

hs2

Appraisal of Sustainability Options Report: Final
Appendix 4: Noise appraisal method statement



1. Noise appraisal method statement

1.1. Overview

- 1.1.1. The noise impact results are based on the outputs of a CadnaA noise model, with additional statistical calculations carried out in GIS. The noise modelling outputs include, in line with WebTAG requirements, change in population annoyed (annoyance) and present value of the noise change (PVB), as well as the number of properties potentially qualifying for noise insulation. The figures are also presented as a 'per km' basis along with the location of settlements where the impacts are likely to occur.
- 1.1.2. This appraisal was intended principally to allow comparison of different options given the current stage of design. The main assumptions and limitations are detailed below. These are largely the same as those listed in the phase one, HS2 London to West Midlands: Appraisal of Sustainability. A more detailed appraisal would be undertaken in due course.

1.2. Railway noise modelling

- 1.2.1. HS2 noise predictions have used the Department for Transport's Technical Memorandum Calculation of Railway Noise 1995 (CRN). Some modifications to the base CRN calculation have been included to account for aerodynamic noise when trains have speeds of above 300km/hr. The effect of acoustic shielding from buildings has been approximated by calculating the noise attenuation at dwellings located in areas of densely populated buildings. The existing digital terrain model is based on 5m interval contour lines extracted from ordnance survey data. The earthworks (cuttings and embankments), which may provide some screening effect for some dwellings, have been modelled based on a standard gradient and width of route.
- 1.2.2. The train source noise level used in the CRN calculation is dependent on the speed, type, number and length of the trains. These details have been provided by HS2 Ltd. All trains are assumed to be 400m in length, although, in practice, some classic compatible services will use trains that may be only 200m.
- 1.2.3. The noise model includes receivers which represent the number of properties within a 50m x 50m grid square. At each of these receivers the noise level is calculated without the scheme (i.e. existing railway noise only) and with the scheme (i.e. existing railway noise and HS2 railway noise). The change in noise level at the grid receiver, combined with the number of properties it represents, is used to calculate the number of people annoyed and PVB at that community location. The overall route annoyance and PVB are the sum of all the values at each of the receivers. If the noise levels at the receiver fall within the noise insulation criteria, all properties that the receiver represents are assumed to potentially qualify for noise insulation.

1.3. Location of settlements

- 1.3.1. The HS2 noise level and the change in noise level are not calculated at each individual dwelling. Locations listed where impacts may occur are based on plotting the receivers which indicate where people may experience a change in annoyance or properties may qualify for noise insulation on a map. The approximate locations of clusters of these impacts are listed in the AoS Options Report. This list is meant for illustrative purposes and not as an exhaustive list of potential noise impact locations. The precise location of the people potentially annoyed is not determined by this method.

1.4. Additional considerations

- 1.4.1. The potential effect of considering existing ambient noise due to traffic on major roads in the 'without scheme' scenario has been taken account of on a qualitative basis only, as the presence of high levels of road traffic may have an effect on the potential noise impacts, particularly where the route closely follows motorways. The potential effect has been indicated as a 'slight', 'moderate' or 'substantial' decrease in impacts.
- 1.4.2. The presence of additional mitigation, such as noise barriers or earth bunds has not been taken account of in the modelled results. However commentary is also provided to indicate the potential reduction on the reported annoyance and cost figures which may be achieved through the implementation of additional mitigation. The potential effect has been indicated as very good, good or limited opportunities for mitigation.
- 1.4.3. Other factors may also have an effect on the reported noise impact figures such as aircraft, industrial and other localised noise sources and social factors. However, these have not been taken account of in the appraisal.

1.5. Noise and non-residential sensitive receptors

- 1.5.1. As part of an initial screening assessment, potentially impacted non-residential noise sensitive receivers have been identified by counting the number of educational, health, places of worship and other non-residential potentially noise sensitive receivers within 300m of the route centreline.
- 1.5.2. The identification of noise sensitive receivers within 300m of the route centreline has been provided as part of an initial screening assessment in support of the social and distributional impacts screening work (see Appendix 5). The noise level at receivers within 300m of the proposed route will vary significantly depending on a range of factors, including the distance from the line and the presence of any noise screening, such as buildings or barriers. Furthermore, the effect of any change in noise is likely to vary significantly between different types of receiver.
- 1.5.3. Due to the strategic nature of the noise assessment completed at this stage of the appraisal process, the appraisal of noise has focused upon potential impacts at dwellings. It is important to note that the information presented in the social and distributional impacts screening work, is not comparable with the more rigorous assessment of potential residential noise impacts within the main body of the AoS options report. A more detailed assessment of noise impacts at non-residential properties would be carried out during the environmental impact assessment stage of the project should the scheme progress.