APPENDIX 7
Noise Impact Assessment

1.   INTRODUCTION

1.1.   Statement of intent

1.1.1.   Parsons Brinckerhoff previously produced the noise and vibration chapter within the Environmental Statement which formed part of the planning application for the Hereford ESG Link Road scheme (Dec 2009). In 2015 Parsons Brinckerhoff were commissioned by Herefordshire Council to update the noise assessment to provide outputs of a WebTAG assessment, reflecting the latest design changes to the scheme now referred to as Hereford City Centre Transport Package (HCCTP), and an update to the traffic modelling.

1.1.2.   The output of this study is a WebTAG assessment, which provides a monetary valuation of changes in noise levels, and a distributional impacts assessment, which considers the environmental impacts across different social groups.

1.2.   Site Location

1.2.1.   The HCCTP is located in the northern part of the Hereford city centre within close proximity to Hereford train station. The closest noise-sensitive receptors to the scheme are dwellings either side of Widemarsh Street (B4359). The scheme primarily involves linking the A49 to the A465 with a new road and making improvements to the Commercial Road section of the A465. There are also changes to junctions and bus lanes on the A49 and A438.

1.2.2.   Figure 1 below shows the scheme and the location of the nearest receptors. The study area covers all the sensitive receptors within 600m from the scheme (physical works associated with the road project) and from any affected routes within a kilometre from the scheme. This is in accordance with the DMRB criteria (Annex 1, A1.11, HD 213/11).

1.2.3.   A total of 6732 properties were assessed within the study area.

1.3.   Assessment methodology

1.3.1.   The WebTAG assessment included outputs from the noise models with the following traffic data scenarios:

- Do-minimum (DM) (without scheme) 2017;
- Do-something (DS) (with scheme) 2017;
- Do-minimum (DM) (without scheme) 2032; and
- Do-something (DS) (with scheme) 2032.

1.3.2.   The traffic data for the scheme was extracted from the HCCTP Saturn Model. The DS scenario is representative of HCCTP scheme implementation and includes 800 additional residential units in the ESG area. It should be noted that this DS scenario represents a worst case scenario.

1.3.3.   The latest version of the calculation spread sheets were taken from the gov.uk website.

1.3.4.   The distributional impact assessment utilises the outputs from the noise models with the traffic scenario 2032 Do-something and the 2017 Do-minimum.

Figure 1: Site Location
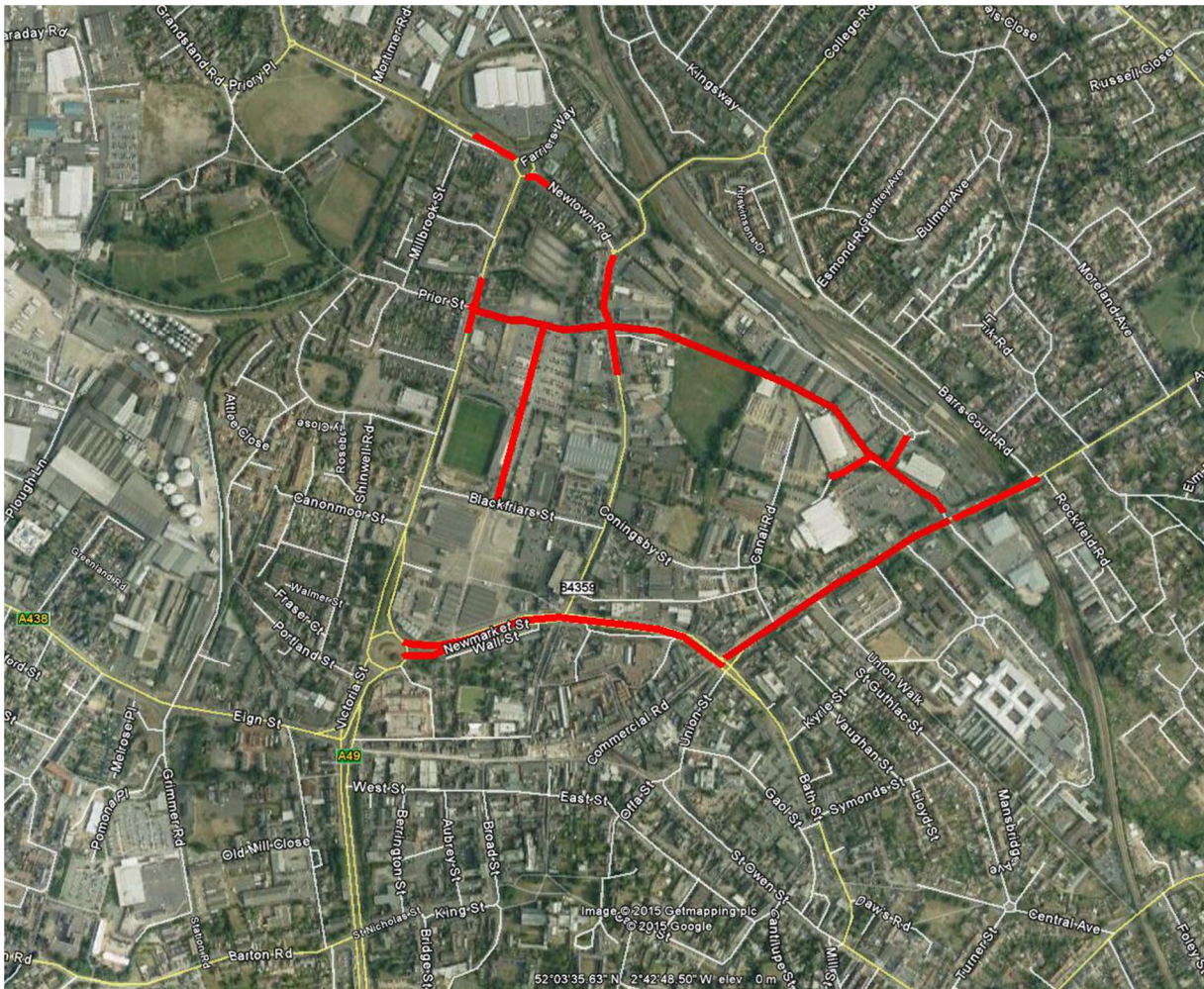
Key

━━━ New or Altered Roads.

2. **RESULTS**

2.1.1. Table 1 in Appendix 7B presents the results of the WebTAG assessment. The assessment shows that 7 fewer people will be annoyed by noise with the scheme. The monetary value of the scheme is -£253,629, which reflects a minor negative change.

2.1.2. Table 2 in Appendix 7B presents the results of the distributional impacts assessment. The assessment shows the impact of noise changes due to the scheme over different income domains. The worst affected income domain is the 40-60% group.

3. **CONCLUSION**

3.1.1. The WebTAG assessment shows that 7 fewer people will be annoyed by noise as a result of the scheme, and the monetary value is -£253,629. The distributional impacts assessment shows that the worst affected income domain is the 40-60% group.

APPENDIX 7A

Glossary of Terms

Ambient Noise	The total sound in a given situation at a given time, usually composed of sound form may sources near and far.
A – Weighting	A-weighting has been found to give the best correlation between perceived and actual loudness. Measurement to which this weighting has been applied include an A in their descriptor.
Background Noise Level, $L_{A90,T}$	The level exceeded for 90% of a given time interval, T.
Decibel (dB)	A logarithmic unit for measuring the relative loudness of noise, i.e. the sound level.
Environmental Noise	Noise governed by environmental legislation, and usually enforced by local authorities. Also termed "nuisance".
Facade Effect	The phenomenon of sound energy (noise) being reflected form the hard rigid, external surface of a building or structure. Where a facade is present, this effect adds approximately 2.5 or 3 dB to the free field noise level (at a distance of 1 metre from the facade).
Free Field Noise Level	The noise level measured away from any reflecting surfaces.
Hertz (Hz)	Unit of frequency, equal to one cycle per second. Frequency is related to the pitch of the sound.
$L_{Aeq, T}$	The equivalent continuous sound level. It provides an "average" sound level over a defined period of time (T).
$L_{A10, 3h}$	The L_{A10} is the sound level exceeded 10 per cent of the time and it is used to define road traffic noise. The L_{A10} (3 hour) dB is the arithmetic average of the values of L_{A10} hourly dB for three one-hour periods between 1000 and 1700 hours. It is used as a way of calculating the $L_{A10, 18h}$ using the equation: $L_{A10, 18h} = L_{A10, 3h} -1$.
$L_{A10, 18h}$	The L_{A10} is the sound level exceeded 10 per cent of the time and it is used to define road traffic noise. The L_{A10} (18 hour) dB is the arithmetic average of the values of L_{A10} hourly dB for each of the eighteen one-hour periods between 0600 and 2400 hours.
L_{Amax}	The maximum sound level measured.

APPENDIX 7B

WebTAG and Distributional Impacts Results Tables

Table 1

APPRAISAL - NOISE POLLUTION

Present value base year:	2010
Current year:	2015
Proposal Opening Year:	2017
Average Household Size:	2.36
Project (Road or Rail):	Road

No. of households experiencing 'without scheme' & 'with scheme' noise levels (given in dB$_{Leq}$) in **Opening Year**

Without scheme \ With scheme	<45	45-47.9	48-50.9	51-53.9	54-56.9	57-59.9	60-62.9	63-65.9	66-68.9	69-71.9	72-74.9	75-77.9	78-80.9	81+
<45	1744	130	2	2	1	0	0	0	0	0	0	0	0	0
45-47.9	6	617	68	1	7	0	0	0	0	0	0	0	0	0
48-50.9	0	22	509	95	11	2	0	0	0	0	0	0	0	0
51-53.9	0	0	25	478	47	0	0	0	0	0	0	0	0	0
54-56.9	0	0	0	13	339	51	0	0	0	0	0	0	0	0
57-59.9	0	0	3	0	72	371	59	0	0	0	0	0	0	0
60-62.9	0	0	0	2	0	10	388	58	0	0	0	0	0	0
63-65.9	0	0	0	0	2	0	19	671	75	1	0	0	0	0
66-68.9	0	0	0	0	2	2	0	42	375	22	0	0	0	0
69-71.9	0	0	0	0	0	2	0	1	35	126	9	0	0	0
72-74.9	0	0	0	0	0	0	0	0	3	3	123	8	6	0
75-77.9	0	0	0	0	0	0	0	0	0	0	8	64	0	0
78-80.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81+	0	0	0	0	0	0	0	0	0	0	0	0	0	0

No. of households experiencing 'without scheme' & 'with scheme' noise levels (given in dB$_{Leq}$) in **15th Year After Opening**

Without scheme \ With scheme	<45	45-47.9	48-50.9	51-53.9	54-56.9	57-59.9	60-62.9	63-65.9	66-68.9	69-71.9	72-74.9	75-77.9	78-80.9	81+
<45	1219	20	0	0	0	0	0	0	0	0	0	0	0	0
45-47.9	104	892	38	1	0	0	0	0	0	0	0	0	0	0
48-50.9	0	54	576	42	0	0	0	0	0	0	0	0	0	0
51-53.9	0	1	36	486	56	0	0	0	0	0	0	0	0	0
54-56.9	0	0	6	19	395	69	1	0	0	0	0	0	0	0
57-59.9	0	0	0	3	18	347	33	0	0	0	0	0	0	0
60-62.9	0	0	0	0	0	22	393	48	0	0	0	0	0	0
63-65.9	0	0	0	0	0	0	65	630	90	1	0	0	0	0
66-68.9	0	0	0	3	0	0	0	38	455	31	1	0	0	0
69-71.9	0	0	0	1	0	0	0	6	61	185	35	2	0	0
72-74.9	0	0	0	0	1	2	0	0	0	6	115	15	3	0
75-77.9	0	0	0	0	0	1	3	0	1	0	15	38	3	0
78-80.9	0	0	0	0	0	0	2	0	3	0	0	0	40	0
81+	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Net Present Value of Noise of Proposal (60 Year Period)	-£253,629 *positive value reflects a **net benefit** (i.e. noise reduction)
Estimated Population Annoyed (Do-Minimum):	2283
Estimated Population Annoyed (Do-Something):	2276
Net Noise Annoyance Change in 15th Year After Opening (no. of people):	-7 *positive value reflects an **increase** in people annoyed by noise

Traffic Data Sources:

Parsons Brinckerhoff Highways Team Traffic Model (Ref:3512983U-PTR date: March 2014) sent to the Noise Team 04/03/14.

Population Data Sources:

N/A

Assumptions:

Average Household Size = 2.36. Routine resurfacing between opening year and 15th year not accounted for.

Assessment scores:

See above

Qualitative Comments:

A decrease in noise for properties near Barrs Court Road and a small section of the A49 has resulted in 7 fewer people being annoyed. However as there are large areas which have a minor increase in noise the net present value of Noise of Proposal shows a small disbenefit of £253,629.

Table 2

Distributional Impacts: Noise

	IoD Income Domain					
	Most deprived ←			→ Least deprived		
	0-20%	20-40%	40-60%	60-80%	80-100%	**Total**
Population in each group with increased noise [A]	0	1,757	2504	1,488	461	6,210
Population in each group with decreased noise [B]	0	103	229	99	0	431
Population in each group with no change in noise [C]	0	19	36	36	0	91
Net no of Winners / Losers in each group [D] = [B] – [A]	0	-1,654	-2,275	-1,389	-461	
Total number of Winners / Losers across all groups [E] = ∑[D]						-5,779
Net winners/losers in each area as percentage of total [F] = [D] / [E]	0%	29%	39%	24%	8%	100%
Share of total population in the impact area	0%	28%	41%	24%	7%	100%
Assessment	**Neutral**	✖✖✖	✖✖✖	✖✖	✖	