

Agenda Item:	Reference: HACC.509
Date: November 22 2007	
Attitudes to Noise from Aviation Sources in England (ANASE)	

Report by the Technical Adviser

## BACKGROUND

1. The Department for Transport published a long awaited report of a study into people's perception of aircraft noise on 2 November 2007. The Study was undertaken to investigate the changes which had taken place since 1982, when the United Kingdom Aircraft Noise Index Study (ANIS) was undertaken. This was carried out when the Number and Noise Index (NNI) was in use to calculate annoyance but was later replaced by LAeq which Government concluded better represented people's reactions.
2. The Study was commissioned from the MVA Consultancy in 2001 and it has taken six years to complete. When first commissioned, it was being directed by a steering group of which the Chairman of HACC was a member but that ceased to be operative some years ago. The Study continued amidst a certain amount of controversy and changes in the aims and methodology to be used. The report of the Study was submitted for peer review by a group of specialists who have made numerous criticisms of the work, although agreeing that much of it adds to the sum of knowledge on the subject, and they have called for further work to be undertaken to clarify a number of the conclusions which were reached. There is no indication currently that the Department intends to commission further work.
3. The HACC has been supplied with one copy of the document which was compiled by seven staff of MVA and which runs to 470 pages, many of them tabulations and appendices. Included are reviews of the Study undertaken by peer reviewers.
4. In view of the length and technical complexity of the document, a request was made that it be discussed within the informed membership of the Heathrow Noise and Track Keeping Group to give those members of the HACC who serve on it, an opportunity of being briefed as to the conclusions of the Study and some of the implications for the population around Heathrow. The request was refused with a comment that this should be a matter to be dealt with instead at a HACC meeting.
5. The Executive Summary of the Study does not set out in an easily identifiable form its primary conclusions identifying those key factors which have caught the headlines of the Press and the concerns of environmental groups relating to increased sensitivity to noise, the numbers of people affected now and in the light of future developments in the industry. These have to be picked out from the text.

## THE REPORT

6. The Study does not deal only with Heathrow Airport; it was conducted on the basis of a number of pilot surveys, phases and a Main Survey. The Main Survey conducted interviews with 2,733 households at seventy six different sites in areas affected by aircraft noise from airports in England. These established that the "discernible factors" that influence community annoyance were aircraft type, number and time of day or night, and identified the discernible differences in levels for each dimension.

7. A quantitative assessment of reported annoyance in very low aircraft noise areas (areas overflown at heights ranging from 4,000 to 12,000ft) found that there may be some additional factors associated with stacks *per se* that are a source of annoyance independently of sound levels but, generally, there was little evidence of reported annoyance in these areas.
8. A number of assumptions were examined as to the effects of paying grants or rebates to those affected by certain levels of aircraft noise with an acknowledgement that these could effectively be negated by local council action.

## **THE PRIMARY CONCLUSIONS OF THE STUDY ABOUT EFFECTS ON PEOPLE**

9. **The Study concludes that more people are affected now than was the case 20 years ago in the previous study. People begin to be more annoyed by aircraft noise before 7.00am or after 11.00pm. The number of respondents at least “very annoyed” by aircraft noise is less than 10% for areas with a LAeq assessment less than 43dB ; the proportion of respondents at least “very annoyed” gradually increases with LAeq for values over 43 dB although there is a relatively large spread in percentages for most LAeq values ; at least 40% of respondents were at least “very annoyed” for all except one of the areas with LAeq greater than 57dB.**
10. **There is no indication from the findings that irregular aircraft events lead to greater reported annoyance than regular aircraft events at any given level of measurement.**
11. **A wide range of variables was tested but only three socio-demographic variables had significant co-efficients:**
  - a. **working from home (those who work from home generally have a greater level of annoyance)**
  - b. **income (those who have a higher household income are generally more annoyed – measured either as average household income or those with an income more than £40,000; and**
  - c. **those in a higher Social Economic category are generally more annoyed measured in SEG A, B or C1**
  - d. **12. In addition to income changes, the Study points out that there will have been other changes over time which are closely correlated to income. Taste effects – such as society’s level of tolerance to environmental intrusion and its expectation of acceptable living conditions – have changed over time as has people’s willingness to be more openly critical of officialdom and government.**
12. **Time of Day sensitivities – the results of the model used indicate that, relative to the daytime, and with some rounding, the sensitivity to the same aircraft noise at other periods are:**

* 23.00 - 03.00	<b>80%</b> more annoying
* 03.00 - 07.00	<b>35%</b> more annoying
* 19.00 – 23.00	<b>15%</b> more annoying
* 15.00 – 19.00	<b>10%</b> more annoying

Further investigation revealed that people are differentially annoyed at different times of the day regardless of whether they are at home or not.

## **WILLINGNESS TO PAY**

13. The Study tested willingness to pay per month per household to reduce aircraft noise based on one less aircraft per day for different sound levels during the middle of the day (11.00 to 15.00) implied by a National Model. The implied willingness to pay values are given by aircraft type and across LAeq bands in high noise areas (LAeq = 60dB)

- \* Jumbo £5 - £9 per aircraft (minimum Single Event Level = 84dB, Maximum = 95dB)
- \* Underwing £2 - £6 per aircraft (minimum Single Event Level = 82db, Maximum = 89db)
- \* Turboprop £2 - £3 per aircraft (minimum Single Event Level = 77dB, Maximum = 82dB)
- \* Tailjet £2 - £5 per aircraft (mimimum Single Event Level = 67dB, Maximum = 84dB)

14. There are questions raised in the report about the link between respondents willingness to pay for a reduction in aircraft noise (e.g. around £5.00 a month for one less Jumbo every day during a certain 4-hour period) and their assumed improvement in their quality of life. These values are considered high and the result is questioned as being very high when the number of aircraft – even Jumbos – that would need to stop flying overhead in order to reduce the overall LAeq by 1dB at the site is considered. Additionally, a large number of respondents “professed zero willingness to pay”.

## **THE CONCLUSIONS OF THE REPORT**

15. The analysis of the ANASE survey data showed that the respondent's household income and Socio Economic Group were the most important influences on the level of annoyance. Once these factors are accounted for there are no further significant location effects (i.e those affected by aircraft at Heathrow, for a given LAeq and income, are no more annoyed than those living close to other airports covered in the study).

16. A comparison between the survey work in 2005 and that undertaken in 1982, has shown that for the same amount of aircraft noise, measured in LAeq, people are more annoyed in 2005 than formerly. If Leq is an appropriate proxy measure of annoyance, one possible explanation of the increase in reported annoyance for a given LAeq between those years, may be a combination of changes in income/standard of living and changes in attitude within society.

17. The 2005 results have shown people to be much more sensitive to aircraft noise at night (particularly around midnight and the early hours thereafter). In contrast, people are least sensitive to aircraft noise in the morning and early afternoon. Ideally therefore, a metric that reflects attitude to aircraft noise should reflect these time of day sensitivities better than the existing LAeq metric – which does not weight by time of day.

18. Having found an increase in the relationship between annoyance and aircraft numbers in 2005, the increase in reported annoyance for a given LAeq may reflect the changes in the composition of number and sound level that people are exposed to, suggesting the use of a different formulation to that implied by use of the LAeq metric.

19. The report goes on to suggest that reversion to the earlier used Number and Noise Index (NNI) type of measure gives a larger weight to the number of aircraft relative to the sound level than does LAeq and that such a use might be more appropriate.

## **REVIEWERS OF THE REPORT**

20. The report of the Study has attached to it the views expressed by peer reviewers – Professor Ian J. Bateman and Dr Brett Day - and another by the Chief Economist of the Department which will be of concern to Members in evaluating the evidence of the Report.

21. Both Professor Bateman and Dr Day are critical of the ANASE report in many of the same respects. The comments by Dr Day in an eleven page critique in which his comments and suggestions for further work are set out, lend themselves to be summarised most easily and are as follows:

- There are reservations concerning the modelling of the contingent valuation (CV) data in which respondents were asked directly how much they would be willing to pay to reduce aircraft noise at their home. Accordingly, he is of the opinion that the values report for a 1dB Leq change coming from that study are not reliable
- The parameters used by the consultants to establish the relative annoyance at different times of the day are confounded by the fact that they do not account for presence or absence from the home; it is not believed that the relativities reported are accurate
- One very important issue that is ignored by the current study is that of self-sorting with regards to noise exposure. In particular, households with relatively high tolerance for noise will choose to locate in areas with relatively high levels of aircraft noise exposure since they are compensated through cheaper housing costs. Conversely, noise intolerant households will be prepared to take on higher housing costs so that they can locate in relatively quiet areas
- One could convincingly argue that the current study is fundamentally flawed because it does not account for self-sorting
- In para.11.1.77, the consultants had suggested taking the contingent value(CV) estimates (£11 and £18 a year) as defining the absolute value of a 1dB reduction in aircraft noise exposure. Brett questions how these absolute values would be disaggregated and says it is far from clear to him how this would work. He questions what exactly should be taken as being the value of a reduction in noise resulting from a Jumbo in the middle of the day? Or a tailjet at night? Indeed, he says, the consultants are very unclear as to how the outputs from the Study should be applied in practice. For this research to be of use to the DfT, he believes these issues need to be considered and clear advice presented in this report.
- Referring to analysis showing different sensitivity to the same aircraft noise in different time periods, he points out that this represents the average (relative) sensitivity to noise at each time period across the entire sample of respondents. However, as shown in tabulations, up to 50% of the sample may be absent from the home in any one period. Individuals are likely to realise little benefit from aircraft noise reductions at their homes when they are in another location.
- Since the measurement of the relative sensitivity to aircraft noise across different periods of the day is one of the key objectives of the study, Brett feels that it is important that the consultants address this issue more thoroughly

22. The Chief Economist of the Department says in a Statement attached to the report that, "in particular, the peer reviewers consider that ANASE results are not sufficiently robust to use quantitatively in certain aspects of policy making" and "they counsel against using the detailed results and conclusions from ANASE in the development of Government policy" and they argue that "the valuations reported coming from the Study are not reliable".

23. The Chief Economist points out that the ANASE Study shows no evidence of a threshold, or step point, at which people become very much more annoyed, that the results show that some people are concerned – and value – aircraft noise at relatively low levels and that people's annoyance – and valuation – increases as noise levels increase. There is no particular threshold at which the increase in annoyance (and valuation) accelerates significantly. He says the finding is in line with the research evidence on noise from road transport and consistent with DfT's approach to the valuation of noise impacts from road and rail.

24. He concludes that further work would be useful in a number of areas such as:

- Further work on numbers and noise
- Additional stated preference work
- Further work as recommended by peer reviewers
- Seek the views of other experts

