

## Airports Commission

### A Response to Discussion Paper 05: Aviation Noise

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#### Introduction

Both day and night time aircraft noise are a major health hazard which needs to be accurately measured, monitored and reduced. This response to the Airports Commission's Discussion Paper on Aviation Noise seeks to highlight the alarming health impacts of noise, and the immediate need to reduce the source of the noise at source.

#### Impact of Noise

In the report, **Design for a US Field Study on the Effects of Aircraft Noise on Sleep** by Mathias Basner, states (2012, page 6):

Undisturbed sleep of sufficient length is necessary to maintain daytime performance and health. (Banks and Dinges, 2007) The human organism recognises, evaluates and reacts to environmental sounds even while asleep. (Oswald, Taylor and Treisman, 1960) These reactions are part of an integral activation process of the organism that expresses itself e.g. as changes in sleep structure or increases in blood pressure and heart rate. Environmental noise may decrease the restorative power of sleep by means of repeatedly occurring activations (so-called sleep fragmentation). Acute and chronic sleep restriction or fragmentation have been shown to affect, among others:

- Waking psychomotor performance (Van Dongen, Maislin, Mullington and Dinges, 2003),
- Creativity (Wagner, Gais, Haider, Verleger and Born, 2004),
- Risk taking behaviour (McKenna, Dickinson, Orff and Drummond, 2007),
- Signal detection performance (Basner, Rubinstein and Fomberstein et al, 2008), and
- Accident risk (Barger, Cade, Ayas et al, 2005; Scott, Hwang, Rogers, Nysse, Dean and Dinges, 2007).

According to the World Health Organisation, c900,000 healthy life years are lost annually in the EU due to sleep disturbance induced by environmental noise (WHO, 2011) and they also consider that the onset of the effects of noise on sleep occurs at an aircraft noise event level of 32 dB  $L_{Amax, indoors}$ . Taking the WHO standards and applying them to the UK, it is found that:

- Over 3300 disability adjusted life-year (DALYs) are lost annually by highly sleep-disturbed people living with noise levels above 45 dBA  $L_{night}$  – the bulk of which occur around London Heathrow
- High levels of annoyance result in the loss of 3500 disability adjusted life-years (DALYs) each year by individuals living with noise levels above 55 dBA  $L_{den}$  – again the bulk of which occur around London Heathrow

The recent CAA review (Jones and Rhodes, 2013, p. 75) also covered the work on cardiovascular and hormonal changes that occur during sleep as a result of noise highlight the importance for further work into the area, due to the potential for long-term health effects.

Continued exposure to aircraft noise also impacts on normal daily routines ranging from work to education (see: Stansfeld et al, 2005; WHO, 2011).

**Conclusion:** Noise, and in particular, noise which interrupts sleep is a serious health hazard. Airports which inflict sleep interruption and deprivation should be open to legal challenge just as any other polluting organisations and those selling life threatening products. As a minimum, night flights should be banned between 23.00 and 07.00, and the daytime noise disturbance should be greatly reduced.

### Measurement of Noise

Noise measurement and assessment around airports should include a metric for the number of noise events, and their loudness in addition to the current averaging approach. It is the noise event and its loudness which causes the interruption to normal daily routines and results in sleep disturbance.

The UK should at least adopt the WHO Interim Target Level of 55 dbA and ideally work to the levels being achieved elsewhere in Europe (see [www.noise.eionet.europa.net](http://www.noise.eionet.europa.net) and the European Noise Directive END, 2002/49/EC).

### Noise Mitigation

Due to the demonstrated health impacts of noise, there should be a year on year reduction in the numbers of individuals exposed to aircraft noise, and all steps should be taken to reduce the noise at source.

### Setting National Targets

Targets need to be set for the number of people exposed to significant noise both individual airports and across all UK airports. If the targets set for the USA are used (Table 1), the UK target would be 60,000. There are currently 725,500 people within the 55L<sub>den</sub> Contour for London Heathrow.

Table 1, Noise Goals and Metrics USA

Aspect	Goal <sub>1</sub>	Performance Metric <sub>2</sub>
Noise	Reduce the number of people exposed to significant noise around US airports in absolute terms, notwithstanding aviation growth, and provide additional measures to protect public health and welfare and our national resources	The US population exposed to significant noise around airports has been reduced to less than 300,000 persons by 2018
Notes: 1: Aviation Environmental and Energy Policy Statement (2012) 2: Aspirational Goals from FAA Destination 2025		

In addition to numerical targets being set, a noise capacity should also be set for all airports (see Gillen, 2001).

### Continuous Descent Approach

Introduce Continuous Descent Approach which brings with it the following benefits:

- Higher for longer: Because the aircraft flying a CDA is higher above the ground for a longer period of time, the noise impact on the ground is reduced in certain areas under the approach path.
- Less engine thrust: Noise on the ground is reduced further because a CDA eliminates the period of level flight when additional engine thrust would have been used.
- Noise reductions up to 5 decibels: Depending on the location and aircraft type, the noise benefit from a CDA compared to a conventional approach could be up to about 5 decibels
- Fuel savings and reduced emissions: There can be significant fuel savings (for the arrival phase of flight) with a CDA because less engine power is required – this also means that aircraft emissions will be reduced  
(See: Civil Aviation Authority)

### **Community Measurement and Monitoring**

In addition to the current noise measurement and monitoring programmes, individuals should be encouraged to submit their own aircraft noise readings using one of the many mobile phone applications (see: dB Volume Meter, TooLoud? and decibel).

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