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THE ROYAL BOROUGH OF  
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AND CHELSEA**

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My reference:  
Your reference:  
Please ask for: Guy Denington

Dear Sirs

**Discussion Paper No.5 – Aviation Noise**

I am submitting our response by e-mail as requested in the consultation advice. We are pleased to be able to comment on the initial analysis of aviation noise in relation to airports, published by the Commission in July. As a west of centre London borough under one of the approach paths to Heathrow Airport, our concerns are particularly about operations at the Airport and any possible additional runway, or runways. Although our residents undoubtedly benefit from having an international airport within easy reach, the south of the borough is affected by aircraft noise particularly in the early morning, or when flights are taking off towards London.

It is reassuring to note that the Commission has given due recognition to the paradox that while individual aircraft are much quieter than fifty years ago, aircraft noise is more disturbing, and affected communities have probably grown more sensitive to this type of noise. This heightened sensitivity aspect was raised in the ANASE study (referred to in *paragraph 2.13*) and while the methodology of the study has been questioned we do not believe that the findings are invalid. Undoubtedly the amplified reaction to aircraft noise is associated with the increased frequency of flights.

We are also interested to see the consideration given to noise impacts including hypertension, cognitive impairment, reduced productivity, sleep disturbance and annoyance. Turning to the measurement of noise, a re-examination of the metrics used to assess aviation noise is long overdue, and if this results in a more realistic means to evaluate noise impacts this in itself will be a major achievement for the Commission.

One of the most striking statistics, highlighted in the paper, is the magnitude of Heathrow's noise impact in comparison with those of the next highest in ranking in the UK, and then hub airports in continental Europe. In *paragraph 2.7 (and tables 2.1 and 2.2)* it states that:

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Size of population within the 57dB<sub>LA eq 16hr</sub> footprint is 258,500 for Heathrow, whereas for Manchester airport the figure is only 35,200, and the population affected by 55dB<sub>Lden</sub> or more is 725,000 for Heathrow and much less – 238,700 in the vicinity of Frankfurt.

It is hardly surprising that the Royal Borough, together with the other local authorities forming the 2M Group, is troubled by the high levels of aircraft noise experienced by residents, and the prospect of even more disturbance if Heathrow is expanded.

I will deal with each of the main chapters in turn and address the questions posed that have the most relevance to the Royal Borough's situation, with references within the paragraphs to the numbering (using italics) in the document.

## 1.0 How does noise affect people?

1.1 The paper invites views on this aspect and we have the following comments to make. In grouping noise impacts (*Paragraph 2.9*) into health impacts, learning and productivity effects and amenity effects, we are concerned that in *Fig 2.2* stress and sleep disturbance have been categorised as amenity effects. While on the margin these may simply affect quality of life e.g. causing annoyance; significant sleep disturbance and stress should definitely be regarded as health effects.

1.2 Indeed although *paragraphs 2.17 - 2.19* point to uncertainties about the impact of sleep disturbance and the need for further research, in chapter 4 (*paragraphs 4.18 to 4.21*) reference is made to a German study concluding that long-term health effects occur even if the noise is insufficient to cause awakening. As the Commission has accepted, this resulted in new guidelines on night-time noise from WHO Europe. As mentioned in *paragraphs 2.30 -2.33*, sleep disturbance may cause loss of concentration during the day with consequences for learning, and productivity in the workplace. Our complainants often refer to being woken prematurely by early morning flights, which when it happens repeatedly, compromises their ability to work effectively.

1.3 We are also aware that the effect of night-time noise from more than one source e.g. aircraft noise and road noise can have an additive impact. Residents living close to busy roads in the south of the borough and under a flight path are liable to be exposed to noise in both the late evening and early morning periods from both sources, but of a different character; we refer to this in 2.4 below. We would therefore urge the Commission in its conclusion to this chapter to adopt a more precautionary approach in the emphasis it gives to sleep disturbance.

1.4 In *paragraphs 2.35 and 2.36* there is a brief discussion about areas of tranquillity and their value to the community. In a densely developed inner London borough, small green spaces and garden squares are especially valued for their relatively quiet atmosphere. Many, by their enclosed nature, exclude traffic noise from the surrounding busy streets, so that the only substantial intrusion is noise from aircraft passing overhead.

1.5 The Environmental Noise Directive and the National Noise Policy Framework both seek to preserve the environmental noise quality of these tranquil areas. However the noise from existing Heathrow flights already affects many of these areas depending on the runway alternation at the time. If new runways with new flight-paths are introduced more of these areas will experience intrusive levels of noise. This would erode rather than protect their tranquillity.

## 2.0 Measurement

2.1 *Paragraphs 3.14 – 3.26:* We understand the limitations of the commonly used metrics and the need to balance technical considerations with the way aircraft noise is commonly perceived. In the absence of any new metric it may be necessary to use a combination of SEL to capture the intensity of each event, one or more of the noise exposure indicators e.g.  $L_{Aeq\ 16\ hour}$ ,  $L_{den}$ , and probably a count of the numbers (N) of noise events above a given level or contour. We agree with the Commission that N/limit frequency contours are easier for a lay person to understand, even if they do not differentiate between events above a certain level.

2.2 *Paragraph 3.45:* we have objected before to the outcome of previous DfT consultations where the  $57dB_{L_{Aeq\ 16\ hour}}$  contour has continued to be used to define the footprint of Heathrow's operations, and argued for at least a reduction to 54 dB, we discuss this further in 2.5 below. We are glad to learn that the Commission will be undertaking a series of noise assessments, using other contours as well as 57dB.

2.3 *Paragraph 3.39:* the noise efficiency concept may provide a means to compare airport performance, but does not seem to offer much in driving down noise levels for the population exposed to aircraft noise from Heathrow.

2.4 *Paragraph 3.53:* Although background noise may have some masking effect, we believe aircraft noise should be judged in absolute terms, otherwise areas with higher ambient noise levels are liable to be exposed to an unacceptable imposition of additional aircraft noise. The different character of aircraft noise, and because it is experienced as a succession of peaks, is less likely to be masked by other background noise.

## 2.5 Question responses

- Appropriate metrics and the case for multiple metrics

2.6 We are pleased that the paper has reopened this issue for discussion, and because of its importance we have devoted some space to comment on the factors that should be taken into account.

2.7 We consider the current use of the  $57dB_{L_{Aeq16h}}$  contour delineating an area in which people are exposed to aircraft noise likely to cause annoyance, to be outdated and unsatisfactory. The choice of the  $55L_{den}$  noise metric, for setting the outer boundary, would be an improvement in being consistent with the Environmental Noise Directive 2002/49/EC "The assessment and management of environmental noise". The Directive requires mapping down to  $55dB_{L_{den}}$ , representing the area where noise is a problem. It should be accepted that this level is a first step and has been arrived at for pragmatic reasons in view of the large scale mapping required.

2.8 The underpinning guidance to the Directive: the European Environment Agency (EEA) Technical report No. 11/2010 "Good practice guide on noise exposure and potential health effects" is highly relevant in being intended to assist policymakers, competent authorities and any other interested parties in understanding and fulfilling the requirements of the directive.

2.9 The EEA report suggests that the threshold of  $55dB_{L_{den}}$ , used for mapping in the directive, is reasonable as a first step, but does not take into account differences that exist

between different noise sources and annoyance. The EEA report implies that the threshold for noise mapping, where aircraft noise is considered to be a problem, should actually be significantly lower than 55dB<sub>Lden</sub>.

2.10 This is based on table 6.1 of the Report which indicates the percentage of people highly annoyed for various sources ranging from 55dB to 45dB<sub>Lden</sub>. It says 27% are highly annoyed by aircraft noise at 55dB<sub>Lden</sub> and 18% at 50dB<sub>Lden</sub>. The initial use of 55dB<sub>Lden</sub> is useful as a reliable indicator of high annoyance and onset of health effects such as hypertension.

2.11 Analysis of data relating to Heathrow Airport from ERCD reports 0706 and 0701 approximates that L<sub>den</sub> is typically 1.7dB higher than LA<sub>eq16h</sub>. On this basis 57dB LA<sub>eq16h</sub> would approximate to 58.7dB<sub>Lden</sub>, and conversely 55L<sub>den</sub> would correlate with 53.3dB LA<sub>eq16h</sub>. Hence 55dB<sub>Lden</sub> would approximate to a useful reduction in the LA<sub>eq16h</sub> for onset of significant community annoyance.

2.12 Therefore the evidence from Europe is that the 57dB LA<sub>eq16h</sub> contour is seriously out of calibration as a benchmark for defining the onset of unacceptable noise emission and annoyance. We suggest the Commission should also seek to review the work on the Attitudes to Noise from Aviation Sources in England (ANASE, 2007) so that its findings can be considered robust enough as an additional reference. If not the UK should adopt emerging EU standards.

2.13 Certainly aircraft noise should be mapped to a lower level than the 57dB LA<sub>eq16h</sub>. Of the alternatives offered, we have suggested the use of 55L<sub>den</sub> but consider it essential that this is supplemented by the mapping of night noise to 50dB<sub>Lnight</sub>. The EEA report also suggests mapping to even lower levels should be considered.

2.14 While the 57dB LA<sub>eq16h</sub> benchmark, as an indicator of annoyance, has been shown to be too high both by the ANASE and the EEA technical Report 11/2010, we consider that before the Commission can report, there is a need to establish whether the LA<sub>eq</sub> index, or indeed L<sub>den</sub> is a suitable predictor of annoyance, on its own, for aircraft noise based on this research. A more realistic assessment of aircraft noise and disturbance, to make alongside the daily dose parameter, (we suggest initially 55dB<sub>Lden</sub>) may be:

- (a) total number of noise events, i.e. departures and landings;
- (b) number of types of aircraft and their individual noise emission characteristics within this total;
- (c) noise emission level contours in terms of SEL, L<sub>max</sub>, and Leq for movements of individual aircraft types;
- (d) time of day.

2.15 The use of the 57dB LA<sub>eq</sub> index was criticised by the inspector hearing the Terminal 5 Public Inquiry. One criticism was that the index did not give adequate weight to the number and type of aircraft movements. The inspector also found the relationship between LA<sub>eq16h</sub> and community annoyance was statistically weak even then (this criticism could also be levelled against L<sub>den</sub>). Following the Inquiry this led in part to the Government setting up the ANASE study.

2.16 One finding of the ANASE study showed that people are much more sensitive to aircraft noise at night (around midnight and the early hours) In contrast least sensitivity was found later in the morning and early afternoon. A noise indicator should reflect these sensitivities not found in Leq, although the L<sub>den</sub> does provide weightings for sensitive times of the day.

2.17 There are signs that the government is listening to the argument that the previous aircraft noise assessment methodology is now inadequate, including the 57 dB LA<sub>eq, 16h</sub>. This not only reflects the findings of WHO and the consensus of EU research, but also tacitly acknowledges the previous research on community responses to aircraft noise (ANASE) commissioned, but then rejected by the government.

2.18 However we believe the onset of annoyance from aircraft noise occurs well below the 55 dB L<sub>den</sub> during the day, and in fact 50dB would be a more realistic threshold in view of the ANASE and EEA reports. 40dB L<sub>night</sub> should be aimed for with reference to WHO Night Noise Guidelines for Europe. We agree with other authorities that 55dB L<sub>den</sub> and 50dB L<sub>night</sub> would be a welcome initial improvement. Looking at Heathrow specifically the 55L<sub>den</sub> contour would encompass approximately 710,000 residents (2010); in comparison the LA<sub>eq16hr</sub> contour which contains 220,000 residents (2010). In our opinion this indicates how unrepresentative of noise annoyance the LA<sub>eq</sub> index is.

- Absolute or relative measurement of aircraft noise - see 2.4 above.
- Characterising the noise environment of areas currently unaffected by aircraft noise – in the past we have argued that where there is a large disparity between densely and lightly populated areas, there should be a redistribution of flights to reduce the impact on the larger number of people. For the smaller number of people affected by raised noise levels, the impact should be mitigated by a more generous noise insulation package.
- However that position was in relation to the existing operations at Heathrow. If new capacity is justified, it would be very unreasonable to inflict a considerable amount of aircraft noise on populated areas presently unaffected. Indeed the preservation of 'good' noise quality areas is referred to in both the National Noise Policy Framework and the EU Noise Directive. Should the Thames estuary airport option be chosen, it would need to be remote from centres of population and with flight paths routed over open water to avoid, or at least minimise the noise impact on local communities along the shoreline.

### 3.0 Quantifying noise effects

3.1 *Paragraph 4.21* relates to night time aircraft noise and the guidelines produced by WHO (Europe) which recommend a maximum level of 55 dB L<sub>night</sub> and a longer term target of 40 dB L<sub>night</sub>. We expressed concern in paragraphs 1.2 and 1.3 about the consequences of sleep disturbance and we are far from satisfied that the night flights regime applying to Heathrow airport is sufficiently strict, it certainly doesn't represent a 40 dB Leq level when most of the flights occur i.e. 4.30 – 7.00 am. In the long-term we consider that night flights should be progressively phased out in order to comply with WHO guidelines.

3.2 *Paragraphs 4.26 to 4.40* put forward the case for assessing the effect of noise by people's willingness to pay for dwellings in quieter areas, or their willingness to tolerate noise if offered compensation. It is by no means clear that the correlation between noise levels and house prices is a "straight line" relationship, particularly at the extremes. In practice house prices, especially those close to airports, are likely to be significantly influenced by aircraft noise, although they may also reflect other confounding factors such as aviation related employment and ease of travel by air.

### 3.3 Question responses

3.4 *Paragraph 4.40* poses the question: is monetising noise effects a sensible approach? For reasons mentioned above we believe it has only limited value.

3.5 The same paragraph questions the extent to which introducing noise to a previously unaffected area compares with adding it to an already affected area. We have effectively commented on this in paragraph 2.5.

#### 4.0 Mitigation

4.1 *Paragraph 5.6*: there is an inherent problem with noise certification and basing quota counts (Heathrow night flights regime) on manufacturers' certifications. As with most machinery, noise levels after some time in service will inevitably deteriorate with the wear and tear on aircraft engines. Any notional improvements to the noise environment, based on manufacturers' certifications, should be modified to take this into account.

4.2 *Paragraph 5.17*: the merits of dispersing flight routes as against concentrating them in a corridor are difficult to balance. In part this relates to our previous comments in 2.5 above. But if the impact of concentrating flights along a narrow corridor is acute, it may be fairer to spread the impact over a wider area. However this implies that the impact of the flights in question has reached an unacceptable level and the better solution is to reduce the number of flights.

4.3 *Box 5.1*: Any possible trade-off between fuel efficiency and noise mitigation should favour noise mitigation, reductions in fuel consumption are undoubtedly important, but should be sought elsewhere.

4.4 *Paragraph 5.16/ Box 5.2*: We are strongly in favour of runway alternation at Heathrow, and attempts by the airport authority to interfere with the system by introducing operational freedoms should be resisted. We are also concerned about increases in early morning flights. We have yet to see evidence from the trials to suggest that the freedoms would not prejudice the relief afforded to residents.

4.5 In fact CAA's report on the trials is four months overdue and the boroughs have so far been denied an opportunity to see an analysis of the environmental impacts. This is particularly frustrating since Heathrow's recently submitted proposals for increasing existing capacity rest in part on three specific freedoms, and it is doubtful whether these were assessed during phase one or two of the trials. Despite Heathrow's claim, there is no doubt that operational freedoms have not been agreed by the boroughs.

4.6 *Paragraph 5.24*: graduated landing charges that are intended as an incentive for airlines to operate quieter aircraft, are beneficial if the charges for noisier aircraft are high enough to induce change. However the paper implicitly questions whether Heathrow's landing charges are sufficiently high, and suggests that charges for noisier aircraft are only raised after the aircraft have stopped operating (to prevent them being returned to the active fleet). If the CAA's report on the effectiveness of differential charges confirms that Heathrow is reluctant to apply a charging scheme as an operational procedure that actually penalises airlines operating noisier aircraft, it is questionable whether this should be regarded as a worthwhile form of mitigation unless a more rigorous mandatory scheme is introduced.

4.7 *Paragraph 5.31:* we believe Heathrow's voluntary agreement on night-flights should be converted into a mandatory curfew in order that stricter controls can be progressively applied – see our comment at 3.1.

4.8 *Paragraph 5.34:* we agree that the benefits of future improvements in aircraft noise performance should be shared between the airline industry and the community on a 50:50 basis.

4.9 *Paragraph 5.36:* the paper raises again the issue about an independent noise regulator. We consider that an independent regulator is essential and we remain in favour of the proposal for the CAA to take on this role.

4.10 *Paragraph 5.38 – 5.43:* although noise insulation should be a mitigation measure of last resort, we consider that the current noise insulation scheme is leaving a sizeable proportion of residents affected by aircraft noise exposed to unacceptable levels in their homes, and should be extended from 69 dB  $L_{Aeq}$  to 63 dB  $L_{Aeq}$  for dwellings, and to 58 dB  $L_{Aeq}$  for public buildings. As is stated in the paper other countries are notably more generous.

## 5.0 Conclusions

Although we have commented quite widely on the points raised in the consultation paper, one of our main concerns is that the full extent of the impact of aircraft noise on affected populations is not being understood, because the Government's assessment method (57dB $L_{Aeq}$ .16hr) is unsuitable.

We also feel strongly that the health impact of aircraft noise should not be understated, and that greater attention should be given to sleep disturbance and its consequences, in this regard we want to see night-flights progressively phased out.

We look forward to the Commission's interim report on short-term options to increase airport capacity due at the end of the year. In the meantime should you have any queries on the points we have raised, please do not hesitate to contact either Mr Ian Hooper, or myself at this office.

Yours faithfully

**Guy Denington**  
**Policy Officer – Environmental Quality Team.**