

7 Sound insulation – Heathrow Airport

7.1 Evolution of sound insulation offer at Heathrow

Concerns about aircraft noise impact date back to the 1950s and 1960s when jet engines started to be introduced, and international aviation became more popular (CAP 1165, 2014).

Sound insulation as an intervention to help mitigate aircraft noise impacts around Heathrow began being discussed in the 1960s, resulting in a range of schemes being developed over the ensuing 60 years. A key aim of such schemes is to reduce noise complaints and general community dissatisfaction by reducing noise disturbance attributable to aircraft overflights. It has been widely assumed that this will have helped to maintain good relationships with community stakeholders, although there has been surprisingly little substantive research to investigate how successful this particular type of intervention has been in achieving this objective. It is, of course, well known that increasing the acoustic attenuation loss of building facades, windows, etc. has no effect on sound levels outdoors and becomes ineffective if windows are left open for natural ventilation purposes, although it has never been firmly established to what extent people's attitudes to aircraft noise are primarily determined by the indoor or outdoor experience. There is some evidence that central to the success of such schemes can be the perceived level of 'generosity' or 'reasonableness' of the action (CATE, 2009), although this is impossible to estimate solely on the basis of acoustic measurements alone. For several practical reasons, entitlement to sound insulation grants unfortunately has to be determined by objective measurements of aircraft noise sound levels, which current evidence suggests do not have a particularly high correlation with community satisfaction. In addition, it is well known that in-situ technical performance often falls short of ideal performance measured under laboratory conditions.

The legislation and statutory instruments around these schemes point to the evolution of the legal framework surrounding the airport's noise strategy. Under Section 79 of the Civil Aviation Act (as subsequently amended), the UK government has powers to direct airport operators to implement noise insulation schemes.

Table 9: Chronology of legislation related to sound insulation at Heathrow.

Year	Scheme
1966	London (Heathrow) Airport Noise Insulation Grants Scheme
1972	Heathrow Airport–London Noise Insulation Grants Scheme
1975	Heathrow Airport–London Noise Insulation Grants Scheme
1980	Heathrow Airport–London Noise Insulation Grants Scheme
1989	Heathrow Airport–London Noise Insulation Grants Scheme

Note: (<http://www.legislation.gov.uk/uksi/1989/247/section/2/made>)

Although the insulation grants scheme legislative statements (published in 1966, 1972, 1975 and 1980) are not readily available in a web-publishable format, the grants scheme for 1989 sets out the relevant legislation that was introduced that year (available @ link above). While some documents still refer to Heathrow being subject to the 1989 legislation, it was actually revoked in 2014 (<http://www.legislation.gov.uk/uksi/2014/3233/section/2/made>). It is apparent that the principles laid out in the 1989 legislation still pertain but the legislation had to be revoked because all insulation had to be completed by 300992: “The Schemes required Heathrow Airport Limited and Gatwick Airport Limited to pay grants towards the cost of installing domestic insulation in eligible dwellings in the vicinity of the airports”.

The last date for lodging an application under the Schemes was 31st March 1991 and all insulation work had to be completed by 30th September 1992. As these dates have been passed the Schemes are spent.” (as per Explanatory Note @ http://www.legislation.gov.uk/uksi/2014/3233/pdfs/uksi_20143233_en.pdf).

Latterly, Heathrow has introduced a range of noise control and mitigation measures voluntarily; although the prospect of statutory action is usually highlighted by government if appropriate ‘voluntary’ actions are not undertaken at UK airports.

7.1.1 Key messages

7.1.1.1 Policy environment

Against the context of planning for runway expansion at Heathrow, in early 2017, the DfT published a draft UK Airspace Policy with a consultation response published in October that year. The response stated that the Government:

§ expects airport operators to offer acoustic insulation to noise sensitive buildings, such as schools and hospitals, exposed to outdoor sound levels of 63dB LAeq,16hr or more

§ expects airport operators to offer financial assistance towards acoustic insulation to residential properties exposed to levels of noise of 63dB LAeq,16hr or more.

The Government went on to publish the Aviation 2050 consultation in December 2018 which proposed the following noise insulation measures:

§ to extend the noise insulation policy threshold beyond the current $L_{Aeq,16hr}$ 63dB contour to $L_{Aeq,16hr}$ 60dB.

§ to require all airports to review the effectiveness of existing schemes. This should include how effective the insulation is and whether other factors (such as ventilation) need to be considered, and also whether levels of contributions are affecting take-up.

§ the government or ICCAN (Independent Commission on Civil Aviation Noise) to issue new guidance to airports on best practice for noise insulation schemes, to improve consistency.

§ for airspace changes which lead to significantly increased overflight, to set a new minimum threshold of an increase of $L_{AeqT3dB}$, which leaves a household in the $L_{Aeq,16hr}$ 54dB contour or above as a new eligibility criterion for assistance with noise insulation.

It is understood that these newer measures have not yet been adopted.

7.1.1.2 Current schemes

A voluntary daytime noise insulation scheme was introduced in the mid-90s, followed by a voluntary night noise insulation scheme early in the following decade. By 2014, Heathrow started to offer the Quieter Homes Scheme for those residents living closest to the airport within the 69dB $L_{Aeq,16hr}$ aircraft noise contour.

Brief details of the existing noise schemes at Heathrow (Heathrow Expansion Consultation, 2019 @ <https://aec.heathrowconsultation.com/wp-content/uploads/sites/5/2019/04/190329-hep-nip-framework-v3.pdf>):

§ The **Quieter Homes Scheme (QHS)** applies to homes based on the 2011 69dB $L_{Aeq,16hr}$ contour. It covers the full cost of carrying out the work which can include loft and ceiling insulation, double-glazing or external door replacements and loft and ceiling overboarding. Around 1200 homes located close to the airport are entitled to this scheme (<https://www.heathrow.com/noise/what-you-can-do/apply-for-help/noise-insulation-schemes>). Thus far, around 750 homes have been in receipt of this offer.

§ The (Residential) **Day Noise Insulation Scheme** (or Day Scheme) is based on the 1994 69dB $L_{Aeq,18hr}$ contour and is designed to protect those homes exposed to the aircraft noise in the day, including in the early morning arrival period before 06:00. These properties are eligible to receive 50% of the cost of replacement windows and external doors, or free secondary-glazing, and free loft insulation and ventilation. 9300 homes fall into this scheme's boundary (<https://www.heathrow.com/noise/what-you-can-do/apply-for-help/noise-insulation-schemes>)

§ The **Night Noise Insulation Scheme** (or Night Scheme) is designed to address the impact of night flights on local residents. The scheme boundary is based on the footprint of the noisiest aircraft regularly operating between 23:30 and 06:00. These properties are eligible to receive 50% of the cost of replacement bedroom or bedsitting room windows, or free secondary-glazing of bedroom or bedsitting room windows, and free loft insulation and ventilation. Approximately 37000 homes fall within this scheme’s boundary (<https://www.heathrow.com/noise/what-you-can-do/apply-for-help/noise-insulation-schemes>).

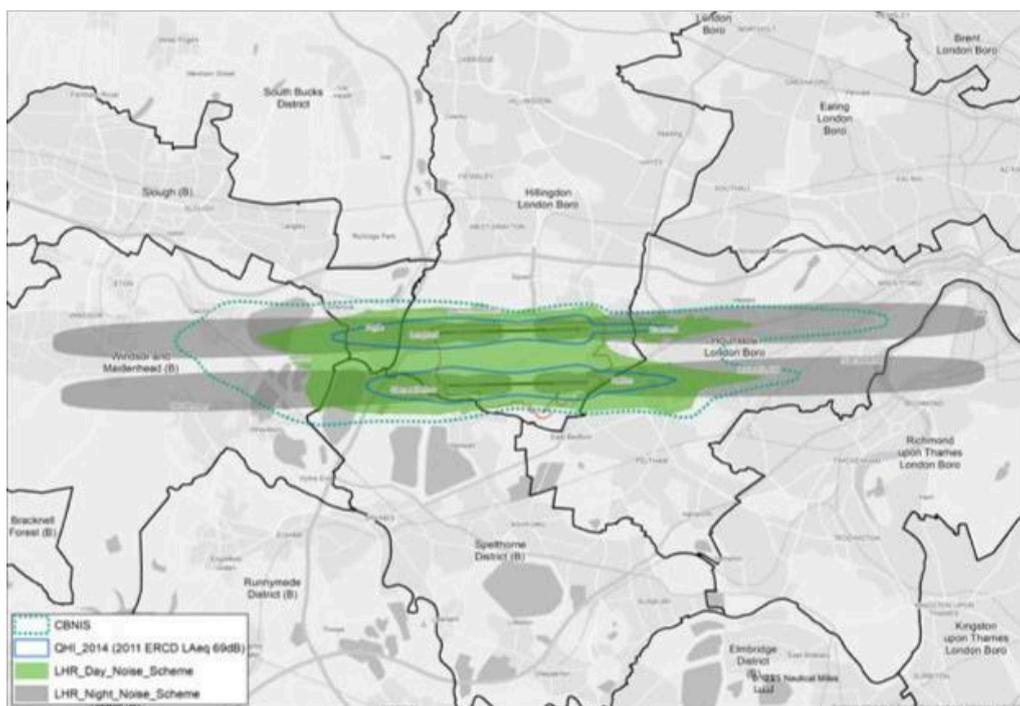


Figure 32: Boundaries of existing noise schemes.

In addition, in their runway expansion consultation document, Heathrow describe the **Community Buildings Noise Insulation Scheme** which applies to noise-sensitive buildings around Heathrow that are exposed to a medium to high level of noise (within the 2002 63dB $L_{Aeq,16hr}$ noise contour). Buildings included are hospitals, schools and colleges, nurseries attached to schools and hospices, nursing homes, registered nurseries, libraries and community halls. The scheme pays for buildings to make noise-insulating modifications such as double-glazing, replacement windows and ventilation. Eligible buildings are those in widespread use within the community, where people spend long periods of time, or where they are vulnerable.

7.1.1.3 Summary of research and key messages

While there has been a history of sound insulation at Heathrow, the effectiveness of the schemes for improving people's quality of life is not readily evident. The interventions, in their various forms, appear to be considered 'good' for their own sake, rather than there being evaluation of how they have contributed to quality of life, perceptions of value, 'fairness' and 'licence to operate'. A potential improvement would be a systematic evaluation of the effectiveness of the schemes in addressing the problem of noise disturbance. One approach is to set a targeted level of sound attenuation; another is to investigate customer satisfaction with the insulation provisions. The latter requires an investigation of the impact of the scheme on perceived levels of noise disturbance and, thus, levels of satisfaction with airport efforts to mitigate noise impacts. This could help inform future actions and determine the cost-effectiveness of this type of mitigation provision. This is not to suggest that the airport does not consult on new mitigation and compensation initiatives; rather that on-going feedback on existing measures would add considerably to the efficacy of future decisions as to the most appropriate and cost-effective range of measures in a given location.

A key aim of sound insulation schemes is to reduce noise disturbance experienced by local communities and thereby maintain good relationships with this key stakeholder group and a 'licence to operate'. Central to the success of such schemes is the perceived level of 'generosity' or 'reasonableness' of the action, yet this is another dimension that has not received substantial attention, either amongst residents in general or those specifically affected by aircraft noise.

The materials reviewed, and other sources, suggest that the lack of 100% take up of insulation schemes may illustrate that these are far from optimal offers. Indeed, discussions with local residents suggest that, as sound insulation does not impact on noise outside the home, or when windows are open, the offer cannot be most advantageous for full use of one's residential environment. Nevertheless, as a part of a suite of offers that are tailored to local circumstances (e.g. alongside financial support to groups and infrastructure in communities, etc.), sound insulation does appear to have some value.

7.2 Resident interviews

7.2.1 Methodology

In order to understand peoples' experience of living in the vicinity of/under en-route paths to/from Heathrow and their views on sound insulation, telephone interviews were carried out in September 2020. Participants were recruited through a local civic group, HACAN (Heathrow Association for the Control of Aircraft Noise), and included ten respondents. This group was purposively selected as their membership of HACAN, whose role is to be a voice for those under Heathrow flight paths, indicated that they would have some willingness to discuss issues related to aircraft noise. It should also be noted that there was a likelihood that some of the group may have had a willingness to oppose the airport and its activities too. This is something that the research team were aware of but it was agreed that the group's views would still provide insight into individual views amongst a small self-selected population. The interviews covered residents' satisfaction with their area and issues affecting their quality of life, their views about the airport and about the sound insulation offer, and an exploration of the value they placed on the intervention.

7.2.2 Results

It is important to reiterate, at the outset, that this was not a randomly selected group of interviewees but a group for whom noise was clearly already a factor. Thus, there needs to be a caveat about the representativeness of the results. Nevertheless, this was a motivated group of individuals who were willing to give their time to discuss quality of life in relation to

aircraft noise - something that was of immense value to the researchers during continued restrictions due to the COVID-19 pandemic which prevented the initially planned questionnaire and focus group approach.

All ten interviewees were located to the East of the airport and variously affected by westerly arrivals (close in at Hounslow and further out along the arrival path) or easterly departures (one under the flightpath taking 40% of easterly departure traffic). All had been in their properties for long periods, except for one participant who had moved from an area near the airport to one which was even closer and had been surprised by the apparent increase in noise intrusion, feeling that she had made a mistake with the move. All were owner occupiers; there were 6 females and 4 males; all had either retired from, or were in, professional jobs. The age distribution was: 1 in age band 35-44, 2 in 45-54, 1 in 55-64, 4 in 65-74 and 1 in 75-84.

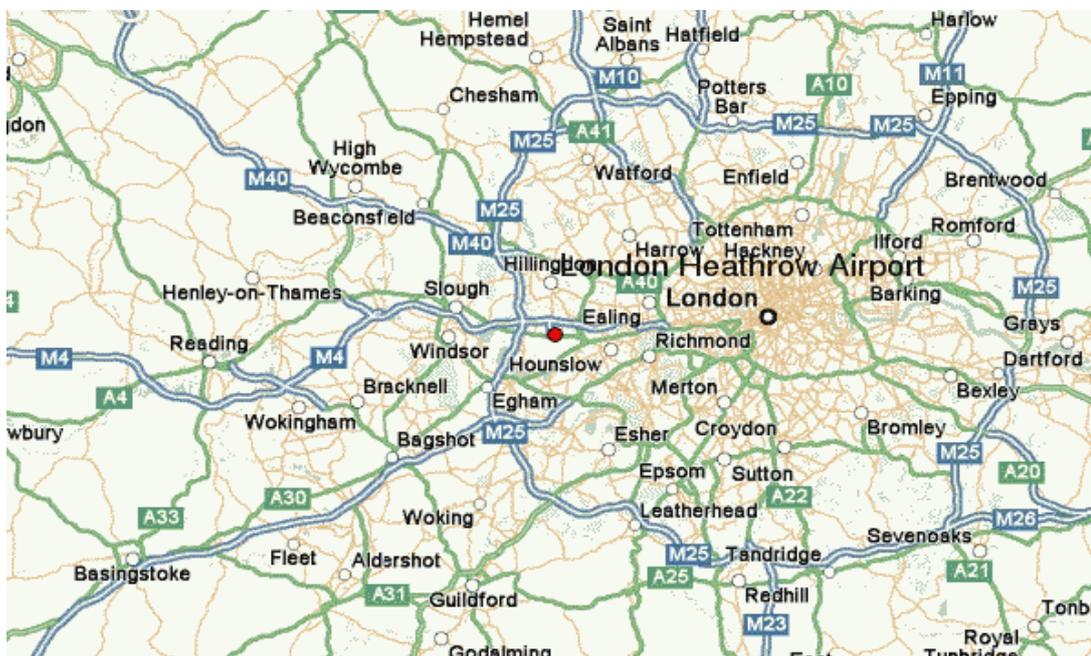


Figure 33: Location of Heathrow Airport.

7.2.3 Discussion

The findings of the qualitative interviews are set out in Figure 34. In this section, a number of main themes explored with interviewees are discussed. Where participants are described as 'uninformed', the views were expressed prior to the interviewer providing information about the sound insulation schemes and activities at the airport.



Figure 34: Main findings of in-depth interviews – Heathrow.

7.2.3.1 Environment and QoL

Generally, there was a low level of awareness of what the airport does to minimise noise exposure. Interviewees reported that there had been very little/no direct contact from the airport regarding their activities, except for some more recent communication on runway expansion. Most people had actively pursued information: indeed, HACAN was a primary source. However, while there was little evidence of a systematic understanding of noise management, there was better appreciation of general airport operations and impact of alternation and westerly/easterly modes. This led some to comment on noise sharing, which was generally supported, although opportunities for greater sharing linked to runway three were not agreed with, all felt more traffic would mean more noise for them

There was some cynicism about governance in general and feeling that communications were largely manipulative and tokenistic. In addition, there appeared to be a general lack of transparency/fairness.

There was a low level of awareness of insulation provision. Participants generally agreed with the principle of addressing the most noise affected, although the means for determining this was criticised (with some either suggesting that L_{eq} did not adequately reflect lived experience or simply that insulation should extend further out and take account of the increase in numbers of aircraft over the years).

Only one participant in the area (in Hounslow, very near to Heathrow) was covered by an insulation scheme (night). This work had been done before she moved in, and when she tried to get further work done during conversion of an attic, this was seen to be outside scheme provision as it was a new alternation. Ultimately, she paid for sound-insulated windows, which have improved the situation but not fully remedied it.

7.2.3.2 Heathrow Insulation provision (informed)

All interviewees understood the various sound insulation schemes once they were explained (they had been sent an information sheet on the schemes for use during the interview) and the use of L_{max} footprint for the night scheme seemed to be sensible. Overall progression of schemes was not very evident, especially as QHS only covers a small number of properties. The 50% offer to pay towards insulation was seen to be unfair – why should residents have to pay to rectify a problem of the airport's making? Generally, interviewees had to work hard for any evaluative comments about sound insulation as an intervention, with participants feeling it was impossible to provide a view without speaking to recipients. Nevertheless, some relevant comments were:

- Future airspace plans are more important
- Respite is more of a contribution than insulation
- Description feels technical
- What's the performance of the insulation provision?
- Offer needs to go further for different scenarios (i.e. consider each operational mode as you are exposed throughout the time when on a particular mode)
- Full costs coverage is a clear improvement
- Good use of money but other things are important
- Would be concerned about contractors and quality of installation
- Offer makes sense from a business perspective, it 'looks good'
- Looks good on paper but what's the real impact?
- Can vulnerability be factored into the qualification for insulation?

7.2.3.3 Airport impacts and interactions

Participants were generally happy to acknowledge the economic benefits from the airport, although personal access was less of a perceived benefit. The interviews also raised the negative issues around frequent fliers and wider environmental problems (carbon and emissions). There was universal agreement that noise disbenefits outweighed any positive contribution from the airport to local communities. Much of this conversation was overlaid with concerns about the airport's expansion through runway three: the decision in favour of which was seen to be misplaced, leading to much criticism of named politicians and processes of decision-making, with communities being 'treated with total contempt'.

The participants described very little direct information from the airport and what little there may have been as tokenistic, leaving people with a feeling of no control. Some had participated in consultations which they felt had some influence (e.g. over departures after 11.30pm) but momentum seems to have waned.

There was a desire to be consulted but there were also fears that the airport would control the agenda and, thus, outcomes. There was clearly room for improvement in communication over how operations can be enhanced to allow for influence over things that currently feel out of control.

7.2.4 Conclusion

Amongst the individuals participating in this study, QoL was generally reported to be good and positive attributes of their environment were readily articulated. When the theme of aircraft noise was introduced, participants did not tend to overtly link it to QoL, referring instead to adopted behaviours and activities in reaction to changes in sound level. There was little awareness of Heathrow's actions in relation to aircraft noise, although there was some familiarity with runway alternation. These individuals tended to be unaware of the sound insulation schemes offered by the airport but, once given information on the topic, expressed concerns around fairness and sound measurements used. Ultimately, this group of participants suggested that there was little communication from the airport and called for more effective engagement on issues that directly impact residents.

7.3 The impact of the sound insulation scheme on quality of life

The empirical work carried out suggests that, for the participants, there is little connection between sound insulation and quality of life. While aircraft noise is a concern, there is no obvious link drawn by the participants between the offer and any positive effect on quality of life. This may be because only one participant had been in receipt, indirectly, of the intervention, and others had not, suggesting that participants may have avoided any assertion which could only really have been conjecture. Equally, it may also be that each individual's experience is distinctive, with no single unique pathway of effect of sound changes across different people.