In Parliament – Session 2022 - 2023

HS2

High Speed Rail (Crewe – Manchester)

Supplementary Environmental Statement 2 and Additional Provision 2 Environmental Statement

Volume 5: Appendix SV-003-00000

Sound, noise and vibration

Operational sound, noise and vibration report

MA01: Hough to Walley's Green

MA02: Wimboldsley to Lostock Gralam

MA03: Pickmere to Agden and Hulseheath

MA06: Hulseheath to Manchester Airport

MA07: Davenport Green to Ardwick

MA08: Manchester Piccadilly Station

S94

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S94

Department for Transport

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Contents

Tables

1 Introduction

1.1 Structure of this appendix

1.1.1 This report is an appendix to the sound, noise and vibration assessment which forms part of Volume 5 of the Supplementary Environmental Statement 2 (SES2) and Additional Provision 2 Environmental Statement (AP2 ES).

1.1.2 This appendix provides details of changes to the operational sound, noise and vibration assessment since the production of the High Speed Two (HS2) High Speed Rail (Crewe – Manchester) Environmental Statement (ES) published in 2022[1] (the main ES) and the Supplementary Environmental Statement 1 (SES1) and Additional Provision 1 Environmental Statement (AP1 ES) also published in 2022[2].

1.1.3 This report should be read in conjunction with Volume 5, Appendices: SV-001-00000[3], SV-002-0MA01, SV-002-0MA02, SV-002-0MA03, SV-002-0MA06 and SV-002-0MA08 which accompanied the main ES.

1.1.4 This report covers the following community areas (CA):

- Hough to Walley's Green (MA01);
- Wimboldsley to Lostock Gralam (MA02);
- Pickmere to Agden and Hulseheath (MA03);
- Hulseheath to Manchester Airport (MA06); and
- Manchester Piccadilly Station (MA08).

1.1.5 Maps referred to in this appendix are contained in the SES2 and AP2 ES Volume 5, Sound, noise and vibration Map Book: Map Series SV-02 – Operational Airborne Noise and Vibration Impacts and Likely Significant Effects, SV-08 – Daytime Operational Sound Contour Maps, and SV-09 – Night-time Operational Sound Contour Maps.

1.1.6 The SES2 and AP2 ES sound, noise and vibration assessment is detailed in the:

- SES2 and AP2 ES Volume 2, Community area reports;

[1] High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement.* Available online at: https://www.gov.uk/government/collections/hs2-phase2b-crewe-manchester-environmental-statement.

[2] High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement*. Available online at: https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-supplementary-environmental-statement-1-and-additional-provision-1-environmental-statement.

[3] High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Sound, noise and vibration methodology, assumptions and assessment*, Volume 5, Appendix: SV-001-00000. Available online at: https://www.gov.uk/government/collections/hs2-phase2b-crewe-manchester-environmental-statement.

- SES2 and AP2 ES Volume 5, Appendix: SV-002-00000; and
- SES2 and AP2 ES Volume 5, Appendix: SV-003-00000 (this report).

1.1.7 The need for a number of corrections to the contents of the main ES and SES1 and AP1 ES have been identified. These are set out in report: Corrections to Volume 5 of the January 2022 Environmental Statement and the July 2022 Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement, see SES2 and AP2 ES Volume 5, Appendix: CT-009-00000.

1.1.8 In order to differentiate between the original scheme and the subsequent changes, the following terms are used:

- 'the original scheme' – the Bill scheme submitted to Parliament in 2022, which was assessed in the main ES;
- 'the SES1 scheme' – the original scheme with any changes described in SES1 that are within the existing powers of the Bill;
- 'the AP1 revised scheme' – the original scheme as amended by SES1 changes and AP1 amendments;
- 'the SES2 scheme' – the original scheme with any changes described in SES1 (submitted in July 2022) and the SES2; and
- 'the AP2 revised scheme' – the original scheme as amended by SES1 and SES2 changes (as relevant) and AP2 amendments.

1.2 Scope of the assessment

1.2.1 This assessment presents the predicted operational sound, noise and vibration where materially altered by either an SES2 change or an AP2 amendment.

1.3 Methodology, data sources, assumptions and limitations

1.3.1 The assessment scope, key assumptions and limitations are as set out in the main ES Environmental Impact Assessment Scope and Methodology Report[4].

1.3.2 The additional environmental baseline information for SES2 has the potential to lead to changes in significant noise effects from those assessed in the main ES in MA01.

1.3.3 In some cases, the SES2 changes and AP2 amendments have resulted in a change in traffic flow on roads within the relevant community area. The in-combination effects of SES2

[4] High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Environmental Impact Assessment Scope and Methodology Report,* Volume 5, Appendix: CT-001-00001. Available online at: https://www.gov.uk/government/collections/hs2-phase2b-crewe-manchester-environmental-statement.

changes and AP2 amendments are presented in the SES2 sections of MA02, MA03, MA06 and MA08.

1.3.4 The following AP2 amendments have the potential to lead to changes in significant noise effects from those assessed in the main ES:

- MA02: Additional land permanently required for modifications to the A559 Manchester Road, A559 Hall Lane and Station Road junction (AP2-002-003); and
- MA06: Additional land permanently required to reconfigure M56 Junction 6 (AP2-006-014).

1.3.5 An assessment of these changes and amendments is presented in this appendix. Details of the standard methodology used for determining significance of effects for sound, noise and vibration are presented in the main ES Volume 5, Appendix: SV-001-00000[5].

Evaluation of impacts and effects

1.3.6 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 SES2 scheme.

1.3.7 Indirect effects arising from permanent changes in traffic patterns on the existing road and rail networks as a consequence of the SES2 scheme are also reported in this appendix, where they would occur within the study area as defined in the main ES Volume 5, Appendix: SV-001-00000.

1.3.8 Route-wide impacts, effects and significant effects associated with noise or vibration from the operation of the SES2 scheme are reported in SES2 and AP2 ES Volume 3, Route-wide effects.

1.3.9 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 in the SES2 and AP2 ES Volume 5, Sound, noise and vibration Map Book: Map Series SV-02.

1.3.10 Baseline sound level data have been collected at locations representative of the airborne sound-sensitive receptors and presented in the main ES, SES1 and SES2.

[5] High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Sound, noise and vibration methodology, assumptions and assessment*, Volume 5, Appendix: SV-001-00000. Available online at: https://www.gov.uk/government/collections/hs2-phase2b-crewe-manchester-environmental-statement.

2 Community area assessments

2.1 Hough to Walley's Green (MA01)

Part 1: Supplementary Environmental Statement 2

Effects arising during operation

Introduction

2.1.1 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 the SES2 and AP2 ES Volume 2, Community Area report: Hough to Walley's Green (MA01).

Avoidance and mitigation measures

2.1.2 The avoidance and mitigation measures are set out in the main ES Volume 2, Community Area report: Hough to Walley's Green (MA01).

Quantitative identification of impacts and effects

Ground-borne sound and vibration

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

2.1.4 For the assessment location where new or different effects are forecast as a result of the SES2 scheme, the assessment results for the non-residential receptor are presented in Table 2. This change is a result of additional baseline information collected since the main ES and SES1. Explanation of the information in Table 2 is provided in Volume 5, Appendix: SV-001-00000 of the main ES, with additional notes in Table 1, below.

Table 1: Explanatory notes for operational ground-borne sound and vibration 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

Symbol	Explanation
	theatres, museums, small auditoria or halls, (G4) offices, schools, colleges, hospitals, hotels and libraries.
NA	Type of effect – Generally no adverse effect.
A	Ground-borne sound or vibration levels from the SES2 scheme exceed Lowest Observed Adverse Effect Level (LOAEL): the significance criteria set out in the main ES Volume 5, Appendix: SV-001-00000, Annex A are considered when establishing significant effects.
S	Ground-borne sound or vibration levels from the SES2 scheme exceed Significant Observed Adverse Effect Level (SOAEL).
VDV	Vibration Dose Value.
~	When considered under the significance criteria set out in the main ES 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: MA01 Operational ground-borne sound and vibration levels, noise and vibration impacts and effects for non-residential receptors (SES2 scheme)

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	Type of effect	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	
610664	Eurocard Centre and Eurosales Centre (Offices), Herald Park, Herald Drive, Crewe	44	0.27	0.13	-	2	A	G4/V3	T	-	-	-	-	<>

Airborne sound: direct impacts and effects

2.1.5 The SES2 changes do not change the likely significant airborne noise effects identified in the main ES.

Airborne sound levels used by other topics

2.1.6 There is no change in the airborne sound levels used by other topics compared to the main ES or, where relevant, the AP2 ES.

Part 2: Additional Provision 2 Environmental Statement

Effects arising during operation

2.1.7 There are no changes in the ground-borne noise and vibration or airborne noise effects compared to the main ES as a result of the AP2 revised scheme.

2.2 Wimboldsley to Lostock Gralam (MA02)

Part 1: Supplementary Environmental Statement 2

Effects arising during operation

Introduction

2.2.1 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 the SES2 and AP2 ES Volume 2, Community Area report: Wimboldsley to Lostock Gralam (MA02).

Avoidance and mitigation measures

2.2.2 The avoidance and mitigation measures are set out in the main ES Volume 2, Community Area report: Wimboldsley to Lostock Gralam (MA02).

Quantitative identification of impacts and effects

Ground-borne sound and vibration

2.2.3 The SES2 changes do not change the likely significant ground-borne sound and vibration effects identified in the main ES.

Airborne sound: direct impacts and effects

2.2.4 The direct effects from the operation of the SES2 scheme, as well as any new, amended or altered roads or railway lines identified as part of the SES2 scheme, are presented in Table 4 for residential receptors. There are no changes to the airborne noise effects at non-residential receptors compared to the main ES as a result of the SES2 scheme. Volume 5, Appendix: SV-001-00000 of the main ES, with the additional information in Table 3, provides an explanation of the information in Table 4. The changes are as a result of the update of traffic information since the main ES and SES1. The results should be considered in conjunction with the information contained in the main ES and the SES2 and AP2 ES Volume 5, Sound, noise and vibration Map Book: Map Series SV-02.

Table 3: Explanatory notes for operational airborne sound 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 'SES2 scheme/AP2 revised scheme only (year 15 traffic)' is greater than LOAEL, and either the change is ≥3dB and <5dB, or where a high baseline is identified during the corresponding period the change is ≥1dB and <3dB.
	Orange denotes a moderate impact at a residential building. A moderate impact is identified where the 'SES2 scheme/AP2 revised scheme only (year 15 traffic)' is greater than LOAEL, and either the change is ≥5dB and <10dB, or where a high baseline is identified during the corresponding period the change is of ≥3dB and <5dB.
	Red denotes a major impact at a residential building. A major impact is identified where the 'SES2 scheme/AP2 revised 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.
*	Day – $L_{pAeq,07:00 - 23:00.}$
**	Night – $L_{pAeq,23:00 - 07:00.}$
***	Max – L_{pAFmax}. In the 'SES2 scheme/AP2 revised 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 AP2 revised scheme and where maximum noise levels from additional services are anticipated to be higher than from HS2 services. In the 'Without SES2 scheme/AP2 revised scheme ' column, the value is the arithmetic average $L_{pAFmax,5min}$ as presented in the corresponding baseline technical appendix. For further information refer to the main ES Volume 5, Appendix: SV-001-00000.
****	Where the SES2 scheme/AP2 revised scheme modifies an existing source, i.e. road or railway realignments, the *SES2 scheme / AP2 revised 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 SES2 scheme/AP2 revised scheme exceed Lowest Observed Adverse Effect Level (LOAEL): the significance criteria set out in the main ES 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 the main ES Volume 5, Appendix: SV-001-00000.

Symbol	Explanation
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 SES2 scheme/AP2 revised scheme do not exceed Lowest Observed Adverse Effect Level (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[6].
R	Residential receptor.
RM	Residential mooring.
S	Sound levels from the SES2 scheme/AP2 revised scheme exceed Significant Observed Adverse Effect Level (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 SES2 scheme/AP2 revised 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 the main ES Volume 5: Appendix SV-001-00000 Annex A, these adverse effects are not considered to be significant on a community basis.
$	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 the main ES 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.

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

Table 4: MA02 Operational airborne sound, noise impacts and significant effects: residential receptors (SES2 scheme)

Assessment location		Impact criteria									Significance criteria								
Reference	Area represented	SES2 Scheme only (year 15)			Without SES2 (opening year baseline)			With SES2 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	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
610204	Chapel End Cottage, Clive Green Lane, Winsford	64	57	61/--	67	61	66	69	63	2	2	S	2	R	T	H	-	-	NI	~
610234	Bostock House Farm, Northwich Road, Stanthorne	65	59	61/--	66	60	65	65	59	-1	-1	S	1	R	T	H	-	-	NI	
610409	Hillsbro, Middlewich Road	59	52	67/--	60	53	58	59	52	-1	-1	A	1	R	T	-	-	-	-	
612528	Mulberry Close, Rudheath	63	57	66/--	63	57	62	63	57	0	0	S	7	R	T	H	-	-	NI	
612558	Birches Lane, Lostock Green	61	55	75/--	73	67	72	61	55	-12	-12	S	2	R	T	H	-	-	NI	
612570	Harris Road, Lostock Gralam	62	56	68/--	66	59	63	65	58	-1	-1	S	3	R	T	H	-	-	NI	
612601	Cranage Villas, Manchester Road, Plumley	64	58	75/--	71	65	70	70	64	-1	0	S	6	R	T	H	-	-	NI	
612875	Foxglove Way, Rudheath	62	55	64/--	62	56	61	62	56	0	0	S	7	R	T	H	-	-	NI	

Airborne sound levels used by other topics

2.2.5 There is no change in the airborne sound levels used by other topics compared to the main ES or, where relevant, the AP1 ES.

Part 2: Additional Provision 2 Environmental Statement

Effects arising during operation

Introduction

2.2.6 The assessment is first reported 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.

Avoidance and mitigation measures

2.2.7 The avoidance and mitigation measures are set out in the main ES Volume 2, Community Area report: Wimboldsley to Lostock Gralam (MA02).

Quantitative identification of impacts and effects

Ground-borne sound and vibration

2.2.8 The AP2 amendments do not change the likely significant ground-borne sound and vibration effects identified in the main ES.

Airborne sound: direct impacts and effects

2.2.9 The direct effects from the operation of all new, amended or altered roads or railway lines, which are identified as part of the AP2 revised scheme and due to the amendments listed in Section 1.3, are presented in Table 5 for residential receptors. There are no changes to the airborne noise effects at non-residential receptors compared to the main ES as a result of the AP2 revised scheme. Volume 5, Appendix: SV-001-00000 of the main ES, with the additional information in Table 3, provides an explanation of the information in Table 5.

2.2.10 The principal AP2 amendment responsible for the change in operational airborne noise effects at the specific assessment locations reported in the following tables is the additional land permanently required for modifications to the A559 Manchester Road, A559 Hall Lane and Station Road junction (AP2-002-003).

2.2.11 The results should be considered in conjunction with the information contained in the main ES and the SES2 and AP2 ES Volume 5, Sound, noise and vibration Map Book: Map Series SV-02.

Table 5: MA02 Operational airborne sound, noise impacts and significant effects: residential receptors (AP2 revised scheme)

Assessment location		Impact criteria									Significance criteria								
Reference	Area represented	AP2 revised scheme only (year 15)			Without AP2 revised scheme (opening year baseline)			With AP2 revised 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	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
613246	Manchester Road, Lostock Gralam	69	62	--/--	69	62	68	69	62	0	0	S	2	R	T	H	-	-	NI	

Airborne sound levels used by other topics

2.2.12 There is no change in the airborne sound levels used by other topics compared to the main ES or, where relevant, the AP1 ES.

2.3 Pickmere to Agden and Hulseheath (MA03)

Part 1: Supplementary Environmental Statement 2

Effects arising during operation

Introduction

2.3.1 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 the SES2 and AP2 ES Volume 2, Community Area report: Pickmere to Agden and Hulseheath (MA03).

Avoidance and mitigation measures

2.3.2 The avoidance and mitigation measures are set out in the main ES Volume 2, Community Area report: Pickmere to Agden and Hulseheath (MA03).

Quantitative identification of impacts and effects

Ground-borne sound and vibration

2.3.3 The SES2 changes do not change the likely significant ground-borne sound and vibration effects identified in the main ES.

Airborne sound: direct impacts and effects

2.3.4 The direct effects from the operation of the SES2 scheme, as well as any new, amended or altered roads or railway lines identified as part of the SES2 scheme, are presented in Table 6 for residential receptors. There are no changes to the airborne noise effects at non-residential receptors compared to the main ES as a result of the SES2 scheme. Volume 5, Appendix: SV-001-00000 of the main ES, with the additional information in Table 3, provides an explanation of the information in Table 6. The changes are as a result of the update of traffic information since the main ES and SES1. The results should be considered in conjunction with the information contained in the main ES and the SES2 and AP2 ES Volume 5, Sound, noise and vibration Map Book: Map Series SV-02.

Table 6: MA03 Operational airborne sound, noise impacts and significant effects: residential receptors (SES2 scheme)

Assessment location		Impact criteria									Significance criteria								
Reference	Area represented	SES2 Scheme only (year 15)			Without SES2 Scheme (opening year baseline)			With SES2 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	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
612628	Pickmere Lane, Pickmere	59	54	74/--	57	52	57	61	56	4	4	A	2	R	T	-	-	-	-	~
612647	Heyrose Lane, Over Tabley	59	54	75/--	47	42	47	59	54	13	12	A	3	R	T	-	-	-	-	~

Airborne sound levels used by other topics

2.3.5 There is no change in the airborne sound levels used by other topics compared to the main ES or, where relevant, the AP1 ES.

Part 2: Additional Provision 2 Environmental Statement

Effects arising during operation

2.3.6 There are no changes in the ground-borne noise and vibration or airborne noise effects compared to the main ES as a result of the AP2 revised scheme.

2.4 Hulseheath to Manchester Airport (MA06)

Part 1: Supplementary Environmental Statement 2

Effects arising during operation

Introduction

2.4.1 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 the SES2 and AP2 ES Volume 2, Community Area report: Hulseheath to Manchester Airport (MA06).

Avoidance and mitigation measures

2.4.2 The avoidance and mitigation measures are set out in the main ES Volume 2, Community Area report: Hulseheath to Manchester Airport (MA06).

Quantitative identification of impacts and effects

Ground-borne sound and vibration

2.4.3 The SES2 changes do not change the likely significant ground-borne sound and vibration effects identified in the main ES.

Airborne sound: direct impacts and effects

2.4.4 The direct effects from the operation of the SES2 scheme, as well as any new, amended or altered roads or railway lines identified as part of the SES2 scheme, are presented in Table 7

for residential receptors. There are no changes to the airborne noise effects at non-residential receptors compared to the main ES as a result of the SES2 scheme. Volume 5, Appendix: SV-001-00000 of the main ES, with the additional information in Table 3, provides an explanation of the information in Table 7. The changes are as a result of the update of traffic information since the main ES and SES1. The results should be considered in conjunction with the information contained in the main ES and the SES2 and AP2 ES Volume 5, Sound, noise and vibration Map Book: Map Series SV-02.

Table 7: MA06 Operational airborne sound, noise impacts and significant effects: residential receptors (SES2 scheme)

Assessment location		Impact criteria									Significance criteria								
Reference	Area represented	SES2 Scheme only (year 15)			Without SES2 Scheme (opening year baseline)			With SES2 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	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
612856	Shay Lane, Hale Barns	40	34	44/45	56	50	55	59	53	3	3	NA	11	R	T	H	-	-	-	MA06-O-C3[7]
612858	Shay Lane, Hale Barns	49	43	48/49	63	58	63	67	62	4	4	A	15	R	T	H	-	-	-	MA06-O-C3[7,8]
612859	Roaring Gate Lane, Ringway	46	40	48/50	70	63	68	72	66	3	3	A	1	R	T	H	-	-	-	MA06-O-C3[7]

[7] Significant effect as a result of indirect road traffic noise change on Shay Lane.

[8] Fewer than the 15 properties represented by this AL are considered likely to be adversely affected.

Airborne sound levels used by other topics

2.4.5 There is no change in the airborne sound levels used by other topics compared to the main ES or, where relevant, the AP1 ES.

Part 2: Additional Provision 2 Environmental Statement

Effects arising during operation

Introduction

2.4.6 The assessment is first reported 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.

Avoidance and mitigation measures

2.4.7 The avoidance and mitigation measures are set out in the main ES Volume 2, Community Area report: Hulseheath to Manchester Airport (MA06).

Quantitative identification of impacts and effects

Ground-borne sound and vibration

2.4.8 The AP2 amendments do not change the likely significant ground-borne sound and vibration effects identified in the main ES.

Airborne sound: direct impacts and effects

2.4.9 The direct effects from the operation of all new, amended or altered roads or railway lines, which are identified as part of the AP2 revised scheme and due to the amendments listed in Section 1.3, are presented in Table 8 for residential receptors and Table 9 for non-residential receptors. Volume 5: Appendix SV-001-00000 of the main ES, with the additional information in Table 3, provides an explanation of the information in Table 8 and Table 9.

2.4.10 The principal AP2 amendment responsible for the change in operational airborne noise effects at the specific assessment locations reported in the following tables is additional land permanently required to reconfigure M56 Junction 6 (AP2-006-014).

2.4.11 The results should be considered in conjunction with the information contained in the main ES and the SES2 and AP2 ES Volume 5, Sound, noise and vibration Map Book: Map Series SV-02.

Table 8: MA06 Operational airborne sound, noise impacts and significant effects: residential receptors (AP2 revised scheme)

Assessment location		Impact criteria									Significance criteria								
Reference	Area represented	AP2 Revised Scheme only (year 15)			Without AP2 Revised Scheme (opening year baseline)			With AP2 Revised 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	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
612731	Lower Thornsgreen Farm, Back Lane, Ashley	51	45	62/63	54	47	52	54	49	1	1	A	1	R	T	-	-	-	-	
612741	Sunbank Lane, Ringway	58	52	72/72	55	48	53	58	53	4	4	A	1	R	T	-	-	-	-	~
612749	Sunbank Lane, Ringway	56	50	60/61	54	47	52	57	50	3	3	A	4	R	T	-	-	-	-	~
612763	Rivershill Gardens, Hale Barns	60	54	59/60	62	55	60	61	55	-1	-1	A	25	R	T	H	-	-	-	
612765	Haslemere Avenue, Hale Barns	60	54	64/65	60	54	59	61	55	1	1	A	27	R	T	-	-	-	-	
612769	Ridge Avenue, Hale Barns	54	48	57/57	55	49	54	55	49	0	0	A	21	R	T	-	-	-	-	
612771	Warburton Drive, Hale Drive	55	49	53/54	58	52	57	56	50	-2	-2	A	18	R	T	-	-	-	-	
612773	Bankside, Hale Barns	53	47	53/54	55	49	54	53	47	-2	-2	A	22	R	T	-	-	-	-	

Assessment location		Impact criteria									Significance criteria								
Reference	Area represented	AP2 Revised Scheme only (year 15)			Without AP2 Revised Scheme (opening year baseline)			With AP2 Revised 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	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
612775	Dobb Hedge Close, Hale Barns	53	47	57/57	55	49	54	56	50	1	1	A	31	R	T	-	-	-	-	
612782	Warburton Close, Hale Barns	57	51	56/57	56	50	55	57	51	1	1	A	29	R	T	-	-	-	-	
612784	Carrwood, Hale Barns	47	41	57/57	49	43	48	50	44	1	1	A	39	R	T	-	-	-	-	
612788	Green Gate, Hale Barns	51	45	52/52	51	45	50	52	46	1	1	A	95	R	T	-	-	-	-	
612798	Marlfield Road, Hale Barns	53	47	53/53	52	46	51	54	48	2	2	A	53	R	T	-	-	-	-	
612799	Marlfield Road, Hale Barns	52	46	54/54	52	46	51	53	47	1	1	A	12	R	T	-	-	-	-	
612810	Green Gate, Hale Barns	48	42	48/49	50	44	49	51	45	1	1	A	70	R	T	-	-	-	-	
612811	Burnside, Hale Barns	55	49	58/58	56	50	55	58	51	1	1	A	17	R	T	-	-	-	-	
612817	Burnside, Hale Barns	49	43	56/57	51	45	50	52	46	1	1	A	19	R	T	-	-	-	-	

Assessment location		Impact criteria									Significance criteria								
Reference	Area represented	AP2 Revised Scheme only (year 15)			Without AP2 Revised Scheme (opening year baseline)			With AP2 Revised 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	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
612818	Warren Drive, Hale Barns	48	42	54/55	50	44	49	50	44	1	1	A	14	R	T	-	-	-	-	
612824	Hale Road, Hale Barns	60	54	61/62	58	52	57	60	54	2	2	A	14	R	T	-	-	-	-	
612832	Hasty Lane, Ringway	56	50	64/65	55	49	54	58	52	3	3	A	7	R	T	-	-	-	-	~
612836	Hasty Lane, Ringway	50	44	56/57	65	59	64	65	59	0	0	A	2	R	T	H	-	-	-	
612880	Hale Road, Hale Barns	58	52	65/65	55	48	53	59	53	5	5	A	1	R	T	-	-	-	-	~

Table 9: MA06 Operational airborne sound, noise impacts and significant effects: non-residential receptors (AP2 revised scheme)

Assessment location		Impact criteria									Significance criteria								
Reference	Area represented	AP2 Revised Scheme only (year 15)			Without AP2 Revised Scheme (opening year baseline)			With AP2 Revised 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	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
612800	World Cargo Centre (Lower Sensitivity Offices), Manchester Airport, Manchester	63	57	51/51	62	56	61	63	57	<1	<1	B	1	A4	T	H	-	-	-	$
612814	World Freight Terminal, Manchester Airport, Manchester	60	53	52/53	61	55	60	60	54	-1	-1	B	1	A4	T	H	-	-	-	$
612816	Manchester Airport Hotels, Runger Lane, Manchester and committed development (Map Book reference: MA06/073[9])	57	51	60/61	69	63	68	69	63	0	0	B	3	A3	T	H	-	-	-	$

[9] see SES2 and AP2 ES Volume 5, Planning Data/Committed Development Map Book.

Assessment location		Impact criteria									Significance criteria								
Reference	Area represented	AP2 Revised Scheme only (year 15)			Without AP2 Revised Scheme (opening year baseline)			With AP2 Revised 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	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
613205	Amazon UK Services Ltd, Manchester	60	54	52/52	60	54	59	61	55	1	1	B	1	A4	T	-	-	-	-	$
613219	The Hutt Group Icon (office and studio), Sunbank Lane	63	57	54/55	58	52	57	63	57	5	5	B	1	A4	T	-	-	-	-	<>

Airborne sound levels used by other topics

2.4.12 There is no change in the airborne sound levels used by other topics compared to the main ES or, where relevant, the AP1 ES.

2.5 Manchester Piccadilly Station (MA08)

Part 1: Supplementary Environmental Statement 2

Effects arising during operation

Introduction

2.5.1 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 the SES2 and AP2 ES Volume 2, Community Area report: Manchester Piccadilly Station (MA08).

Avoidance and mitigation measures

2.5.2 The avoidance and mitigation measures are set out in the main ES Volume 2, Community Area report: Manchester Piccadilly Station (MA08).

Quantitative identification of impacts and effects

Ground-borne sound and vibration

2.5.3 The SES2 changes do not change the likely significant ground-borne sound and vibration effects identified in the main ES.

Airborne sound: direct impacts and effects

2.5.4 The direct effects from the operation of the SES2 scheme, as well as any new, amended or altered roads or railway lines identified as part of the SES2 scheme, are presented in Table 10 for residential receptors. There are no changes to the airborne noise effects at non-residential receptors compared to the main ES as a result of the SES2 scheme. Volume 5, Appendix: SV-001-00000 of the main ES, with the additional information in Table 3, provides an explanation of the information in Table 10. The changes are as a result of the update of traffic information since the main ES and SES1. The results should be considered in conjunction with the information contained in the main ES and the SES2 and AP2 ES Volume 5, Sound, noise and vibration Map Book: Map Series SV-02.

Table 10: MA08 Operational airborne sound, noise impacts and significant effects: residential receptors (SES2 scheme)

Assessment location		Impact criteria										Significance criteria								
Reference	Area represented	AP2 Revised Scheme only (year 15)			Without AP2 Revised Scheme (opening year baseline)			With AP2 Revised 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	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
615287	Chapeltown Street, Manchester	53	48	60/63	56	52	63	57	53	1	1	A	47	R	T	-	-	-	-	
615311	Wharf Close, Manchester	41	36	50/52	61	55	60	58	52	-3	-3	NA	15	R	T	H	-	-	-	MA08-O-C2
615317	Thomas Telford Basin, Manchester	40	35	52/54	55	49	54	53	47	-2	-2	NA	8	R	T	-	-	-	-	
615319	Store Street, Manchester	40	35	49/51	62	56	61	60	54	-3	-3	NA	20	R	T	H	-	-	-	MA08-O-C2
615321	Thomas Telford Basin, Manchester	37	32	51/53	46	40	45	46	40	-1	-1	NA	10	R	T	-	-	-	-	
615324	Wharf Close, Manchester	43	38	52/54	51	45	50	47	42	-4	-3	NA	21	R	T	-	-	-	-	MA08-O-C2[10]
615329	Ducie Street, Manchester	41	36	53/55	49	43	48	45	39	-4	-4	NA	25	R	T	-	-	-	-	MA08-O-C2[10]

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

Assessment location		Impact criteria									Significance criteria								
Reference	Area represented	AP2 Revised Scheme only (year 15)			Without AP2 Revised Scheme (opening year baseline)			With AP2 Revised 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	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
616004	Store Street, Manchester	39	34	54/ 56	57	51	56	56	50	-2	-2	NA	374	R	T	-	-	-	-	
616900	Store Street, Manchester and committed development (Map Book ref.: MA08/361)	34	29	46/ 48	60	54	59	57	51	-3	-3	NA	66	CD -R	T	-	-	-	-	MA08-O-C2[10]

Airborne sound levels used by other topics

2.5.5 There is no change in the airborne sound levels used by other topics compared to the main ES or, where relevant, the AP2 ES.

Part 2: Additional Provision 2 Environmental Statement

Effects arising during operation

2.5.6 There are no changes in the ground-borne noise and vibration, or airborne noise effects compared to the main ES as a result of the AP2 revised scheme.

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