

Airports Commission

Aviation Noise Discussion Paper

Response from HACAN

HACAN is a long-established organisation which represents residents under the Heathrow flight paths

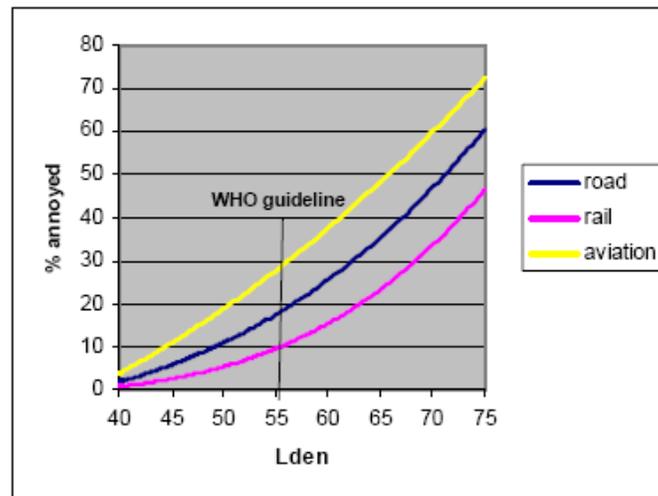
Overview

The discussion document sets out the issues clearly, concisely and even-handedly. We respond chapter by chapter.

Chapter 2: How does noise affect people

This chapter takes a balanced view of the impact of aviation noise. It correctly states that it impacts far fewer people than road noise but recognizes there is evidence to show that people become disturbed more quickly by aircraft noise. It helpfully reproduces the table below.

Figure 2 Percentage of people annoyed as a function of noise exposure of dwellings (Lden in dB(A))



Source: Miedema & Oudshoorn (2001).

The paper also usefully quotes the research by the European Environment Agency which found that 27% of people are ‘highly annoyed’ by aircraft noise at 55dB (Lden) but only 6% of people by the same levels of road noise. This, the paper argues, “supports the view that people are more sensitive to aircraft noise than other noises”.

The experience of HACAN members would bear this out. Many are not merely annoyed by the noise but are truly disturbed by it.

The debate as to why people can get so disturbed by aircraft noise is ongoing. The book, *Why Noise Matters*, suggests “it could be to do with the high level of low-frequency content it contains. Wherever noise has a stronger than average low-frequency component – powerful stereo-systems, wind turbines, heavy lorries, high speed trains, for example – it seems to become particularly problematic” (Stewart et al, 2011). A Swedish study ((Pederson et al, 2005) showed that people tended to become more annoyed more quickly by wind turbines, which also emit significant levels of low-frequency noise, than by noise from other industrial sources or from traffic noise – very similar to people’s reactions to aircraft noise. The large amount of low-frequency within aircraft noise has implications for the way it should be measured, which we detail later in this submission.

2.2 Weight to be given to complaints

Your discussion paper is right to question whether the number of noise complaints is a reliable indicator of the impact of aircraft noise on communities – for the reasons you outline. We would add one further reason: lower income communities, though often worst affected by noise, historically complain less. This could also be another reason why complaints about aircraft noise are higher than those about traffic noise. These days, in the UK, traffic noise is more of a problem for poorer communities. Traffic noise, certainly in urban areas, tends only to be problem for people living on main roads (since many ‘residential’ roads have been traffic-calmed: cutting traffic volumes, speed and, usually, noise). This has a particular impact on poorer households who live in disproportionately large numbers on the main roads. A study found a fifth of council tenants in the London Borough of Greenwich rated traffic noise as big a problem as crime, with those living on main roads the most concerned (Stewart, 1998).

See also <http://www.chhearing.org/noise-center-home/noise-archives/intrusive-community-noises-yeild-more-complaints>, which also notes that the level of complaints does not accurately reflect the level of disturbance. It also says older people are more likely to be disturbed.

2.3 People who are not bothered by aircraft noise

Policy-making is made difficult by the apparently random way people react to aircraft noise. A person living over 20 miles from a busy airport can become utterly distressed by the noise while somebody close by will say that it doesn't bother them.

2.4 Introducing aircraft noise to a new area

In chapter 4 you raise the question of the impact of introducing aircraft noise to an area which previously had no planes or few of them. It seems always to be the case that people become particularly disturbed when aircraft start flying over the communities for the first time. A relatively small number can be tolerated but once the 'tipping point' has been reached disturbance becomes very noticeable.

Here are two examples which illustrate this:

In the mid-1990s the recommended point for Heathrow aircraft landing at the airport to join their final approach path over London was moved about 3 miles further east. At a stroke, it brought probably as many as 250,000 people living London's densely-populated boroughs under the flight path to Heathrow.

"It was as if someone flicked a switch. I lived in Clapham North for 20 years. Until 3 years ago one hardly noticed planes, apart from Concorde. Then, quite suddenly, in summer '95 the occasional drone became a remorseless whine. It was like living under an aerial motorway."

"We moved into Stockwell 14 years ago after checking out aircraft noise (we had previously been in Fulham). There was no perceivable aircraft noise day or night. There has been a change. We have inadvertently become the new neighbours of Heathrow."

Residents writing in 1998.

A Bureau Veritas report (Turner et al, 2007) commissioned by HACAN highlighted the changes:

"In Ruskin Park in Camberwell, 20 kilometres from the airport, aircraft noise dominates the local environment. During busy hours a plane flies over almost every 90 seconds, usually louder than 60 decibels."

The changes prompted the formation of the campaign group, ClearSkies (later to merge with HACAN). Ever since Heathrow opened there had been no protest group in these areas. The Terminal 4 and Terminal 5 campaigns focused exclusively on the impact on West London (and, to the west, parts of Berkshire). ClearSkies was simply the result of so many people becoming, as one resident put it, ‘the new neighbours of Heathrow’. New noise disturbs.

The second example of the impact of new noise comes from Frankfurt in Germany.

The fourth runway, opened in October 2011, resulted in tens of thousands of people being significantly overflowed for the first time. It has resulted in one of the most astonishing



aviation protests that Germany has ever seen. Every Monday evening since the new runway opened up to 5,000 residents have occupied the terminal, demanding the new runway is closed.

We discuss the implications for respite and dispersal of introducing noise to new areas later in our response.

2.5 Heathrow in a league of its own

Airport	Population within the 55L _{den} contour
London Heathrow	725,500
Frankfurt	238,700
Paris Charles de Gaulle	170,000
Paris Orly	110,000
Brussels	49,700
Amsterdam	43,700
Madrid	43,300

We welcome the clear recognition in the discussion paper that noise from Heathrow and its flight paths affects many more people than anywhere else in Europe. Indeed, 28% of the people

in Europe affected by aircraft noise live near Heathrow. The *percentage* of the overall population affected is higher in Frankfurt but in terms of *actual* numbers Heathrow is in a league of its own. The areas heavily overflown include some of the most densely populated – and most deprived – wards in the UK. We would argue, therefore, that there is not only a strong environmental argument against expanding Heathrow but also a powerful equity case to be made against further expansion of Heathrow.

There is evidence that people's health (Jarrup et al) and children's education (Haines et al) are impacted by aircraft noise at Heathrow.

Chapter 3: Measuring aviation noise and Chapter 4: Quantifying noise effects

The measurement of noise – and of noise annoyance/disturbance – needs revising. Currently it is misleading. Any noise measurement that does not reflect reality lacks credibility. The current 57 db Leq contour – the official area which defines where community annoyance sets in - excludes places like Putney and Fulham in West London! Not the real world!

A misleading noise contour will have two important negative consequences:

- It will lead to mistrust between residents and an airport;
- Policy based on wrong information can lead to unsound decision-making.

As you point out in your paper, the Government in its Aviation Policy Framework issued in March 2013 recognised the weakness of the current measurement: *“Average noise exposure contours are a well-established measure of annoyance and are important to show historic trends in total noise around airports. However, the Government recognises that people do not experience noise in an averaged manner and that the value of the LAeq indicator does not necessarily reflect all aspects of the perception of aircraft noise. For this reason we recommend that average noise contours should not be the only measure used when airports seek to explain how locations under flight paths are affected by aircraft noise.”* This is a welcome development.

Finding the best noise metric(s) will not be easy and no metric will be perfect but it seems to us that the one option that is not feasible is a continuation of the status quo because it is so unreflective of reality.

We will look at the current problems and then assess possible ways forward.

3.1 The problems with the current metrics

There are key flaws in the way noise annoyance is measured.

a. The noise is averaged out over a 16 hour period. Averaging out noise over a given period might work for a busy main road where traffic is fairly constant throughout the day but average measurements are not suitable for the more intermittent nature of aircraft noise. The averaging out of aircraft noise includes the quiet periods of the day and the quiet days of the year, so underestimates the noise people actually hear. It does not reflect the way people are disturbed by the noise.

- The 16 hr contour doesn't include the period from 6-7am, one of Heathrow's busiest hours for landings with both runways in use.

- In London, there is an additional problem that the noise from City and Heathrow aircraft are measured separately and so the cumulative impact on communities which experience both is not captured.

b. The method used to average out the noise does not give enough weight to the number of aircraft flying overhead. It concentrates on the noise made by each individual aircraft. It assumes annoyance levels will remain the same if the number of aircraft operations are doubled so long as the individual aircraft noise levels are reduced. Under this system, one Concorde followed by 3 hours and 58 minutes of relief is said to be as disturbing as four hour's worth of non-stop noise from Boeing 757s at a rate of one every two minutes (Hendin, R). This is clearly not a reflection of reality!

This means that the noise metrics have not captured what has been happening in recent decades: the impact on residents of the huge increase in the number of aircraft passing overhead. It is instructive to note what happened in the 1990s. The decade saw less noisy aircraft introduced but also saw a big increase in flight numbers.....and complaints. It was the decade when HACAN membership grew like never before or since. The increase in flight numbers was the all-important factor – not reflected in the noise metrics. Using those metrics, the aviation industry and government could claim that the noise contour was shrinking. Technically that was true but it masked what was happening on the ground.

b(1). The measurements do not cover the areas where noise has become a significant problem over the past 18 years. They only include areas about 8.5 miles from Heathrow. Yet, as we have said, in 1995/6 the flight paths were extended so that aircraft noise became a real problem for areas 20 miles and more from Heathrow. This is largely because the metric used underestimates the impact of flight numbers.

It cannot be over-emphasised that the number of flights passing overhead is the key factor affecting the level of noise annoyance and disturbance.

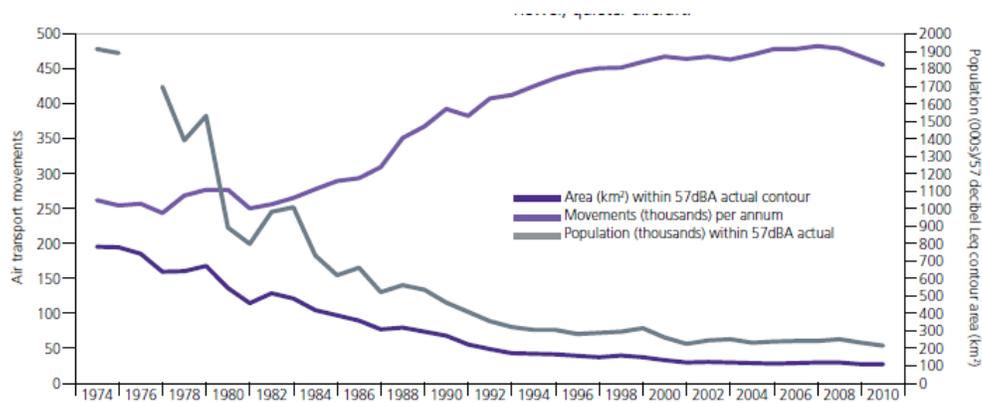


Figure 4.3 Area and population within the 57 decibel contour around Heathrow²⁴

We believe that the graph above, taken from *A Quieter Heathrow* (Heathrow Airport, 2013) is accurate but misleading. The number of flights has nearly doubled yet the claim is that both the area and population disturbed by noise has shrunk. It is simply not true! In 1974 the campaigns which did exist were made up of people living only a few miles from the airport. Today HACAN’s membership reaches from Greenwich in the east to Reading in the west. The main reason for this increase has been the growth in the number of planes.

c. The point at which people are said to become annoyed by the noise is unrealistic. To repeat what we said earlier, it is claimed annoyance only sets in when the noise averages out at 57 decibels across the 16 hour period. This excludes places like Putney and Fulham! We do appreciate that acousticians point out that the 57 decibel cut off point does not technically imply that nobody suffers from noise outside the contour. But politicians, the public and the press do not live in the rarefied world of acousticians! The perception that 57 is the cut off point is false and needs to be countered.

d. The low-frequency content of aircraft noise is likely to be underestimated.

The World Health Organisation (Berglund et al, 2000) has recommended:

“Special attention should also be given to: noise sources in an environment with low background sound levels; combinations of noise and vibrations; and to noises with low-frequency components” (our emphasis)

WHO recommends that, when aircraft noise, using ‘C’ or ‘D’ weighted measurements, is around 10 decibels higher than when the conventional ‘A’ weighted measurements are used, it indicates the presence of significant levels of low-frequency. In these circumstances, ‘A’ weighted measurements do not fully capture the impact of the noise and ‘C’ or ‘D’ weighted measurements should be used.

A study carried out by HACAN showed that aircraft using Heathrow fell into this category (Hendin, 2003). It suggested that a reason why people may not be responding positively to less noisy aircraft is that “the improvements have been in the mid to higher frequencies.” An exception to this may be the A320 family of aircraft which emit what residents, some distance from the airport, have described as ‘a high-pitched whine’.

3.2 Possible ways forward

The current 57 LAeq metric

We understand that this might need to be retained simply for purposes of historical comparison but that should be its sole use. It is so flawed it should not be used for any other purpose.

The EU 55Lden metric

This method averages out the noise over a 12 hour day, a 4 hour evening and an 8 hour night, adding 5 and 10 decibels to the evening and night periods respectively to reflect the lower background noise levels at these times. We appreciate the points made in the paper that this addition of 5 and 10 decibels may not exactly reflect the background levels but the 55 Lden contour comes much closer to reflecting the situation in the real world which should, in our view, be the basic test of any metric. A 54 LAeq metric might achieve similar results.

The WHO 50 LAeq and 55 LAeq recommended metrics

The WHO argues that the ‘onset of moderate community annoyance’ starts at 50 decibels and ‘severe’ annoyance at 55. This, in our view, reflects most accurately the actual reality on the ground. It is closest to the findings of ANASE, the last major study commissioned by the UK Government. And, we would argue, any Government should be required to come up with very cogent reasons if it is to reject the findings of a body with the wealth of experience in noise research possessed by the WHO.

The N70 metric

This is a metric based on the number of noise events aircraft passing overhead that reach or exceed a certain decibel level within a given time period (usually a day). We agree with your paper’s statement that this “may be more easily understood by the public than LAeq”. This has proved to be the case in Sydney where it was pioneered.

The noise histograme

A histograme might be useful in identifying noise in a particular spot. It shows cumulative impacts in a way that the N70 metric doesn’t do. The diagram below is from work commissioned by Heathrow Airport from Flindell and others (Flindell, I. et al, 2011). It relates to a monitor about 2 miles west of the northern runway. You can see that the corresponding N70 would be about 28, but that the *total* number of measurable events is about 130. The histogram is revealing data concealed by N70.



‘Noise efficiency’ metric

We are not at all convinced that this metric which your paper has highlighted would be helpful. The Commission is seeing it as a way of comparing the noise efficiency of different airports: “L_{Aeq} contours...rank airports in relation to the number of people living within their 57L contours L_{Aeq}16h. This type of comparison does not take account of the productivity of the airport, which is typically expressed in terms of either a) the annual number of Air Transport Movements (ATM), or b) the annual number of passengers using the airport. It is possible to design longer period noise exposure metrics which take this into account”. We cannot see what relevance this has to the number of people who are annoyed/disturbed by the noise. The concept of ‘noise efficiency’ simply over-complicates matters.

Night Noise

In your discussion paper you write: “WHO Europe guidance sets an interim maximum target for noise levels of 55L_{night}, and a long-term maximum target of 40L.....to achieve even the WHO Europe interim target in London would essentially require a near complete closure of the transport system between 23:00 and 07:00”. That is correct and clearly would be untenable at present. But a distinction ought to be made between shutting down the nation’s road system, which could not be done, and ending night flights which is more realistic.

If night flights do continue (we favour no flights before 6am and a progressive reduction between 6am and 7am), our view is that it is singularly inappropriate to average out the noise at night unless there are a large number of flights throughout the

night at an airport. At Heathrow, where there are just 16 scheduled flights between 11.30pm and 6am (plus on average one unscheduled take-off in the late evening), the cap on the number of events is much more meaningful.

The discussion paper asks whether “monetising noise impacts and effects [is] a sensible approach? If so, which monetisation methods described here hold the most credibility, or are most pertinent to noise and its various effects?” HACAN commissioned a report from CE Delft which looked at this (Korteland and Faber, 2011). The Department of Transport did not accept all its conclusions but did accept its basic argument that SCABA (Social Cost Benefit Analysis) was a viable way of monetising the noise impacts of flights and night. We would suggest that SCABA is used to do this.

Chapter 5: Mitigation

There are a number of ways in which to mitigate the noise.

- **steeper approaches**

The angle at which planes come into land, known as the glideslope, can affect noise levels. At present most airports use a 3 degree glideslope. A steeper glideslope would mean planes would be higher longer, thus reducing the noise over more communities. At present the International Civil Aviation Organisation (ICAO) is looking at the practicability of a 4 degree glideslope. Their trials have shown that 3.25 degree approaches are possible even for the largest aircraft but a 3.25 degree approach would only offer a small improvement. Nevertheless steeper approaches have potential to cut noise. However, they would need to be introduced with care as, for example, a two-tiered glideslope - where planes reverted to a less steep approach as they approached the airport - could impact adversely on communities below where aircraft changed from one angle to another.

- **continuous descent and departure (climb)**

A common technique to reduce noise used at some airports, including Heathrow, is Continuous Descent Approach (CDA). This is where aircraft aim for a smooth approach rather than the traditional step-by-step one which caused noise problems for

communities in areas where aircraft were moving from a higher step to a lower one. Its critics argue it results in more noise in areas some considerable distance from the airport because, in order to achieve their smoother descent, aircraft are joining their final approach path further out than previously but, overall, it cuts noise. The same is true for continuous climb on departure.

- **dispersing the flights**

It has been Government policy to concentrate flights, particularly on departure, but the new Aviation Policy Framework, published in March, opens the door to dispersal: “The Government believes that, in most circumstances, it is desirable to concentrate aircraft along the fewest possible number of specified routes...however, in certain circumstances, such as where there is intensive use of certain routes, and following engagement with local communities, it may be appropriate to explore options for respite which share noise between communities on an equitable basis, provided this does not lead to significant numbers of people newly affected by noise.”

Respite is not necessarily the same as dispersal as respite can be given without dispersal (such as in the runway alternation enjoyed by much of West London). Nevertheless this new approach by Government is welcome. It gives the flexibility needed at airports where dispersal would be desirable. The alternative to some dispersal at Heathrow is the creation of noise ghettos.

Of course, everybody living under the Heathrow flight path is not in a noise ghetto as the frequency of flights in some areas over 20 miles from the airport is not sufficient to justify the term. In those areas there is often already sufficient dispersal. But there are areas, which don't get the alternation enjoyed by West London, which have become noise ghettos with over 40 planes an hour at certain times of the day. These are the areas where respite is required.

New technology means that planes will be able to be guided much more precisely as they land and take off. This opens the way for a greater sharing of flight paths, thus providing people with some respite from the noise. Given that so many areas in London and the Home counties already experience noise from Heathrow, some

element of dispersal would bring noise to a few new areas. Where it may be inevitable, the number of planes using these new areas must be limited.

HACAN does not favour creating new Noise Preferential Routes for take-offs. We favour retaining the existing routes, but for dispersal within those routes.

It is worth re-stressing the importance of runway alternation to the areas which benefit from it. Hounslow Council, in its submission to GLA Transport Committee, said in that “a predictable period of respite is the single most effective noise mitigation measure available”.

- **less noisy aircraft**

Aircraft have become less noisy over recent decades, with the important caveat we mentioned earlier that the low-frequency content of the noise may not have reduced. Yet, during that period, complaints have gone up at Heathrow. This is because for most residents the benefits of the less noisy aircraft have been off-set by the big increase in the number of planes. And, as we said earlier, the noise metrics have not reflected that. It is why we do not think the claim by the industry group Sustainable Aviation, in its recent report, that less noisy aircraft could mean “air traffic movements can double without increasing the total noise output” does not stand up to scrutiny.

An important factor for the Commission to consider is whether planes are less noisy for the whole length of their journey. There have been suggestions that manufacturers have targeted the ICAO measuring points which are relatively close to the runway, with performance elsewhere taking a back seat. Some of our members argue the A380 on arrival is at some West London locations actually noisier than the old 747s it is replacing. In 2007 ICAO seemed to acknowledge this but subsequently seem to have buried it in the long grass. HACAN does not possess the technical know-how to assess these claims but we believe the Commission should ask these questions.

The noise monitors at Heathrow are all relatively close to the airport. We would like to see noise monitors placed in areas much further from the airport to reflect the way

noise has become a problem much further from the airport in recent years.

We have used the term “less noisy” rather than “quieter” to describe the new aircraft because, with or without a third runway, in 20 years’ time Heathrow, even with “quieter” aircraft, planes will still be the cause of significant noise problems across London and the Home Counties.

- **noise envelopes**

We are wary of noise envelopes. We repeat what we said in response to the DfT Consultation on its aviation policy framework: “HACAN, in its response to the Scoping Document, expressed real reservations that noise envelopes risked becoming a device which allowed more growth without bringing any real benefits to residents. We welcome the fact that the Department has tried to address these fears. This consultation document argues that a noise envelope could take different forms. It could, for example, simply be a cap on the number of aircraft allowed to use the airport. This would be warmly welcomed by most residents. However, the consultation says: ‘There was a stark difference in views on whether an envelope should include a cap on movement numbers’. Faced with this the Government says it is ‘therefore interested in exploring other more sophisticated ways of articulating noise envelopes.’ It floats the idea of limiting the number of people exposed to noise or the size of the area. The correct envelope could bring benefits to both the industry and local communities but, without a cap on flight numbers being a part of any envelope, local communities are likely to remain nervous about the concept”.

- **independent noise regulator**

HACAN now has a good professional working relationship with Heathrow Airport and there would be little obvious benefits in bringing in an independent regulator. But this situation is not replicated across the country. At some airports, such as London City and Southend, key residents’ groups are not even permitted to be members of the airport consultative committees. Therefore, an independent regular could be of benefit. But we would caution that s/he will not provide a panacea. The long-established regulatory body in Paris, ACNUSA, has not prevented considerable discontent amongst residents overflown by either Charles de Gaulle or Orly airports.

Indeed, our conversations with these groups suggest that both these airports are far behind Heathrow in developing improved operational practices.

- **More noise insulation**

There is a good case to extend the area where the residents can claim subsidised noise insulation. At present there are many areas where noise is a problem but where help with insulation is not available.

John Stewart

Chair HACAN

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