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HS2

High Speed Rail (Crewe – Manchester) Environmental Statement

Volume 5: Appendix SV-003-0MA02

Sound, noise and vibration

MA02: Wimboldsley to Lostock Gralam

Operational sound, noise and vibration report

M268

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Department for Transport

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1 Introduction

1.1.1 This report is an appendix to the sound, noise and vibration assessment relating to the Wimboldsley to Lostock Gralam area (MA02). This appendix presents detailed operational sound, noise and vibration levels.

1.1.2 This appendix should be read in conjunction with:

- Volume 2, Community Area reports;
- Volume 3, Route-wide effects;
- Volume 4, Off-route effects; and
- Volume 5, Appendices.

1.1.3 The sound, noise and vibration appendices comprise three sections. The first of these is an introduction to relevant policy and assessment methodology (see Volume 5, Appendix SV-001-00000); this relates to the sound, noise and vibration assessment for all areas.

1.1.4 In addition to this report for the Wimboldsley to Lostock Gralam area, a baseline and construction sound, noise and vibration report is set out (see Volume 5, Appendix SV-002-0MA02). This includes details of regional and local policy guidance and engagement.

1.1.5 The outcomes of the sound, noise and vibration assessments are summarised in the Volume 2, Community Area reports, including commentary regarding any likely significant effects identified in the assessment.

1.1.6 Maps referred to throughout the sound, noise and vibration appendices are contained in the Volume 2, MA02 Map Book and Volume 5, Sound, noise and vibration Map Book.

2 Scope, assumptions and limitations

2.1 Methodology

2.1.1 The methodology used for the assessment of airborne sound, ground-borne sound and vibration impacts and the determination of significant effects is defined in the Environmental Impact Assessment Scope and Methodology Report (SMR) (see Volume 5, Appendix CT-001-00001).

2.2 Assumptions

2.2.1 Route-wide assumptions are outlined in Volume 1, Section 8, and are further detailed in Volume 5, Appendix SV-001-00000. Local assumptions that apply to the assessment of operational sound, noise and vibration within this area are set out in Volume 2, Community Area report: Wimboldsley to Lostock Gralam (MA02), Section 13.

2.3 Limitations

2.3.1 The route-wide limitations and the approach adopted to ensure that they will not compromise the robust assessment of sound, noise and vibration are presented in Volume 5, Appendix SV-001-00000 and Volume 2, Community Area report: Wimboldsley to Lostock Gralam (MA02), Section 13.

3 Operational

3.1 Evaluation of impacts and effects

3.1.1 This appendix provides a quantitative assessment of operational noise and vibration impacts and effects and a qualitative assessment of likely significant effects, based on the impacts and effects identified and other local context information consistent with the scope and methodology defined for the Proposed Scheme.

3.1.2 Indirect effects arising from permanent changes in traffic patterns on the existing road and rail networks as a consequence of the Proposed Scheme are also reported in this appendix, where they would occur within the study area as defined in Volume 5, Appendix SV-001-00000.

3.1.3 Route-wide impacts, effects and significant effects associated with noise or vibration from the operation of the Proposed Scheme are reported in Volume 3, Route-wide effects.

3.1.4 Off-route effects of noise or vibration arising from the operation of the Proposed Scheme, including those likely to arise from permanent changes in traffic patterns on roads or railways outside of the study area for direct effects are reported in Volume 4, Off-route effects.

3.1.5 In undertaking the assessment of sound, noise and vibration, consistent with Environmental Impact Assessment (EIA) Directive[1] and planning practice and guidance on noise[2] a differentiation between impacts, effects, adverse effects and significant effects is made. Further information is provided in Volume 5, Appendix SV-001-00000.

3.1.6 The assessment of impacts has been undertaken at assessment locations that are representative of a number of dwellings or other sensitive receptors. The operational assessment locations employed in this assessment are presented on Volume 5, Sound, noise and vibration Map Book, Map Series SV-02.

3.1.7 Baseline sound level data have been collected at locations representative of the airborne sound-sensitive receptors and presented in Volume 5, Appendix SV-002-0MA02, Table 1.

[1] European Commission, *Environmental Impact Assessment – EIA.* Available online at: Environmental Impact Assessment - EIA - Environment - European Commission (europa.eu).

[2] Ministry of Housing Communities & Local Government (2019), *National Planning Policy Framework*. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/810197/NPPF_Feb_2019_revised.pdf.

3.2 Effects arising during operation

Introduction

3.2.1 The assessment is reported first for ground-borne sound and vibration and then for airborne sound. Under each of these headings, the results of the quantitative identification of impacts, effects and significant effects are presented. The significant effects and the evidence used to support these conclusions are presented in Volume 2, Community Area report: Wimboldsley to Lostock Gralam (MA02), Section 13.

Avoidance and mitigation measures

3.2.2 These are set out in Volume 2, Community Area report: Wimboldsley to Lostock Gralam (MA02), Section 13.

Quantitative identification of impacts and effects

Ground-borne sound and vibration

3.2.3 Assessment locations defined for the quantitative assessment of impacts are shown on Volume 5, Sound, noise and vibration Map Book, Map Series SV-02. SV-02 also displays ground-borne noise and vibration impacts and any resultant significant effects.

3.2.4 For each assessment location, the assessment results for residential and non-residential receptors are presented in Table 2. Explanation of the information in Table 2 is provided in Volume 5, Appendix SV-001-00000, with the following additional notes in Table 1.

Table 1: Explanatory notes for assessment results

Symbol	Explanation
V1-V4	Type of receptor (ground-borne vibration) – (V1) vibration sensitive research and manufacturing; hospitals with vibration sensitive equipment/operations; universities with vibration sensitive research equipment/operations, (V2) hotels, hospital wards and education dormitories, (V3) offices, schools and places of worship, (V4) workshops.
G1-G4	Type of receptor (ground-borne sound) – (G1) theatres/large auditoria and concert halls, (G2) sound recording/broadcast studios, (G3) places of meeting for religious worship/courts/cinemas/lecture theatres/museums/small auditoria or halls, (G4) offices/schools/colleges/hospitals/hotels/libraries.
NA	Type of effect - Generally no adverse effect.
A	Ground-borne sound or vibration levels from the Proposed Scheme exceed Lowest Observed Adverse Effect Level (LOAEL): the significance criteria set out in Volume 5: Appendix SV-001-00000, Annex A, Section 1.3 are considered when establishing significant effects.
S	Ground-borne sound or vibration levels from the Proposed Scheme exceed Significant Observed Adverse Effect Level (SOAEL).
VDV	Vibration Dose Value.

Symbol	Explanation
~	When considered under the significance criteria set out in Volume 5: Appendix SV-001-00000, Annex A, Section 1.3, these adverse effects are not considered to be significant on a community basis.
<>	The quantitative impact methodology has identified an impact at this receptor which, based upon further qualitative receptor information, (see assessment text) does not gives rise to a significant effect.
	Where the significant effect column is highlighted in pink, then a significant effect is identified at the referenced residential community area, or individual receptor.
	For residential receptors yellow denotes a low ground-borne noise impact or a minor ground-borne vibration impact.
	For residential receptors orange denotes a medium ground-borne noise impact or a moderate ground-borne vibration impact.
	For residential receptors red denotes a high ground-borne noise impact or a major ground-borne vibration impact.
	For residential receptors dark red denotes a very high ground-borne noise impact.

Table 2: Operational ground-borne sound and vibration levels, noise and vibration impacts and effects for residential and non-residential receptors

Assessment location		Impact criteria				Significance criteria								Significant effect
Reference	Area represented	Ground-borne sound level dB L_{pASmax}	VDV $m/s^{1.75}$ Daytime (07:00 - 23:00)	VDV $m/s^{1.75}$ Night-time (23:00 - 07:00)	% increase or decrease in VDV	Number of impacts represented	Type of effect	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	
610171	Manor Cottage, Wimboldsley	-	0.12	0.06	-	1	NA	R	T	-	-	-	-	
610206	Clive Green Lane, Stanthorne	-	0.00	0.00	-	2	NA	R	T	-	-	-	-	
610238	Heyescroft, Northwich Road, Stanthorne	-	0.10	0.06	-	1	NA	R	T	-	-	-	-	
610258	Whatcroft Hall Lane, Whatcroft	-	0.27	0.16	-	3	A	R	T	-	-	-	-	~
612555	Village Close, Lostock Green	-	0.12	0.07	-	12	NA	R	T	-	-	-	-	
612558	Birches Lane, Lostock Green	-	0.16	0.10	-	2	NA	R	T	-	-	-	-	
612865	Village Close, Lostock Green	-	0.12	0.07	-	9	NA	R	T	-	-	-	-	

Ground-borne sound and vibration impact summary

3.2.5 The operational ground-borne noise and vibration impacts identified in Table 2 are summarised in Table 3 and Table 4.

Table 3: Summary of operational ground-borne noise impacts

Property type	Number of ground-borne noise impacts			
	Low	Medium	High	Very high
Residential properties	0	0	0	0
Non-residential properties				0

Table 4: Summary of operational ground-borne vibration impacts

Property type	Number of ground-borne vibration impacts			
	Minor	Moderate	Major	Risk of building damage
Residential properties	0	0	0	0
Non-residential properties			0	0

Airborne sound: direct impacts and effects

3.2.6 The direct effects from the operation of the Proposed Scheme as well as any new, amended or altered roads or railway lines, which are identified as part of the scheme, are presented in Table 6 for residential receptors and Table 7 for non-residential receptors.

3.2.7 The assessment information, impact criteria and significance criteria for the assessment of the incorporated mitigation case at residential and non-residential receptors are presented in Table 6 and Table 7 respectively. The results should be considered in conjunction with the information contained in Volume 5, Sound, noise and vibration Map Book, Map Series SV-02.

3.2.8 Explanation of the information in Table 6 and Table 7 is provided in Volume 5, Appendix SV-001-00000, with the following additional notes in Table 5.

Table 5: Explanatory notes for operational assessment results

Symbol	Explanation
	Where the significant effect column is marked, then a significant effect is identified at the referenced group of dwellings, or individual residential or non-residential receptor.
	Yellow denotes a minor impact at a residential building. A minor impact is identified where the "Proposed Scheme only (year 15 traffic)" is greater than LOAEL, and either the change is ≥3dB – <5dB, or where a high baseline is identified during the corresponding period the change is ≥1dB – <3dB.
	Orange denotes a moderate impact at a residential building. A moderate impact is identified where the "Proposed Scheme only (year 15 traffic)" is greater than LOAEL, and either the change is ≥5dB – <10dB, or where a high baseline is identified during the corresponding period the change is of ≥3dB – <5dB.
	Red denotes a major impact at a residential building. A major impact is identified where the "Proposed Scheme only (year 15 traffic)" is greater than LOAEL, and either the change is ≥10dB, or where a high baseline is identified during the corresponding period the change is of ≥5dB.
	Green denotes a beneficial impact at a residential building. A beneficial impact is identified where the relevant baseline value is greater than LOAEL and the change is of >3dB.

Symbol	Explanation
*	Day - $L_{pAeq,07:00 - 23:00}$.
**	Night - $L_{pAeq,23:00 - 07:00}$.
***	Max - L_{pAFmax}. In the 'Proposed Scheme only' column where two train noise level values are presented. The first value represents the highest maximum noise level from HS2 services. The second value is provided where there are additional services (Northern Powerhouse Rail) operating on the HS2 Scheme and where maximum noise levels from additional services are anticipated to be higher than from HS2 services. In the 'Without Proposed Scheme' column, the value is the arithmetic average $L_{pAFmax,5min}$ as presented in the corresponding baseline technical appendix. For further information refer to Volume 5: Appendix SV-001-00000.
****	Where the Proposed Scheme modifies an existing source, i.e. road or railway realignments, the *Proposed Scheme only* and *(Opening year baseline + Year 15 traffic)* levels in the table include the sound from the modified source.
A	Sound levels from the Proposed Scheme exceed LOAEL: the significance criteria set out in Appendix SV-001-00000, Annex A, Section 1.3 are considered when establishing significant effects.
B	For non-residential receptors further detail about the type of effect is set out in the text of Appendix SV-001-00000.
CD	Committed Development. The 'Area represented' column contains information about the potential number of impacts included in the development.
A1 – A4	Type of receptor (airborne sound) - (A1) large and small auditoria; concert halls, sound recording and broadcast studios and theatres (A2) places of meeting for religious worship, courts, cinemas, lecture theatres, museums and small auditoria or halls, (A3) schools; colleges; hospitals, hotels and libraries (A4) offices and amenity spaces.
H	High existing ambient sound level. Defined as >65dB $L_{Aeq, day}$ and/or >55dB $L_{Aeq, night}$.
L	Low existing ambient sound level. Defined as <42dB $L_{Aeq, day}$ and/or <32dB $L_{Aeq, night}$.
LD	Landscape receptor.
NA	Sound levels from the Proposed Scheme do not exceed LOAEL, therefore generally no adverse effect.
NI	The receptor is predicted to qualify for mitigation, which shall be provided to the specification defined in the Noise Insulation (Railways and other Guided Rail Systems) Regulations 1996[3].
R	Residential receptor.
RM	Residential mooring.
S	Sound levels from the Proposed Scheme exceed SOAEL: noise insulation therefore provided.
T	Type of receptor: Typical.
+	The use and sensitivity of this non-residential receptor or land use is very sensitive to noise and has been included in the detailed assessment (presented in Volume 2) where there is a change less than 3dB. In each case specific information is presented in an associated footnote.
#	A change of 3dB or greater has been identified however, the assessment methodology only defines an impact where the absolute sound level from the Proposed Scheme is greater or equal to 50dB $L_{pAeq,07:00 - 23:00}$ during the daytime or 40dB $L_{pAeq,23:00 - 07:00}$ at night. At the receptor denoted the absolute level condition is not met and therefore no impact is identified.
~	When considered under the significance criteria set out in Annex A, Section 1.3 Volume 5: Appendix SV-001-00000, these adverse effects are not considered to be significant on a community basis.

[3] *The Noise Insulation (Railway and Other Guided Transport Systems) Regulations 1996*. Her Majesty's Stationery Office, London.

Symbol	Explanation
$	The impact methodology for non-residential receptors includes a screening criterion for A1 building use of 50dB $L_{pAeq,07:00-23:00}$ and 50dB $L_{pAeq,23:00-07:00}$, A2 building use of 50dB $L_{pAeq,07:00-23:00}$, A3 building use of 50dB $L_{pAeq,07:00-23:00}$, and 45dB $L_{pAeq,23:00-07:00}$ and for A4 building use 55dB $L_{pAeq,07:00-23:00}$. At the receptor denoted, the screening criteria is met but a change of 3dB or greater has not been identified and therefore no impact is identified. Further information is provided in Volume 5: Appendix SV-001-00000.
<>	The quantitative impact methodology has identified an impact at this receptor which, based upon further qualitative receptor information, (see assessment text) does not gives rise to a significant effect.

Table 6: Operational airborne sound, noise impacts and significant effects: residential receptors

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
610165	Verdin Arms, Nantwich Road, Minshull Vernon	63	57	72/--	73	67	72	64	57	-10	-10	S	1	R	T	H	-	-	NI	
610168	Nantwich Road, Minshull Vernon	47	40	60/--	43	38	<40	47	41	4	3	A	2	R	T	-	-	-	-	~
610169	Wimboldsley Hall, Wimboldsley	56	50	72/--	51	48	50	56	50	5	2	A	1	R	T	-	-	-	-	~
610171	Manor Cottage, Wimboldsley	69	61	87/--	63	57	61	69	61	6	4	S	1	R	T	H	-	-	NI	~
610173	Rose Cottage, Wimboldsley	70	64	73/--	70	63	68	70	64	<1	<1	S	1	R	T	H	-	-	NI	
610174	New Farm, Occleston	45	38	60/--	59	52	57	59	52	0	0	A	1	R	T	-	-	-	-	
610176	Holly Croft, Occleston	44	37	59/--	58	51	56	58	51	0	0	A	1	R	T	-	-	-	-	
610177	Smithy Farm, Occleston	44	38	59/--	62	55	60	62	55	0	0	A	1	R	T	H	-	-	-	

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
610178	Hopley House, Nantwich Road, Wimboldsley	50	43	66/--	64	58	63	64	58	0	0	A	1	R	T	H	-	-	-	
610180	Nantwich Road, Wimboldsley	52	45	67/--	52	46	50	55	48	3	3	A	8	R	T	-	-	-	-	~
610181	Occleston Green Farm, Occleston	45	38	58/--	52	45	54	53	46	1	1	A	1	R	T	-	-	-	-	
610182	Wimboldsley Grange, Nantwich Road, Wimboldsley	53	48	68/--	48	46	49	53	48	5	2	A	1	R	T	-	-	-	-	~
610183	Lea Drive, Wimboldsley	50	43	65/--	60	54	59	60	54	0	0	A	12	R	T	-	-	-	-	
610184	Saunders Field, Wimboldsley	44	37	57/--	52	45	54	52	46	1	1	NA	1	R	T	-	-	-	-	
610186	Nantwich Road, Wimboldsley	52	45	68/--	59	52	57	59	53	1	1	A	6	R	T	-	-	-	-	
610188	Newfield Farm, Occleston	45	38	59/--	44	38	43	48	41	3	3	A	1	R	T	-	-	-	-	#

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
610189	Nantwich Road, Wimboldsley	54	47	70/--	43	40	41	54	47	11	8	A	4	R	T	-	-	-	-	~
610191	Leahead Farm, Nantwich Road, Wimboldsley	58	50	73/--	50	44	49	58	51	8	7	A	1	R	T	-	-	-	-	~
610192	Lea House Farm, Nantwich Road, Wimboldsley	56	49	70/--	63	57	62	64	57	0	0	A	1	R	T	H	-	-	-	
610193	Nantwich Road, Stanthorne	58	51	74/--	55	49	54	59	52	4	3	A	2	R	T	-	-	-	NI[4]	~
610194	Clive Green Lane, Stanthorne	58	51	74/--	45	39	43	58	51	13	11	A	11	R	T	-	-	-	-	MA02-O-C1

[4] This receptor is predicted to qualify for noise insulation as the predicted night-time noise level due to road traffic noise from the Proposed Scheme exceeds the World Health Organization's Interim Target of 55dB on the other side of the building to the assessment location. However, the noise levels at the façade with the greatest change in noise level are presented in the table. For further information refer to Volume 2, Community Area Report: Wimboldsley to Lostock Gralam (MA02), Section 13.

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
610196	Clive Back Lane, Winsford	47	40	60/--	53	51	54	54	52	1	0	A	2	R	T	-	-	-	-	
610197	Norcroft Farm, Nantwich Road, Stanthorne	49	42	64/--	51	46	52	53	47	2	1	A	1	R	T	-	-	-	-	
610198	Clive Back Lane, Winsford	50	44	61/--	49	44	47	52	46	3	2	A	1	R	T	-	-	-	-	~
610199	Clive Green Lane, Winsford	64	58	63/--	66	60	65	64	58	-2	-2	S	2	R	T	H	-	-	NI	
610200	Willow Court, Clive Green Lane, Winsford	57	50	63/--	55	48	53	57	50	2	2	A	1	R	T	-	-	-	-	
610201	Pear Tree Farm, Clive Back Lane, Winsford	48	41	60/--	49	46	48	51	47	2	1	A	1	R	T	-	-	-	-	
610202	2 Wharf Cottage, Clive Green Lane, Stanthorne	55	48	69/--	62	56	61	55	48	-7	-8	A	1	R	T	H	-	-	-	

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
610204	Chapel End Cottage, Clive Green Lane, Winsford	57	51	61/--	68	61	66	69	62	1	1	A	1	R	T	H	-	-	-	~
610205	Oak Lea House, Nantwich Road, Stanthorne	60	53	67/--	60	54	59	60	54	0	0	A	1	R	T	-	-	-	-	
610206	Clive Green Lane, Stanthorne	63	55	81/--	45	39	44	63	56	18	16	S	2	R	T	-	-	-	NI	MA02-O-C1
610209	Coalpit Lane, Stanthorne	55	47	71/--	44	37	42	55	47	11	10	A	3	R	T	-	-	-	-	~
610216	Middlewich Road, Winsford	43	36	57/--	60	54	59	60	54	0	0	NA	17	R	T	-	-	-	-	
610217	Seaton Street, Winsford and committed development (Map book ref: MA02/335)	47	40	63/--	47	41	45	50	43	3	2	A	17	CD -R	T	-	-	-	-	

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
610219	Middlewich Road, Winsford	48	40	63/--	54	48	53	55	48	1	0	A	37	R	T	-	-	-	-	
610220	Coalpit Lane, Stanthorne	51	43	69/--	42	35	40	51	44	10	8	A	2	R	T	-	-	-	-	~
610221	Coalpit Lane, Stanthorne	42	35	57/--	42	36	41	45	38	3	2	NA	2	R	T	-	-	-	-	#
610222	Middlewich Road, Winsford	51	43	66/--	55	48	53	56	49	1	1	A	4	R	T	-	-	-	-	
610224	Earl's Cottage, Birch Lane, Stanthorne	49	41	64/--	44	37	42	49	42	6	5	A	1	R	T	-	-	-	-	MA02-O-C3
610225	Mill Farm, Birch Lane, Stanthorne	47	39	61/--	40	34	<40	47	39	7	6	A	1	R	T	L	-	-	-	#
610226	Birch Lane, Stanthorne	50	42	63/--	43	37	42	50	42	7	6	A	6	R	T	-	-	-	-	MA02-O-C3
610228	Stanthorne Hall, Middlewich Road, Stanthorne	55	47	74/--	47	41	46	55	48	8	7	A	1	R	T	-	-	-	-	~

Assessment location		Impact criteria										Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
610229	Goodwood Rise, Middlewich	42	35	55/--	52	46	51	53	46	0	0	NA	6	R	T	-	-	-	-	
610230	Birch Lane, Stanthorne	52	45	66/--	47	41	46	53	45	5	4	A	8	R	T	-	-	-	-	MA02-O-C3
610231	Stanthorne Lodge, Middlewich Road, Stanthorne	56	49	72/--	59	52	57	56	49	-2	-3	A	1	R	T	-	-	-	-	
610232	Middlewich Road, Stanthorne	58	51	61/--	61	54	59	61	54	0	0	A	2	R	T	-	-	-	-	
610233	Sundown, Birch Lane, Stanthorne	58	52	69/--	61	55	60	58	52	-3	-3	A	7	R	T	H	-	-	-	
610234	Bostock House Farm, Northwich Road, Stanthorne	56	50	61/--	69	63	68	69	63	0	0	A	1	R	T	H	-	-	-	
610238	Heyescroft, Northwich Road, Stanthorne	67	59	84/--	64	58	63	67	59	3	1	S	1	R	T	H	-	-	NI	~

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
610239	Bank Farm, Northwich Road, Stanthorne	61	54	74/--	61	55	60	61	54	0	-1	A	1	R	T	H	-	-	-	
610240	Bostock Road, Bostock	52	45	67/--	42	36	41	52	45	10	9	A	1	R	T	-	-	-	-	~
610241	South Lodge, Bostock Road, Bostock	48	41	62/--	63	56	61	63	57	0	0	A	1	R	T	H	-	-	-	
610242	Croxton Lane, Byley	44	38	60/--	67	61	66	67	61	0	0	A	2	R	T	H	-	-	-	
610243	Bostock Road, Bostock	44	38	58/--	58	51	56	58	52	0	0	A	3	R	T	-	-	-	-	
610246	Dairyhouse Farm, Croxton Lane, Byley	46	40	62/--	51	38	48	52	42	1	4	A	1	R	T	-	-	-	-	~
610248	The Courtyard, Bostock Road, Bostock	47	42	61/--	49	44	49	51	46	2	2	A	52	R	T	-	-	-	-	

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
610249	Bostock Road, Bostock	44	38	58/--	49	44	49	50	45	1	1	A	15	R	T	-	-	-	-	
610250	Middle Lodge, Bostock Road, Bostock	42	36	56/--	57	50	55	57	51	1	1	NA	1	R	T	-	-	-	-	
610251	North Lodge, Bostock Road, Bostock	45	39	61/--	55	49	54	56	49	1	1	A	1	R	T	-	-	-	-	
610255	Whatcroft Hall Lane, Rudheath	49	44	65/--	<40	30	43	50	44	>10	14	A	1	R	T	L	-	-	-	~
610256	Whatcroft Hall Lane, Whatcroft	54	48	69/--	45	40	46	55	49	10	9	A	9	R	T	-	-	-	-	MA02-O-C4
610257	Halfway House, King Street, Byley	45	39	59/--	72	66	71	72	66	0	0	A	1	R	T	H	-	-	-	
610258	Whatcroft Hall Lane, Whatcroft	67	61	89/--	45	40	46	67	61	22	21	S	3	R	T	-	-	-	NI	MA02-O-C4
610259	Manor Lane, Whatcroft	52	47	69/--	45	40	46	53	47	8	8	A	2	R	T	-	-	-	-	MA02-O-C4

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
610260	Drakelow Farm, Whatcroft Hall Lane, Rudheath	45	39	59/--	49	43	48	51	44	1	2	A	1	R	T	-	-	-	-	
610261	Whatcroft Hall Lane, Rudheath	52	46	67/--	50	44	49	54	48	4	5	A	2	R	T	-	-	-	-	~
610262	Brook Farm Cottage, Old Lane, Whatcroft	52	46	68/--	51	45	54	54	49	4	3	A	1	R	T	-	-	-	-	MA02-O-C4
610263	Old Lane, Whatcroft	59	53	75/--	51	45	54	59	54	9	8	A	2	R	T	-	-	-	-	MA02-O-C4
610265	Manor Farm, Old Lane, Whatcroft	52	47	69/--	51	45	54	55	49	4	4	A	1	R	T	-	-	-	-	MA02-O-C4
610266	Shipbrook Hill Farm, Davenham Road, Whatcroft	46	40	60/--	48	41	46	50	44	2	2	A	1	R	T	-	-	-	-	
610267	Shipbrook Hill Farm, Davenham Road, Whatcroft	45	40	61/--	65	59	64	65	59	0	0	A	1	R	T	H	-	-	-	

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
610269	Yew Tree Farm, Davenham Road, Whatford	50	44	65/--	61	54	59	61	54	0	0	A	1	R	T	-	-	-	-	
610402	Beckett Avenue, Winsford	47	39	63/--	43	37	42	48	41	5	4	A	21	R	T	-	-	-	-	#
610403	Middlewich Road, Winsford	49	41	65/--	49	43	47	52	45	3	2	A	11	R	T	-	-	-	-	
610408	Birch Lane, Stanthorne	54	47	67/--	51	45	50	54	47	3	2	A	7	R	T	-	-	-	-	MA02-O-C3
610409	Steam House, Middlewich Road	63	56	67/--	61	54	59	63	56	2	2	S	1	R	T	-	-	-	NI	
610722	Middlewich Road, Winsford (Clive)	50	42	65/--	42	36	40	50	43	8	7	A	8	R	T	-	-	-	-	MA02-O-C2
610732	Coalpit Lane, Stanthorne	42	34	57/--	42	35	40	44	37	3	2	NA	1	R	T	-	-	-	-	#

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
610733	Northwich Road, Bostock and committed development (Map book ref: MA02/062)	56	49	73/--	54	48	53	58	51	4	3	A	7	CD -R	T	-	-	-	-	~
610736	Whatcroft Hall Lane, Whatcroft	57	52	76/--	<40	31	<40	57	52	>18	21	A	1	CD -R	T	L	-	-	-	MA02-O-C4
610746	Wimboldsley, Middlewich	65	59	72/--	68	62	67	69	63	<1	<1	S	3	R	T	H	-	-	NI	
610875	Middlewich Road, Winsford and committed development (Map book ref: MA02/217)	44	36	58/--	66	59	64	65	59	0	0	A	5	CD -R	T	H	-	-	-	

Assessment location		Impact criteria										Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
610876	Middlewich Road, Winsford and committed development (Map book ref: MA02/217)	45	37	59/--	52	46	51	53	46	1	0	A	16	CD-R	T	-	-	-	-	
610880	Manor Farm, Old Lane, Whatcroft and committed development (Map book ref: MA02/348)	53	48	70/--	51	45	54	55	50	5	4	A	6	CD-R	T	-	-	-	-	MA02-O-C4
612500	King Street, Lach Dennis	53	47	68/--	69	63	68	68	62	-1	-1	A	7	R	T	H	-	-	-	
612503	Billinge Green Barn, Davenham Road, Billenge Green	52	46	67/--	56	49	54	57	50	1	1	A	1	R	T	-	-	-	-	

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
612504	Little Grebe Cottage, Davenham Road, Billenge Green	57	51	74/--	52	45	50	58	52	6	7	A	1	R	T	-	-	-	-	~
612505	Davenham Road, Billenge Green	57	51	75/--	52	46	53	58	52	6	6	A	10	R	T	-	-	-	-	MA02-O-C5
612506	Park Farm, Whatcroft	46	40	63/--	46	36	42	49	41	3	5	A	1	R	T	-	-	-	-	~
612510	Ashbrook House, Penny's Lane, Lach Dennis	48	42	63/--	55	48	53	55	49	1	1	A	1	R	T	-	-	-	-	
612513	School Road, Rudheath	42	36	58/--	50	47	53	50	47	0	0	A	3	R	T	-	-	-	-	
612516	Penny's Lane, Lach Dennis	63	55	71/--	62	56	61	63	55	1	-1	S	4	R	T	H	-	-	NI	
612519	Melvin Holme Farm, Penny's Lane, Lach Dennis	62	56	77/--	51	45	50	62	56	11	11	S	1	R	T	-	-	-	NI	~

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
612523	Tudor Close, Rudheath	49	42	60/--	64	58	63	63	57	-1	-1	A	12	R	T	H	-	-	-	
612524	School Road, Rudheath	44	37	57/--	61	55	60	61	54	0	0	NA	4	R	T	H	-	-	-	
612526	Tudor Close, Rudheath	45	39	58/--	53	47	52	53	46	0	0	A	24	R	T	-	-	-	-	
612527	King Street, Rudheath	47	40	60/--	61	55	60	61	54	-1	-1	A	12	R	T	H	-	-	-	
612528	Mulberry Close, Rudheath	63	54	66/--	64	58	63	63	54	-1	-4	A	7	R	T	H	-	-	-	
612529	Cookes Lane, Rudheath	55	46	64/--	55	49	54	55	47	0	-2	A	13	R	T	-	-	-	-	
612530	Central Road, Rudheath	41	34	53/--	50	44	49	50	43	0	0	NA	34	R	T	-	-	-	-	
612531	Penny's Lane, Rudheath	53	45	63/--	54	47	52	53	46	0	-2	A	12	R	T	-	-	-	-	
612532	Waterside View, Rudheath	43	36	56/--	51	47	54	51	47	0	0	NA	40	R	T	-	-	-	-	

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
612533	King Street, Rudheath	45	39	58/--	67	60	65	66	60	0	0	A	25	R	T	H	-	-	-	
612534	East Avenue, Rudheath	40	33	52/--	55	49	54	54	48	-1	-1	NA	100	R	T	-	-	-	-	
612535	Wyche Close, Rudheath	44	37	57/--	51	47	54	51	47	0	0	NA	13	R	T	-	-	-	-	
612537	Waterside View, Rudheath	44	37	57/--	51	47	54	51	47	0	0	NA	29	R	T	-	-	-	-	
612538	Penny's Lane, Rudheath	47	40	60/--	47	41	46	49	42	1	1	A	22	R	T	-	-	-	-	
612539	Lavender Drive, Rudheath	42	36	55/--	51	47	54	51	47	0	0	NA	54	R	T	-	-	-	-	
612540	East Avenue, Rudheath	42	35	55/--	47	41	46	47	41	0	0	NA	35	R	T	-	-	-	-	
612541	Hangmans Lane, Lostock Green	41	35	56/--	45	39	44	46	39	0	0	NA	2	R	T	-	-	-	-	
612542	East Avenue, Rudheath	41	34	54/--	58	52	57	58	51	-1	-1	NA	114	R	T	-	-	-	-	

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
612543	Middlewich Road, Rudheath	44	37	58/--	63	57	62	63	56	0	0	A	14	R	T	H	-	-	-	
612546	St Andrews Close, Rudheath	43	36	57/--	55	48	53	54	48	0	0	NA	105	R	T	-	-	-	-	
612548	Birches Lane, Lostock Green	46	40	63/--	46	40	45	48	42	2	2	A	15	R	T	-	-	-	-	
612549	Birch Grove, Lostock Green	48	42	66/--	49	43	48	49	43	-1	0	A	16	R	T	-	-	-	-	
612551	Birches Lane, Lostock Green	49	43	65/--	52	45	50	51	45	0	0	A	10	R	T	-	-	-	-	
612552	Cottage Close, Rudheath	44	37	57/--	60	54	59	60	53	0	0	NA	47	R	T	-	-	-	-	
612554	Cinder Lane, Lostock Green	53	47	67/--	58	52	57	53	47	-5	-5	A	17	R	T	-	-	-	-	MA02-O-C6
612555	Village Close, Lostock Green	57	51	72/--	72	65	70	57	51	-14	-14	A	12	R	T	H	-	-	-	MA02-O-C6
612556	Greenside Drive, Lostock Green	51	45	65/--	50	44	49	51	45	1	2	A	17	R	T	-	-	-	-	

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
612557	Birches Lane, Lostock Green	62	53	71/--	65	59	64	62	54	-3	-5	A	1	R	T	H	-	-	-	MA02-O-C6
612558	Birches Lane, Lostock Green	61	54	75/--	74	67	72	61	54	-12	-13	A	2	R	T	H	-	-	-	MA02-O-C6
612561	Birches Lane, Lostock Green	63	56	78/--	62	56	61	66	59	3	3	S	1	R	T	H	-	-	NI	~
612562	Birches Lane, Lostock Green	59	52	74/--	63	56	61	64	58	2	2	A	2	R	T	H	-	-	-	~
612563	Moss Lane, Lostock Green	47	41	62/--	54	47	48	55	48	1	1	A	2	R	T	-	-	-	-	
612565	Birches Lane, Lostock Green	56	50	72/--	50	43	48	57	50	7	7	A	1	R	T	-	-	-	-	~
612566	Fields Farm, Lostock Gralam	59	53	77/--	52	46	51	59	53	7	8	A	1	R	T	-	-	-	-	~
612567	Hame Farm, Moss Lane, Lostock Gralam	49	43	62/--	54	47	48	55	48	1	1	A	1	R	T	-	-	-	-	

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
612569	Paulden Road, Lostock Gralam	53	45	68/--	55	49	57	56	50	1	1	A	21	R	T	-	-	-	-	
612570	Harris Road, Lostock Gralam	62	54	68/--	66	60	64	65	57	-2	-3	A	3	R	T	H	-	-	-	
612573	Harris Road, Lostock Gralam	58	49	67/--	58	52	56	58	50	0	-2	A	15	R	T	-	-	-	-	
612574	Arthur Street, Lostock Gralam	47	41	65/--	58	52	57	58	52	0	0	A	68	R	T	-	-	-	-	
612575	Pack Horse Close, Lostock Gralam	54	46	67/--	58	52	57	58	51	0	-1	A	24	R	T	-	-	-	-	
612576	Bateman Road, Lostock Gralam	50	43	65/--	51	44	49	52	45	1	1	A	6	R	T	-	-	-	-	
612577	Manchester Road, Lostock Gralam	45	39	62/--	49	43	47	50	44	1	1	A	25	R	T	-	-	-	-	
612580	Manchester Road, Lostock Gralam	46	39	62/--	48	42	46	49	43	1	1	A	3	R	T	-	-	-	-	

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
612581	Stubbs Lane, Lostock Gralam	48	41	62/--	58	52	57	59	52	0	0	A	9	R	T	-	-	-	-	
612582	Crossways Care Home, Station Road, Lostock Gralam	44	37	57/--	53	47	52	53	47	0	0	NA	1	R	T	-	-	-	-	
612583	Silverlea Road, Lostock Gralam	47	41	63/--	50	43	48	51	45	1	1	A	42	R	T	-	-	-	-	
612584	Broseley Way, Lostock Gralam	53	46	66/--	64	57	62	63	57	-1	-1	A	28	R	T	H	-	-	-	
612585	Lodge Lane, Lostock Gralam	46	39	61/--	56	49	54	56	50	0	0	A	14	R	T	-	-	-	-	
612586	Wells Avenue, Lostock Gralam	50	43	63/--	53	47	52	54	47	1	1	A	19	R	T	-	-	-	-	
612588	Lodge Lane, Lostock Gralam	46	39	60/--	57	51	56	58	51	1	1	A	83	R	T	-	-	-	-	

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
612589	Acorn Hollow and Avandale Lodge Care Home, Manchester Road, Lostock Gralam	44	37	58/--	60	53	58	59	53	0	0	A	1	R	T	-	-	-	-	
612593	Holford Avenue, Lostock Gralam	45	38	59/--	53	50	56	53	50	0	0	A	69	R	T	-	-	-	-	
612594	Highfield Avenue, Lostock Gralam	45	39	60/--	51	45	50	51	45	0	0	A	61	R	T	-	-	-	-	
612595	Lostock Lodge Care Home, Cheshire Business Park Roundabout	53	47	70/--	68	61	66	67	61	-1	-1	A	1	R	T	H	-	-	-	
612596	Townshend Road, Lostock Gralam	43	37	57/--	60	53	58	59	52	-1	-1	NA	166	R	T	-	-	-	-	
612597	Wilson Crescent, Lostock Gralam	49	43	66/--	62	56	61	62	56	0	0	A	65	R	T	H	-	-	-	

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
612598	Townshend Road, Lostock Gralam	45	39	61/--	60	53	58	59	52	0	0	A	88	R	T	-	-	-	-	
612599	Ascol Drive, Plumley	57	50	75/--	57	50	55	59	52	2	1	A	11	R	T	-	-	-	-	
612601	Manchester Road, Plumley	65	56	75/--	72	65	70	71	64	0	-1	S	6	R	T	H	-	-	NI	
612603	Plumley Moor Road, Plumley	45	40	61/--	51	45	50	52	46	1	1	A	3	R	T	-	-	-	-	
612604	Chester Road, Plumley	53	47	68/--	77	72	77	77	72	0	0	A	2	R	T	H	-	-	-	
612606	Plumley Moor Road, Plumley	50	44	65/--	56	51	56	57	52	1	1	A	2	R	T	-	-	-	-	
612607	Linnards Lane, Wincham	50	44	65/--	46	40	45	51	45	6	6	A	4	R	T	-	-	-	-	~
612863	Sovereign Close, Rudheath	49	42	62/--	48	41	46	50	43	2	1	A	5	R	T	-	-	-	-	
612864	Sovereign Close, Rudheath	48	41	61/--	48	42	47	49	42	1	1	A	6	R	T	-	-	-	-	

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
612865	Village Close, Lostock Green	57	51	71/--	72	65	70	57	51	-15	-15	A	9	R	T	H	-	-	-	MA02-O-C6
612867	Greenside Drive, Lostock Green	54	47	68/--	57	51	56	55	48	-2	-2	A	18	R	T	-	-	-	-	
612868	Salary Row, Lostock Gralam	54	47	68/--	64	58	63	63	57	-1	-1	A	19	R	T	H	-	-	-	
612869	Silverlea Road, Lostock Gralam	50	43	63/--	54	48	53	55	48	0	0	A	20	R	T	-	-	-	-	
612870	Silverlea Road, Lostock Gralam	50	43	63/--	52	46	51	53	46	1	1	A	27	R	T	-	-	-	-	
612871	Harris Road, Lostock Gralam	49	42	65/--	48	41	46	50	43	2	2	A	24	R	T	-	-	-	-	
612872	Sweet Water Court, Lostock Gralam	46	39	61/--	45	38	43	47	41	3	3	A	32	R	T	-	-	-	-	#
612873	Thornley Green, Lostock Gralam	48	42	63/--	50	44	49	51	45	1	2	A	32	R	T	-	-	-	-	

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
612874	Ascol Drive, Plumley	60	52	75/--	62	56	61	62	55	<1	0	A	11	R	T	H	-	-	-	
612875	Foxglove Way, Rudheath	62	53	64/--	63	57	62	62	53	-1	-3	A	7	R	T	H	-	-	-	
612876	Foxglove Way, Rudheath	56	47	62/--	64	57	62	62	55	-1	-2	A	4	R	T	H	-	-	-	
612877	Foxglove Way, Rudheath	48	41	61/--	55	48	53	54	47	-1	-1	A	21	R	T	-	-	-	-	
612879	Harris Road, Lostick Gralam	57	48	68/--	62	56	61	62	55	0	0	A	15	R	T	H	-	-	-	
612882	Pavillion Way, Lostock Gralam	49	43	63/--	53	46	51	54	47	1	1	A	19	R	T	-	-	-	-	
612884	School Road, Rudheath	48	42	64/--	50	47	53	52	48	2	1	A	2	R	T	-	-	-	-	
612886	St Thomas House, King Street, Rudheath	46	39	59/--	67	61	66	66	60	0	0	A	1	R	T	H	-	-	-	

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
613053	Sovereign Close, Rudheath	48	41	61/--	47	41	46	49	42	2	1	A	14	R	T	-	-	-	-	
613054	Foxglove Way, Rudheath	53	45	62/--	62	55	60	61	54	-1	-1	A	17	R	T	H	-	-	-	
613055	Sovereign Close, Rudheath	48	41	60/--	47	41	46	49	42	2	1	A	7	R	T	-	-	-	-	
613056	Foxglove Way, Rudheath	53	45	63/--	53	47	52	53	46	0	-1	A	10	R	T	-	-	-	-	
613057	Mulberry Close, Rudheath	57	48	65/--	57	51	56	57	48	0	-2	A	5	R	T	-	-	-	-	
613058	Birches Lane, Lostock Green	53	47	70/--	65	59	64	65	59	0	0	A	2	R	T	H	-	-	-	
613060	Harris Road, Lostock Gralam	48	41	63/--	46	40	46	49	42	3	2	A	27	R	T	-	-	-	-	
613062	Penny's Lane, Northwich	53	47	68/--	65	58	63	65	58	0	0	A	3	R	T	H	-	-	-	
613067	Birches Lane, Lostock Green	56	49	68/--	64	57	62	63	57	0	-1	A	8	R	T	H	-	-	-	

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
613069	Harris Road, Lostock Gralam	51	44	66/--	50	44	49	52	45	2	1	A	21	R	T	-	-	-	-	
613073	Chester Road, Plumley	55	49	71/--	71	66	71	71	66	0	0	A	1	R	T	H	-	-	-	
613212	Griffiths Road, Lostock Gralam and committed development (Map book ref: MA02/262)	41	34	54/--	68	62	67	68	61	0	0	NA	2	CD -R	T	H	-	-	-	
613213	411 Manchester Road, Lostock Gralam and committed development (Map book ref: MA02/277)	42	35	55/--	63	57	62	63	56	0	0	NA	16	CD -R	T	H	-	-	-	

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
613215	162 Middlewich Road Care Home, Rudheath and committed development (Map book ref: MA02/342)	43	36	57/--	63	57	62	63	56	-1	-1	NA	1	CD -R	T	H	-	-	-	

Table 7: Operational airborne sound, noise impacts and significant effects: non-residential receptors

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
610185	Wimboldsley Community Primary School, Nantwich Road, Wimboldsley	51	43	66/--	73	67	72	73	67	0	0	B	1	A3	T	H	-	-	-	$
610207	Unit I - M (Lower Sensitivity Offices), Sheriff House, Nantwich Road, Stanthorne, Middlewich	50	43	63/--	47	41	46	50	43	3	3	B	1	A4	T	-	-	-	-	
610387	Environment Agency (Offices), Road Three, Winsford	44	36	58/--	46	40	45	48	41	2	1	B	1	A4	T	-	-	-	-	
610388	The Cottage Cattery (Lower Sensitivity Offices), Occleston	44	37	58/--	48	41	46	49	42	1	1	B	1	A4	T	-	-	-	-	

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
610398	Oakwood Marina (Lower Sensitivity Offices), Davenham Road, Rudheath	59	54	75/--	47	42	48	60	54	13	12	B	1	A4	T	-	-	-	-	MA02-O-N1
610399	Firthfield Kennels (Lower Sensitivity Offices), Whatcroft Hall Lane, Rudheath	51	45	66/--	48	41	46	53	47	5	5	B	1	A4	T	-	-	-	-	
610723	KC Auto (Offices), Road Three, Winsford	45	37	60/--	44	38	43	47	40	3	2	B	1	A4	T	-	-	-	-	
610724	Kinderton Accident Management (Offices), Road Three, Winsford	44	36	59/--	43	37	41	46	39	3	3	B	1	A4	T	-	-	-	-	
610725	Car Transplant (Offices), Road Three, Winsford	43	35	59/--	<40	33	<40	44	37	>5	4	B	1	A4	T	L	-	-	-	

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
610726	Go Furniture (Offices), Road Three, Winsford	43	35	57/--	42	36	41	45	38	3	2	B	1	A4	T	-	-	-	-	
610727	Bam Nuttall Signs (Offices), Road Three, Winsford	45	38	60/--	42	36	40	47	39	5	4	B	1	A4	T	-	-	-	-	
610877	Wimboldsley Community Primary School, Nantwich Road, Wimboldsley and committed development (Map Book ref: MA02/328)	47	39	61/--	54	48	53	55	48	1	1	B	1	A3	T	-	-	-	-	
612507	Gadbrook Park (Offices), Gadbrook Business Centre, Rudheath	48	42	64/--	50	47	53	52	48	2	1	B	1	A4	T	-	-	-	-	

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
612508	Langdale House and Century House (Offices), Gadbrook Business Centre, Rudheath	48	43	65/--	50	47	53	52	48	2	1	B	1	A4	T	-	-	-	-	
612509	Orchard Marina (Office), School Road, Rudheath	47	42	64/--	50	47	53	52	48	2	1	B	1	A4	T	-	-	-	-	
612511	Sherwood House (Offices), Gadbrook Business Centre, Rudheath	42	36	59/--	50	47	53	50	47	0	0	B	1	A4	T	-	-	-	-	
612512	Chrysalis Day Nursery, Gadbrook Business Centre, Rudheath	44	38	63/--	50	47	53	51	47	1	0	B	1	A3	T	-	-	-	-	

Assessment location		Impact criteria										Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
612514	Unit 12-13 Brunel Court (Offices), Rudheath	44	38	61/--	50	47	53	51	47	1	0	B	1	A4	T	-	-	-	-	
612515	1 Gadbrook Park (Offices), Rudheath	40	35	58/--	50	47	53	50	47	0	0	B	1	A4	T	-	-	-	-	
612522	Rudheath Youth Centre, Gadbrook Road, Rudheath	40	33	54/--	64	57	62	63	57	0	0	B	1	A3	T	H	-	-	-	
612525	Rudheath Primary Academy and Little Owls Pre-School Nursery, Gadbrook Road, Rudheath	41	34	54/--	58	52	57	57	51	-1	-1	B	1	A3	T	-	-	-	-	
612553	Lostock Green Methodist Church, Birches Lane, Lostock Green	49	43	64/--	60	53	58	60	54	0	0	B	1	A2	T	-	-	-	-	

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
612564	Ineos Chlor (Office), Griffiths Road, Lostock Gralam	45	38	57/--	60	54	59	60	54	0	0	B	1	A4	T	-	-	-	-	
612568	North West Trucks (Offices), Griffiths Road, Lostock Gralam	46	40	62/--	54	48	52	55	48	0	0	B	1	A4	T	-	-	-	-	
612571	Parish of Lostock Gralam Church Hall, Station Road, Lostock Gralam	46	39	62/--	48	41	47	49	43	1	1	B	1	A2	T	-	-	-	-	
612572	Lostock Tiny Tots Pre-School, Station Road, Lostock Gralam	48	42	65/--	60	53	58	60	54	0	0	B	1	A3	T	-	-	-	-	
612578	St John The Evangelist Church, School Lane, Lostock Gralam	46	39	61/--	52	46	50	53	46	1	1	B	1	A2	T	-	-	-	-	

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
612579	Lostock Gralam Church of England Primary School, School Lane, Lostock Gralam	47	40	63/--	47	41	46	49	42	2	2	B	1	A3	T	-	-	-	-	
612587	Slow & Easy Hotel, Manchester Road, Lostock Gralam	44	37	59/--	62	56	61	62	55	0	0	B	1	A3	T	H	-	-	-	
612590	Children's Centre, School Lane, Lostock Gralam	45	38	58/--	52	46	51	53	46	0	0	B	1	A3	T	-	-	-	-	
612591	Travelodge (Hotel), Wells Avenue, Lostock Gralam	52	46	67/--	67	60	65	66	60	-1	-1	B	1	A3	T	H	-	-	-	$
612592	Cheshire Business Park (Offices), Lostock Gralam	48	42	65/--	51	45	50	52	46	1	1	B	1	A4	T	-	-	-	-	

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
612600	Holford Hall (Wedding Venue), Chester Road, Plumley	48	42	64/--	49	45	49	51	47	2	2	B	1	A2	T	-	-	-	-	
612602	Holford Mill House (Holiday Let), Plumley	54	48	70/--	62	56	61	62	56	0	0	B	1	A3	T	H	-	-	-	$
612878	Park Farm Marina (Office), Davenham Road, Rudheath	51	46	66/--	44	36	41	52	46	8	10	B	1	A4	T	-	-	-	-	
612885	Mallard Court (Offices), Canal Walk, Rudheath	43	36	55/--	54	47	52	53	47	0	0	B	1	A4	T	-	-	-	-	
613004	Dalby Court (Offices), Gadbrook Road, Rudheath	47	41	63/--	50	47	53	52	48	2	1	B	1	A4	T	-	-	-	-	
613070	Cheshire Business Park (Offices), Lostock Gralam	46	40	60/--	48	41	46	49	43	1	1	B	1	A4	T	-	-	-	-	

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
613071	Cheshire Business Park (Offices), Lostock Gralam	48	41	64/--	50	44	49	51	45	1	1	B	1	A4	T	-	-	-	-	
613092	Cheshire Business Park (Offices), Lostock Gralam	51	45	69/--	56	50	55	57	50	1	1	B	1	A4	T	-	-	-	-	
613203	Morrisons Gadbrook, Rudheath	54	48	73/--	46	39	44	54	49	9	10	B	1	A4	T	-	-	-	-	
613204	Gadbrook Produce, Rudheath	50	44	65/--	51	45	50	50	44	-1	-1	B	1	A4	T	-	-	-	-	
613214	Unit 5, 469 Manchester Road, Lostock Gralam and committed development (Map book ref: MA02/269)	45	39	62/--	60	54	59	60	53	0	0	B	1	A4	T	-	-	-	-	

Assessment location		Impact criteria									Significance criteria								Significant effect
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique features	Combined impact	Mitigation effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
613216	Gadbrook Park (Office), Rudheath and committed development (Map book ref: MA02/347)	41	36	59/--	50	47	53	50	47	0	0	B	1	A4	T	-	-	-	-	

Direct impact – summary

3.2.9 The operational airborne noise impacts identified in Table 6 and Table 7 are summarised in Table 8.

Table 8: Summary of operational airborne sound impacts

Receptor type	Numbers of impacts (Number of impacts excluding those in committed developments)				
	Above LOAEL	Above SOAEL	Impacts		
			Minor	Moderate	Major
Residential properties	1717 (1671)	29 (29)	34 (27)	53 (53)	38 (37)
Non-residential properties	N/A	N/A			1
Schools	N/A	N/A			0
Quiet areas	N/A	N/A			0

Airborne sound: indirect impacts and effects

3.2.10 The transport assessment presented in Volume 5, Appendices TR-001, TR-002, TR-003 and TR-005, has been used to identify those roads or railways within this study area where the alignment remains as at present, but a change in flow or composition is identified which is greater than the screening criteria defined in Volume 5, Appendix SV-001-00000.

3.2.11 No roads or railways which exceed the criteria defined in Volume 5, Appendix SV-001-00000 have been identified in this study area. The assessment of operational noise and vibration indicates that significant indirect effects on residential receptors are unlikely to occur in this area.

Airborne sound levels used in other assessments

3.2.12 The operational sound results contained in this document have been used by other disciplines, namely agriculture, historic environment, landscape and visual, communities and socio economics, in their assessments. This includes the information in Table 6 and Table 7. Locations of interest to these other disciplines which may not appear in Table 6 and Table 7 are presented in Table 9.

Table 9: Operational airborne sound levels for use in cross-discipline assessments

Assessment location		Impact criteria									Discipline			
Reference	Area represented	Proposed Scheme only (year 15)			Without Proposed Scheme (opening year baseline)			With Proposed Scheme (opening year baseline + year 15 traffic) ****		Change		Agriculture	Ecology	Historic environment	Landscape and visual
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **				
610544	Yew-Tree Farm (Livestock), Coalpit Lane, Stanthorne (MA02/6)	65	57	84/--	40	34	<40	65	57	25	23	Y	-	-	-
610546	Dairy Farm (Livestock), Whatcroft Hall Lane, Whatcroft (MA02/13)	61	56	78/--	45	40	46	61	56	16	16	Y	-	-	-

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