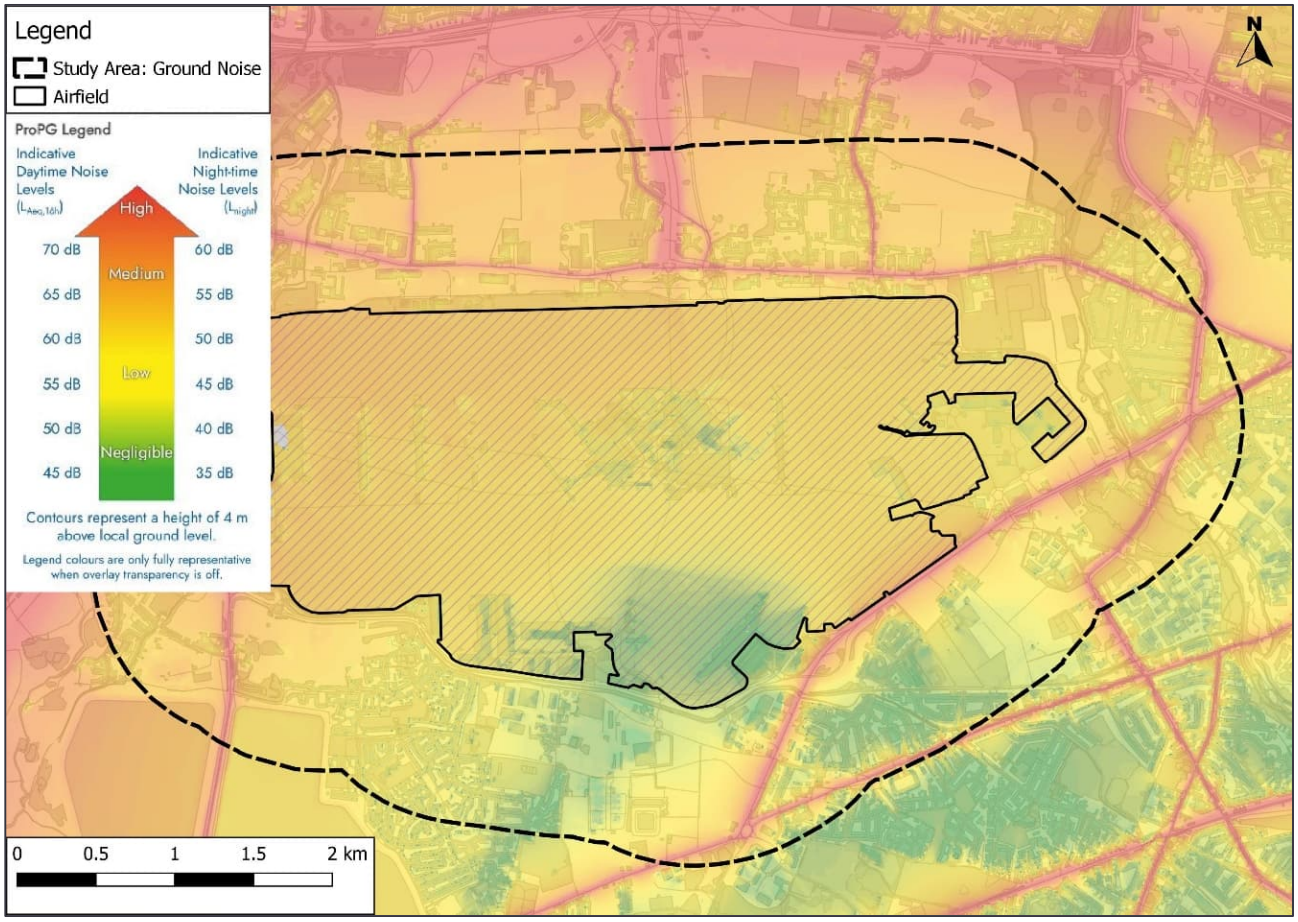
Strategic noise mapping 2017

5.2.6 With reference to **Table A7.3.10**, **Graphic A7.3.29** and **Graphic A7.3.30** present the Round 3 Strategic Noise Mapping road traffic and railway noise levels for the daytime ($L_{Aeq,16hr}$) and night-time ($L_{Aeq,8hr}$), respectively. The graphics are focused on the aircraft 'ground' noise study area.

Graphic A7.3.29 2017 $L_{Aeq,16hr}$ strategic noise mapping daytime road traffic and railway noise contours



Graphic A7.3.30 2017 $L_{Aeq,8hr}$ strategic noise mapping night-time road traffic and railway noise contours



Round two: Aircraft 'ground' noise baseline data collection

5.2.7 For areas in the immediate vicinity of the Airport, noise from the airfield and aircraft operating on the ground also contributes to the baseline noise environment. These receptors are typically located close to areas where aircraft 'ground' movements take place, for example near to taxiways, runway hold and exit points, engine testing facilities and parking stands.

5.2.8 Ground noise is likely to be appreciable at the airport boundary and in surrounding areas of Sipson, Harmondsworth, Harlington Cranford, Feltham, Stanwell, Stanwell Moor and Longford.

5.3 Adopted baseline

5.3.1 An existing baseline scenario is not required for the assessment of ground noise due to the assessment focusing on an assessment year of 2028 which represents the first full year of implementation.

5.3.2 However, existing baseline conditions in the vicinity of the NSRs closest to the airfield are fundamentally defined by the prevailing aircraft movements and surface transportation (road traffic) in the study area.

5.3.3 Importantly, noise exposure from ground noise is not routinely predicted.

5.4 Evolution of baseline

5.4.1 Aircraft 'ground' noise is likely to reduce marginally over time as a result of continued modernisation, and improvements in aircraft noise emissions. The numbers of aircraft will not significantly increase over the adopted baseline due to the airport's 480,000 air transport movements cap.

5.5 Adopted future baseline

5.5.1 Future baseline scenarios have been calculated using the methodology advised in **Appendix 7.6: Ground Noise**. The future baseline scenario represents the aircraft 'ground' noise conditions for the assessment year of 2028 in the absence of the Proposed Development.

5.5.2 The future baseline conditions are reported as figures in **Volume IV** of the Environmental Statement. Notably, **Figure 7.6.2-WoD** presents the daytime ($L_{Aeq,16hr}$) noise contours without the Proposed Development and **Figure 7.6.3-WoD** presents the night-time ($L_{Aeq,8hr}$) noise contours without the Proposed Development.