



High Speed Rail (West Midlands - Crewe)

Environmental Statement

Volume 5: Technical appendices

CA5: South Cheshire

Sound, noise and vibration report (SV-002-005)



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Department for Transport

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A report prepared for High Speed Two (HS2) Limited:

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1 Introduction

- 1.1.1 This document is part of the sound, noise and vibration Appendix to the sound, noise and vibration assessment.
- 1.1.2 The appendices are split into two sections:
- the first of these is a single document containing an introduction to the relevant route-wide methodology, assumptions and assessment (Volume 5: Appendix SV-001-000) and relates to the sound, noise and vibration assessment for all community areas (CA); and
 - the second is split across five documents, one per CA, and contains the detailed sound, noise and vibration levels for that CA.
- 1.1.3 This document relates to the South Cheshire community area (CA5), and contains the detailed baseline, construction and operational sound noise and vibration levels.
- 1.1.4 The outcomes of the sound, noise and vibration assessment are summarised in Volume 2: Community area reports.
- 1.1.5 Maps referred to throughout the sound, noise and vibration appendices are contained in the Volume 5: Sound, Noise and Vibration Map Book.

2 Scope, assumptions and limitations

2.1 Regional and local policy guidance

- 2.1.1 The policy framework for sound, noise and vibration is set out in Volume 1¹ and in Volume 5: Appendix SV-001-000. As part of the engagement with local authorities, where the Proposed Scheme would operate, information regarding any specific local planning guidance in respect of noise and vibration were requested. For the South Cheshire area the guidance within the Cheshire East Council (CEC) Local Plan, currently issued as a draft for consultation² has been considered as part of formulating the detailed application of the impact and significance criteria set out in Volume 5: Appendix SV-001-000, the Phase 2a Scope and Methodology Report (SMR) and the SMR Addendum³ (Section 6).

2.2 Engagement

- 2.2.1 Details of engagement on a route-wide basis with the local and county authorities' Environmental Health Practitioners is set out in Volume 1.
- 2.2.2 Meetings have been held with representatives of CEC⁴ regarding the approach which has been taken to baseline monitoring within this area, the identification of noise and vibration sensitive receptors, the selection of assessment locations and to discuss the development of the mitigation to be included in the Proposed Scheme.
- 2.2.3 Changes suggested during these meetings have influenced the assessment locations used and the monitoring undertaken and reported in this appendix. CEC officers were invited to attend baseline sound measurements in this area and witness the measurement procedures used.
- 2.2.4 Local engagement through the working draft Environmental Impact Assessment (EIA) Report consultation provided the opportunity for local stakeholders to suggest appropriate baseline sound monitoring locations, building uses and review of the draft list of non-residential properties to be considered in the assessment.

2.3 Methodology

- 2.3.1 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 SMR and the SMR Addendum. Further information is contained in Volume 5: Appendix SV-001-000.

2.4 Assumptions

- 2.4.1 Route-wide assumptions are outlined in Volume 1 (Section 8) and are further detailed in Volume 5: Appendix SV-001-000. Local assumptions that apply to the assessment

¹ See Environmental Statement Volume 1, Introduction to the Environmental Statement

² Cheshire East Council (2014), *Cheshire East local plan strategy*, http://www.cheshireeast.gov.uk/planning/spatial_planning/cheshire_east_local_plan/cheshire_east_local_plan.aspx.

³ Environmental Impact Assessment Scope and Methodology Report, Volume 5: Appendix CT-001-001 and Environmental Impact Assessment Scope and Methodology Report Addendum, Volume 5: Appendix CT-001-002

⁴ Meetings held on 22 April 2016, 5 July 2016 and 13 October 2016

of construction sound noise and vibration within this area are set out Volume 2, South Cheshire (CA Report 5), Section 13.

2.5 Limitations

- 2.5.1 The route-wide limitations and the approach adopted to ensure that they will not impact the robust assessment of sound, noise and vibration are presented in Volume 5: Appendix SV-001-000 and Volume 2.

3 Baseline

3.1 Existing acoustic environment

- 3.1.1 The area is predominantly a rural setting, becoming more urbanised towards Crewe. The sound environment is generally dominated by local and distant road traffic, with trains (on the West Coast Main Line (WCML)), overflying aircraft, local neighbourhood sources and natural sounds also contributing.
- 3.1.2 There are several busy main roads within this community area including Newcastle Road that runs through Hough, the A531 Newcastle Road and the A500 Shavington Bypass. The Stafford to Crewe railway line runs past Chorlton. Sound levels close to the WCML are high during the day, with little reduction at night. The daytime and night-time sound levels are lower at greater distances from the WCML and local roads.
- 3.1.3 The community of Wrinehill is characterised by sound from the A531 Main Road which runs through the town, where daytime sound levels are typically around 50dB daytime and 45dB night-time for those dwellings facing the A531 Newcastle Road.
- 3.1.4 The community of Blakenhall has low existing sound levels as it is removed from major roads. Existing sound levels are typically around 45dB during the daytime and 40dB during the night-time.
- 3.1.5 The community of Chorlton/Wynchwood Park is located approximately 150m east of the WCML which runs north to south past the community. Daytime sound levels at properties closest to the WCML are typically around 50dB daytime and 45dB night-time for those dwellings facing the railway. Within Chorlton/Wynchwood Park, sound from local roads and from the WCML produce levels around 40dB daytime and 35dB night-time.
- 3.1.6 The community of Weston is situated south of the A500 Shavington Bypass, north of the A531 east of the WCML and is therefore characterised by sound from these noise sources. Sound levels in Weston are typically around 50dB daytime and 40dB night-time.

3.2 Existing baseline sound monitoring locations

- 3.2.1 Baseline monitoring locations have been defined in order to provide representative sound levels at each assessment location within the study area. Baseline information has been gathered incrementally through successive rounds of field surveys focused on locations where likely significant effects are forecast.
- 3.2.2 Areas within the study area where baseline data is required have been divided into a series of smaller sub-areas. Each of these sub-areas is representative of clusters of receptors where the noise climate is influenced by the same sound sources. Within each of the sub-areas, a programme of unattended monitoring has been undertaken, supplemented by attended observations to ensure identification of the contributing sources to the sound climate at the measurement locations. All attended observations have been undertaken simultaneously with the unattended measurements to allow a direct comparison between assessment locations to be established.

- 3.2.3 Maps showing the baseline sound monitoring locations and assessment locations with this area are included in Map Series SV-03 and SV-04 (Volume 5: Sound, Noise and Vibration Map Book).

3.3 Existing baseline data collection methodology

- 3.3.1 The overall approach to baseline data collection for sound noise and vibration is described in Volume 5: Appendix SV-001-000. In summary, the approach to defining baseline levels includes a mixture of sound monitoring and – for major transport noise sources – sound modelling verified using results from sound monitoring.
- 3.3.2 Within the South Cheshire area, 14 locations have been defined to represent all sound and vibration sensitive receptors within the spatial scope of the assessment. The assessment locations are shown on the detailed maps in Map Series SV-03 and SV-04 (Volume 5: Sound, Noise and Vibration Map Book). These measurement locations have been classified as follows:
- six long-term measurements – unattended measurements of several days duration; and
 - eight medium-term measurements – attended measurements typically of 24 hours duration.

3.4 Existing baseline sound levels

- 3.4.1 From the measurements described in Section 3.1, baseline sound levels have been ascertained for each assessment location within this area. These levels are presented in terms of the following key sound indicators:
- baseline levels used for the operational sound assessment:
 - $L_{pAeq,16hr}$ weekday daytime (07:00-23:00) sound pressure level;
 - $L_{pAeq,8hr}$ weekday night-time (23:00-07:00) sound pressure level;
 - arithmetic average of $L_{pAFmax,5min}$ night-time sound pressure level; and
 - highest $L_{pAFmax,5min}$ night-time sound pressure level.
 - baseline levels used for the construction sound assessment:
 - daytime L_{pAeq} sound pressure level (Monday to Friday 07:00-19:00; Saturday 07:00-13:00);
 - evening/weekend L_{pAeq} sound pressure level (Monday to Friday 19:00-23:00, Saturday 13:00-23:00 and Sunday 07:00-23:00); and
 - night-time L_{pAeq} sound pressure level (Monday to Sunday 23:00-07:00).
- 3.4.2 These values are presented in Table 1. The data source coding included within this table details how the baseline sound levels allocated to each assessment location have been derived. This coding is summarised in Table 2 and explained in detail in Volume 5: Appendix SV-001-000. Codes contained within parentheses relate to the derivation of night-time baseline noise levels where they are different to the daytime derivation method.

Table 1: Existing baseline sound levels

Assessment location		Measurement location	Existing baseline sound levels (dB)							Data source coding
Ref	Area represented		For operational sound assessment				For construction sound assessment			
			Daytime L _{pAeq,16hr}	Night-time L _{pAeq,8hr}	Arithmetic average L _{pAFmax,5min}	Highest night-time L _{pAFmax,5min}	Daytime, L _{pAeq}	Evening / weekend, L _{pAeq}	Night-time, L _{pAeq}	
8406	Basford Hall, Basford	-	56	52	63	84	56	55	52	4, C, -, b
8515	Meridian Canal Fishery, Wynchwood Park, Chorlton	-	42	38	48	86	43	38	41	5, B, -, b
15005	Main Road, Wrinehill	-	51	44	45	56	53	47	44	5, C, -, c
15014	Checkley Lane, Wrinehill	-	48	43	60	85	50	45	43	5, C, -, c
15016	Den Lane, Wrinehill	-	50	38	52	70	51	41	38	3(5), C, -, c
15019	Checkley Lane, Wrinehill	ML164	56	45	60	85	56	56	45	2, A, i, a
15021	Den Lane, Wrinehill	-	46	39	52	70	48	42	39	5, C, -, c
15023	Checkley Lane, Wrinehill	ML164	49	38	60	85	49	49	38	2, B, ii, a
15024	Den Lane, Wrinehill	-	69	65	67	86	69	68	65	4, A, -, b
15026	Checkley Lane, Wrinehill	ML57	48	41	52	77	48	47	41	1, A, i, b
15027	The Grange Farm, Checkley	ML57	48	41	52	77	48	47	41	1, A, i, b
15028	Checkley Lane, Wrinehill	ML57	48	41	52	77	48	47	41	1, A, i, b
15029	Checkley Lane, Wrinehill	ML83	47	41	55	79	49	45	41	2, A, i, a
15031	Checkley Lane, Wrinehill	ML57	48	41	52	77	48	47	41	1, A, i, a
15033	Den Lane, Wrinehill	-	46	42	52	70	46	45	42	4, C, -, b
15035	Den Lane, Wrinehill	ML163	42	41	52	70	44	38	41	5(2), C(B), i, a

Assessment location		Measurement location	Existing baseline sound levels (dB)							Data source coding
Ref	Area represented		For operational sound assessment				For construction sound assessment			
			Daytime L _{pAeq,16hr}	Night-time L _{pAeq,8hr}	Arithmetic average L _{pAFmax,5min}	Highest night-time L _{pAFmax,5min}	Daytime, L _{pAeq}	Evening / weekend, L _{pAeq}	Night-time, L _{pAeq}	
15036	Den Lane, Wrinehill	-	55	52	60	79	55	54	52	4, C, -, b
15037	Checkley Lane, Checkley	ML57	48	41	52	77	48	47	41	1, A, ii, b
15040	Richmond Close, Weston	-	40	37	51	82	41	36	39	5, B, -, b
15042	Wychwood Park, Weston	-	40	37	51	82	42	37	40	5, B, -, b
15044	Checkley Lane, Checkley	ML57	48	41	52	77	48	47	41	1, A, ii, b
15045	Woodlands Drive, Weston	-	40	37	51	82	41	36	39	5, B, -, b
15046	Freshwater Drive, Weston	-	43	40	51	82	45	40	42	5, B, -, b
15047	Freshwater Drive, Weston	-	43	39	51	82	44	39	42	5, B, -, b
15049	Hampstead Drive, Weston	-	49	46	55	65	50	45	48	5, B, -, b
15050	Mill Lane, Blakenhall	ML18	48	42	54	72	49	38	42	3(2), C(A), ii, c
15051	Mill Lane, Blakenhall	ML18	44	42	54	72	41	44	42	2, A, ii, b
15052	Hampstead Drive, Weston	-	45	41	55	65	46	41	43	5, B, -, b
15054	Hampstead Drive, Weston	-	50	47	55	65	51	46	49	5, B, -, b
15055	Ashbourne Drive, Weston	-	42	38	51	82	43	38	41	5, B, -, b
15056	Main Road, Weston	ML161	48	40	55	65	49	40	40	3, C, iii, c
15057	Ashbourne Drive, Weston	-	42	38	51	82	43	38	41	5, B, -, b

Assessment location		Measurement location	Existing baseline sound levels (dB)							Data source coding
Ref	Area represented		For operational sound assessment				For construction sound assessment			
			Daytime L _{pAeq,16hr}	Night-time L _{pAeq,8hr}	Arithmetic average L _{pAFmax,5min}	Highest night-time L _{pAFmax,5min}	Daytime, L _{pAeq}	Evening / weekend, L _{pAeq}	Night-time, L _{pAeq}	
15058	Freshwater Drive, Weston	-	45	41	51	82	46	41	44	5, B, -, b
15060	Mill Lane, Blakenhall	ML18	44	42	54	72	41	44	42	2, A, i, a
15061	Ashbourne Drive, Weston	-	42	39	51	82	44	39	42	5, B, -, b
15064	Kendal Way, Chorlton	-	43	39	51	82	44	39	42	5, B, -, b
15065	Springwater Drive, Weston	-	43	40	51	82	45	40	42	5, B, -, b
15066	Abbeydale Close, Crewe	-	41	37	51	82	42	37	40	5, B, -, b
15067	Springwater Drive, Weston	-	43	40	51	82	45	40	42	5, B, -, b
15068	Abbeydale Close, Crewe	-	41	38	51	82	43	38	41	5, B, -, b
15069	Freshwater Drive, Weston	-	52	48	55	65	53	48	51	5, B, -, b
15070	Mill Lane, Blakenhall	ML18	44	42	54	72	41	44	42	2, A, i, a
15071	Springwater Drive, Weston	-	43	40	51	82	45	40	42	5, B, -, b
15072	Gonsley Green Farm, Blakenhall	-	45	42	53	73	45	44	42	4, C, -, b
15073	Springwater Drive, Weston	-	43	40	51	82	45	40	42	5, B, -, b
15074	Kendal Way, Chorlton	-	43	40	55	65	45	40	42	5, B, -, b
15076	Freshwater Drive, Weston	-	50	46	55	65	51	46	49	5, B, -, b
15077	Haverhill Close, Weston	-	50	43	51	82	51	46	46	5, B, -, b

Assessment location		Measurement location	Existing baseline sound levels (dB)							Data source coding
Ref	Area represented		For operational sound assessment				For construction sound assessment			
			Daytime L _{pAeq,16hr}	Night-time L _{pAeq,8hr}	Arithmetic average L _{pAFmax,5min}	Highest night-time L _{pAFmax,5min}	Daytime, L _{pAeq}	Evening / weekend, L _{pAeq}	Night-time, L _{pAeq}	
15079	Westwood Close, Weston	-	44	40	55	65	45	40	42	5, B, -, b
15081	Fairhaven, Weston	-	44	40	51	82	45	40	42	5, B, -, b
15082	Edenbridge Close, Weston	-	46	43	51	82	48	43	45	5, B, -, b
15083	Westwood Close, Weston	-	47	43	55	65	48	43	45	5, B, -, b
15084	Manor Farm, Blakenhall	ML18	44	42	54	72	41	44	42	2, A, ii, b
15085	Fairhaven, Weston	-	46	42	51	82	47	42	45	5, B, -, b
15086	St. Clements Court, Weston	-	52	48	55	65	53	48	51	5, B, -, b
15087	Chiltern Close, Weston	-	46	42	55	65	47	42	44	5, B, -, b
15088	Kingswood Avenue, Weston	-	50	44	51	82	51	46	47	5, B, -, b
15089	Mere Road, Weston	ML160	50	42	53	67	51	47	42	2, A, ii, c
15090	Henley Road, Weston	-	51	47	55	65	52	47	50	5, B, -, b
15091	2 Gonsley Cottage, Blakenhall	ML18	44	42	54	72	41	44	42	2, A, ii, b
15092	Mill Lane, Blakenhall	ML14	47	42	51	70	45	49	42	2, A, ii, b
15093	Henley Road, Weston	-	53	49	55	65	54	49	52	5, B, -, b
15095	Chiltern Close, Weston	-	51	47	55	65	52	47	50	5, B, -, b
15096	Spinney Drive, Weston	ML160	50	42	53	67	51	47	42	2, A, ii, c

Assessment location		Measurement location	Existing baseline sound levels (dB)							Data source coding
Ref	Area represented		For operational sound assessment				For construction sound assessment			
			Daytime L _{pAeq,16hr}	Night-time L _{pAeq,8hr}	Arithmetic average L _{pAFmax,5min}	Highest night-time L _{pAFmax,5min}	Daytime, L _{pAeq}	Evening / weekend, L _{pAeq}	Night-time, L _{pAeq}	
15097	Chorlton Lane, Chorlton	-	63	58	60	85	64	59	61	5, B, -, b
15098	Mill Lane, Blakenhall	ML14	47	42	51	70	45	49	42	2, A, i, a
15099	Fairview Avenue, Weston	ML160	50	42	53	67	51	47	42	2, A, ii, c
15100	Millbeck Close, Weston	ML160	50	42	53	67	51	47	42	2, A, ii, b
15101	Wesleyan Methodist Chapel, Chorlton	-	51	47	54	90	53	48	50	5, B, -, b
15102	Dairy Farm / 1&2 New Cottages, Chorlton Lane, Chorlton	-	53	49	54	87	53	52	49	4, C, -, b
15103	Chorlton Lane, Chorlton	-	59	55	60	85	61	56	57	5, B, -, b
15104	Newcastle Road, Chorlton	ML163	57	50	54	90	58	50	50	3(5), A, iii, c
15106	Chorlton Lane, Chorlton	-	45	42	54	87	45	44	42	4, C, -, b
15107	Half Moon Holding, Blakenhall	ML130	47	41	53	73	49	35	41	2, A, iii, b
15109	Weston Lane, Basford	-	52	45	53	67	53	46	45	3, A, -, b
15111	Newcastle Road, Chorlton	-	61	56	59	81	64	59	56	5, A, -, c
15112	Newcastle Road, Chorlton	-	67	62	63	84	67	66	62	4, A, -, b
15113	Newcastle Road, Chorlton	-	49	45	54	87	49	48	45	4, C, -, b
15114	Newcastle Road, Chorlton	-	66	61	63	84	66	65	61	4, A, -, b
15115	Weston Lane, Basford	ML159	53	47	53	78	55	49	47	5, A, i, c

Assessment location		Measurement location	Existing baseline sound levels (dB)							Data source coding
Ref	Area represented		For operational sound assessment				For construction sound assessment			
			Daytime L _{pAeq,16hr}	Night-time L _{pAeq,8hr}	Arithmetic average L _{pAFmax,5min}	Highest night-time L _{pAFmax,5min}	Daytime, L _{pAeq}	Evening / weekend, L _{pAeq}	Night-time, L _{pAeq}	
15117	Casey Lane, Basford	-	50	45	50	89	52	46	45	5, A, -, c
15118	Newcastle Road, Chorlton	-	56	48	52	70	57	48	48	3, A, -, c
15120	Weston Lane, Basford	ML909	50	39	50	89	49	49	39	1, A, i, a
15122	Weston Lane, Basford	ML909	48	39	50	89	50	44	39	5(1), C(A), i, b
15123	Cobbs Lane, Hough	ML700	42	35	54	87	42	41	35	1, BD, iii, c
15124	Back Lane, Shavington	ML41	47	42	53	73	47	46	42	1, A, iii, c
15125	Newcastle Road, Hough	ML76	58	50	55	65	59	49	50	3, A, iii, c
15126	Weston Lane, Basford	ML909	52	39	53	67	53	47	39	3, A, ii, c
15127	Larch Avenue, Basford	ML909	44	39	50	89	47	42	39	5(1), C(A), ii, b
15128	Larch Avenue, Basford	ML909	42	39	50	89	45	42	39	5(1), C(A), ii, b
15129	Cobbs Lane, Hough	ML76	51	46	51	82	53	50	46	2, A, iii, c
15130	Larch Avenue, Basford	ML909	42	39	50	89	44	39	39	5(1), C(A), ii, b
15131	Larch Avenue, Basford	ML909	43	39	50	89	44	39	39	5(1), C(A), ii, b
15132	Back Lane, Shavington	-	48	39	50	89	50	44	39	6, A, iii, c
15133	Newcastle Road, Hough	ML76	54	46	51	82	55	46	46	3, A, iii, c
15134	Cobbs Lane, Hough	ML76	52	44	51	82	53	44	44	3, A, iii, c

Assessment location		Measurement location	Existing baseline sound levels (dB)							Data source coding
Ref	Area represented		For operational sound assessment				For construction sound assessment			
			Daytime L _{pAeq,16hr}	Night-time L _{pAeq,8hr}	Arithmetic average L _{pAFmax,5min}	Highest night-time L _{pAFmax,5min}	Daytime, L _{pAeq}	Evening / weekend, L _{pAeq}	Night-time, L _{pAeq}	
15135	Cobbs Lane, Hough	ML700	42	35	54	87	42	41	35	1, BD, iii, c
15136	Westgate Park, Hough	ML700	42	35	51	82	42	41	35	1, BD, iii, c
15137	Kings Meadow, Hough	ML700	42	35	51	82	42	41	35	1, BD, iii, c
15138	Buck Lane, Hough	ML76	51	46	51	82	53	50	46	2, A, iii, c
15139	Weston Lane, Basford	-	55	45	53	67	56	49	45	3, A, -, c
15140	Hough Methodist Church	ML700	42	35	51	82	42	41	35	1, BD, iii, c
15141	Ridley Close, Hough	ML700	42	35	51	82	42	41	35	1, BD, iii, c
15142	Hough Village Hall, Hough	ML700	42	35	51	82	42	41	35	1, BD, iii, c
15143	Cobbs Lane, Hough	ML700	42	35	51	82	42	41	35	1, BD, iii, c
15144	Holly Mount, Shavington	-	55	45	53	67	56	48	45	3, A, -, c
15145	Weston Lane, Shavington	-	52	44	53	67	53	46	44	3, A, -, c
15146	Weston Lane, Shavington	-	56	47	53	67	57	50	47	3, A, -, c
15174	Basford Bridge Cottage, Chorlton	-	64	57	59	81	65	56	57	3(5), A(C), -, c
15180	Weston Lane, Basford (CD Ref.: 14/0256N)	-	58	53	63	84	61	58	53	5(4), C, -, b
15185	Checkley Lane, Checkley	ML57	48	41	52	77	48	47	41	1, A, ii, c
15186	Birch Lane, Hough	-	40	36	48	86	43	39	36	5(4), C, -, c

Assessment location		Measurement location	Existing baseline sound levels (dB)							Data source coding
Ref	Area represented		For operational sound assessment				For construction sound assessment			
			Daytime L _{pAeq,16hr}	Night-time L _{pAeq,8hr}	Arithmetic average L _{pAFmax,5min}	Highest night-time L _{pAFmax,5min}	Daytime, L _{pAeq}	Evening / weekend, L _{pAeq}	Night-time, L _{pAeq}	
15187	Fairview Avenue, Weston	-	42	37	53	67	43	38	37	5, C, -, c
15188	Mill Lane, Blakenhall	ML18	44	42	54	72	41	44	42	2, A, ii, b
15190	Cobbs Lane, Hough	ML700	42	35	51	82	42	41	35	1, BD, iii, c
15191	Newcastle Road, Crewe	-	59	52	53	78	60	52	52	3(5), A, -, c
15193	Committed Development CD/10/4029N	ML18	44	42	54	72	41	44	42	2, A, i, a

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Table 2: Data source coding key

Code	Data source type
1	Long-term measurement location (c. 7 days)
2	Short-term (c. 24 hours)
3	Specific road traffic validated prediction
4	Specific rail traffic validated prediction
5	Specific combined road and rail traffic validated prediction
6	Levels adopted from nearby assessment location
Code	Corrections applied
A	Data from above source applied directly
B	Correction applied for distance from source
C	Correction applied for downwind conditions
D	Minimum level cut-off applied
Code	Distance from measurement
i	Data applied from a measurement at or very close to the assessment location
ii	Data applied from a local measurement location at a greater distance but noted to have equivalent acoustic climate
iii	Data applied from a distant measurement location where sound levels would be expected to be similar
Code	Uncertainty
a	Data are considered highly representative of the prevailing sound climate
b	Data are considered representative of the prevailing sound climate, but uncertainties and/or variations in measured levels indicate that there may be a higher degree of uncertainty than for (a)
c	Data are considered to be an estimate of the sound climate due to assumptions made

3.5 Future baseline methodology

Construction

- 3.5.1 The assessment of noise from construction activities assumes a future baseline year of 2020. As a conservative assumption it has been assumed that no change in baseline sound levels will occur between the existing baseline (2016) and the future baseline year of 2020.

Operation

- 3.5.2 Future baseline sound levels for operation (2027) have been calculated to account for changes in baseline sound sources between the date of the existing baseline sound levels and 2027. Changes in existing sound sources between 2016 and 2027 may result in changes to baseline sound levels.

3.5.3 For major transportation sources, data for existing and future baseline operations have been reviewed. Where changes may occur between the existing baseline and future baseline (2027) situations which may influence the assessment of likely significant effects, expected changes in baseline sound levels have been derived. For example, expected changes in traffic flow, composition and speed have been used to calculate changes in sound emission from roads using the methodology from the Calculation of Road Traffic Noise⁵.

3.5.4 The changes to major sound sources which have been identified in this area are summarised in Table 3.

Table 3: 2027 future baseline sound levels

Sound source affected	Cause of change in levels	Change in sound levels (existing baseline to 2027 future baseline (dB))	
		Daytime, $L_{pAeq,16hr}$	Night-time, $L_{pAeq,8hr}$
A500 Shavington Bypass	Increased traffic flow	1.6	1.2

⁵ DoT memorandum, Calculation of road traffic noise, 1988

4 Construction

4.1 Evaluation of impacts and effects

- 4.1.1 This appendix provides a quantitative assessment of construction noise and vibration impacts/effects and a qualitative assessment of likely significant effects, based on the impacts/effects identified and other local context information consistent with the scope and methodology defined for the Proposed Scheme.
- 4.1.2 Indirect effects arising from temporary changes in traffic patterns on the existing road network as a consequence of constructing the Proposed Scheme are reported, where they are likely to occur within the study area as defined in Volume 5: Appendix SV-001-000.
- 4.1.3 In undertaking the assessment of sound, noise and vibration, consistent with the EIA Directive⁶ and National Planning Practice Guidance⁷ a differentiation between impacts and effects, adverse effects and significant effects is made. Further information is provided in Volume 5: Appendix SV-001-000.
- 4.1.4 The assessment of impacts and effects has been undertaken at assessment locations that are representative of a number of dwellings or other sensitive receptors. The construction assessment locations employed in this assessment are presented on Map Series SV-03 (Volume 5: Sound, Noise and Vibration Map Book).
- 4.1.5 Baseline sound level data has been collected at locations representative of the airborne sound-sensitive receptors and presented in Table 1, and corrected where applicable using the values in Table 3.

4.2 Effects during construction

Introduction

- 4.2.1 The assessment is reported first for ground-borne 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 is presented in Volume 2, South Cheshire (CA Report 5), Section 13.
- 4.2.2 The structure of this section of the assessment report is:
- avoidance and mitigation measures; and
 - quantitative identification of impact and effects:
 - ground-borne sound and vibration:
 - residential; and
 - non-residential.

⁶ European Commission (2014), EC Directive 85/337/EEC, as amended by 97/11/EC, 2003/35/EC, 2011/92/EC and 2014/52/EU ('the EIA Directive')

⁷ National Planning Practice Guidance – Noise, <http://planningguidance.planningportal.gov.uk>; refer to the table summarising noise exposure hierarchy

- Airborne sound:
 - residential; and
 - non-residential.

Avoidance and mitigation measures

4.2.3 These are set out in, Volume 2, South Cheshire (CA5 Report 5), Section 13.






Quantitative identification of impacts and effects

Ground-borne vibration

4.2.4 Assessment locations defined for the quantitative assessment of impacts are shown on Map Series SV-03 (Volume 5: Sound, Noise and Vibration Map Book).

4.2.5 For each assessment location, the assessment results for residential and non-residential receptors are presented in Table 5. Explanation of the information in Table 5, Table 6 and Table 7 is provided in Volume 5: Appendix SV-001-000, with the following additional notes in Table 4.

Table 4: Explanatory notes for assessment results – direct construction effects

Symbol	Explanation
	Where the significant effect column is highlighted, then a significant effect is identified at the referenced community, or individual receptor
	Yellow denotes a low ground-borne noise impact or a minor ground-borne vibration impact
	Orange denotes a medium ground-borne noise impact or a moderate ground-borne vibration impact
	Red denotes a high ground-borne noise impact or a major ground-borne vibration impact
	Dark red denotes a very high ground-borne noise impact
*	Significant effect – the quantitative impact methodology has identified an impact at this receptor which, based upon further qualitative receptor information, (see assessment text) does not give rise to a significant effect
~	When considered under the significance criteria set out in Volume 5: Appendix SV-001-000, Annex A, Section 1.3, these adverse effects are not considered to be significant on a community basis
A	Sound levels from HS2 exceed Lowest Observed Adverse Effect Level (LOAEL): the significance criteria set out in Volume 5: Appendix SV-001-000, Annex A, Section 1.3 are considered when establishing significant effects
S	Sound levels from HS2 exceed Significant Observed Adverse Effect Level (SOAEL): noise insulation (or temporary rehousing at higher noise levels) therefore provided
NA	Sound levels from HS2 do not exceed Lowest Observed Adverse Effect Level (LOAEL), therefore generally no adverse effect
B	Type of receptor – residential
R	Type of receptor – residential
G1 – G5	Type of receptor - (G1) theatres, large auditoria and concert halls, (G2) sound recording and broadcast studios, (G3) places of meeting for religious worship, courts, cinemas, lecture theatres, museums and small auditoria or halls, (G4) schools, colleges, hospitals, hotels and libraries, and (G5) offices and general commercial premises

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Symbol	Explanation
V1-V4	Type of receptor – (V1) vibration sensitive research and manufacturing, hospital, and university equipment, (V2) hotels, hospital wards and education dormitories, (V3) offices, schools and places of worship, (V4) workshops
T	Receptor design – typical
S	Receptor design - special
H	Existing environment – high existing ambient noise levels, day >75 dB, evening >65 dB or night >55 dB L_{pAeq} at the facade
L	Existing environment – low existing ambient noise levels, day and evening ≤ 45 dB, or night ≤ 35 dB L_{pAeq} at the facade
D,E,N	Impact duration (months) – duration of impact during the day (D), evening (E) or night (N)
O, CT, V	Combined Impact: If impacts from other construction activities occur at this location: Onsite activities (O), off-site construction traffic activities (CT), or construction Vibration (V)
NI	Mitigation effect - identified as likely to qualify for noise insulation under the Draft Code of Construction Practice (CoCP) ⁸
TR	Mitigation effect - identified as likely to qualify for temporary rehousing under the Draft CoCP

⁸ Draft Code of Construction Practice, Volume 5: Appendix CT-003-000

Table 5: Assessment of construction induced ground-borne vibration at residential and non-residential receptors

Assessment location		Impact criteria				Significance criteria										Significant effect
Ref.	Area represented	Peak particle velocity (PPV) [mm/s] on foundation	Typical/highest monthly indoor vibration dose value (VDV) [m/s ^{1.75}]		Construction activity resulting in highest forecast vibration levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing	Unique feature	Combined impact	Impact duration [m]	Mitigation effect		
			Day 0700-2300	Night 2300-0700												
15023	Checkley Lane, Wrinehill	0.2	0.19/0.25	-	Piling	NA	1	R	T	-	-	-	Up to 3	-	~	
15026	Checkley Lane, Wrinehill	1	0.03/<0.8	-	Road construction	A	1	R	T	-	-	-	1	-	~	
15036	Den Lane, Wrinehill	0.4	0.38/0.47	-	Piling	A	1	R	T	-	-	-	1	-	~	
15050	Mill Lane, Blakenhall	0.6	0.02/0.4	-	Road construction	A	6	R	T	-	-	-	0.75	-		
15097	Chorlton Lane, Chorlton	>3	0.01/<0.8 ⁹	-	Road construction	A	1	R	T	-	-	-	1	-	~	
15102	Chorlton Lane, Chorlton	0.3	0.02/0.2	-	Underground utility diversion	NA	3	R	T	-	-	-	0.2	-	¹⁰	
15103	Chorlton Lane, Chorlton	0.3	0.08/0.2	-	Retaining wall construction	NA	1	R	T	-	-	-	1	-	~	
15113	Newcastle Road, Chorlton	0.5	0.28/0.6	-	Piling	A	1	R	T	-	-	-	Up to 2	-	~	
15114	Newcastle Road, Chorlton	0.2	0.06/0.1	-	Underground utility diversion	NA	1	R	T	-	-	-	-	-		
15115	Weston Lane, Basford	0.6	0.02/0.4	-	Road construction	A	2	R	T	-	-	-	1	-	~	

⁹ Construction methods will be selected to ensure that the on a monthly basis the significant adverse effect level is not exceeded

¹⁰ Impacts with durations of less than 1 month are not generally considered significant

Assessment location		Impact criteria			Significance criteria										Significant effect
Ref.	Area represented	Peak particle velocity (PPV) [mm/s] on foundation	Typical/highest monthly indoor vibration dose value (VDV) [m/s ^{1.75}]		Construction activity resulting in highest forecast vibration levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing	Unique feature	Combined impact	Impact duration [m]	Mitigation effect	
			Day 0700-2300	Night 2300-0700											
15117	Casey Lane, Basford	0.4	0.06/0.3	-	Site set-up/takedown	A	8	R	T	-	-	-	1	-	~
15125	Newcastle Road, Hough	2.2	0.01/<0.8	-	Road construction	A	2	R	T	-	-	-	1	-	~

Airborne sound: direct impacts and effects

- 4.2.6 Activities associated with the construction phases of the Proposed Scheme will generate airborne noise. The assessment of the likely impacts and significant effects as a result of the construction noise has considered the effects on:
- residential receptors, both as individual dwellings and communities; and
 - non-residential receptors, including quiet areas.
- 4.2.7 For each type of receptor, subject to the screening distances identified, and based upon supplied plant information from engineers, the typical and highest monthly $L_{Aeq,T}$ noise levels from construction activities have been calculated at the façade of all assessment locations, which are representative of a number of receptors in the study area.
- 4.2.8 The assessment results, impact criteria and significance criteria for the assessment of the scheme at residential and non-residential receptors are presented in Table 6 and Table 7 respectively.
- 4.2.9 Explanation of the information within Table 6 and Table 7 is provided in Volume 5: Appendix SV-001-000, with the additional notes presented in Table 4.

Table 6: Assessment of construction noise at residential receptors

Assessment location		Impact criteria			Significance criteria										Significant effect
Ref	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the facade [Assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
15005	Main Road, Wrinehill	47/51 [A]	-	-	Day: On-site traffic	NA	8	R	T	-	-	-	-	-	
15014	Checkley Lane, Wrinehill	48/52 [A]	-	-	Day: On-site traffic	NA	13	R	T	-	-	-	-	-	
15016	Den Lane, Wrinehill	49/53 [A]	-	-	Day: Borrow pit excavation	NA	14	R	T	-	-	-	-	-	
15019	Checkley Lane, Wrinehill	53/56 [A]	-	-	Day: Earthworks	NA	1	R	T	-	-	-	-	-	
15021	Den Lane, Wrinehill	51/54 [A]	-	-	Day: Borrow pit excavation	NA	8	R	T	-	-	-	-	-	
15023	Checkley Lane, Wrinehill	58/62 [A]	-	-	Day: Earthworks	NA	1	R	T	-	-	-	-	-	
15024	Den Lane, Wrinehill	61/64 [C]	-	-	Day: Demolitions	NA	5	R	T	-	-	-	-	-	
15026	Checkley Lane, Wrinehill	67/74 [A]	-	-	Day: Earthworks	A	1	R	T	-	-	D4	-	-	~
15028	Checkley Lane, Wrinehill	60/66 [A]	-	-	Day: Earthworks	A	3	R	T	-	-	D2	-	-	~
15029	Checkley Lane, Wrinehill	53/58 [A]	-	-	Day: Earthworks	NA	3	R	T	-	-	-	-	-	
15031	Checkley Lane, Wrinehill	53/59 [A]	-	-	Day: Earthworks	NA	1	R	T	-	-	-	-	-	
15033	Den Lane, Wrinehill	63/67 [A]	-	-	Day: Earthworks	A	1	R	T	-	-	D9	-	-	CSV05-C01
15035	Den Lane, Wrinehill	66/71 [A]	-	-	Day: Demolition of bridge	A	5	R	T	-	-	D19	-	-	CSV05-C01
15036	Den Lane, Wrinehill	68/74 [A]	-	-	Day: Earthworks	A	1	R	T	-	-	D16	-	-	~

Assessment location		Impact criteria			Significance criteria										
Ref	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the facade [Assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	Significant effect
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
15037	Checkley Lane, Checkley	50/55 [A]	-	-	Day: Earthworks	NA	1	R	T	-	-	-	-	-	
15040	Richmond Close, Wynchwood Park, Weston	49/55 [A]	-	-	Day: On-site traffic	NA	13	R	T	-	-	-	-	-	
15042	Wychwood Park, Weston	52/56 [A]	-	-	Day: Demolition of bridge	NA	12	R	T	-	-	-	-	-	
15044	Checkley Lane, Checkley	50/54 [A]	-	-	Day: Earthworks	NA	11	R	T	-	-	-	-	-	
15045	Woodlands Drive, Wynchwood Park, Weston	49/55 [A]	-	-	Day: Demolition of bridge	NA	16	R	T	-	-	-	-	-	
15046	Freshwater Drive, Wynchwood Park, Weston	52/56 [A]	-	-	Day: Demolition of bridge	NA	7	R	T	-	-	-	-	-	
15047	Freshwater Drive, Wynchwood Park, Weston	50/55 [A]	-	-	Day: On-site traffic	NA	12	R	T	-	-	-	-	-	
15049	Hampstead Drive, Wynchwood Park, Weston	60/63 [A]	-	-	Day: Vegetation clearance	NA	4	R	T	-	-	-	-	-	
15050	Mill Lane, Blakenhall	64/68 [A]	-	-	Day: On-site traffic	A	6	R	T	-	-	D16	-	-	CSV05-Co2
15051	Mill Lane, Blakenhall	62/67 [A]	-	-	Day: On-site traffic	A	6	R	T	-	-	D12	-	-	CSV05-Co2
15052	Hampstead Drive, Wynchwood Park, Weston	51/56 [A]	-	-	Day: On-site traffic	NA	13	R	T	-	-	-	-	-	

Assessment location		Impact criteria			Significance criteria										Significant effect
Ref	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the facade [Assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
15054	Hampstead Drive, Wynchwood Park, Weston	61/65 [A]	-	-	Day: Vegetation clearance	NA	9	R	T	-	-	-	-	-	
15055	Ashbourne Drive, Wynchwood Park, Weston	49/54 [A]	-	-	Day: On- site traffic	NA	8	R	T	-	-	-	-	-	
15056	Main Road, Weston	51/57 [A]	-	-	Day: Vegetation clearance	NA	3	R	T	-	-	-	-	-	
15057	Ashbourne Drive, Wynchwood Park, Weston	50/56 [A]	-	-	Day: On- site traffic	NA	13	R	T	-	-	-	-	-	
15058	Freshwater Drive, Wynchwood Park, Weston	53/58 [A]	-	-	Day: On- site traffic	NA	9	R	T	-	-	-	-	-	
15060	Mill Lane, Blakenhall	59/65 [A]	-	-	Day: Earthworks	NA	2	R	T	-	-	-	-	-	
15061	Ashbourne Drive, Wynchwood Park, Weston	51/57 [A]	-	-	Day: On- site traffic	NA	15	R	T	-	-	-	-	-	
15064	Kendal Way, Chorlton	50/56 [A]	-	-	Day: On- site traffic	NA	11	R	T	-	-	-	-	-	
15065	Springwater Drive, Wynchwood Park, Weston	52/57 [A]	-	-	Day: On- site traffic	NA	22	R	T	-	-	-	-	-	
15066	Abbeyle Close, Crewe	47/53 [A]	-	-	Day: On- site traffic	NA	10	R	T	-	-	-	-	-	
15067	Springwater Drive, Wynchwood Park, Weston	52/58 [A]	-	-	Day: On- site traffic	NA	7	R	T	-	-	-	-	-	

Assessment location		Impact criteria			Significance criteria										Significant effect
Ref	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the facade [Assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
15068	Abbeydale Close, Crewe	50/56 [A]	-	-	Day: On- site traffic	NA	8	R	T	-	-	-	-	-	
15069	Freshwater Drive, Wynchwood Park, Weston	64/67 [A]	-	-	Day: Earthworks	A	7	R	T	-	-	D12	-	-	CSV05-Co4
15070	Mill Lane, Blakenhall	58/63 [A]	-	-	Day: Earthworks	NA	4	R	T	-	-	-	-	-	
15071	Springwater Drive, Wynchwood Park, Weston	52/57 [A]	-	-	Day: On- site traffic	NA	5	R	T	-	-	-	-	-	
15072	Gonsley Green Farm, Blakenhall	70/76 [A]	-	-	Day: On- site traffic	S	3	R	T	-	-	D28	-	NI	CSV05-Co2
15073	Springwater Drive, Wynchwood Park, Weston	52/58 [A]	-	-	Day: On- site traffic	NA	5	R	T	-	-	-	-	-	
15074	Kendal Way, Chorlton	52/57 [A]	-	-	Day: On- site traffic	NA	11	R	T	-	-	-	-	-	
15076	Freshwater Drive, Wynchwood Park, Weston	59/63 [A]	-	-	Day: Vegetation clearance	NA	6	R	T	-	-	-	-	-	
15077	Haverhill Close, Wynchwood Park, Weston	53/58 [A]	-	-	Day: Demolition of bridge	NA	9	R	T	-	-	-	-	-	
15079	Westwood Close, Wynchwood Park, Weston	50/55 [A]	-	-	Day: On- site traffic	NA	4	R	T	-	-	-	-	-	
15081	Fairhaven, Wynchwood Park, Weston	49/55 [A]	-	-	Day: On- site traffic	NA	4	R	T	-	-	-	-	-	

Assessment location		Impact criteria			Significance criteria										Significant effect
Ref	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the facade [Assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
15082	Edenbridge Close, Wynchwood Park, Weston	55/60 [A]	-	-	Day: Demolition of bridge	NA	21	R	T	-	-	-	-	-	
15083	Westwood Close, Wynchwood Park, Weston	54/59 [A]	-	-	Day: On- site traffic	NA	6	R	T	-	-	-	-	-	
15084	Manor Farm, Blakenhall	58/62 [A]	-	-	Day: Earthworks	NA	1	R	T	-	-	-	-	-	
15085	Fairhaven, Wynchwood Park, Weston	54/59 [A]	-	-	Day: On- site traffic	NA	11	R	T	-	-	-	-	-	
15086	St. Clements Court, Chorlton, Weston	61/66 [A]	-	-	Day: Earthworks	NA	18	R	T	-	-	D3	-	-	CSV05-Co4
15087	Chiltern Close, Wynchwood Park, Weston	53/58 [A]	-	-	Day: On- site traffic	NA	16	R	T	-	-	-	-	-	
15088	Kingswood Avenue, Wynchwood Park, Weston	55/59 [A]	-	-	Day: Demolition of bridge	NA	20	R	T	-	-	-	-	-	
15089	Mere Road, Weston	49/52 [A]	-	-	Day: Demolition of bridge	NA	67	R	T	-	-	-	-	-	
15090	Henley Road, Wynchwood Park, Weston	59/63 [A]	-	-	Day: Earthworks	NA	6	R	T	-	-	-	-	-	
15091	2 Gonsley Cottage, Blakenhall	58/63 [A]	-	-	Day: Earthworks	NA	2	R	T	-	-	-	-	-	
15092	Mill Lane, Blakenhall	54/59 [A]	-	-	Day: Earthworks	NA	2	R	T	-	-	-	-	-	

Assessment location		Impact criteria			Significance criteria										Significant effect
Ref	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the facade [Assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
15093	Henley Road, Wynchwood Park, Weston	62/66 [A]	-	-	Day: Earthworks	A	5	R	T	-	-	D3	-	-	CSV05-Co4
15095	Chiltern Close, Wynchwood Park, Weston	66/68 [A]	-	-	Day: Earthworks	A	3	R	T	-	-	D16	-	-	CSV05-Co4
15096	Spinney Drive, Weston	48/52 [A]	-	-	Day: Demolition of bridge	NA	32	R	T	-	-	-	-	-	
15097	Chorlton Lane, Chorlton	67/71 [B]	-	-	Day: Haul road setup	A	1	R	T	-	-	D5	-	-	CSV05-Co4
15098	Mill Lane, Blakenhall	54/58 [A]	-	-	Day: Earthworks	NA	5	R	T	-	-	-	-	-	
15099	Fairview Avenue, Weston	54/56 [A]	-	-	Day: Demolition of bridge	NA	57	R	T	-	-	-	-	-	
15100	Millbeck Close, Weston	52/55 [A]	-	-	Day: Demolition of bridge	NA	64	R	T	-	-	-	-	-	
15102	Dairy Farm / 1&2 New Cottages, Chorlton Lane, Chorlton	73/79 [A]	-	-	Day: On- site traffic	S	3	R	T	-	-	D37	-	NI	CSV05-Co3
15103	Chorlton Lane, Chorlton	59/64 [A]	-	-	Day: Haul road setup	NA	1	R	T	-	-	-	-	-	
15104	Newcastle Road, Chorlton	61/64 [A]	-	-	Day: Vegetation clearance	NA	1	R	T	-	-	-	-	-	
15106	Chorlton Lane, Chorlton	62/67 [A]	-	-	Day: On- site traffic	A	6	R	T	-	-	D5	-	-	CSV05-Co3
15107	Half Moon Holding, Blakenhall	57/61 [A]	-	-	Day: Earthworks	NA	3	R	T	-	-	-	-	-	
15109	Weston Lane, Basford	46/51 [A]	-	-	Day: On- site traffic	NA	1	R	T	-	-	-	-	-	

Assessment location		Impact criteria			Significance criteria										Significant effect
Ref	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade [Assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
15111	Newcastle Road, Chorlton	66/72 [B]	-	-	Day: Demolition of bridge	A	2	R	T	-	-	D2	-	-	CSV05-C05
15112	Newcastle Road, Chorlton	63/69 [C]	-	-	Day: Demolition of bridge	NA	1	R	T	-	-	-	-	-	
15113	Newcastle Road, Chorlton	66/71 [A]	-	-	Day: On- site traffic	A	1	R	T	-	-	D21	-	-	CSV05-C05
15114	Newcastle Road, Chorlton	70/73 [C]	-	-	Day: Demolition of bridge	NA	1	R	T	-	-	-	-	-	
15115	Weston Lane, Basford	58/63 [A]	-	-	Day: Demolition of bridge	NA	2	R	T	-	-	-	-	-	
15117	Casey Lane, Basford	65/68 [A]	-	-	Day: Demolition of bridge	A	8	R	T	-	-	D24	-	-	CSV05-C05
15118	Newcastle Road, Chorlton	64/69 [A]	-	-	Day: Underground utility diversion	A	1	R	T	-	-	D26	-	-	CSV05-C05
15120	Weston Lane, Basford	44/51 [A]	-	-	Day: Track laying	NA	1	R	T	-	-	-	-	-	
15122	Weston Lane, Basford	50/55 [A]	-	-	Day: Demolition of bridge	NA	1	R	T	-	-	-	-	-	
15123	Cobbs Lane, Hough	53/57 [A]	-	-	Day: Demolition of bridge	NA	3	R	T	-	-	-	-	-	
15124	Back Lane, Shavington	55/58 [A]	-	-	Day: Demolition of bridge	NA	1	R	T	-	-	-	-	-	
15125	Newcastle Road, Hough	70/74 [A]	-	-	Day: Underground utility diversion	A	2	R	T	-	-	D30	-	-	~
15126	Weston Lane, Basford	53/57 [A]	-	-	Day: Demolition of bridge	NA	12	R	T	-	-	-	-	-	
15127	Larch Avenue, Basford	52/55 [A]	-	-	Day: Demolition of bridge	NA	6	R	T	-	-	-	-	-	

Assessment location		Impact criteria			Significance criteria										Significant effect
Ref	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade [Assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
15128	Larch Avenue, Basford	51/55 [A]	-	-	Day: Demolition of bridge	NA	9	R	T	-	-	-	-	-	
15129	Cobbs Lane, Hough	56/60 [A]	-	-	Day: Underground utility diversion	NA	9	R	T	-	-	-	-	-	
15130	Larch Avenue, Basford	48/54 [A]	-	-	Day: Demolition of bridge	NA	6	R	T	-	-	-	-	-	
15131	Larch Avenue, Basford	48/55 [A]	-	-	Day: Underground utility diversion	NA	9	R	T	-	-	-	-	-	
15132	Back Lane, Shavington	57/61 [A]	-	-	Day: Demolition of bridge	NA	3	R	T	-	-	-	-	-	
15133	Newcastle Road, Hough	60/64 [A]	-	-	Day: Underground utility diversion	A	16	R	T	-	-	-	-	-	
15134	Cobbs Lane, Hough	59/63 [A]	-	-	Day: Underground utility diversion	A	11	R	T	-	-	-	-	-	
15135	Cobbs Lane, Hough	52/57 [A]	-	-	Day: Demolition of bridge	NA	13	R	T	-	-	-	-	-	
15136	Westgate Park, Hough	53/57 [A]	-	-	Day: Demolition of bridge	NA	25	R	T	-	-	-	-	-	
15137	Kings Meadow, Hough	52/56 [A]	-	-	Day: Demolition of bridge	NA	11	R	T	-	-	-	-	-	
15138	Buck Lane, Hough	61/65 [A]	-	-	Day: Underground utility diversion	NA	4	R	T	-	-	-	-	-	
15139	Weston Lane, Basford	52/55 [A]	-	-	Day: Demolition of bridge	NA	8	R	T	-	-	-	-	-	

Assessment location		Impact criteria			Significance criteria										Significant effect
Ref	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the facade [Assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
15141	Ridley Close, Hough	50/54 [A]	-	-	Day: On-site traffic	NA	80	R	T	-	-	-	-	-	
15143	Cobbs Lane, Hough	48/54 [A]	-	-	Day: On-site traffic	NA	158	R	T	-	-	-	-	-	
15144	Holly Mount, Shavington	52/55 [A]	-	-	Day: Demolition of bridge	NA	15	R	T	-	-	-	-	-	
15145	Weston Lane, Shavington	46/50 [A]	-	-	Day: Underground utility diversion	NA	21	R	T	-	-	-	-	-	
15146	Weston Lane, Shavington	49/54 [A]	-	-	Day: Demolition of bridge	NA	8	R	T	-	-	-	-	-	
15174	Basford Bridge Cottage, Chorlton	60/67 [C]	-	-	Day: Demolition of bridge	NA	1	R	T	-	-	-	-	-	
15180	Weston Lane, Basford (CD Ref.: 14/0256N)	43/50 [B]	-	-	Day: Track laying	NA	2	CD-R	T	-	-	-	-	-	
15190	Cobbs Lane, Hough	47/53 [A]	-	-	Day: On-site traffic	NA	1	R	T	-	-	-	-	-	
15191	Newcastle Road, Crewe	60/66 [A]	-	-	Day: On-site traffic	NA	9	R	T	-	-	D12	-	-	CSV05-C05
15193	Committed Development CD/10/4029N	49/53	-	-	Day: On-site traffic	NA	9	R	T	-	-	-	-	-	

Table 7: Assessment of construction noise at non-residential receptors

Assessment location		Impact criteria				Significance criteria										
Ref	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade [Assessment category A/B/C]		Change		Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	Significant effect
		Day 0700-1900	Night 2300-0700	Day 0700-1900	Night 2300-0700											
15101(N)	Wesleyan Methodist Chapel, Chorlton	57/63	-	8	-	Day: Demolition of bridge	B	1	G3	T	-	-	-	-	-	*
15140(N)	Hough Methodist Church, Hough	48/53	-	9	-	Day: On-site traffic	B	1	G3	T	-	-	-	-	-	
15142(N)	Hough Village Hall, Hough	47/53	-	9	-	Day: On-site traffic	B	1	G3	T	-	-	-	-	-	

Airborne sound: indirect effects

- 4.2.10 Construction road traffic associated with the construction phases of the Proposed Scheme would generate airborne noise. Based upon traffic information for the Proposed Scheme, the change in traffic noise level at a reference distance of 10m from the edge of the nearside carriageway resulting from the presence of construction traffic for a given road has been predicted. Data has been produced for a typical month during the construction period and for a worst-case month during the construction period. The results for potentially significant road links are presented in Table 9.
- 4.2.11 Explanation of the information within Table 9 is provided in Volume 5: Appendix SV-001-000, with the following additional notes in Table 8.

Table 8: Explanatory notes for assessment results

Colour	Explanation
	Where the significant effect column is highlighted, then a significant effect is identified on nearby communities or individual receptors
	Yellow denotes a minor impact – a change is of 3-5 dB or 1-3dB where a high existing sound level is identified
	Orange denotes a moderate impact – a change is of 5-10 dB or 3-5dB where a high existing sound level is identified
	Red denotes a major impact – a change is of >10 dB or >5dB where a high existing sound level is identified

Table 9: Assessment of construction traffic noise levels

Road name	Portion of road affected	Number of dwellings affected	Daytime traffic sound levels $L_{A10,18hr}$ dB			Change compared to current traffic sound level (dB)		Combined impact	Significant effect
			Without HS2 (2017)	Typical month during construction	Peak month during construction	Typical month during construction	Peak month during construction		
Checkley Lane	From the intersection with the Proposed Scheme to the east of the Grange Farm to London Road In Bridgemere	30	55	57	59	2	4		*
Den Lane	From the junction with Mill Lane to the junction with the A531 at Wrinehill	35	51	56	59	6	8	O	CSV05-Co1/CSV05-Co6

Airborne sound levels used in other assessments

- 4.2.12 The construction sound results contained in this document have been used by other disciplines, namely agriculture, cultural heritage, 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 or Table 7 are presented in Table 10.

Table 10: Construction airborne sound levels for use in cross discipline assessments

Assessment location		Sound level information				Discipline					
Ref	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade [Assessment category A/B/C]		Change		Construction activity resulting in highest forecast noise levels	Agriculture	Communities	Heritage	Landscape & visual	Socio-economic
		Day 0700-1900	Night 2300-0700	Day 0700-1900	Night 2300-0700						
8406(N)	Basford Hall, Basford	44/51	-	1	-	Day: Track laying	-	-	Y	-	-
8515(N)	Meridian Canal Fishery, Wynchwood Park, Chorlton	48/53	-	8	-	Day: On- site traffic	-	Y	-	-	-
15027(N)	The Grange Farm, Checkley	64/68	-	17	-	Day: Earthworks	Y	-	-	-	-
15101(N)	Wesleyan Methodist Chapel, Chorlton	57/63	-	8	-	Day: Demolition of bridge	-	-	Y	-	-
15140(N)	Hough Methodist Church, Hough	48/53	-	9	-	Day: On- site traffic	-	-	-	-	-
15142(N)	Hough Village Hall, Hough	47/53	-	9	-	Day: On- site traffic	-	-	-	-	-
15185(N)	Checkley Lane, Checkley	56/60	-	10	-	Day: Earthworks	-	-	-	Y	-
15186(N)	Birch Lane, Hough	55/60	-	14	-	Day: Demolition of bridge	-	-	-	Y	-
15187(N)	Fairview Avenue, Weston	50/55	-	10	-	Day: Demolition of bridge	-	-	-	Y	-
15188(N)	Mill Lane, Blakenhall	58/63	-	20	-	Day: Earthworks	-	-	-	Y	-

5 Operational

5.1 Evaluation of impacts and effects

- 5.1.1 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.
- 5.1.2 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, where they would occur within the study area as defined in Volume 5: Appendix SV-001-000.
- 5.1.3 Route-wide impacts, effects and significant effects associated with noise or vibration from the operation of the Proposed Scheme are reported in Volume 3¹¹.
- 5.1.4 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 4¹².
- 5.1.5 In undertaking the assessment of sound, noise and vibration, consistent with the EIA Directive⁶ and National Planning Practice Guidance⁷ a differentiation between impacts and effects, adverse effects and significant effects is made. Further information is provided in Volume 5: Appendix SV-001-000.
- 5.1.6 The assessment of impacts has been undertaken at assessment locations that are representative of a number of dwellings or other sensitive receptors. The assessment Locations employed in this assessment are presented on Map Series SV-02 in the Volume 5: Sound, Noise and Vibration Map Book.
- 5.1.7 Baseline sound level data has been collected at locations representative of the airborne sound-sensitive receptors and presented in Table 1, and corrected where applicable using the values in Table 3.

5.2 Effects arising during operation

Introduction

- 5.2.1 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 is presented in Volume 2, South Cheshire (CA Report 5), Section 13.

Avoidance and mitigation measures

- 5.2.2 These are set out in Volume 2, South Cheshire (CA Report 5), Section 13.

¹¹ See Environmental Statement Volume 3, Route-wide effects

¹² See Environmental Statement Volume 4, Off-route effects

Quantitative identification of impacts and effects

Ground-borne sound and vibration

- 5.2.3 Assessment locations defined for the quantitative assessment of impacts are shown on Map Series SV-02 (Volume 5: Sound, Noise and Vibration Map Book). SV-02 also displays ground-borne noise and vibration impacts and any resultant significant effects.
- 5.2.4 For each assessment location, the assessment results for residential and non-residential receptors are presented in Table 12. Explanation of the information in Table 11 is provided in Volume 5: Appendix SV-001-000, with the following additional notes in Table 11.

Table 11: Explanatory notes for assessment results

Symbol	Explanation
B	For non-residential receptors further detail about the type of effect is set out in the text of Volume 5: Appendix SV-001-000.
NA	Type of effect - Generally no adverse effect
A	Ground-borne sound or vibration levels from HS2 exceed Lowest Observed Adverse Effect Level (LOAEL): the significance criteria set out in Appendix SV-001-000, Annex A, Section 1.3 are considered when establishing significant effects
S	Ground-borne sound or vibration levels from HS2 exceed Significant Observed Adverse Effect Level (SOAEL):
VDV	Vibration Dose Value
~	When considered under the significance criteria set out in Appendix SV-001-000, Annex A, Section 1.3, these adverse effects are not considered to be significant on a community basis.
	Where the significant effect column is highlighted in pink, then a significant effect is identified at the referenced residential community area, or individual receptor.
	Yellow denotes a low ground-borne noise impact or a minor ground-borne vibration impact
	Orange denotes a medium ground-borne noise impact or a moderate ground-borne vibration impact
	Red denotes a high ground-borne noise impact or a major ground-borne vibration impact
	Dark red denotes a very high ground-borne noise impact

Table 12: 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
		Groundborne 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	
Ref	Area represented													
15072	Gonsley Green Farm, Blakenhall	-	0.04	0.02	-	3	NA	R	T	-	-	-	-	-
15097	Chorlton Lane, Chorlton	-	0.06	0.03	-	1	NA	R	T	-	-	-	-	-
15102	Dairy Farm / 1&2 New Cottages, Chorlton Lane, Chorlton	-	0.17	0.08	-	3	NA	R	T	-	-	-	-	-
15103	Chorlton Lane, Chorlton	-	0.02	0.01	-	1	NA	R	T	-	-	-	-	-
15112	Newcastle Road, Chorlton	-	0.02	0.01	-	1	NA	R	T	-	-	-	-	-

Ground-borne sound and vibration impact summary

- 5.2.5 The operational ground-borne noise and vibration impacts identified in Table 12 are summarised in Table 13.





Table 13: Summary of operational ground-borne noise and vibration impacts

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

- 5.2.6 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 15 for residential receptors and Table 16 for non-residential receptors.
- 5.2.7 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 15 and Table 16 respectively. Note that all committed developments (including ones for residential developments) are presented in Table 15. The results should be considered in conjunction with the information contained in map series Sv-02 in the Volume 5: Sound, Noise and Vibration Map Book.
- 5.2.8 Explanation of the information in Table 15 and Table 16 is provided in Volume 5: Appendix SV-001-000, with the following additional notes in Table 14.

Table 14: Explanatory notes for 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 change is of 3-5 dB
	Orange denotes a moderate impact at a residential building – a change is of 5-10 dB
	Red denotes a major impact at a residential building – a change is of >10 dB
*	Day - $L_{pAeq,07:00-23:00}$
**	Night - $L_{pAeq,23:00-07:00}$
***	Max - L_{pAFmax} In the Proposed Scheme only column, two values are presented. The first is the value for the HS2 mitigated train and the second is the value for the TSI compliant train. For further information refer to Volume 5: Appendix SV-001-000

Appendix SV-002-005

Symbol	Explanation
****	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 HS2 exceed Lowest Observed Adverse Effect Level (LOAEL): the significance criteria set out in Appendix SV-001-000, 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 Volume 5: Appendix SV-001-000
CD	Committed Development. The 'Area represented' column contains information about the potential number of impacts included in the development
G	(G1) Theatres, large auditoria and concert halls, (G2) Sound recording and broadcast studios, (G3) Places of meeting for religious worship, courts, cinemas, lecture theatres, museums and small auditoria or halls, (G4) Schools, colleges, hospitals, hotels and libraries, and (G5) Offices and general commercial premises
H	High existing ambient sound level. Defined as $>65\text{dB}_{\text{Aeq, day}}$ and/or $>55\text{dB}_{\text{Aeq, night}}$
L	Low existing ambient sound level. Defined as $<42\text{dB}_{\text{Aeq, day}}$ and/or $<32\text{dB}_{\text{Aeq, night}}$
LD	Landscape receptor
NA	Sound levels from HS2 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
R	Residential receptor
RM	Residential mooring
S	Sound levels from HS2 exceed Significant Observed Adverse Effect Level (SOAEL): noise insulation therefore provided.
#	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 $50\text{ dB } L_{\text{pAeq, 23:00-07:00}}$ during the daytime or $40\text{ dB } L_{\text{pAeq, 07:00-23:00}}$ 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-001-000, Annex A, Section 1.3, these adverse effects are not considered to be significant on a community basis.
\$	A change of 3dB or greater has been identified however, the impact methodology for non-residential receptors includes a screening criteria for G3 building use of $50\text{ dB } L_{\text{pAeq, 07:00-23:00}}$, for G4 building use $55\text{ dB } L_{\text{pAeq, 07:00-23:00}}$ and $45\text{ dB } L_{\text{pAeq, 23:00-07:00}}$, for G5 building use $55\text{ dB } L_{\text{pAeq, 07:00-23:00}}$. At the receptor denoted the screening criteria is not met and therefore no impact is identified. Further information is provided in Volume 5: Appendix SV-001-000.

Table 15: Operational airborne sound, noise impacts and significant effects: residential receptors

Assessment location		Impact criteria										Significance criteria							Significant effect	
Ref	Area represented	Proposed Scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact		Mitigation effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
15005	Main Road, Wrinehill	45	35	59/61	51	44	45	52	45	1	1	A	8	R	T	-	-	-	-	
15014	Checkley Lane, Wrinehill	45	36	60/61	48	43	60	50	44	2	1	A	13	R	T	-	-	-	-	
15016	Den Lane, Wrinehill	42	33	56/58	50	38	52	51	39	1	1	A	14	R	T	-	-	-	-	
15019	Checkley Lane, Wrinehill	50	40	63/64	56	45	60	57	46	1	1	A	1	R	T	-	-	-	-	
15021	Den Lane, Wrinehill	43	33	56/57	46	39	52	48	40	2	1	NA	8	R	T	-	-	-	-	
15023	Checkley Lane, Wrinehill	60	50	74/76	49	38	60	60	50	11	12	A	1	R	T	-	-	-	-	~
15024	Den Lane, Wrinehill	49	39	64/65	69	65	67	69	65	0	0	A	5	R	T	H	-	-	-	
15026	Checkley Lane, Wrinehill	58	49	74/75	48	41	52	58	49	10	8	A	1	R	T	-	-	-	-	OSV05-Co1
15028	Checkley Lane, Wrinehill	56	46	71/73	48	41	52	56	47	8	6	A	3	R	T	-	-	-	-	OSV05-Co1
15029	Checkley Lane, Wrinehill	50	41	67/69	47	41	55	52	44	5	3	A	3	R	T	-	-	-	-	~
15031	Checkley Lane, Wrinehill	55	46	71/72	48	41	52	56	47	8	6	A	1	R	T	-	-	-	-	OSV05-Co1
15033	Den Lane, Wrinehill	54	45	70/72	46	42	52	55	47	9	5	A	1	R	T	-	-	-	-	OSV05-Co2
15035	Den Lane, Wrinehill	54	45	70/72	42	41	52	54	46	12	5	A	5	R	T	-	-	-	-	OSV05-Co2
15036	Den Lane, Wrinehill	48	39	66/69	55	52	60	56	52	1	0	A	1	R	T	-	-	-	-	

Assessment location		Impact criteria										Significance criteria							Significant effect	
Ref	Area represented	Proposed Scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact		Mitigation effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
15037	Checkley Lane, Checkley	49	40	63/64	48	41	52	52	43	4	2	A	1	R	T	-	-	-	-	#
15040	Richmond Close, Wynchwood Park, Weston	38	29	52/53	40	37	51	42	36	2	-1	NA	13	R	T	-	-	-	-	
15042	Wychwood Park, Weston	40	30	54/55	40	37	51	42	37	2	0	NA	12	R	T	-	-	-	-	
15044	Checkley Lane, Checkley	44	35	58/60	48	41	52	50	42	2	1	A	11	R	T	-	-	-	-	
15045	Woodlands Drive, Wynchwood Park, Weston	39	29	53/55	40	37	51	42	37	2	0	NA	16	R	T	-	-	-	-	
15046	Freshwater Drive, Wynchwood Park, Weston	44	35	60/62	43	40	51	46	39	3	0	A	7	R	T	-	-	-	-	#
15047	Freshwater Drive, Wynchwood Park, Weston	44	34	59/61	43	39	51	46	39	3	0	A	12	R	T	-	-	-	-	#
15049	Hampstead Drive, Wynchwood Park, Weston	47	38	65/67	49	46	55	49	42	0	-3	A	4	R	T	-	-	-	-	
15050	Mill Lane, Blakenhall	52	43	70/72	48	42	54	53	45	5	3	A	6	R	T	-	-	-	-	OSV05-Co3
15051	Mill Lane, Blakenhall	51	42	67/69	44	42	54	52	45	8	3	A	6	R	T	-	-	-	-	OSV05-Co3
15052	Hampstead Drive, Wynchwood Park, Weston	45	36	61/63	45	41	55	48	40	3	0	A	13	R	T	-	-	-	-	#
15054	Hampstead Drive, Wynchwood Park, Weston	47	38	63/65	50	47	55	50	43	0	-4	A	9	R	T	-	-	-	-	

Assessment location		Impact criteria										Significance criteria							Significant effect	
Ref	Area represented	Proposed Scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact		Mitigation effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
15055	Ashbourne Drive, Wynchwood Park, Weston	44	35	57/58	42	38	51	46	39	4	0	A	8	R	T	-	-	-	-	#
15056	Main Road, Weston	40	31	55/56	48	40	55	48	40	0	0	NA	3	R	T	-	-	-	-	
15057	Ashbourne Drive, Wynchwood Park, Weston	44	35	58/59	42	38	51	46	39	4	1	A	13	R	T	-	-	-	-	#
15058	Freshwater Drive, Wynchwood Park, Weston	46	37	59/61	45	41	51	48	41	3	-1	A	9	R	T	-	-	-	-	#
15060	Mill Lane, Blakenhall	48	38	65/67	44	42	54	49	44	5	2	A	2	R	T	-	-	-	-	#
15061	Ashbourne Drive, Wynchwood Park, Weston	45	36	60/62	42	39	51	47	40	4	0	A	15	R	T	-	-	-	-	#
15064	Kendal Way, Chorlton	47	37	60/61	43	39	51	48	40	5	1	A	11	R	T	-	-	-	-	#
15065	Springwater Drive, Wynchwood Park, Weston	47	37	61/62	43	40	51	48	40	5	1	A	22	R	T	-	-	-	-	#
15066	Abbeyle Close, Crewe	43	34	58/59	41	37	51	45	38	4	1	A	10	R	T	-	-	-	-	#
15067	Springwater Drive, Wynchwood Park, Weston	47	37	61/62	43	40	51	48	40	5	1	A	7	R	T	-	-	-	-	#
15068	Abbeyle Close, Crewe	45	35	59/61	41	38	51	46	39	5	1	A	8	R	T	-	-	-	-	#
15069	Freshwater Drive, Wynchwood Park, Weston	49	40	63/64	52	48	55	52	44	0	-4	A	7	R	T	-	-	-	-	

Assessment location		Impact criteria										Significance criteria							Significant effect	
Ref	Area represented	Proposed Scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact		Mitigation effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
15070	Mill Lane, Blakenhall	46	37	63/65	44	42	54	48	43	4	1	A	4	R	T	-	-	-	-	#
15071	Springwater Drive, Wynchwood Park, Weston	47	38	61/62	43	40	51	48	41	5	1	A	5	R	T	-	-	-	-	#
15072	Gonsley Green Farm, Blakenhall	62	52	78/80	45	42	53	62	53	17	11	S	3	R	T	-	-	-	NI	OSV05-Co3/ OSV05-D01
15073	Springwater Drive, Wynchwood Park, Weston	47	38	62/63	43	40	51	48	41	5	1	A	5	R	T	-	-	-	-	#
15074	Kendal Way, Chorlton	48	38	61/62	43	40	55	49	41	6	1	A	11	R	T	-	-	-	-	#
15076	Freshwater Drive, Wynchwood Park, Weston	51	42	64/65	50	46	55	53	45	3	-1	A	6	R	T	-	-	-	-	OSV05-Co5
15077	Haverhill Close, Wynchwood Park, Weston	45	35	60/61	50	43	51	49	42	-1	-1	A	9	R	T	-	-	-	-	
15079	Westwood Close, Wynchwood Park, Weston	49	40	62/63	44	40	55	50	42	6	2	A	4	R	T	-	-	-	-	#
15081	Fairhaven, Wynchwood Park, Weston	49	39	65/66	44	40	51	50	42	6	2	A	4	R	T	-	-	-	-	#
15082	Edenbridge Close, Wynchwood Park, Weston	48	39	63/64	46	43	51	50	42	3	-1	A	21	R	T	-	-	-	-	#
15083	Westwood Close, Wynchwood Park, Weston	50	42	64/66	47	43	55	51	44	4	1	A	6	R	T	-	-	-	-	OSV05-Co5

Assessment location		Impact criteria										Significance criteria							Significant effect	
Ref	Area represented	Proposed Scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact		Mitigation effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
15084	Manor Farm, Blakenhall	47	38	64/66	44	42	54	49	43	5	1	A	1	R	T	-	-	-	-	#
15085	Fairhaven, Wynchwood Park, Weston	49	41	66/67	46	42	51	50	43	4	1	A	11	R	T	-	-	-	-	#
15086	St. Clements Court, Chorlton, Weston	54	44	67/68	52	48	55	55	47	3	-2	A	18	R	T	-	-	-	-	OSV05-Co5
15087	Chiltern Close, Wynchwood Park, Weston	49	41	66/67	46	42	55	51	43	5	2	A	16	R	T	-	-	-	-	#
15088	Kingswood Avenue, Wynchwood Park, Weston	49	39	64/65	50	44	51	51	43	1	-1	A	20	R	T	-	-	-	-	
15089	Mere Road, Weston	32	23	51/52	50	42	53	50	42	0	0	NA	67	R	T	-	-	-	-	
15090	Henley Road, Wynchwood Park, Weston	53	44	67/68	51	47	55	55	46	4	-1	A	6	R	T	-	-	-	-	OSV05-Co5
15091	2 Gonsley Cottage, Blakenhall	50	41	67/68	44	42	54	51	45	7	3	A	2	R	T	-	-	-	-	OSV05-Co3
15092	Mill Lane, Blakenhall	42	33	59/60	47	42	51	48	43	1	1	A	2	R	T	-	-	-	-	
15093	Henley Road, Wynchwood Park, Weston	54	45	68/69	53	49	55	56	48	3	-2	A	5	R	T	-	-	-	-	OSV05-Co5
15095	Chiltern Close, Wynchwood Park, Weston	54	44	67/68	51	47	55	55	46	4	-1	A	3	R	T	-	-	-	-	OSV05-Co5
15096	Spinney Drive, Weston	30	21	50/51	50	42	53	50	42	0	0	NA	32	R	T	-	-	-	-	

Assessment location		Impact criteria										Significance criteria							Significant effect	
Ref	Area represented	Proposed Scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact		Mitigation effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
15097	Chorlton Lane, Chorlton	58	49	73/75	63	58	60	63	55	1	-3	A	1	R	T	H	-	-	-	
15098	Mill Lane, Blakenhall	41	31	56/58	47	42	51	48	42	1	0	A	5	R	T	-	-	-	-	
15099	Fairview Avenue, Weston	37	28	52/54	50	42	53	50	42	0	0	NA	57	R	T	-	-	-	-	
15100	Millbeck Close, Weston	34	25	49/50	50	42	53	50	42	0	0	NA	64	R	T	-	-	-	-	
15102	Dairy Farm / 1&2 New Cottages, Chorlton Lane, Chorlton	65	56	81/83	53	49	54	65	56	12	7	S	3	R	T	-	-	-	NI	OSV05-Co4/ OSV05-Do2
15103	Chorlton Lane, Chorlton	61	52	76/78	59	55	60	63	55	3	0	A	1	R	T	H	-	-	-	~
15104	Newcastle Road, Chorlton	49	40	66/67	57	50	54	54	47	-3	-3	A	1	R	T	-	-	-	-	
15106	Chorlton Lane, Chorlton	57	47	73/74	45	42	54	57	48	12	6	A	6	R	T	-	-	-	-	OSV05-Co4
15107	Half Moon Holding, Blakenhall	49	40	63/65	47	41	53	51	43	4	2	A	3	R	T	-	-	-	-	#
15109	Weston Lane, Basford	29	20	48/49	52	45	53	52	45	0	0	NA	1	R	T	-	-	-	-	
15111	Newcastle Road, Chorlton	52	43	71/72	61	56	59	60	55	-1	-1	A	2	R	T	H	-	-	-	
15112	Newcastle Road, Chorlton	55	46	77/78	67	62	63	67	62	0	0	A	1	R	T	H	-	-	-	
15113	Newcastle Road, Chorlton	57	47	71/73	49	45	54	57	49	8	4	A	1	R	T	-	-	-	-	~
15114	Newcastle Road, Chorlton	42	33	62/63	66	61	63	66	61	0	0	A	1	R	T	H	-	-	-	
15115	Weston Lane, Basford	39	31	52/54	53	47	53	53	47	0	0	NA	2	R	T	-	-	-	-	

Assessment location		Impact criteria										Significance criteria							Significant effect	
Ref	Area represented	Proposed Scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact		Mitigation effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
15117	Casey Lane, Basford	46	37	59/60	50	45	50	49	45	-1	0	A	8	R	T	-	-	-	-	
15118	Newcastle Road, Chorlton	46	37	63/64	56	48	52	53	45	-3	-3	A	1	R	T	-	-	-	-	
15120	Weston Lane, Basford	17	10	5/5	50	39	50	50	39	0	0	NA	1	R	T	-	-	-	-	
15122	Weston Lane, Basford	17	10	46/47	48	39	50	48	39	0	0	NA	1	R	T	-	-	-	-	
15123	Cobbs Lane, Hough	45	35	61/62	42	35	54	47	38	5	3	A	3	R	T	-	-	-	-	#
15124	Back Lane, Shavington	36	27	53/55	47	42	53	47	42	0	0	NA	1	R	T	-	-	-	-	
15125	Newcastle Road, Hough	56	47	56/57	58	50	55	56	47	-2	-3	A	2	R	T	-	-	-	-	
15126	Weston Lane, Basford	23	14	59/61	52	39	53	52	39	0	0	A	12	R	T	-	-	-	-	
15127	Larch Avenue, Basford	22	14	49/51	44	39	50	44	39	0	0	NA	6	R	T	-	-	-	-	
15128	Larch Avenue, Basford	21	13	49/50	42	39	50	42	39	0	0	NA	9	R	T	-	-	-	-	
15129	Cobbs Lane, Hough	42	33	56/57	51	46	51	51	46	0	0	NA	9	R	T	-	-	-	-	
15130	Larch Avenue, Basford	22	14	60/61	42	39	50	42	39	0	0	A	6	R	T	-	-	-	-	
15131	Larch Avenue, Basford	21	13	49/50	43	39	50	43	39	0	0	NA	9	R	T	-	-	-	-	
15132	Back Lane, Shavington	39	31	55/56	48	39	50	48	39	0	0	NA	3	R	T	-	-	-	-	
15133	Newcastle Road, Hough	51	42	55/56	54	46	51	51	44	-3	-2	A	16	R	T	-	-	-	-	

Assessment location		Impact criteria										Significance criteria							Significant effect	
Ref	Area represented	Proposed Scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact		Mitigation effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
15134	Cobbs Lane, Hough	49	40	54/55	52	44	51	49	42	-3	-2	A	11	R	T	-	-	-	-	
15135	Cobbs Lane, Hough	41	32	58/59	42	35	54	45	37	3	2	A	13	R	T	-	-	-	-	#
15136	Westgate Park, Hough	41	31	57/59	42	35	51	44	37	2	2	A	25	R	T	-	-	-	-	
15137	Kings Meadow, Hough	41	31	58/59	42	35	51	44	37	2	2	A	11	R	T	-	-	-	-	
15138	Buck Lane, Hough	48	38	54/55	51	46	51	49	45	-2	-1	NA	4	R	T	-	-	-	-	
15139	Weston Lane, Basford	24	15	47/48	55	45	53	55	45	0	0	NA	8	R	T	-	-	-	-	
15141	Ridley Close, Hough	39	29	55/56	42	35	51	44	36	2	1	NA	80	R	T	-	-	-	-	
15143	Cobbs Lane, Hough	39	29	55/56	42	35	51	44	36	2	1	NA	158	R	T	-	-	-	-	
15144	Holly Mount, Shavington	25	16	46/47	55	45	53	55	45	0	0	NA	15	R	T	-	-	-	-	
15145	Weston Lane, Shavington	25	16	46/47	52	44	53	52	44	0	0	NA	21	R	T	-	-	-	-	
15146	Weston Lane, Shavington	24	15	45/47	56	47	53	56	47	0	0	NA	8	R	T	-	-	-	-	
15174	Basford Bridge Cottage, Chorlton	49	40	66/68	64	57	59	49	51	-15	-6	A	1	R	T	H	-	-	-	
15180	Weston Lane, Basford (CD Ref.: 14/0256N)	17	10	5/5	58	53	63	58	53	0	0	NA	2	CD-R	T	-	-	-	-	
15190	Cobbs Lane, Hough	39	30	56/57	42	35	51	44	36	2	1	NA	1	R	T	-	-	-	-	

Assessment location		Impact criteria										Significance criteria							Significant effect	
Ref	Area represented	Proposed Scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact		Mitigation effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
15191	Newcastle Road, Crewe	50	40	67/68	59	52	53	56	48	-3	-4	A	9	R	T	-	-	-	-	
15193	Committed Development CD/10/4029N	45	35	60/62	44	42	54	47	43	3	1	A	1	R	T	-	-	-	-	

Table 16: Operational airborne sound, noise impacts and significant effects: non-residential receptors

Assessment location		Impact criteria										Significance criteria							Significant effect	
Ref	Area represented	Proposed Scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact		Mitigation effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
15101(N)	Wesleyan Methodist Chapel, Chorlton	53	44	68/69	51	47	54	54	47	3	0	B	1	G3	T	-	-	-	-	
15140(N)	Hough Methodist Church	40	31	57/58	42	35	51	44	36	2	1	B	1	G3	T	-	-	-	-	
15142(N)	Hough Village Hall, Hough	39	30	56/57	42	35	51	44	36	2	1	B	1	G3	T	-	-	-	-	

Direct impact - Summary

- 5.2.9 The operational airborne noise impacts identified in Table 15 and Table 16 are summarised in Table 17.

Table 17: Summary of operational airborne sound impacts

Receptor type	Numbers of impact (numbers of impacts excluding those in committed developments)				
	Above LOAEL	Above SOAEL	Impacts		
			Minor	Moderate	Major
Residential properties	492 (492)	6 (6)	45 (45)	23 (23)	19 (19)
Non-residential properties	N/A	N/A	None		
Schools	N/A	N/A	None		
Quiet areas	N/A	N/A	None		

Airborne sound: indirect impacts and effects

- 5.2.10 The transport assessment presented in Volume 5: Appendix TR-000-001, 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-001-000.
- 5.2.11 No roads or railways which exceed the criteria defined in Volume 5: Appendix SV-001-000 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

- 5.2.12 The operational sound results contained in this document have been used by other disciplines, namely agriculture, cultural heritage, landscape and visual, communities and socio economics, in their assessments. This includes the information in Table 15 and Table 16. Locations of interest to these other disciplines which may not appear in Table 15 and Table 16 are presented in Table 18.

Table 18: Operational airborne sound level for use in cross discipline assessments

Assessment location		Sound level information										Discipline				
Ref	Area represented	Proposed Scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Agriculture	Communities	Heritage	Landscape and visual	Socio-economic
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **					
8406(N)	Basford Hall, Basford	17	10	5/5	56	52	63	56	52	0	0	-	-	Y	-	-
8515(N)	Meridian Canal Fishery, Wynchwood Park, Chorlton	43	34	56/58	42	38	48	45	38	4	0	-	Y	-	-	-
15027(N)	The Grange Farm, Checkley	64	54	79/80	48	41	52	64	55	16	14	Y	-	-	-	-
15101(N)	Wesleyan Methodist Chapel, Chorlton	53	44	68/69	51	47	54	54	47	3	0	-	-	Y	-	-
15140(N)	Hough Methodist Church, Hough	40	31	57/58	42	35	51	44	36	2	1	-	-	-	-	-
15142(N)	Hough Village Hall, Hough	39	30	56/57	42	35	51	44	36	2	1	-	-	-	-	-
15185(N)	Checkley Lane, Checkley	52	42	67/68	48	41	52	53	45	5	4	-	-	-	Y	-
15186(N)	Birch Lane, Hough	52	43	68/69	40	36	48	52	44	12	8	-	-	-	Y	-
15187(N)	Fairview Avenue, Weston	36	27	52/53	42	37	53	43	37	1	0	-	-	-	Y	-
15188(N)	Mill Lane, Blakenhall	48	39	64/66	44	42	54	50	44	6	2	-	-	-	Y	-

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