

# CAA Response to the Airports Commission: Discussion Paper 5, Aviation Noise

**CAP 1099**



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## SECTION 1

# Introductory Remarks

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The CAA welcomes the Airports Commission's discussion paper on Aviation Noise, which makes use of a range of background information provided to the Commission by the CAA. Although the aviation sector has reduced its noise footprint considerably over the last 40 years, more can be done to encourage further improvements in performance.

We support the Commission's desire to ensure that when considering future airport capacity, any effects on noise are fully taken into account. However, noise should not be looked at in isolation. The trade-offs and interrelationships that exist with and between other environmental impacts, such as air quality and climate change, should be considered when making decisions by the Commission or Government.

As the UK's specialist aviation regulator, the CAA has a key role to play in helping the aviation sector improve its environmental performance. This is why we have the following strategic objective:

- Improve environmental performance through more efficient use of airspace and make an efficient contribution to reducing the aviation industry's environmental impacts.

In 2012 we published [CAA and the Environment](#), our four-year plan that sets out how we will deliver on this strategic objective. A key element of our plan is that we should operate only in those areas where we can add real value, avoiding duplication of work by others. It is in this spirit that we will have contributed to this consultation on aviation noise.

After the CAA's initial response to the Government's Aviation Policy Framework consultation, the CAA published an insight note titled [Aviation Policy for the Environment](#), which considered how to enable UK aviation to grow without unacceptable environmental consequences. The note focused on key environmental challenges, one of which is noise, and highlighted the need for a twin-track approach to noise policy focused on two high-level outcomes:

- continued reductions in the number of people affected by noise
- better engagement with communities in order to achieve greater consensus in support of sustainable development of the sector

**SECTION 2****General Questions**

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Q1. What is the most appropriate methodology to assess and compare different airport noise footprints? For example:

- What metrics or assessment methods would an appropriate 'scorecard' be based on?
- To what extent is it appropriate to use multiple metrics, and would there be any issues of contradiction?
- Are there additional relevant metrics to those discussed in Chapter 3 which the Commission should be aware of?
- What baseline should any noise assessment be based on? Should an assessment be based on absolute noise levels or on changes relative to the existing noise environment?
- How should we characterise a noise environment currently unaffected by aircraft noise?

For comparing across airports and to inform decisions on the effects of providing additional airport capacity, it is essential that metrics are linked to noise impacts - daytime noise metrics need to be linked to annoyance, and night-time noise metrics to sleep disturbance. We note that, currently, only Leq-based metrics have been linked to daytime annoyance in social surveys involving UK residents. While there has been a steady shift towards combining day and night noise into a single metric, such as Lden, we note that Lden is insensitive to significant changes in night-time exposure where daytime movements dominate, despite the additional weighting Lden places on night-time operations. In our view, separate daytime and night-time noise contours, as was recommended in the Aviation Policy Framework, offer benefits over combined metrics.

A number of supplementary metrics have come into popular use in the last decade. These have primarily been used to help communication of changes in noise exposure and have not been linked to noise impacts. Many of these metrics are not new and have been considered in the past as alternatives to Leq-based metrics, and in the limited studies where they were compared with Leq-based metrics they were found to be inferior in terms of their correlation with annoyance<sup>1</sup>.

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1 Aircraft noise in Australia, A survey of community reaction. NAL Report No. 88, February 1982

However, we believe that supplementary metrics can play an important role in how developments are taken forward, for example, use at Sydney airport to inform debate on noise concentration versus sharing.

With regard to the baseline used in an assessment, we believe it is important to assess each proposal in the same way and that the requirements of the Environmental Impact Assessment Directive clearly define how the effects of a project will be determined.

- Q.2 How could the assessment methods described in Chapter 4 be improved to better reflect noise impacts and effects?

There is currently a lack of consensus on how noise exposure relates to daytime annoyance in particular. Historically, the relationship between the two has been assessed through snapshot surveys of attitudes to aircraft noise. The CAA submitted evidence to the Commission showing that attitudes vary considerably depending on the level of public debate and this has an influence on public surveys of attitudes to aircraft noise. The only way to overcome this at a time of regular public debate on aviation planning issues is to undertake regular surveys over periods of time in order to establish steady state attitudes. Historically, this has not been considered viable due to the high cost of collecting measured noise exposure levels at the same location as the attitude surveys. We believe noise modelling has improved so much that future studies could use existing modelled noise exposure data and focus on attitudinal surveys.

- Q.3 Is monetising noise impacts and effects a sensible approach? If so, which monetisation methods described here hold the most credibility, or are most pertinent to noise and its various effects?

The DfT Chief Economist in 2007<sup>2</sup> noted that relationships between daytime noise and annoyance offer no obvious thresholds. Indeed, the most well-known relationship, the 'Schultz curve', is a smooth logistic regression function with a very shallow gradient at low noise exposure. The Chief Economist's recommendation was instead to monetise the impacts. However, since the methods for monetising noise annoyance are highly correlated with annoyance, the costs associated with very low exposure and marginal impacts dominate because of the relatively high numbers of people exposed at these low levels.

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2 Chief Economist statement on ANASE, Department for Transport, 02 November 2007

- Q.4 Are there any specific thresholds that significantly alter the nature of any noise assessment, e.g. a level or intermittency of noise beyond which the impact or effect significantly changes in nature?

The UK ANIS study<sup>3</sup> was produced in the 1980's, but, despite its age, it is one of the few studies that attempted to put attitudes to noise in context with attitudes to other issues people face in everyday life. Instead of attempting to find a 'zero annoyance' threshold, it sought to find a level where aircraft noise became the critical issue.

- Q.5 To what extent does introducing noise at a previously unaffected area represent more or less of an impact than increasing noise in already affected areas?

It is widely acknowledged that immediately following changes in noise exposure, reactions are temporarily elevated but then reduce back to their long-term levels over a relatively short period of time<sup>4</sup>. Because the majority of research is aimed at long-term reactions to inform policy decisions, there is limited quantitative data on the short-term effects. The US assessment framework is one of the few examples where recognition is given to long-term and short-term reactions (sleep disturbance) to night-time noise.

- Q.6 To what extent is the use of a noise envelope approach appropriate, and which metrics could be used effectively in this regard?

We are currently working with the DfT on the form noise envelopes could take and how they could be used to generate agreement between airports and local residents on how an airport may grow. International examples, such as at Amsterdam Schiphol, show how the concept can be used to engage with local residents. The benefit of greater certainty for residents over current and future noise exposure, and for airports on what level of development will be considered acceptable to residents may come at the cost of reduced operational flexibility for the airport. For some envelope criteria, simple factors outside an airport's control, such as a change of wind direction, could cause a breach of a noise envelope.

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3 DR Report 8402, United Kingdom Aircraft Noise Index Study. Civil Aviation Authority/Department for Transport 1985

4 Horonjeff, R. D., and Robert, W. E. (1997). "Attitudinal response to changes in noise exposure in residential communities," NASA Report No. CR-97-205813, National Aeronautics and Space Administration, Washington DC, p. 150.

- Q.7 To what extent should noise concentration and noise dispersal be used in the UK? Where and how could these techniques be deployed most effectively?

The CAA welcomes the debate on this, especially in respect of the forthcoming Performance-Based Navigation (PBN) technology, which will enable aircraft to fly along pre-defined routes with greater precision, and which would lead to increased noise concentration in the absence of policy intervention.

The Government's position, as set out in the Aviation Policy Framework, is that the balance of social and environmental advantage lies in concentrating aircraft taking off from airports along the fewest possible number of specified routes and that these routes avoid densely populated areas as far as possible.

We recognise that there may be local circumstances where the advantage lies in dispersing traffic, especially for the purposes of sharing noise impacts and providing noise relief/respice over noise sensitive areas by means of alternating flight paths. PBN could facilitate this, though any proposals must be compatible with the complex and highly interactive airspace arrangements in the south-east of England.

Further to the complexities of monetising noise disturbance detailed in our answer to Q 4 above, we note that there seems to be little work available which estimates and monetises the value of periods of respice from noise over and above their effect on the average long-term noise exposure.

- Q.8 What constitutes best practice for noise compensation schemes abroad and how do these compare to current UK practice? What noise assessments could be effectively utilised when constructing compensation arrangements?

While the 2003 Air Transport White Paper improved UK best practice, it would appear that UK practice is somewhat less generous than international best practice with regard to compensation. In our view compensation should be linked to daytime annoyance and night-time sleep disturbance and therefore linked to the daytime Leq metric and the Sound Exposure Level (for risk of sleep disturbance) respectively.