Survey of Noise Attitudes 2014: Aircraft

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Background

- Obtain new and updated evidence on attitudes to aviation noise around airports in England, including the effects of aviation noise on annoyance, wellbeing and health.
- Obtain new and updated evidence on what influences attitudes to aviation noise, and how attitudes vary, particularly how attitudes vary with L_{Aeq}, but also other non-acoustic factors that may influence attitudes, such as location and time of day, and socio economic group of respondents.
- Examine whether the currently used measure of annoyance, L_{Aeq}, is the appropriate measure of annoyance for measuring the impact on people living around major airports.
- Consider the appropriateness of the policy threshold for significant community annoyance from aviation noise.
- Provide baseline results that can be used for a programme of regular surveys of attitudes to aviation noise.

Survey of Noise Attitudes (SoNA) 2014

- Continuation of previous surveys undertaken by Defra, but with the variable section of the survey on civil aircraft noise.
- Target of 2,000 face to face interviews
- Survey questionnaire, comprised of five sections:
  1. A general section
  2. An optional Road Traffic Noise section
  3. An optional Neighbourhood Noise section
  4. A Civil Aircraft Noise section
  5. A health section
- Two questions on noise annoyance that sought responses on a 5-point scale and an 11-point scale, recommended by ICBEN and ISO respectively, which allow direct comparison with the 2007 ANASE study

Survey design (1)

- Fieldwork was conducted between 5 October 2014 and 8 February 2015.
- Respondents selected at random, across 9 airports, according to the populations around the sample airports.
- All eligible households were located within the pre-defined noise exposure areas, with a minimum noise threshold being set at 51dB LAeq16h, in order to ensure that estimated noise exposure information remained reliable.
- Noise exposure was estimated for each respondent's postcode location for the following noise indicators:
  - Average summer day LAeq16h, N70 and N65
  - Average annual 24hr Lden

Survey design (2)

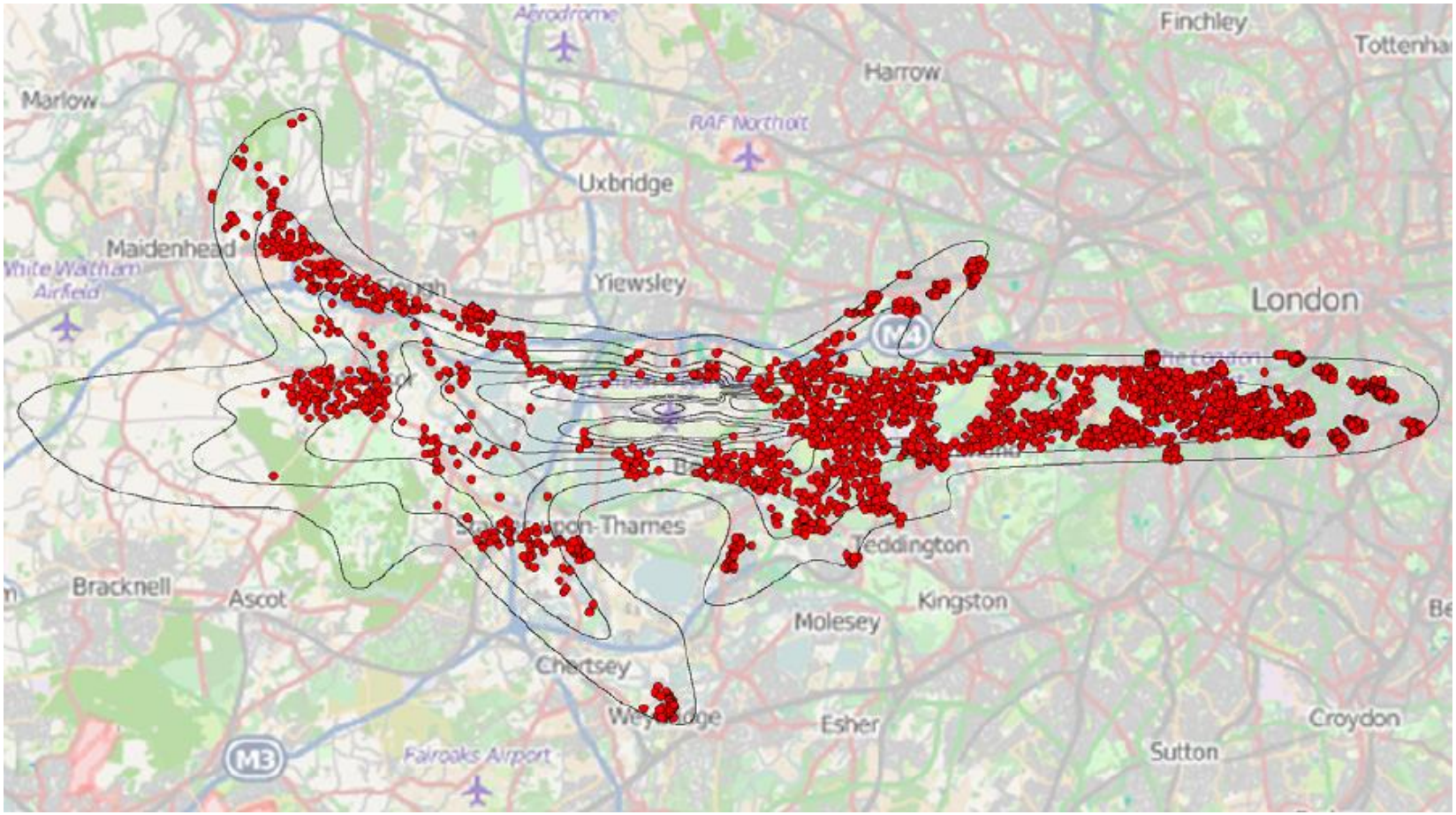
- To account for changes in runway direction, LAeq16h noise data was also considered over different averaging periods as well as the summer average:
  - 100% westerly-mode
  - 100% easterly-mode
  - 7 day average modal-split prior to interview
  - 30 day average modal-split prior to interview
  - The highest noise level from either the 100% westerly or 100% easterly modes

Distribution of noise exposure

- Respondents categorised by 2014 summer average mode $L_{Aeq,16h}$ (N=1,847)

Noise exposure variable Average summer day $L_{Aeq,16h}$ (dB)	Airport									
	BHX	EMA	LGW	LHR	LCY	LTN	MAN	NCL	STN	Total
48-50.9			1	74			2		2	79
51-53.9	28	1	15	644	3	7	86	3	5	792
54-56.9	34	2	9	360	63	5	36	3	3	515
57-59.9	20		3	178	16	6	34	2	2	261
60-62.9	8	1	1	103	6	1	8			129
≥63	1			61	5	2	1		1	71
Total	**90**	**5**	**31**	**1,419**	**93**	**21**	**168**	**8**	**12**	**1,847**

Distribution of respondents around Heathrow

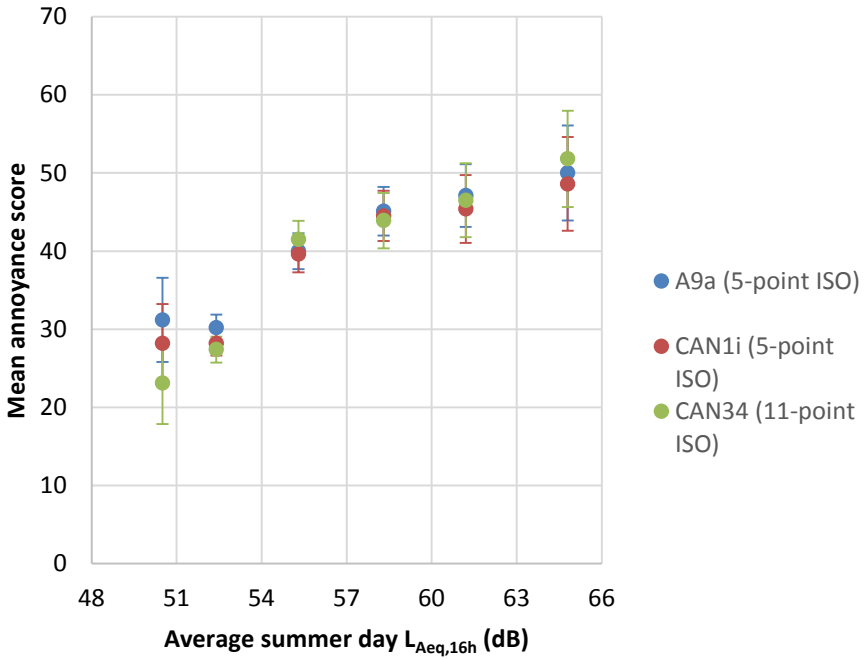


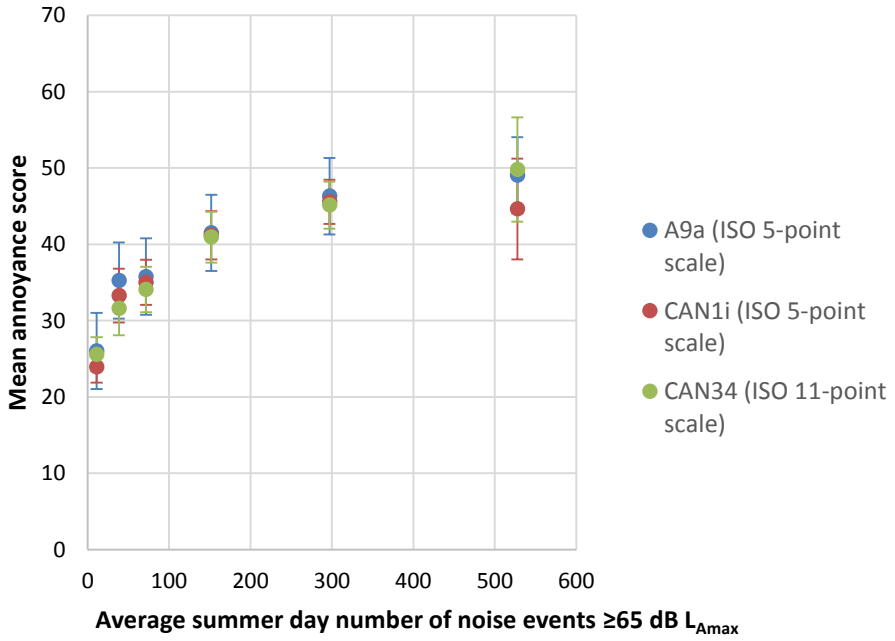
Taken from Ipsos-MORI Survey Technical Report

Is $L_{Aeq,16h}$ still the most appropriate indicator to use to estimate the annoyance arising from aircraft noise?

- Mean annoyance score correlated well with average summer day noise exposure, $L_{Aeq,16h}$
- There was no evidence found to suggest that any of the other indicators L_{den}, N70 or N65 correlated better with annoyance than $L_{Aeq,16h}$.

Correlation with annoyance



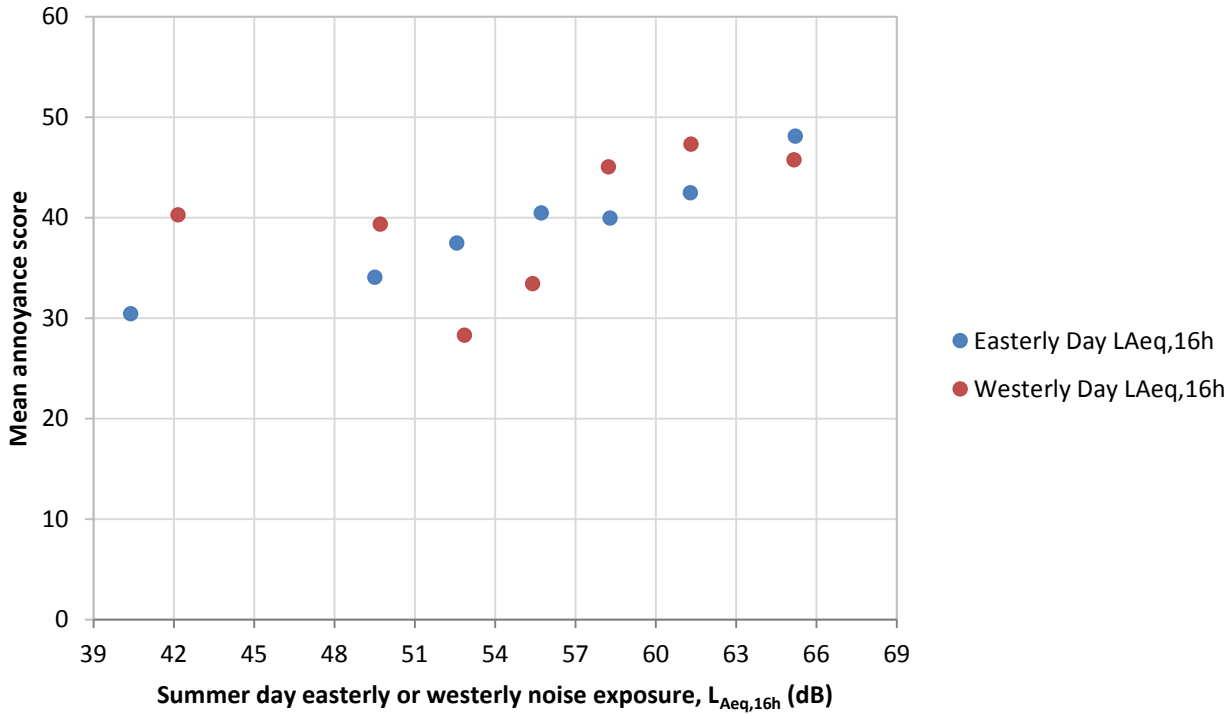


Is summer day, average mode, still the best time period to use as opposed to single-mode?

- Evidence was found indicating that easterly-mode noise exposure correlated best with mean annoyance score, however, westerly-mode noise exposure was found to have the poorest correlation.
- This occurs because respondents were found to be more annoyed by easterly-mode noise exposure compared to westerly-mode for a given noise level. Practically, this means that single-mode contours are unsuitable for decision making, but that they may be helpful for portraying exposure and changes to exposure.
- Of the average-day modes, the existing 92 day summer average mode was found to correlate better than shorter average modes.
- There was therefore no evidence found to support a change from the current practice of basing LAeq16h on an average summer day.

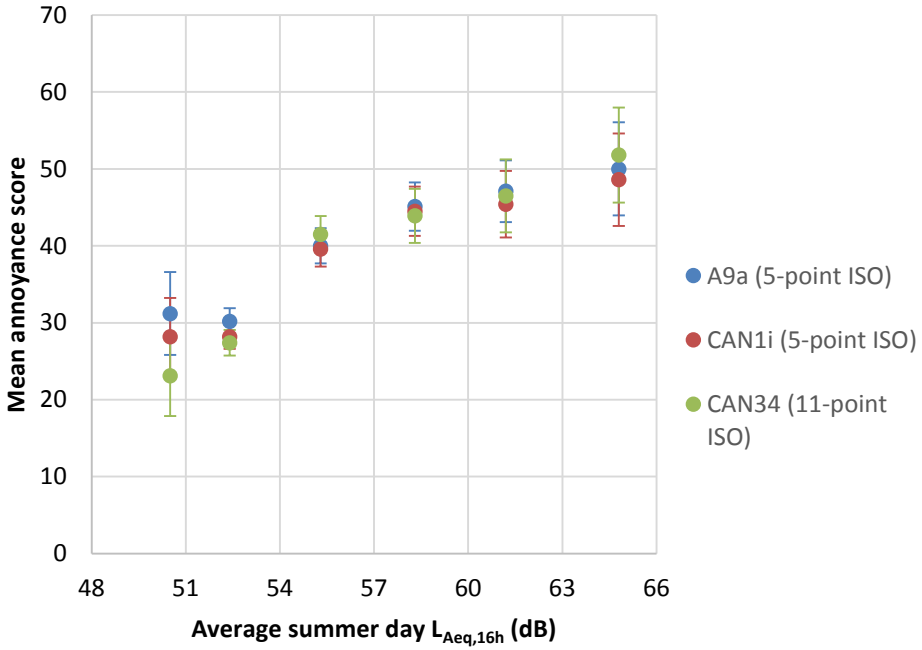
Mean annoyance score for easterly & westerly noise exposure

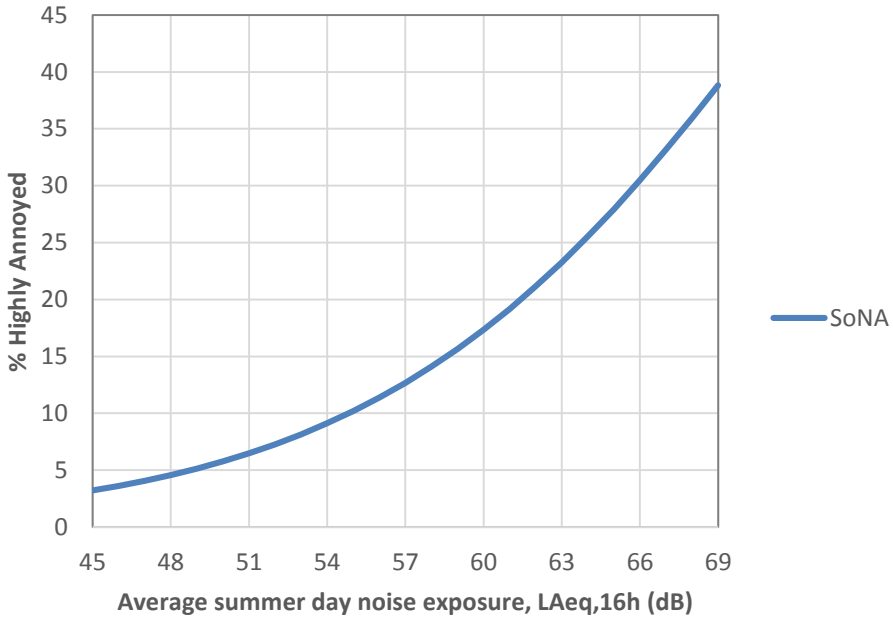
- Differing attitudes between respondents exposed to solely easterly or westerly mode noise



How does annoyance relate to exposure?

- Mean annoyance score and the likelihood of being highly annoyed were found to increase with increasing noise exposure ($L_{Aeq,16h}$). The relationship found was close to linear, though annoyance levels plateau at low exposure and do not reach zero annoyance.





How do the results compare with ANIS, ANASE & Miedema?

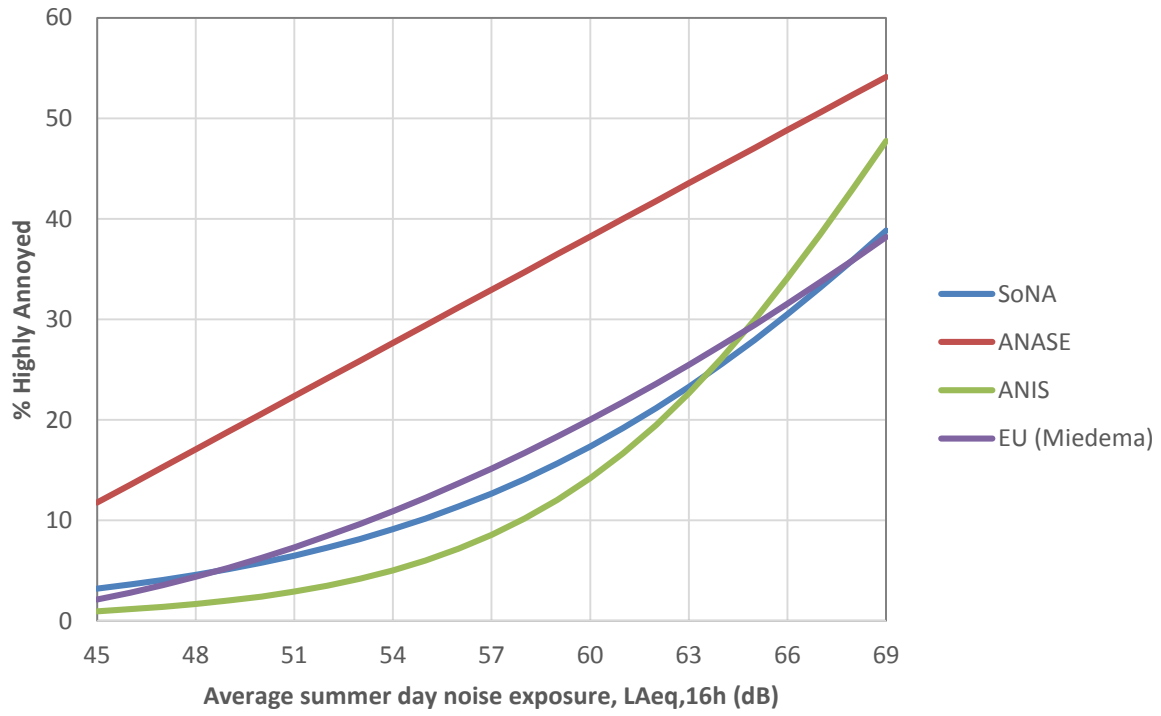
- For a given noise exposure, a higher proportion of respondents was found to be highly annoyed than compared with ANIS:

Average summer day noise exposure, $L_{Aeq,16h}$ (dB)	% Highly annoyed	
	ANIS 1982	SoNA 2014
51	3%	7%
54	5%	9%
57	9%	13%
60	14%	17%
63	23%	23%
66	34%	31%
69	48%	39%

- Annoyance scores were found to be comparable with those found for the ANASE restricted sites, but lower than found by the full ANASE study, and higher than found by ANIS.
- For a given noise exposure, a lower proportion of respondents was found to be highly annoyed than compared with ANASE, the results of which were considered unreliable.

How do the results compare with ANIS, ANASE & Miedema?

- Comparison of % highly annoyed for SoNA, ANIS, ANASE and EU (Miedema)



How do measures of health and well-being relate to exposure?

- Noise exposure and reported annoyance were compared against self-reported health rating (5 point scale) and the Short Warwick-Edinburgh Mental Wellbeing Scale (SWEMWBS), a measure of well-being.
- Poorer health ratings and lower SWEMWBS scores were found to be associated annoyance, but not with noise exposure.

What non-acoustical factors seem to influence annoyance?

- The following factors were found to have a statistically significant effect on annoyance:
  - Noise sensitivity
  - Approximated social grade
  - Expectations – prior to moving to the area and in the future
- These factors can substantially alter the relationship between noise exposure and annoyance.
- Urban/rural classification may be a non-acoustic factor, however, this was confounded by approximated social grade and the presence of double-glazing.

Questions?

Civil Aviation Authority