Department for Transport

Guide to WebTAG Noise Appraisal for non-experts

Moving Britain Ahead

The Department for Transport has actively considered the needs of blind and partially sighted people in accessing this document. The text will be made available in full on the Department's website. The text may be freely downloaded and translated by individuals or organisations for conversion into other accessible formats. If you have other needs in this regard please contact the Department.

Department for Transport
Great Minster House
33 Horseferry Road
London SW1P 4DR
Telephone 0300 330 3000
Website www.gov.uk/dft
General enquiries: https://forms.dft.gov.uk

Contents

1. WebTAG Noise Workbook

1.1 The government supports a risk-based approach to assessing the impacts of aviation noise. WebTAG provides a way of doing this which also allows for a comparison of impacts from different airspace change options.

1.2 Several respondents to the UK Airspace Policy consultation stated that they did not know how WebTAG worked or how it could be used for the purposes intended. The information below is designed to give people a high level understanding of how WebTAG can be used to value noise impacts as part of the airspace change options appraisal.

What is WebTAG?

1.3 WebTAG is the Department for Transport's suite of guidance on how to assess the expected impacts of transport policy proposals and projects. This guidance covers various transport modes including; rail, road, aviation, walking and cycling. Although designed primarily for use by government, the guidance can be used by others, as all of WebTAG is publically available.

1.4 WebTAG includes guidance documents, excel tools, excel data books and excel summary sheets.

1.5 The guidance relating to the environment, including noise (TAG Unit A3), is supported by excel workbooks. These workbooks can be used to monetise certain aspects of the noise impact, given the correct inputs are available.

WebTAG Noise Workbook

1.6 The WebTAG noise workbook is a tool which assesses the impact of changes in noise exposure. This can be used to assess the impacts of a proposed airspace change compared to the current airspace arrangements. Multiple airspace options can be assessed in this manner.

1.7 For each one decibel change in average noise level, a monetary value is assigned for the change in the following health impacts: amenity (annoyance), acute myocardial infarction, dementia, stroke, and sleep disturbance. These values are based on the latest evidence from the World Health Organisation[1] on the link between noise exposure and health impacts, the government recognises they may not capture the full noise impacts experienced by everyone. WebTAG is regularly reviewed to consider how new evidence and methodologies should be incorporated and is formally updated twice a year. The updated noise workbook allowing

[1] WHO (2011) Methodological guidance on estimating the burden of disease from environmental noise

assessment of the impact of changes in noise exposure from airspace changes will be published by January 2018.[2]

1.8 This is not a comprehensive assessment of all the noise impacts. It is only currently possible to monetise the impacts listed above and to do so using average noise metrics. Leq is a measurement of the average noise level over a period of time. If during this time there is a period of respite then it will bring down the average noise level and thus lead to a lower Leq than without the respite.

1.9 Despite these drawbacks, this approach allows decisions on transport schemes to take account, in a consistent manner, of the costs and benefits of different options of distributing noise.

How does WebTAG calculate a value for health impacts?

1.10 The calculation is based on the probability of experiencing a negative impact from one of the health outcomes listed above. The impact of noise on an individual's health is subjective. Not everyone will experience the same adverse health impact at a given level of noise. Therefore we use evidence based probabilities to measure the likely impacts in a population. As the noise exposure increases so does the probability of negative health impacts. The uncertainty means that health impacts can be valued for populations but should not be used to assess individual impact.

1.11 A decrease in noise exposure will result in a reduction in negative health impact (i.e. an improvement in health impacts), whereas an increase in noise exposure will result in an increase in negative health impacts. No change in noise exposure will result in no change in health outcomes.

1.12 For each option for an airspace change that is assessed, the noise tool is able to produce a value based on the total number of households that experience changes in noise exposure compared to what would happen if there was no change.

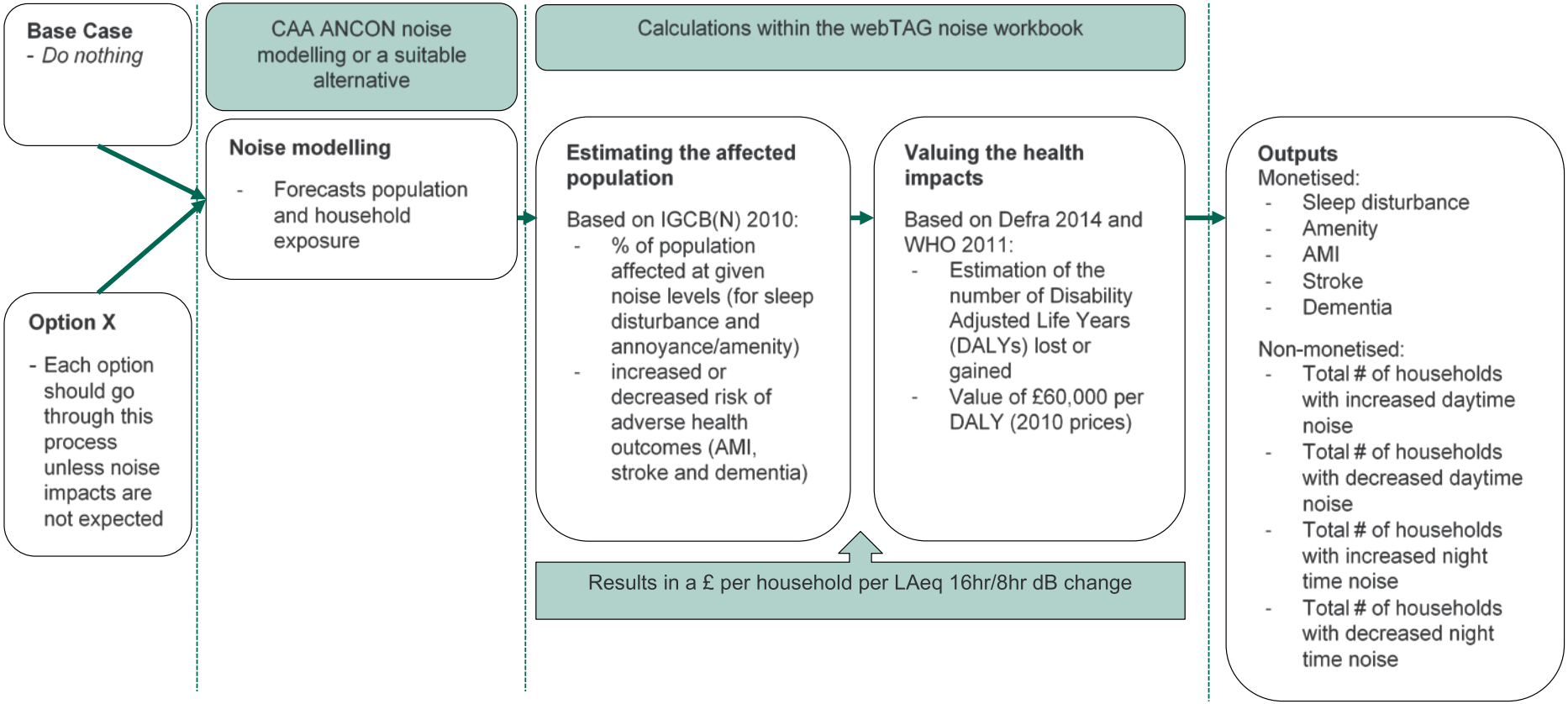
1.13 The inputs used in the noise workbook come from noise modelling forecasts which estimate the number of people and households exposed to different levels of aircraft noise.

1.14 The WebTAG noise workbook input matrix gives the option to users to make inputs in either 1dB or 3dB intervals. Our preference is for the 1dB option to be used wherever possible in the context of assessing the impacts of airspace changes as it produces a more accurate calculation of the monetised value of the impact. This is because the monetary values provided by DEFRA and used in the TAG workbook are for 1dB changes in the level of noise. When inputs are made at 3dB intervals, the implicit assumption made is that all inputs are in the middle of the 3dB band and any change in bands represents a 3dB change. This may not always accurately reflect the change in noise levels that have actually occurred and could potentially over or under estimate the value of the noise impact associated with the proposed airspace change.

See Figure 1 for an illustration of the noise assessment process.

[2] https://www.gov.uk/government/publications/webtag-environmental-impacts-worksheets

Figure 1: Illustration of the noise assessment process[3]



[3] [3] References: CAA ANCON noise modelling – a model used to map and forecast noise from aviation, managed by the Environmental Research and Consultancy Department of the Civil Aviation Authority, see https://www.caa.co.uk/Environment/Noise/Features-of-the-ANCON-noise-modelling-process/
IGCB(N) (2010), Noise & Health – Valuing the Human Health Impacts of Environmental Noise Exposure, available at: http://webarchive.nationalarchives.gov.uk/20130123222346/http://archive.defra.gov.uk/environment/quality/noise/igcb/documents/igcn-noise-health-response100707.pdf
Defra, (2014), Environmental Noise: Valuing impacts on: sleep disturbance, annoyance, hypertension, productivity and quiet, available at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/380852/environmental-noise-valuing-imapcts-PB14227.pdf
WHO, (2011), Burden of disease from environmental noise, available at http://www.euro.who.int/__data/assets/pdf_file/0008/136466/e94888.pdf
DALYs are presented in 2010 prices for consistency purposes, this can be adjusted within the workbook.

A worked example (shown using inputs in 3dBLeq)

1.15 The example below shows the impacts of a hypothetical airspace change compared to the existing arrangements (the baseline scenario). Two sets of inputs are needed for this process:

1 The number of households[4] experiencing different noise levels (in bands of 1dBLeq or 3dBLeq) in the baseline scenario and the option proposed (without airspace change and with airspace change scenarios) for the opening year.

2 The number of households experiencing different noise levels (in bands of 1dBLeq or 3dBLeq) in the baseline and the option proposed (without scheme and with scheme scenario) for the final year (the final year is decided by the change sponsor in line with CAA guidance).

1.16 These inputs will be produced through noise modelling. This process must be carried out for each of the options where noise impacts are expected.

1.17 In the tables below, the number of households experiencing a reduction in noise compared to the baseline scenario are shown in green, whereas those who experience more noise are in red, and those with no change in yellow.

1.18 It should be noted that when appraising the impact of an airspace change, if the scheme will affect houses that were not previously included within the noise contours of the flight path then these houses will be included in the without scheme under the <45dBLeq band.

Figure 2: Opening year - no. of households experiencing 'baseline/without scheme' and 'proposed option/with scheme' noise levels

(dB Leq, 16h)	With scheme	<45	45-48	48-51	51-54	54-57	57-60	60-63	63-66	66-69	69-72	72-75	75-78	78-81	81+
Without scheme															
<45		3794300	87200	4600											
45-48		30450	419250	67500	11200										
48-51			17750	180850	46400	14700									
51-54				20550	97200	29800	7900								
54-57					36350	4220	12600								
57-60					16300	11400	22550	2600							
60-63					1050	5050	4000	18250	100						
63-66								900	14500	100					
66-69										7300	50				
69-72											3950				
72-75												6150			
75-78															
78-81															
81+															

[4] Health impacts are related to the number of people affected. There is an assumption in the model on the average number of people in a household. This is set at the national average, 2.3, but can be adjusted to reflect local circumstance.

Figure 3: Forecast year - no. of households experiencing 'baseline/without scheme' and 'proposed option/with scheme' noise levels

(dB Leq, 16h)	With scheme	<45	45-48	48-51	51-54	54-57	57-60	60-63	63-66	66-69	69-72	72-75	75-78	78-81	81+
Without scheme															
<45		3794300	87200	4600											
45-48		30450	419250	67500	11200										
48-51			17750	180850	46400	14700									
51-54				20550	97200	29800	7900								
54-57					36350	42200	12600								
57-60					16300	11400	22550	2600							
60-63					1050	5050	4000	18250	100						
63-66								900	14500	100					
66-69										7300	50				
69-72											3950				
72-75												4800			
75-78															
78-81															
81+															

1.19 For the simplicity of this example, only daytime noise is considered. This will result in expected values for the change in amenity (annoyance), acute myocardial infarction, dementia and stroke. However a separate assessment must be carried out for night time noise which will provide results for changes in sleep disturbance.

1.20 The results are calculated separately for each of the health impacts listed above. Results are based on the change in noise multiplied by the number of people affected, taking account of the value of health impact. The final outputs include:

- A monetary cost for each health impact
- The total number of households experiencing changes (increases and decreases presented) in either day time or night time noise

Figure 4: Example output sheet from webTAG noise workbook

Noise Workbook - Worksheet 1

Proposal Name:	Hypothetical webTAG example
Present Value Base Year	2010
Current Year	2017
Proposal Opening year:	2018
Project (Road, Rail or Aviation):	aviation

Net present value of change in noise (£):	-£28,315,621

*positive value reflects a **net benefit** (i.e. a reduction in noise)

Net present value of impact on sleep disturbance (£):	£0
Net present value of impact on amenity (£):	-£25,922,110
Net present value of impact on AMI (£):	£390,098
Net present value of impact on stroke (£):	-£1,104,598
Net present value of impact on dementia (£):	-£1,679,011

Quantitative results

Households experiencing increased daytime noise in forecast year:	284750
Households experiencing reduced daytime noise in forecast year:	143800
Households experiencing increased night time noise in forecast year:	n/a
Households experiencing reduced night time noise in forecast year:	n/a

Qualitative Comments:

Data Sources:

Further Information

1.21 More detailed information on how WebTAG can be applied to assess noise impacts of airspace changes can be found in the Air Navigation Guidance published alongside this government response. For other information relevant to this topic please see.

- DfT(2017) Transport Analysis Guidance: WebTAG https://www.gov.uk/guidance/transport-analysis-guidance-webtag
- DfT (2017) "TAG unit A3 environmental impact appraisal, December 2015", https://www.gov.uk/government/publications/webtag-tag-unit-a3-environmental-impact-appraisal-december-2015
- DfT (2017) "WebTAG: environmental impacts worksheets", see Local Air Quality workbook, Greenhouse gases workbook and Noise workbook, https://www.gov.uk/government/publications/webtag-environmental-impacts-worksheets
- DfT (2017) "Air Navigation Guidance 2017", see Annex C, Options appraisal of an airspace change, https://www.gov.uk/government/publications/uk-air-navigation-guidance-2017