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HS2

High Speed Rail (Crewe – Manchester) Environmental Statement

Volume 5: Appendix SV-003-0MA08

Sound, noise and vibration

MA08: Manchester Piccadilly Station

Operational sound, noise and vibration report

M274

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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 Manchester Piccadilly Station area (MA08). 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 Manchester Piccadilly Station area, a baseline and construction sound, noise and vibration report is set out (see Volume 5, Appendix SV-002-0MA08). 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, MA08 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: Manchester Piccadilly Station (MA08), 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: Manchester Piccadilly Station (MA08), 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 Environemntal 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-002-0MA08, 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: Manchester Piccadilly Station (MA08), Section 13.

Avoidance and mitigation measures

3.2.2 These are set out in Volume 2, Community Area report: Manchester Piccadilly Station (MA08), 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 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, 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 (0700 – 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	
615273	Tower Block Piccadilly Station (Offices), Piccadilly, Manchester	-	0.01	-	-	1	NA	G4/ V3	T	-	-	-	-	
615281	Staycity (Hotel), Piccadilly, Manchester	-	0.01	-	-	1	NA	G4/ V2	T	-	-	-	-	
615287	Chapeltown Street, Manchester	-	0.02	0.01	-	47	NA	R	T	-	-	-	-	
615292	Chapeltown Street, Manchester	-	0.01	0.01	-	30	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 Volume 5: Appendix SV-001-00000, Annex A 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 Volume 5: 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 Volume 5: Appendix SV-001-00000 Annex A, these adverse effects are not considered to be significant on a community basis.

[3] *The Noise Insulation (Railways and Other Guided Transport Systems) Regulation 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 **									
615186	St. Gregory's Road, Manchester	43	38	52/53	51	46	46	51	46	0	0	NA	27	R	T	-	-	-	-	
615187	Union Street, Ardwick	47	42	56/59	61	55	59	56	51	-4	-3	A	22	R	T	H	-	-	-	[4]
615189	Brydon Avenue, Manchester	45	40	56/57	54	48	51	53	48	0	0	A	20	R	T	-	-	-	-	
615190	Cotter Street, Manchester	52	46	55/57	58	52	56	57	52	-1	-1	A	62	R	T	-	-	-	-	
615191	Brydon Avenue, Manchester	46	41	56/58	58	52	56	57	51	-1	-1	A	8	R	T	-	-	-	-	
615193	Paddock Street, Manchester	59	53	54/56	62	55	60	61	54	-1	-1	A	10	R	T	H	-	-	-	
615195	Cotter Street, Manchester	46	41	57/58	62	56	61	61	55	-1	-1	A	11	R	T	H	-	-	-	

[4] This is not considered a significant beneficial effect at the community due to the temporary nature of the accommodation in the building affected (Brydon Court).

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 **									
615210	Liberty Point, Berry Street, Manchester	47	41	56/58	52	46	50	52	46	0	0	A	712	R	T	-	-	-	-	
615224	Piccadilly Point, Berry Street, Manchester	48	43	58/60	57	52	55	58	52	0	0	A	178	R	T	-	-	-	-	
615242	Bombay Street, Manchester	<30	<20	<40/<40	65	59	64	65	58	0	0	NA	213	R	T	H	-	-	-	
615244	Echo Street, Manchester and committed development (Mapbook ref: MA08/160)	34	29	48/50	57	52	53	57	52	0	0	NA	497	CD-R	T	-	-	-	-	
615248	Whitworth Street, Manchester	<30	<20	<40/<40	66	59	64	65	59	0	0	NA	54	R	T	H	-	-	-	
615251	London Road, Manchester	32	27	46/47	70	64	69	70	63	0	0	NA	5	R	T	H	-	-	-	
615253	Cobourg Street, Manchester	<30	24	45/46	67	61	66	67	60	0	0	NA	22	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 **									
615264	Whitworth Street, Manchester	33	28	46/47	62	56	60	62	56	0	0	NA	26	R	T	H	-	-	-	
615266	Piccadilly Place, Manchester	<30	23	43/45	41	36	47	41	36	0	0	NA	147	R	T	L	-	-	-	
615267	Canal Street, Manchester	<30	<20	<40/<40	54	48	53	54	48	0	0	NA	37	R	T	-	-	-	-	
615278	Linton Close, Manchester	47	42	59/60	60	53	58	59	53	-1	0	A	6	R	T	-	-	-	-	
615279	Aytoun Street, Manchester	<30	<20	<40/<40	63	57	62	63	57	0	0	NA	478	CD-R	T	H	-	-	-	
615280	Ancoats Grove, Manchester	45	40	56/58	58	51	56	57	51	-1	0	A	16	R	T	-	-	-	-	
615284	Ripley Close, Manchester	48	42	60/61	58	52	57	58	52	0	0	A	12	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 **									
615286	Minshull Street, Manchester and committed development (Mapbook ref: MA08/066)	<30	<20	<40/<40	60	54	59	60	54	0	0	NA	39	CD-R	T	-	-	-	-	
615287	Chapeltown Street, Manchester	60	53	60/63	56	52	63	61	56	5	4	A	47	R	T	-	-	-	-	MA08-O-C1[5]
615288	Every Street, Manchester	47	42	59/60	59	53	58	59	53	0	0	A	11	R	T	-	-	-	-	
615289	Advent Way, Manchester	51	45	60/61	65	59	64	65	59	0	0	A	201	CD-R	T	H	-	-	-	
615291	Advent Way, Manchester	50	45	60/62	67	61	66	67	60	0	0	A	112	R	T	H	-	-	-	

[5] Approximately 30 dwellings (flats) within the building represented by the assessment location facing the Proposed Scheme are likely to be affected. The impact is expected to be substantially lower at the other dwellings (flats) with facades facing away from the Proposed Scheme.

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 **									
615292	Chapeltown Street, Manchester	53	47	59/61	56	52	63	57	53	1	1	A	30	R	T	-	-	-	-	
615294	Advent Way, Manchester	43	38	58/60	43	37	41	46	40	3	3	A	35	R	T	-	-	-	-	#
615295	Thomas Telford Basin, Manchester	46	41	54/56	55	51	62	55	51	0	0	A	12	R	T	-	-	-	-	
615296	Chapeltown Street, Manchester	47	41	54/57	56	52	63	56	52	0	0	A	27	R	T	-	-	-	-	
615297	Advent Way, Manchester	42	37	54/55	40	35	<40	44	39	4	4	NA	76	R	T	L	-	-	-	#
615299	Thomas Telford Basin, Manchester	41	35	51/53	55	51	62	55	51	0	0	NA	8	R	T	-	-	-	-	
615301	Pollard Street, Manchester	42	37	56/58	57	51	56	57	51	0	0	A	121	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 **									
615302	Isaac Way, Manchester	45	40	57/59	53	47	52	53	47	0	0	A	242	R	T	-	-	-	-	
615304	John Smeaton Court, Manchester	38	33	49/52	43	35	47	43	36	0	1	NA	8	R	T	-	-	-	-	
615305	Thomas Telford Basin, Manchester	42	37	53/55	46	40	44	46	40	0	0	NA	18	R	T	-	-	-	-	
615307	Fairham Walk, Manchester	42	37	53/54	49	43	48	49	43	0	0	NA	21	R	T	-	-	-	-	
615308	Aytoun Street, Manchester	<30	<20	<40/<40	61	57	62	61	57	0	0	NA	116	R	T	H	-	-	-	
615310	John Smeaton Court, Manchester	46	41	59/61	52	47	50	53	48	1	1	A	38	R	T	-	-	-	-	
615311	Wharf Close, Manchester	46	40	50/52	61	55	60	56	49	-6	-6	A	15	R	T	H	-	-	-	MA08-O-C2
615314	Pollard Street, Manchester	44	39	56/58	57	50	55	56	50	0	0	A	36	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 **									
615315	John Smeaton Court, Manchester	40	35	55/56	43	37	46	44	38	1	2	NA	16	R	T	-	-	-	-	
615316	Thomas Telford Basin, Manchester	38	32	48/49	41	35	40	42	36	1	1	NA	8	R	T	L	-	-	-	
615317	Thomas Telford Basin, Manchester	43	37	52/54	55	49	54	51	45	-5	-5	NA	8	R	T	-	-	-	-	MA08-O-C2
615318	John Smeaton Court, Manchester	36	31	47/49	44	38	44	42	37	-2	-1	NA	6	R	T	-	-	-	-	
615319	Store Street, Manchester	44	38	49/51	62	56	61	56	50	-6	-6	NA	20	R	T	H	-	-	-	MA08-O-C2
615320	Chapeltown Street, Manchester	46	40	58/61	56	51	53	56	51	0	0	A	38	R	T	-	-	-	-	
615321	Thomas Telford Basin, Manchester	38	32	51/53	47	41	46	44	38	-3	-3	NA	10	R	T	-	-	-	-	MA08-O-C2

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 **									
615322	Pollard Street, Manchester	44	39	56/58	56	50	54	56	50	0	0	A	16	R	T	-	-	-	-	
615323	Isaac Way, Manchester	42	37	54/55	42	36	40	45	39	3	3	NA	143	R	T	-	-	-	-	#
615324	Wharf Close, Manchester	46	40	52/54	51	45	50	48	42	-3	-3	A	21	R	T	-	-	-	-	MA08-O-C2
615325	William Jessop Court, Manchester	35	30	48/49	43	37	43	43	37	0	0	NA	29	R	T	-	-	-	-	
615328	Chapeltown Street, Manchester	45	40	58/60	61	55	59	61	55	0	0	A	38	R	T	H	-	-	-	
615329	Ducie Street, Manchester	45	39	53/55	49	43	47	47	41	-2	-2	NA	25	R	T	-	-	-	-	
615331	Every Street, Manchester	42	37	54/56	56	50	55	56	50	0	0	NA	30	R	T	-	-	-	-	
615332	Ducie Street, Manchester	45	39	54/56	49	42	47	47	41	-2	-1	NA	25	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 **									
615333	Jutland Street, Manchester	45	39	52/54	49	43	48	47	41	-2	-2	NA	20	R	T	-	-	-	-	
615336	Pollard Street, Manchester	41	36	54/55	60	54	58	59	53	-1	-1	NA	63	R	T	-	-	-	-	
615338	James Brindley Basin, Manchester	34	29	46/48	52	46	51	52	46	0	0	NA	34	R	T	-	-	-	-	
615339	Jutland Street, Manchester	44	39	50/53	49	43	48	48	42	-1	-1	NA	57	R	T	-	-	-	-	
615340	Pollard Street, Manchester	38	33	52/54	41	35	40	43	37	1	2	NA	62	R	T	L	-	-	-	
615341	Ducie Street, Manchester	41	35	50/52	55	48	56	55	48	0	0	NA	28	R	T	-	-	-	-	
615343	Great Ancoats Street, Manchester and committed development (Mapbook ref: MA08/092)	34	29	46/48	62	55	60	61	55	0	0	NA	43	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 **									
615344	Dale Street, Manchester	<30	20	<40/<40	60	54	59	60	53	-1	-1	NA	64	R	T	-	-	-	-	
615346	Ducie Street, Manchester	35	30	49/51	49	42	47	51	44	2	2	NA	29	R	T	-	-	-	-	
615348	Great Ancoats Street, Manchester	42	37	53/54	68	61	66	67	61	0	0	NA	100	R	T	H	-	-	-	
615349	Great Ancoats Street, Manchester	45	40	56/58	60	54	59	60	54	0	0	A	100	R	T	-	-	-	-	
615351	Brewer Street, Manchester	33	28	47/49	49	42	47	51	44	2	1	NA	117	R	T	-	-	-	-	
615352	Hilton Street, Manchester	34	28	47/48	49	43	47	49	43	1	1	NA	201	R	T	-	-	-	-	
615353	Spindle Mews, Manchester	38	33	51/53	55	49	52	54	49	0	0	NA	57	R	T	-	-	-	-	
615355	Dale Street, Manchester	<30	<20	42/43	62	56	61	62	56	0	0	NA	14	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 **									
615358	Brewer Street, Manchester	34	29	48/50	51	44	49	51	44	0	0	NA	92	R	T	-	-	-	-	
615359	Tariff Street, Manchester	<30	21	41/42	49	43	48	49	43	0	0	NA	24	R	T	-	-	-	-	
615360	Cheetwood House, Dale Street, Manchester and committed development (Mapbook ref: MA08/222)	<30	<20	<40/<40	59	52	57	59	52	0	0	NA	16	CD-R	T	-	-	-	-	
615361	Tariff Street, Manchester	32	26	46/48	51	44	49	51	45	0	0	NA	42	R	T	-	-	-	-	
615363	Hilton Street, Manchester	<30	21	41/42	61	55	60	62	55	<1	<1	NA	16	R	T	H	-	-	-	
615367	Old Mill Street, Manchester	<30	22	45/47	57	50	55	56	50	-1	-1	NA	101	CD-R	T	-	-	-	-	
615369	Vesta Street, Manchester	40	35	53/55	56	50	54	56	50	0	0	NA	169	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 **									
615402	Fairfield Street, Manchester	34	28	48/49	65	59	64	65	59	0	0	NA	100	R	T	H	-	-	-	
616003	Chapeltown Street, Manchester	49	43	62/64	57	54	61	58	54	0	0	A	126	CD-R	T	-	-	-	-	
616004	Store Street, Manchester	40	35	54/56	57	51	56	54	48	-4	-3	NA	374	CD-R	T	-	-	-	-	MA08-O-C2[6]
616007	Ducie Street, Manchester and committed development (Mapbook ref: MA08/098)	38	33	51/52	57	50	55	58	51	1	1	NA	128	CD-R	T	-	-	-	-	
616886	Chapeltown Street, Manchester	40	35	50/52	68	61	66	67	61	0	0	NA	38	R	T	H	-	-	-	

[6] The size of the beneficial effect is applicable to fewer properties than identified.

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 **									
616888	Union Street, Ardwick	42	37	52/53	65	59	64	58	52	-7	-6	NA	5	R	T	H	-	-	-	[4]
616889	Union Street, Manchester	41	36	51/53	66	60	65	66	60	-1	-1	NA	17	R	T	H	-	-	-	
616890	Union Street, Manchester	40	35	50/51	67	61	66	66	60	-1	-1	NA	8	R	T	H	-	-	-	
616895	Ducie Street, Manchester and committed development (Mapbook ref: MA08/212)	36	31	47/49	59	53	58	60	53	1	1	NA	41	CD-R	T	-	-	-	-	
616898	Victoria House, Great Ancoats Street, Manchester and committed development (Mapbook ref: MA08/255)	46	40	56/58	69	63	68	68	62	-1	-1	A	177	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 **									
616899	Mindal House, Bloom Street, Manchester and committed development (Mapbook ref: MA08/342)	<30	<20	<40/<40	57	51	56	57	51	0	0	NA	80	CD-R	T	-	-	-	-	
616900	Store Street, Manchester and committed development (Mapbook ref: MA08/361)	37	31	46/48	60	53	58	54	48	-6	-5	NA	66	CD-R	T	-	-	-	-	MA08-O-C2

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 **									
615188	St. Thomas Conference Centre, Ardwick Green North, Manchester	46	40	50/52	49	43	47	48	42	0	0	B	1	A2	T	-	-	-	-	
615192	Old School House (Offices), Thirsk Street, Manchester	56	50	53/54	59	53	57	58	52	-1	-1	B	1	A4	T	-	-	-	-	$
615194	City View House (Offices), Union Street, Manchester	49	43	54/56	58	52	55	57	52	-1	-1	B	1	A4	T	-	-	-	-	
615196	Graphite House (Offices), Manor Street, Manchester	58	52	52/53	64	58	63	64	58	-1	-1	B	1	A4	T	H	-	-	-	$
615218	Sackville Street (Offices), Manchester	<30	23	46/48	65	60	62	65	60	0	0	B	1	A4	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 **									
615234	Macdonald Hotel, London Road, Manchester and committed development (Mapbook ref: MA08/399)	41	36	55/57	59	54	55	59	54	0	0	B	1	A3	T	-	-	-	-	
615247	Bainbridge House (Office), London Road, Manchester	33	27	47/48	68	62	67	68	62	0	0	B	1	A4	T	H	-	-	-	
615258	The Manchester College, Shena Simon Campus, Chorlton Street Manchester	<30	22	44/45	64	57	62	63	57	0	0	B	1	A3	T	H	-	-	-	
615263	London Road Fire Station (Hotel), Manchester	<30	23	43/44	67	61	65	67	61	0	0	B	1	A4	T	H	-	-	-	
615268	Monroes Bar Hotel, London Road, Manchester	<30	20	<40/41	67	62	66	67	62	0	0	B	1	A3	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 **									
615273	Tower Block Piccadilly Station (Offices), Piccadilly, Manchester	47	41	55/57	53	48	51	54	48	1	1	B	1	A4	T	-	-	-	-	
615277	3 Piccadilly Place (Education), Manchester and committed development (Mapbook ref: MA08/180)	<30	<20	<40/41	65	62	67	65	61	0	0	B	1	A3	T	H	-	-	-	
615281	Staycity (Hotel), Piccadilly, Manchester	48	42	54/57	50	44	48	50	43	0	0	B	1	A3	T	-	-	-	-	
615282	Aeroworks (Offices), Adair Street, Manchester	55	49	64/66	58	52	56	60	54	3	3	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 **									
615285	DoubleTree by Hilton Hotel, Piccadilly Place, Manchester	<30	20	<40/<40	62	56	61	62	56	0	0	B	1	A3	T	H	-	-	-	
615293	Manchester Crown Court, Minshull Street, Manchester	<30	<20	<40/<40	63	58	61	62	58	0	0	B	1	A2	T	H	-	-	-	
615298	Holiday Inn Hotel, Aytoun Street, Manchester	<30	23	<40/<40	64	58	62	63	58	0	0	B	1	A3	T	H	-	-	-	
615300	Malmaison Hotel, Gore Street, Manchester	36	30	<40/<40	65	59	64	65	59	0	0	B	1	A3	T	H	-	-	-	
615303	Native Aparthotel, Ducie Street, Manchester	52	46	54/56	52	45	50	53	47	1	1	B	1	A4	T	-	-	-	-	
615306	Fabrica (Offices), Great Ancoats Street, Manchester	44	39	58/60	68	62	67	67	61	0	0	B	1	A4	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 **									
615309	Rodwell Tower (Offices), Piccadilly, Manchester	47	41	49/52	60	54	59	60	54	0	0	B	1	A4	T	-	-	-	-	
615312	Britannia Hotel, Portland Street, Manchester	<30	<20	<40/<40	57	51	56	56	50	0	0	B	1	A3	T	-	-	-	-	
615313	Ibis Hotel, Pollard Street, Manchester	44	39	55/57	69	63	68	69	62	-1	-1	B	1	A3	T	H	-	-	-	
615326	La Reserve Aparthotel, Ducie Street, Manchester	41	35	<40/<40	57	51	56	58	52	1	1	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 **									
615327	Westminster House (Education), 11 Portland Street, Manchester and committed development (Mapbook ref: MA08/318)	<30	<20	<40/<40	61	57	65	61	57	0	0	B	1	A3	T	H	-	-	-	
615330	Premier Inn, Dale Street, Manchester	47	40	<40/<40	59	53	58	59	53	0	0	B	1	A3	T	-	-	-	-	
615334	11 Ducie Street (Offices), Manchester	42	36	50/53	59	52	57	60	54	2	2	B	1	A4	T	-	-	-	-	
615335	The Grand Portland and Gardens Hotels, Manchester	<30	<20	<40/<40	49	45	50	49	45	0	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 **									
615337	Abode Manchester (Hotel), Piccadilly, Manchester	32	26	<40/<40	55	49	54	55	49	0	0	B	1	A3	T	-	-	-	-	
615342	Paradise Wharf (Offices), Ducie Street, Manchester	35	30	47/48	55	48	56	55	48	0	0	B	1	A4	T	-	-	-	-	
615345	Your Smile Clinic (Healthcare), Dale Street, Manchester	37	31	<40/<40	55	49	54	54	48	-1	-1	B	1	A4	T	-	-	-	-	
615347	Piccadilly (Offices), Manchester	<30	<20	<40/<40	61	55	60	62	56	<1	<1	B	1	A4	T	H	-	-	-	
615350	Ducie House (Offices), Ducie Street, Manchester	32	26	46/47	63	56	61	63	57	0	0	B	1	A4	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 **									
615354	Lizard Street (Offices), Manchester	<30	20	<40/<40	63	56	61	63	56	0	0	B	1	A4	T	H	-	-	-	
615356	Staycity - Northern Quarters Aparthotel, Laystall Street, Manchester and committed development (Mapbook ref: MA08/216)	36	30	47/49	52	45	50	52	46	1	1	B	1	A3	T	-	-	-	-	
615357	Fourways House (Offices), Hilton Street, Manchester	<30	21	41/43	40	33	<40	40	34	1	1	B	1	A4	T	L	-	-	-	
615362	Hatters Hostel, Newton Street, Manchester	<30	<20	<40/<40	62	56	61	63	57	1	1	B	1	A3	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 **									
615364	University of Manchester Pariser Building, Sackville Street, Manchester	<30	<20	<40/<40	45	39	43	45	39	0	0	B	1	A3	T	-	-	-	-	
615365	MSS Tower (University), Sackville Street, Manchester	43	37	45/47	64	58	63	64	58	0	0	B	1	A3	T	H	-	-	-	
615366	Piccadilly (Hotel), Manchester and committed development (Mapbook ref: MA08/089)	<30	<20	<40/<40	61	55	60	61	55	<1	<1	B	1	A3	T	H	-	-	-	
615370	Portland Street (College), Manchester	<30	<20	<40/<40	51	47	53	51	47	0	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 **									
615381	University of Manchester Ferranti Building, Sackville Street Campus, Manchester	<30	<20	<40/<40	46	40	44	45	39	0	0	B	1	A3	T	-	-	-	-	
615382	University of Manchester The Mill, Sackville Street Campus, Manchester	<30	23	40/41	55	49	53	55	49	0	0	B	1	A3	T	-	-	-	-	
615383	University of Manchester Paper Science Building, Sackville Street Campus, Manchester	<30	<20	<40/<40	53	48	56	53	48	0	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 **									
615384	University of Manchester Morton Lab, Sackville Street Campus, Manchester	<30	21	<40/<40	61	55	60	61	55	0	0	B	1	A3	T	H	-	-	-	
615385	University of Manchester Renold Building, Altrincham Street, Manchester	<30	24	41/42	62	58	61	62	58	0	0	B	1	A3	T	H	-	-	-	
615386	University of Manchester Barnes Wallis Building, Sackville Street Campus, Manchester	33	27	46/47	60	56	57	60	56	0	0	B	1	A3	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 **									
615387	University of Manchester Moffat Building, Sackville Street Campus, Manchester	31	26	48/50	60	55	58	60	55	0	0	B	1	A3	T	H	-	-	-	
615388	University of Manchester Sackville Street Building, Sackville Street, Manchester	<30	23	42/43	60	54	59	60	54	0	0	B	1	A3	T	-	-	-	-	
615391	Motel One (Hotel), London Road, Manchester	30	25	41/43	65	60	67	64	59	0	0	B	1	A3	T	H	-	-	-	
615393	Transport for Greater Manchester (Offices), Piccadilly, Manchester	<30	<20	<40/<40	62	58	70	62	58	0	0	B	1	A4	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 **									
616005	Dakota Manchester (Hotel), Ducie Street, Manchester	31	26	45/47	56	49	54	57	51	2	2	B	1	A3	T	-	-	-	-	
616504	4 Piccadilly Place (Offices), Manchester	<30	<20	<40/<40	66	63	69	66	63	0	0	B	1	A4	T	H	-	-	-	
616506	George House Trust, Ardwick Green North, Manchester	42	37	51/52	50	45	46	50	45	0	0	B	1	A4	T	-	-	-	-	
616507	Manchester Chinese Centre, Ardwick Green, Manchester	42	37	52/53	50	45	47	51	45	0	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 **									
616894	Dale House, Dale Street, Manchester and committed development (Mapbook ref: MA08/219)	<30	<20	<40/<40	54	48	53	55	48	0	0	B	1	A4	T	-	-	-	-	
616896	Adair Street (Hotel), Manchester and committed development (Mapbook ref: MA08/260)	49	43	60/62	64	58	63	64	58	0	0	B	1	A3	T	H	-	-	-	
616897	Indemnity House (Education), Chatham Street, Manchester	<30	<20	<40/<40	51	45	50	51	45	1	0	B	1	A3	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	2500 (1996)	0 (0)	0 (0)	47 (47)	0 (0)
Non-residential properties	N/A	N/A			0
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 traffic)			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 **				
No additional assessment locations to inform the agriculture, ecology, historic environment and landscape and visual assessments are identified in this area.															

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