

## Respite from Aviation Noise

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### ABSTRACT

The concept of providing respite from aircraft noise has been moving up the agenda in recent years, as a useful and effective strategy for providing a break from aviation noise. However, there are no specific guidelines to explain what *respite from aircraft noise* means and how it should be implemented.

Following recommendations from the Respite Working Group (RWG), a research project has been carried out, sponsored by Heathrow Airport Ltd, to address the key objectives identified by the RWG. This paper describes the work of the RWG and its recommendations, and the aims and objectives of the follow on research work.

### RESPITE WORKING GROUP

Heathrow Airport Ltd (HAL) acknowledged the importance of understanding how to deliver effective respite in the context of developing its noise management strategy. In October 2014, the Respite Working Group (RWG) was set up to review current state of the art on respite from aircraft noise. Its role was to provide advice to the Heathrow Noise Forum on the management and assessment of respite from aircraft noise.

The RWG considered a review of the evidence on the 'current state of the art of respite' and reported on its findings, as well as a proposal for future research<sup>1</sup>.

Overall, the following key conclusions were drawn by the RWG based on the review evidence:

- **There is currently no clear, consistent or universally accepted definition of respite.**

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<sup>1</sup> The report can be found at [http://www.heathrow.com/file\\_source/HeathrowNoise/Static/Respite\\_Review\\_June\\_2016.pdf](http://www.heathrow.com/file_source/HeathrowNoise/Static/Respite_Review_June_2016.pdf).

The RWG agreed on the working definitions for the purposes of their project – see Box 1. There are many factors affecting the perception of respite and additional work is required to further define 'a period of time', 'break' and 'reduction' in terms of community perception.

- **What the community values as respite is not fully understood.**

Despite a number of related studies and implementation examples, there is at present no clear understanding of what the community values as effective respite<sup>2</sup>. Effective provision of respite depends not only on operational features but also specifically on how the community perceives and values respite. Community-level understanding is therefore a priority in developing an effective respite strategy for Heathrow Airport.

- **There is no universal formula for the successful implementation of an effective respite strategy and operational design for respite needs to consider operational conditions at an airport.**

The effective provision of respite depends on the relative position of the local community to the different flight paths that might be used, and how often each flight path is actually used. The operational conditions at an airport will determine which options may be feasible in terms of delivering respite. These could include factors such as safety, efficiency, aircraft and avionics capabilities and controllers' workload, amongst others.

- **There is currently no single acoustic metric that can adequately describe respite.**

Our review work has shown that only a few metrics have been used to objectively describe respite. Since it is not clear what the community deems as effective respite, and therefore which parameters are useful in describing its key elements, it is not possible to choose a suitable metric that is fit for purpose at this time. Instead, the Group has suggested a list of guiding principles and a candidate list of metrics to describe the noise environment in terms of offering respite.

- **Further work is needed to develop a clearer understanding of which parameters are useful in describing respite, in a way that is valued by the community.**

Using this information we can then test the suitability of our candidate measures. We also need to understand the relative importance of acoustic and non-acoustic metrics in evaluating respite, so that we can put the usefulness and limitations of any acoustic metric in context.

- **A strong and effective communication strategy and good community engagement is essential for the successful implementation of respite.**

From the cases analysed, two conclusions were drawn: multi-stakeholder engagement is fundamental and more efforts in communication are needed. It is key to engage *all* stakeholders during *all* phases of respite design and implementation. Communication should ensure that those involved understand the likely implications and associated trade-offs of respite implementation.

Once we have a clearer understanding of how the community values respite, research can then focus on the selection of the most suitable engagement method for cross-sector involvement, how to identify the key information to share, how best to describe and present that information and the most effective combinations of media to use to disseminate the information.

- **There is currently insufficient information on the benefits of respite to health and on the economic value of the effects of respite.**

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<sup>2</sup> Although the term community refers to the population of overflown residents, it is worth noting that the opinions may not be entirely unanimous and that residents may have differing opinions on effective respite.

There is clearly no one-size-fits-all solution, every end solution will vary - there is a need for further research.

### Box 1: Working Definitions used by the RWG for the purposes of this work

**Relief** can be defined as a break from or a reduction in aircraft noise.

**Respite** can be defined as a scheduled relief from aircraft noise for a period of time.

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The RWG agreed that priority must be focussed on gaining a better understanding of how the community values respite, before considering operational feasibility, cost-effectiveness and the development of metrics.

The following key research objective was identified for Heathrow: ***To better understand the key characteristics of an effective respite strategy for Heathrow Airport and its local communities, consistent with efficient operations.***

Two research phases were proposed:

- **Phase 1:** To develop a set of principles for providing effective respite from aviation noise at Heathrow. Two key questions have emerged. The first is what spatial variation in routes is required to make a perceived difference and benefit, in terms of height and position for both arrivals and departures; the second, what are the optimum temporal separations or patterns required in order for the community to value it as effective respite?
- **Phase 2:** Test practical implications for airspace design of the emerging principles from Phase 1 above. This would involve community subjective response research and operational testing of options.

## LABORATORY AND FIELD WORK

A research project programme was set up to start to address the questions raised in Phase 1.

The aim of this research project was to look towards Stage 1, at community attitudes and focuses on some key underlying principles based on perceived differences and temporal preferences - to address Questions 1 and 2.

- a. By how far do you need to spatially change **routes** to make both a discernible difference and a difference which is perceived of benefit or indeed worthwhile (in terms of height and track, and for arrivals and departures)? For example, to provide effective respite through route alternation, the routes must be spatially separated to a sufficient extent to make meaningful differences in sound levels as perceived on the ground. This was investigated through laboratory work.
- b. What are the optimum **temporal distribution patterns** preferred? In theory, and subject to operational constraints, it may be possible to provide respite according to any preferred temporal distribution, and it could be of considerable value to better understand community preferences in this respect. This was investigated through fieldwork.

This was a new piece of research, it looked at underlying relationships to underpin any developing recommendations – it is not a solution but part of an evolving process in understanding and developing effective principles for delivering respite.

The presentation will include some of the headline findings from this work and will consider the needs for any follow-on work. It will also provide details of the full technical report which was under review at the time of submitting the text of this paper.

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