**WCC/P/9**

# NOISE

PROOF OF EVIDENCE OF
DARRAN HUMPHESON BSc (HONS) MSc MIOA
ON BEHALF OF WILTSHIRE COUNTY COUNCIL

PUBLIC INQUIRY INTO:

WILTSHIRE COUNTY COUNCIL PLANNING APPLICATION W07.09002
LAND TO THE EAST AND NORTH OF WESTBURY, WILTSHIRE,
DEVELOPMENT: CONSTRUCTION OF A SINGLE CARRIAGEWAY
ROAD WITH CLIMBING LANE OVER PART OF THE ROUTE,
ROUNDABOUT JUNCTIONS, ASSOCIATED INFRASTRUCTURE
CALLED IN FOR DETERMINATION BY THE SECRETARY OF STATE,
COMMUNITIES & LOCAL GOVERNMENT (SECTION 77 TOWN AND
COUNTRY PLANNING ACT 1990 AS AMENDED)

THE WILTSHIRE COUNTY COUNCIL (A350 WESTBURY BYPASS CLASSIFIED
ROAD) COMPULSORY PURCHASE ORDER 200'

THE WILTSHIRE COUNTY COUNCIL (A350 WESTBURY BYPASS CLASSIFIED
ROAD) SIDE ROAD ORDER 200'

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## 2 Qualifications and Experience

1.1 My Name is Darran Humpheson; I am a Director of Acoustics at RPS. I hold a Bachelor of Science degree with Honours in Applied Physics, a Master of Science degree in Environmental Acoustics and am a corporate member of the Institute of Acoustics.

1.2 I have over 15 years research and project experience in acoustics, covering transport, industrial, commercial and residential developments, recreation, and building acoustics. Prior to entering consultancy in 2002, I was head of the Royal Air Force's Noise and Vibration Division. My experience covered the assessment of environmental impacts from aircraft and the effects of noise on local communities. I also undertook work on a considerable number of other acoustic problems, unrelated to transport or industry. I have lectured in Acoustics at the University of Bath and for the Royal Military College of Science.

1.3 I have worked on 8 bypass proposals and 4 major highway improvement projects. I am currently technical lead for the Highway Agency's M11 improvement project.

1.4 My evidence is given on behalf of Wiltshire County Council and considers the noise and vibration aspects of the proposed A350 Westbury Eastern Bypass (the Scheme).

1.5 My involvement with the Scheme started in 2004 when RPS was commissioned to undertake the Design Manual for Roads and Bridges (DMRB) Volume 11, Stage 3 environmental assessment. I was not involved in the route selection process.

1.6 My duties included project management of the noise and vibration aspects of the Stage 3 assessment, including supervision of the baseline noise surveys, calculation of road traffic noise levels and authorisation of the noise assessment contained within the Environmental Statement that was published in February 2007.

1.7 I have visited the site and am familiar with the area.

## 3 Scope and Structure of Evidence

3.1 My evidence is presented in support of the planning application by Wiltshire County Council for: Construction of a new single carriage bypass east of Westbury.

3.2 My evidence is concerned with the noise effects associated with the operation of the bypass, principally the benefits and disbenefits associated with the scheme at residential and non-residential locations within the vicinity of the existing route through Westbury and along the route of the proposed bypass.

3.3 As my evidence is technical in nature, I have provided respectively in Appendices A and B a glossary of acoustic terms and background information on road traffic noise, including the procedures required for an environmental assessment of a road scheme. Further supporting information is provided in Chapter 12, Noise and Vibration of the Environmental Statement.

3.4 In my proof of evidence I demonstrate that in accordance with national policy, the Scheme is consistent with Planning Policy Guidance Note 24 - PPG24 in terms of protection of the environment. I also consider a number of objections to the Scheme.

3.5 The structure of my proof of evidence is set out in five main sections:

**Section 3** The planning policies and guidance with respect to noise are described.

**Section 4** The existing road traffic and ambient noise environment is described by reference to noise surveys and calculation of road traffic noise.

**Section 5** Operational effects arsing from the use of the bypass (Do-Something) are identified at potentially noise sensitive receptors and are compared against the no-bypass assessment case (Do-Minimum). The absolute and relative magnitudes of the effect are assigned an

appropriate level of significance based on the criteria adopted for the assessment. Both residential and non-residential noise sensitive locations are assessed.

**Section 6** Provides a response to objections raised by the White Horse Alliance, The Campaign to Protect Rural England and comments made by third parties.

**Section 7** Provides a summary and draws conclusions

## 4 Relevant Planning Policy and Guidance on Noise

4.1 Key national, regional and local planning policy and guidance on noise relevant to my evidence include:

- PPG24 - Department of the Environment. 1994. Planning Policy Guidance: Planning and Noise (PPG24). HMSO. **[DD76]**
- Design Manual for Roads and Bridges Volume 11 Section 3 Part 7 'Traffic Noise and Vibration' (August 1994). **[DD89]**
- Calculation of Road Traffic Noise. Department of Transport (Welsh Office). HMSO 1988. **[DD90]**
- World Health Organisation, Guidelines for Community Noise (2000). **[DD91]**

4.2 Appendix C provides a summary and relevant extracts of PPG24. Appendix B provides background information on the relevant noise guidance.

4.3 The above policies and guidance are predominantly designed to protect the amenity of sites used for habitable use (both internal and external living spaces) and those buildings/areas used for public use, including places of religious worship and recreational areas, eg public parks. When describing and rating the noise environment of sites of ecological importance (eg SSSIs) there is little scientific evidence and guidance, especially the promotion of acceptable noise limits. In these situations it is customary to use the same noise guidance as used for humans.

# 5 Existing and Future Do Minimum Road Traffic Noise Environment

## Description of Proposals

5.1 The Westbury bypass is designed to improve and reduce the current traffic flows through Westbury, specifically on the A350. The new bypass alignment will be constructed to the east of Westbury from Madbrook Farm to the Glenmore Link, where it then rejoins the existing A350 to the north of Westbury. The existing route through the town will be retained for local access, but a traffic flow reduction of up to 70% is expected to occur. The design has included mitigation measures, such as earth bunding, embankments and cuttings, to minimise adverse noise effects where practicable. The bypass will consist of a single carriageway road, approximately 6 km in length. Access to the new road will be via four new roundabouts at the following locations:

- immediately south of Madbrook Farm on the existing A350 Warminster Road, south of Westbury (the Madbrook roundabout);
- immediately north of the existing A350 Trowbridge Road/Coach Road junction, northnortheast of Westbury (the Cement Works roundabout);
- immediately north of Glenmore Farm on the existing B3097, north-northwest of Westbury (the Glenmore roundabout); and
- adjacent to Hawkeridge Farm.

5.2 The proposed bypass is to be constructed with a thin wearing course which is assumed to reduce traffic noise by 2.5dB(A) compared to ‘hot rolled asphalt’ (HRA). Road surfacing on existing roads is primarily HRA, apart from the recent Hawkeridge Link Road (A363 roundabout to Hawkeridge Road) and the A350 through Westbury from the junction of Haynes Road and Station Road south, which have a ‘thin surfacing dressing’.

5.3 In addition, two railway bridges and two new road bridges on Bratton Road and Newtown Road will be constructed. Other structures include an accommodation bridge at Chalford, underpass and wildlife tunnel at Wellhead and Bere's Mere Farm respectively and small bridges as the bypass crosses Bitham Brook at three locations. The bypass will incorporate a section of climbing lane for southbound traffic between the low point north of Bratton Road and the crest south of Newtown.

5.4 The alignment for the preferred scheme mainly runs through an area considered to be rural, situated to the east of Westbury. The alignment has been located away from major settlements and is in a cutting where practicable, which assists with noise reduction. As the proposed bypass was designed to provide an alternative route through Westbury, it is expected that traffic noise along the existing route will decrease as a result.

5.5 I consider the following engineering features to be of relevance to my proof of evidence:

- To the northeast of the Madbrook Roundabout the bypass would be in a cutting which assists with noise reduction in the vicinity of Chalford Accommodation Bridge.
- In the vicinity of Wellhead Springs (and White Scar Hanging) the bypass would be on an embankment with additional mounding to create a 3 metre high false cutting in certain sections. This will assist with noise shielding.
- At Newton Bridge the bypass is in a cutting which greatly assists in reducing road traffic noise at Newtown to the west and Beggar's Knoll to the east.
- In the vicinity of the B3098 Bratton Road, a combination of cuttings, embankments and mounds assist with the partial shielding of the residential areas (and cemetery) to the west of the bypass.

- Although not intended as acoustic measures, in part, the bat screens will assist with noise shielding.

**Existing Noise Environment**

5.6 For locations where road traffic is the dominant noise source, the normal practice is to undertake calculations to determine the existing road traffic sound levels. Whereas for locations subject to a variety of noise sources, of which traffic noise is not dominant, then the approach is to undertake noise monitoring at selected locations. These locations can then be considered representative of a group of noise sensitive receptors.

5.7 The existing noise environment through Westbury is dominated by road traffic noise, whereas to the east of the town a combination of different noise sources will contribute to the overall ambient noise level, which in this case are traffic on minor (un-modelled) local roads, overflying aircraft, general neighbourhood noise, farming activity and natural sounds (bird song and wind noise through trees and hedges).

5.8 During the preparation of the DMRB stage 2 assessment, noise surveys were undertaken at 7 locations to appreciate the ambient sound levels to the east of Westbury. These 7 surveys were primarily undertaken near residential properties and not in open areas, ie footpaths or designated sites. Although the surveys were not reported within the Stage 3 Environmental Statement, they were used as a means of verifying the robustness of the road traffic noise model.

5.9 Subsequently, additional surveys were undertaken between Thursday 10th April 2008 and the morning of Friday 11th April 2008 at non-residential locations. In summary, 5 separate locations were surveyed and the results are presented in Table 5.1. Unlike the previous measurements which were recorded over a period of 3 hours (in accordance with the shortened measurement approach of CRTN), representative ambient sound levels were recorded over a period of 15 minutes at each location. Although this approach differs

to the previous assessment, I consider that if the ambient noise is reasonably consistent, then a shortened measurement period is more than satisfactory. In the context of the local area and observations made during site visits, I consider that ambient noise levels are reasonably consistent and there is unlikely to be any significant variation to the sound levels over a typical assessment period of 18 hours. Therefore the data presented in Table 5.1 is representative of the existing noise environment experienced in the local area.

**Table 5.1 : 2008 Noise Survey Details**

| Site | Description | Survey location Lat / Long | Date / Time | Observed Noise Sources | Noise Survey Metric (dB) | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $L_{Aeq}$ | $L_{Amax}$ | $L_{A10}$ | $L_{A90}$ |
| 1 | On path south-east of power station on Wellhead Drove. Representative of Upton Cow Down SSSI | N 51.24912 E -2.17776 | 10/04/2008 13:30 | distant road traffic, birdsong, wind in trees, overhead light aircraft | 46.0 | 66.7 | 46.6 | 41.7 |
| | | | 10/04/2008 16:13 | distant road traffic, birdsong, wind in trees, overhead light aircraft | 44.9 | 55.5 | 46.6 | 42.5 |
| 2 | On track between Wellhead Drove and Newtown approx half way | N 51.25371 E -2.17139 | 10/04/2008 14:08 | distant road traffic, wind | 42.3 | 66.4 | 44.0 | 38.3 |
| | | | 10/04/2008 16:38 | wind speeds, traffic noise louder due to prevailing north wind | 47.7 | 69.0 | 49.8 | 40.6 |
| 3 | In field next to Long River Road Representative of Brattons Downs SSSI | N 51.25819 E -2.15986 | 10/04/2008 14:55 | wind in trees, birdsong, overhead light aircraft, occasional vehicle pass by on road | 47.4 | 62.6 | 49.5 | 40.5 |
| | | | 10/04/2008 17:17 | wind in trees, birdsong, overhead light aircraft, occasional vehicle pass by on road | 49.0 | 68.8 | 51.1 | 39.8 |
| 4 | On corner of Coach Road | N 51.26837 E -2.17398 | 10/04/2008 15:30 | traffic on A350, wind in trees | 48.7 | 69.1 | 50.2 | 45.8 |
| | | | 11/04/2008 09:01 | traffic on A350, variable wind speeds - occasional wind noise | 50.1 | 57.5 | 51.5 | 47.9 |
| 5 | North of bypass - Representative of Picket & Clanger Wood SSSI | N 51.28621 E -2.18065 | 10/04/2008 18:08 | traffic on A350, birdsong, wind in trees | 49.5 | 59.0 | 50.8 | 47.4 |
| | | | 11/04/2008 09:42 | traffic on A350, birdsong, variable wind speeds - occasional wind noise | 53.8 | 72.1 | 55.5 | 50.1 |

5.10 I consider the data to be representative of a rural environment. It should be noted that this measured data not only describes the

existing noise environment but can also be used to determine the significance of the road traffic noise with the proposed bypass.

5.11 Dr Keith Jones in his Proof of Evidence on ecological matters considers the effects of the proposals on statutory designated sites and non-statutory designated sites (country wildlife sites). The main sites identified are:

- Picket and Clanger Wood (SSSI);
- Bratton Downs (SSSI);
- Upton Cow Down (SSSI); and
- White Scar Hanging Country Wildlife Site.

5.12 In addition, a number of public rights of way intersect these areas and according to the most recent noise surveys, existing representative sound levels within these sites are in the range 40 to 55dB $L_{Aeq,t}$ and would be considered representative for sites of this type.

**Future Noise Environment – Do Minimum**

5.13 Future changes in traffic flow characteristics in 2009 and 2024 will lead to an increase in traffic flows and hence consequential increases in road traffic sound levels. Chapter 12 of the Environmental Statement noted that future road traffic sound levels are likely to increase slightly, typically less than 3dB(A), ie an imperceptible change based on gradual increases in noise levels.

## 6 Do Something - Noise Effects Along Existing Route

6.1 The Stage 3 DMRB assessment reported in Chapter 12 of the Environmental Statement assesses the totality of the proposals against the Do Minimum scenarios.

6.2 In summary, the proposals will lead to a significant noise benefit for residential properties along the existing route of the A350 through the town centre. In the Do Something case in the design year of 2024, a greater number of properties will experience a noise decrease compared to those that experience a noise increase. I consider this change in road traffic noise exposure to be a considerable noise benefit to the residents along the route of the existing A350.

6.3 A revised version of Figure 12.5 – numbered Figure 1 - (first floor sound levels at selected receptors) of the Environmental Statement is reproduced in the Appendices. The figure highlights those areas where a noise decrease is expected and those areas where a noise increase would occur. It should be noted that the actual figure included within the ES (and Figure 12.4) transposed road traffic sound levels, which incorrectly reported the change in sound level between Do Minimum and Do Something for the opening and design years. The revised figure included within my evidence corrects this formatting error and also includes additional locations which I will discuss later in my evidence.

### Effects along the route of existing A350

6.4 All things being equal, it will take a doubling or halving of traffic flows for a 3dB change in road traffic sound levels to occur. Locations along the route of the existing A350 will generally experience a perceptible 3-5dB reduction in road traffic sound levels. In terms of benefits associated with road schemes, I consider this magnitude of reduction to be significant in environmental noise terms.

**6.5** In addition, the number of properties that will experience a perceptible benefit (>1dB change for the year of opening) will be 4,586 according to the DMRB assessment and those properties that will experience a perceptible noise increase will be 556. Again on balance, I consider this to be a significant benefit to the Westbury area.

**Effects along Route of Bypass**

6.6 Road traffic sound levels along the route of the bypass will affect residential areas to the west of the bypass (east of Westbury) and the open areas to the east of the bypass. Within this section I consider the effects of the Scheme on the open areas to the east and the ecological sites identified by my colleague, Dr Keith Jones. For the purposes of consistency, I will initially consider the noise effects on the residential and non-residential public sites, followed by the noise effects on the ecological sites.

Effects on residential properties and other sensitive areas

6.7 To the east of Westbury, there are numerous residential properties that would have sight towards the route of the bypass. Again road traffic sound levels calculations have been undertaken and the degree of noise change calculated. It is only these properties that will experience a noise increase and according to the DMRB assessment, 556 properties will experience a noise increase of various magnitudes. Of these properties, 531 experience an increase below 50dB $L_{A10,\ 18hr}$ and 25 properties experience an increase between 50 and 60dB $L_{A10,\ 18hr}$. No properties experience an increase in road traffic sound level above 60dB $L_{A10,\ 18hr}$.

6.8 Those properties closest to the bypass will naturally experience the greatest noise change. Some of the closest dwellings to the bypass are located on Newtown and are single storey dwellings. The reported noise change within the ES was found to be approximately 7dB(A) regardless of the year of assessment. The absolute levels of road traffic are relatively low, ie with bypass <50dB $L_{A10,\ 18hr}$ due to

the road being in a cutting in the area of the Newtown bridge. Other residential areas along the length of the bypass will experience similar magnitudes of noise change.

6.9 Two locations will experience a noise change that is deemed to be major adverse and these areas are:

- In the vicinity of Fair View Farm on the B3098 Westbury Road (~3 properties); and
- Seven Perches, New Town (~4 properties);

6.10 None of the above properties experiences an increase in road traffic sound level that would trigger eligibility for sound insulation under the term of the Noise Insulation Regulations 1975. Because of the inherent engineering design features, ie bunding and landscaping features, the overall level of road traffic sound at the above properties is less than or equal to 55dB $L_{A10,18hr}$. As stated previously, sound levels of this magnitude are at the lower end of the WHO's guidelines values for environmental noise.

6.11 At non-residential properties including noise sensitive community facilities, the Environmental Statement reported that the majority of sites experience a perceptible noise reduction of approximately 2-4dB(A), with only Bitham Brook County Primary School experiencing an imperceptible noise increase of 0.3dB(A) and only the cemetery off Bratton Road experiencing a perceptible noise increase of approximately 6dB(A).

6.12 Various open areas are located in the vicinity of the proposed bypass and these are discussed in paragraph 6.14.

6.13 In conclusion, I consider that on balance there is a significant noise benefit associated with the Scheme and although a small number of residential properties experiences perceptible changes in the road traffic noise environment, the absolute magnitude of the noise is not adverse. All noise sensitive community facilities, except the cemetery, do not experience a perceptible increase in road traffic sound level. The Scheme, as designed, incorporates significant

engineering controls and I consider that no further migration measures are necessary.

Effects on Designated and Non-Designated Sites

6.14 As stated in paragraph 5.10, the following sites require particular consideration as open spaces.

- Picket and Clanger Wood (SSSI);
- Bratton Downs (SSSI);
- Upton Cow Down (SSSI); and
- White Scar Hanging Country Wildlife Site

6.15 Dr Keith Jones in his proof of evidence on ecological matters considers the significance of the proposals on the ecology of the sites, whilst I consider the changes in road traffic sound levels as a result of the Scheme. A combination of noise surveys and calculations have been undertaken to determine whether changes in ambient sound levels at the above locations are sufficient to effect the 'rural character' of the area.

6.16 The measured levels reported in Table 5.1 have been combined with the calculated road traffic sound levels to produce an ambient sound level. I consider that the measured sound levels at the monitoring locations will not vary significantly over the 15 year period between the opening and design years and therefore the measured levels have been used for both the 2009 and 2024 assessment years.

6.17 The noise difference for each location has been calculated and a semantic scale rating has been applied (see Appendix B). The results are presented in Table 6.1. Where more than one receptor has been modelled for an area, sound levels of the 'worst case' receptor (i.e. receptor with the most adverse noise change) have been presented.

**Table 6.1 : Road Traffic Sound Levels in Designated and Non-Designated Sites**

| Assessment Year | Location | Do Minimum $L_{A10, 18hr}$ | Do Something $L_{A10, 18hr}$ | Noise Change | Semantic Scale Rating | Significance Rating | |
|---|---|---|---|---|---|---|---|
| 2009 | Pickett & Clanger Wood SSSI | 53.1 | 53.6 | 0.5 | No significant change | Negligible | ~ |
| | Brattons Down SSSI | 50.3 | 51.8 | 1.5 | No significant change | Negligible | ~ |
| | Upton Cow Down SSSI | 46.6 | 50.9 | 4.3 | Minor increase | Minor | Adverse |
| | White Scar Hanging CWS | 44.0 | 52.6 | 8.6 | Moderate Increase | Moderate | Adverse |
| 2024 | Pickett & Clanger Wood SSSI | 53.1 | 53.7 | 0.6 | No significant change | Negligible | ~ |
| | Brattons Down SSSI | 50.3 | 52.1 | 1.8 | No significant change | Negligible | ~ |
| | Upton Cow Down SSSI | 46.6 | 51.5 | 4.9 | Minor increase | Minor | Adverse |
| | White Scar Hanging CWS | 44.0 | 53.4 | 9.4 | Moderate Increase | Moderate | Adverse |

6.18 As can be seen from the above table, combined $L_{A10}$ (ambient measured and calculated road traffic sound levels combined by logarithmic addition) sound levels have been presented for both the Do Minimum and Do Something cases. In the Do Minimum case, the sound levels are consistent regardless of the year of assessment. Whereas in the Do Something case, sound levels are predicted to increase imperceptibly from the opening year to the design year.

6.19 For each site I consider that:

- Picket and Clanger Wood (SSSI) – there is a negligible change in the sound level due to the spatial separation from the wood to the proposed scheme and the dominance of the existing road traffic noise environment.
- Bratton Downs (SSSI) – the nearest element of the SSSI is adjacent to Long River Road and local road traffic is the dominant source of noise. Sound levels are predicted to increase by a small but negligible amount. Although there will be audible road traffic noise, I consider the magnitude of the increase to not adversely affect the enjoyment or 'tranquillity' of the area.
- Upton Cow Down (SSSI) – due to its proximity to the southern end of the bypass, the degree of noise change is the greatest of

the SSSIs. Sound levels are predicted to increase from approximately 47dB to 51-52dB $L_{A10,18hr}$. This degree of change would be perceptible but would still be below that considered by the WHO to be adverse for humans and according to the EU would just be above the guidance for quiet rural areas (see paragraph 7.6). Road traffic sound levels would be audible within the SSSI but the magnitude of the sound would not be such that a significant adverse effect would occur. Furthermore the majority of the SSSI lies away from the bypass and road traffic sound levels would be lower at these locations.

- White Scar Hanging Country Wildlife Site – The CWS lies to the east of the proposed bypass and current sound levels are approximately 44dB $L_{A10,18hr}$. With the bypass, sound levels are predicted to increase to 53dB $L_{A10,18hr}$. This change in noise is considered moderate significance and road traffic noise would be clearly perceptible.

6.20 Figure 1 displays the calculated road traffic sound levels for the Do Minimum and Do Something assessment cases at the sites listed above in paragraph 6.19. This figure only compares changes in road traffic sound levels and not the increase in the ambient sound level as a result of the Scheme. In addition, a number of other sites are also included within the figure, which are for information purposes only (the noise change at these sites is generally lower than those reported in Table 6.1 when the existing ambient noise environment is taken into account). As noted earlier, I consider that these sites are also representative of road traffic sound levels on public rights of way.

6.21 Road traffic sound level contours are shown in Figures 2 and 3 for the Do Minimum and Do Something cases in 2009. As shown whilst road traffic sound levels close to the bypass will increase, at locations further from the bypass the sound level is unlikely to be materially affected and these distances are typically 500-700 metres.

6.22 In conclusion, I consider that road traffic sound levels within the designated and non-designated sites (and public rights of way) will increase as a result of the proposals, but for the majority of sites the significance of the change in road traffic sound level will be negligible. A number of sites will experience a moderate adverse noise change depending upon the proximity of the observer within the site to the bypass but overall, I consider the benefits of the scheme on residential and community facilities outweigh the disbenefits of the Scheme.

6.23 In addition, as the Scheme has incorporated engineering design features to minimise the potential adverse effects of the proposals, I consider that these features are in keeping with the requirements and spirit of PPG24 to minimise the effects of noisy development especially on sites of special interest. Therefore no further mitigation measures are required.

**Road Traffic Vibration**

6.24 As described in the DMRB and Chapter 12 of the Environmental Statement, ground-borne vibrations are essentially caused by heavy vehicles passing over irregularities in roads that are not maintained in a good condition. As new road surfaces do not present such irregularities, it is expected that this type of vibration would not arise along any section of the proposed bypass alignment.

6.25 Airborne vibration arises from low frequency sound from vehicle engines and the disturbance they cause to building occupiers are generally considered to be 10% lower than the disturbance caused by the traffic noise itself. On average, traffic induced vibration is expected to affect a very small percentage of people at exposure levels below 58dB(A). As very few properties are exposed to road traffic sound levels above this guidance level then it is expected that vibration disturbance to their occupiers is very unlikely.

**Construction Effects**

6.26 Construction effects are considered in detail within Chapter 12 of the Environmental Statement. I do not consider the construction noise and/or vibration effects to be material to this appeal as there are statutory measures available which can be used to minimise and control the disturbance that may occur.

## 7 Response to Objections

7.1 A number of objections to the Scheme have been formally submitted and those objections (which I am aware of) are detailed below:

- The White Horse Alliance (WHA) has objected to the Scheme on grounds set out in their Rule 6 Statement, repeated in their Rule 7 Statement of Case. The objection relating to noise is as follows (paragraph numbers are indicated in brackets):

  1. 'irreparable and unjustified damage to the tranquillity of a protected landscape of great historical significance on the western escarpment of Salisbury Plain'. (WHA 1.2).

  2. 'Noise pollution from the road would damage rural tranquillity over a wide area' (WHA 4.1).

  3. 'renders a distinctive and popular part of the Wiltshire countryside less attractive by virtue of the intrusive nature of the road, its …. traffic noise.' (WHA 4.4.2).

  4. 'whether mitigation of ….noise impacts is possible'. (WHA 4.4.3).

  5. 'noise impact in the countryside and …. noisy development proposed in or near Sites of Special Scientific Interest (SSSIs) and other area of … value'. (WHA 4.4.4).

  6. 'examine alternatives to an eastern bypass for Westbury in the context of ….. noise impact'. WHA (4.4.7).

- Campaign to Protect Rural England (CRPE) - West Wiltshire Group – original letter dated 6th May 2005. The CPRE objection relates to similar themes as those stated by the WHA. The CPRE consider that the Scheme to the east of Westbury will be an 'unacceptable blight' and that the tranquillity of the area will be affected.

7.2 Objections to the scheme have also been received from a number of residents concerning the compulsory purchase orders. Having

reviewed the letters, I have grouped the noise concerns with those raised by the WHA and CPRE.

7.3 Much of WHA's and CPRE's objections relate to future road traffic noise affecting the areas to the south and east of the bypass. The WHA and CPRE use the term rural tranquillity, however there is no true definition of what constitutes tranquillity and certainly no acceptable or un-acceptable noise limit or criterion.

7.4 I consider that the most relevant research on tranquillity is that undertaken on behalf of the CPRE, which was published in February 2008 (CPRE – Tranquillity Mapping: Developing a Robust Methodology for Planning Support, January 2008 (revised)) **[DD92]**. In addition, The European Commission established a service contract to support Directive 2002/49/EC 'Assessment and Management of Environmental Noise Directive'. The 'Report on the Definition, Identification and Preservation of Urban and Rural Quiet Areas' (Symonds Group Limited 4E 59492. (July 2003)) **[DD93]** was published to advise the EU working group on the assessment of exposure to noise. It is my understanding that the findings of the Symonds' report were accepted by the EU Working Group.

7.5 According to the CPRE's sponsored report, *tranquillity is a widely used term. It is considered to be a state of calm, quietude and is associated with peace; a state of mind that promotes mental well being*. The CPRE report goes on to state that *tranquillity appears to be a holistic sensory experience and there are many variables which input into an individual's feeling of tranquillity.*

7.6 The CPRE report, which included a literature review, does not promote a noise level that would be considered tranquil, although it does consider that anthropogenic noise sources, including trains, railways and aircraft are negative factors influencing tranquillity as are visual anthropogenic features. In contrast, the Symonds' report notes that $L_{den}$ *50dB should be the upper limit for relatively quiet areas in urban locations. If a higher 'gold standard' level is to be defined for urban areas then it would be sensible to strive for 40dB*

$L_{den}$. For rural areas: *the upper noise limit criterion for rural quiet areas should be 40dB* $L_{Aeq,\ 24\ hour}$ *or its equivalence in* $L_{den}$. The EU Directive defines an area of relative quiet in the countryside as being '*undisturbed by noise from traffic, industry or recreational activities*'.

7.7 The CPRE report includes a number of composite tranquillity maps, which include sources of road traffic noise as well as other sensory factors. These composite maps display areas of either positive or negative factors influencing tranquillity. The maps which include road traffic noise were derived by making broad assumptions regarding road traffic flow characteristics and sound propagation (sound levels were calculated in Microsoft Excel and only at a 500 metre grid resolution using normalised road traffic flows). It should be noted that the CPRE assessment approach is not comparable to the assessment of road traffic sound levels using the CRTN technical memorandum. Therefore the CPRE tranquillity maps should be treated with caution if used at a local level. I have therefore based my assessment of WHA's and CPRE's objections on the information contained within Chapter 12 of the Environmental Statement and Section 5 of my evidence.

7.8 In addition, the authors of the World Health Organisation's Guidelines for Community Noise note that disruption of tranquillity in parkland and conservation areas is a negative aspect and noise levels in *existing large quiet outdoor areas should be preserved and the signal-to-noise ratio kept low.*

7.9 In paragraph 6.14 onwards, the effects of the Scheme on the designated and non-designated sites were evaluated. I consider that the measurements of existing ambient noise and calculations of future traffic sound levels at these sites are sufficient to assess the effects of the proposals on the character of the surrounding area, ie the tranquillity of the area with respect to noise.

7.10 The existing $L_{Aeq}$ data presented in Table 5.1 lies within the range 42 to 54dB and the quieter locations away from the existing roads

would be considered, according to the Symonds' report, to be representative of a *rural quiet area*. When the effects of the Scheme are taken into account, Table 6.1 indicates that existing noise levels are likely to increase by 0.5dB to 9.4dB $L_{A10, 18hr}$. For the majority of areas away from the bypass, where future changes in road traffic sound levels would be small, an observer would be able to subjectively distinguish a change in the character of the noise, which would not be reflected as a significant change in sound level (ie greater than a 3dB change in sound level).

7.11 For locations with a sound level change greater than 2-3dB, I would consider that the character of the area with respect to noise would be affected.

7.12 It should be noted that the reported changes in sound levels are the maximum that would be expected, as the calculation locations are the closest points to the Scheme within each of the sites identified in paragraph 6.19. As would be expected, sites further away from the calculation locations, but still within the sensitive sites, will experience a smaller change in the combined road traffic sound level. Hence there are alternative locations if one were to preserve the 'signal to noise ratio' stated by the authors of the World Health Organisation's Guidelines for Community Noise.

7.13 In contrast to residential locations, any recreational uses of the open areas to the east of the Scheme by members of the public would be classified as transient, ie non-permanent sensitive locations. In these circumstances, a lower significance weighting is often applied to temporary locations. Therefore I have placed more emphasis on the improvements that the Scheme will generate for residents of Westbury than the potential adverse effects in the open areas.

## 8 Conclusions and Summary

8.1 An assessment of the Scheme has been conducted in accordance with the Design Manual for Road and Bridges Volume 11, Section 3 Part 7, Traffic Noise and Vibration. This is the normal approach for evaluating the environmental noise effects of a road scheme.

8.2 The assessment approach has involved the following key elements:

- assessment of existing road traffic noise levels by means of measurement and calculation; and
- quantitative assessment of future road traffic noise using noise change and benchmark comparisons at identified sensitive locations with and without the proposals (Do Something and Do Minimum).

8.3 The DMRB methodology assesses the totality of the proposals, whereas noise change and benchmark comparisons have been used to assess the effects of the proposals at specific locations.

8.4 All things being equal, it will take a doubling or halving of traffic flows for a 3dB change in road traffic sound levels to occur. The assessment has shown that locations along the route of the existing A350 will generally experience a perceptible, 3-5dB, reduction in road traffic sound levels. In terms of benefits associated with road schemes, I consider this magnitude of reduction to be significant in environmental noise terms.

8.5 The number of properties that will experience a perceptible benefit, which for the opening year is defined as a noise change greater than 1dB, will be 4,586 according to the DMRB assessment and those properties that will experience a perceptible noise increase will be 556. On balance, I consider this to be a significant benefit to the Westbury area.

8.6 The DMRB and noise changes assessments have shown that a small number of properties will experience a small disbenefit and that the inherent design features of the Scheme will enable the potential

adverse effect of the Scheme to be minimised as far as is practicable.

8.7 Road traffic sound levels within the designated and non-designated sites (and public rights of way) will increase as a result of the proposals, but for the majority of sites the significance of the change in road traffic sound level will be negligible. A number of sites will experience a moderate adverse noise change depending upon the proximity of the observer within the site to the bypass.

8.8 Much of objections by the White Horse Alliance and CPRE relate to future road traffic noise affecting the areas to the south and east of the bypass. Specifically the effects of the scheme on the tranquillity and quietude of the area. Although parts of the areas in the vicinity of the bypass will experience a perceptible change in the ambient noise environment, I consider that on balance, the benefits of the scheme on residential and community facilities outweigh the disbenefits of the Scheme.

8.9 The DMRB states that '*on average traffic induced vibration is expected to affect a very small percentage of people at exposure levels below 58dB(A)*'. As very few properties are exposed to road traffic sound levels above this guidance level then it is expected that vibration disturbance to their occupiers is very unlikely.

8.10 I do not consider that the Scheme's construction noise and/or vibration effects to be material to this appeal as there are statutory measures available which can be used to minimise the disturbance that may occur.

8.11 In conclusion, the A350 Westbury bypass will lead to a significant noise benefit for the residents of Westbury.