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Contents

14. Construction Traffic Noise Assessment

14.1 Introduction

14.1.1 This appendix has been produced to support Chapter 14: Noise and Vibration (document reference 6.14) of the Environmental Statement (ES) (Volume 6 of the Development Consent Order (DCO) application) for Norwich to Tilbury (the 'Project'). It sets out the assessment of construction traffic noise and the public highway and temporary access routes at noise sensitive receptors (NSR). This appendix includes:

- Construction traffic noise (public highways)
- Construction traffic noise (temporary haul roads).

14.2 Construction Traffic Noise (Public Highway)

Assessment Methodology

14.2.1 The assessment of construction traffic noise has been conducted following the guidance detailed in Design Manual for Roads and Bridges (DMRB) LA 111 (Highways England *et al*, 2020). This provides guidance for the assessment and noise and vibration impacts from road projects; however, the guidance is widely used in the assessment of construction noise and vibration impacts from other types of project, particularly with regards to construction traffic noise in lieu of other guidance.

Data Sources

14.2.2 The assessment is based on traffic data and assumptions that have been produced by National Grid to support the transport assessment (as described in Chapter 16: Traffic and Transport (document reference 6.16)), including the proposed numbers of heavy goods vehicles (HGV).

Study Area

14.2.3 Noise from construction traffic on the existing local road network has been assessed based on the proposed construction traffic routes, as show on Figure 16.1: Primary Access Routes (document reference 6.16.F1). The Study Area is defined following the guidance detailed in DMRB LA 111 which states that the construction traffic Study Areas should include a 50 m width from the kerb line of public roads with the potential for an increase in basic noise level (BNL) of 1 dB(A)[1] or more because of the additional construction traffic to existing traffic levels.

Assessment Criteria

14.2.4 Noise from construction traffic on the public highway has been calculated in accordance with the Calculation of Road Traffic Noise (Department of Transport (DoT), 1988)

[1] A-weighted decibels

(CRTN) and assessed against the criteria detailed in DMRB LA 111. The BNL from public roads used as construction traffic routes has been calculated in accordance with CRTN for the 'Without Development' and 'With Development' scenarios in the construction period. The calculated BNL values were compared to determine the magnitude of the effect.

14.2.5 The BNL is a standardised metric for determining the noise level from a road and is defined as the noise level exceeded for 10% of the time at a reference of 10 m away from the nearside carriageway edge obtained from traffic flow, speed, and is calculated in line with the methodology described in CRTN.

14.2.6 Calculations are based on the Annual Average Weekday Traffic (AAWT) over the 18-hour period between 06:00 and 00:00 (AAWT,18 h). The standard CRTN BNL calculation is applicable where the AAWT,18 h traffic flows are greater than 4000 vehicles per 18-hour day. Where flows are between 1000 and 4000 vehicles per day, a 'low flow' correction can be applied which is a function of the distance from the carriageway.

14.2.7 Where there are potential changes in the BNL on roads greater than or equal to 1dB(A) a subsequent assessment of the effects on NSR within 50 m of routes where there are potential significant effects has been conducted. NSR include dwellings, healthcare facilities, education facilities or other buildings where noise can cause disturbance to people using the buildings.

14.2.8 Construction traffic noise effects are significant where there are medium or large magnitude impacts for a duration of ten or more days in any 15 consecutive days or for a total number of days exceeding 40 in any six consecutive months. A detailed program of works is not currently available. However, for the purpose of this assessment it is assumed that the above temporal thresholds may be exceeded, as a worst-case.

14.2.9 Where traffic flows are low or very low, resultant noise levels have the potential to be relatively low, even if the magnitude of change in noise level is medium or large. In such instances consideration is given to resultant absolute noise levels, in particular the construction noise Significant Observed Adverse Effect Level (SOAEL) at NSR, in determining potential significance of effect on a case by case basis.

14.2.10 There are also potential significant effects where there is a small magnitude impact at NSR located within Noise Important Areas (NIA), which are more sensitive to increases in noise. NIAs are determined via strategic noise maps and highlight the residential areas experiencing the highest 1% of noise levels from road and rail sources in England.

14.3 Noise Assessment

14.3.1 The results of the construction traffic noise assessment are provided in Table A14.2. below. It is assumed that there is no change in average speed between the do-minimum and do-something scenarios. The construction traffic data includes traffic flows for the Project, as well as construction traffic from other permitted developments. As such, the assessment considers cumulative effects. The results are colour coded as follows:

- Green – Negligible magnitude impact (neutral)
- Yellow – Small magnitude impact (no NIA) (adverse)
- Orange – medium magnitude impact, or small magnitude with NIA (adverse)

- Red – Large magnitude impact (adverse).

14.3.2 The results indicate that the magnitude of impact from construction traffic noise on the public highway is negligible or small along most routes and therefore likely to be not significant.

14.3.3 There is, however, one route where there is the potential for a **large (adverse)** magnitude impact; namely:

- Link PAR 30 - Bentley Road.

14.3.4 With regards to Link PAR 30, there are 16 NSRs within 50 m of the route. Effects at these NSR have the potential to be **significant** without mitigation. However, traffic flows would be regarded as low, and resultant absolute noise levels are expected to be below the SOAEL at most of these 16 NSR. Of these, one NSR is of particular concern; namely:

- Jasmine Cottage, Bentley Road, Little Bentley, CO7 8SS (National Grid Reference (NGR) 611136, 226669).

14.3.5 Jasmine Cottage is located immediately adjacent to Bentley Road at a distance of approximately 1 m from the carriageway edge. The predicted noise increase at this specific property is 11.4 dB which is a **large** magnitude (adverse) impact, with the absolute noise level being above the construction noise SOAEL, principally due to the small distance between the property and the carriageway.

14.3.6 There are also two routes where there is potential **medium (adverse)** magnitude impacts; namely:

- Link PAR 32 - Wick Lane (Section C)
- Link PAR 33 - Old Ipswich Road (Section D).

14.3.7 Link PAR 32 - Wick Lane (Section C), there are two NSR within 50 m of the route. Total traffic flows are predicted to be relatively low on this route and absolute noise levels are expected to be below the SOAEL is therefore expected to lead to a **small** magnitude effect and therefore **not significant**. However, it is noted that one NSR (San Antone, Wick Lane, Ardleigh, CO7 7RG (NSR 604013, 229449)) is located close to the carriageway (approximately 4 m from the carriageway edge) and there is therefore potential for adverse effect from construction traffic noise at this property.

14.3.8 With regards to Link PAR 33 - Old Ipswich Road (Section D), there is one NSR within 50 m of the route. This road runs directly adjacent to the A12 and the overall change in noise level at this location is therefore likely to be **small**. Effects are therefore considered to be **not significant**.

14.3.9 Routes which are predicted to experience a **small (adverse)** magnitude impact have been reviewed and there are no instances where they pass through a NIA. As such, there are **no expected significant adverse effects** within NIA.

Table A14.2.1 Construction Traffic Noise Assessment – Public Highway

Access Route Name/ID	Project Section(s)	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB (Minimum to Maximum)	Outcome magnitude and effect.
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Construction Traffic (Minimum to Maximum)		
Link PAR 30 - Bentley Road	Section C	1,493*	2.9	3532*	29.0	56.2	67.6	11.4	Large - **Significant**
Link PAR 33 - Old Ipswich Road	Section D	2,227*	7.5	3627*	12.6	60.7	64.7	4.0	Medium – **Significant**
Link PAR 32 - Wick Lane	Section C	1,366*	2.5	1482*	7.4	56.1	59.3	3.2	Medium – **Significant**
Link PAR 33 - Old Ipswich Road	Section C	3,170*	8.9	4685*	13.8	64.8	67.5	2.7	Small – **Not Significant**
Link PAR 56 - Ivy Barns Lane	Section F	1,088*	5.6	1214*	10.5	55.0	57.4	2.4	Small – **Not Significant**
Link PAR 6 - Fundenhall Road	Section A	1,680*	2.7	1935*	6.5	57.5	59.8	2.3	Small – **Not Significant**
Link PAR 13 - Wickham Road	Section B	2,024*	5.8	2279*	11.5	60.0	62.2	2.2	Small – **Not Significant**
Link PAR 15 - Thornham Road	Section B	1,044*	3.8	1129*	7.6	54.2	56.1	1.9	Small – **Not Significant**

Access Route Name/ID	Project Section(s)	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB (Minimum to Maximum)	Outcome magnitude and effect.
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Construction Traffic (Minimum to Maximum)		
Link PAR 12 - B1113 Finningham Road / B1113 Walsham Road	Section B	2,391*	6.9	2646*	11.6	61.5	63.3	1.8	Small – **Not Significant**
Link PAR 23 - A1071	Section C	2,599*	30.8	4312	24.0	65.9	67.5	1.6	Small – **Not Significant**
Link PAR 52 - Vicarage road	Section F	1,739*	5.9	1856*	9.1	58.7	60.3	1.6	Small – **Not Significant**
Link PAR 5 - Wymondham Road	Section A	1,261*	9.8	1389*	11.7	57.6	58.9	1.3	Small – **Not Significant**
Link PAR 7 - B1134 Station Road / B1134 Long Row	Section A	2,462*	7.1	2783*	9.1	62.1	63.3	1.2	Small – **Not Significant**
Link PAR 26 - Ipswich Road	Section C	2,174*	4.6	2354*	6.5	59.6	60.8	1.2	Small – **Not Significant**
Link PAR 36 - A134 Northern Approach Road / A134 Wildeve Avenue / A134 Nayland Road / A134 The Causeway	Section D	7,824	3.9	8200	7.3	67.6	68.7	1.1	Small – **Not Significant**

Access Route Name/ID	Project Section(s)	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB (Minimum to Maximum)	Outcome magnitude and effect.
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Construction Traffic (Minimum to Maximum)		
Link PAR 36 - A134 Northern Approach Road / A134 Wildeve Avenue / A134 Nayland Road / A134 The Causeway	Section D	10,047	3.5	10423	6.2	66.6	67.7	1.1	Small – **Not Significant**
Link PAR 62 - Dunton Road / Brentwood Road	Section G	1,480*	9.8	1607*	12.1	58.7	59.8	1.1	Small – **Not Significant**
Link PAR 13 - Wickham Road	Section B	1,992*	12.8	2120*	15.5	61.5	62.5	1.0	Small – **Not Significant**
Link PAR 16 - A1120 Church Road / A1120 Bell's Lane	Section B	3,893*	12.8	5312	11.2	65.3	66.3	1.0	Small – **Not Significant**
Link PAR 38 - Mill Road	Section D	2,387*	10.0	2502*	13.1	62.0	63.0	1.0	Small – **Not Significant**
Link PAR 3 - Stansfield Road / Wymondham Road	Section A	5,450	2.9	5833	4.8	64.8	65.7	0.9	Negligible – **Not Significant**
Link PAR 17 - A1120 south of A14 J50	Section B	2,694*	25.5	2972*	28.4	65.5	66.4	0.9	Negligible – **Not Significant**

Access Route Name/ID	Project Section(s)	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB (Minimum to Maximum)	Outcome magnitude and effect.
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Construction Traffic (Minimum to Maximum)		
Link PAR 24 - B1070 (A12 access)	Section C	5,065	2.4	5359	4.7	65.3	66.2	0.9	Negligible – **Not Significant**
Link PAR 27 - Birchwood Road	Section C	4,128	2.1	4215	3.9	61.8	62.7	0.9	Negligible – **Not Significant**
Link PAR 36 - A134 Northern Approach Road / A134 Wildeve Avenue / A134 Nayland Road / A134 The Causeway	Section D	12,450	3.9	12826	6.0	67.8	68.7	0.9	Negligible – **Not Significant**
Link PAR 54 - B1002 Main Road	Section G	6,859	1.1	7118	2.9	64.1	65.0	0.9	Negligible – **Not Significant**
Link PAR 4 - B1113	Section A	4,395	2.2	4650	3.8	63.6	64.4	0.8	Negligible – **Not Significant**
Link PAR 48 - Chelmsford Road	Section F	3,240*	4.0	3355*	5.9	61.9	62.7	0.8	Negligible – **Not Significant**
Link PAR 16 - A1120 Church Road / A1120 Bell's Lane	Section B	8,666	3.4	10085	3.9	67.9	68.7	0.8	Negligible – **Not Significant**

Access Route Name/ID	Project Section(s)	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB (Minimum to Maximum)	Outcome magnitude and effect.
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Construction Traffic (Minimum to Maximum)		
Link PAR 44 - A131 Great Notley Bypass / A131 Great Leighs Bypass / A131 Braintree Road	Section E	20,366	4.7	24040	5.2	72.0	72.8	0.8	Negligible – **Not Significant**
Link PAR 25 - B1070 Hadleigh Road	Section C	6,073	6.4	6367	8.2	65.3	66.0	0.7	Negligible – **Not Significant**
Link PAR 35 - A1341 Via Urbis Romanae	Section D	17,396	3.1	17772	4.7	69.0	69.7	0.7	Negligible – **Not Significant**
Link PAR 37 - A1124 Halsted Road	Section D	10,357	3.0	10701	4.4	66.7	67.4	0.7	Negligible – **Not Significant**
Link PAR 39 - Great Tey Road	Section D	2,254*	12.7	2427*	13.6	62.2	62.9	0.7	Negligible – **Not Significant**
Link PAR 44 - A131 Great Notley Bypass / A131 Great Leighs Bypass / A131 Braintree Road	Section F	24,610	3.4	27965	3.6	72.4	73.1	0.7	Negligible – **Not Significant**
Link PAR 55 - Wantz Road	Section G	4,661	5.0	4787	6.2	63.6	64.2	0.6	Negligible – **Not Significant**

Access Route Name/ID	Project Section(s)	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB (Minimum to Maximum)	Outcome magnitude and effect.
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Construction Traffic (Minimum to Maximum)		
Link PAR 22 - A1214 London Road	Section C	18,794	5.5	20544	6.2	70.2	70.8	0.6	Negligible – **Not Significant**
Link PAR 64 - Lower Dunton Road	Section G	4,736	4.0	4952	4.8	63.2	63.8	0.6	Negligible – **Not Significant**
Link PAR 1 - A140 Ipswich Road	Section A	24,636	4.1	25547	5.3	72.6	73.1	0.5	Negligible – **Not Significant**
Link PAR 11 - Lion Road	Section B	3,305*	2.2	3433*	3.2	61.4	61.9	0.5	Negligible – **Not Significant**
Link PAR 20 - B1113 Bramford Road / B1113 Loraine Way	Section B	4,033	37.3	4455	38.0	69.1	69.6	0.5	Negligible – **Not Significant**
Link PAR 46 - B1008 Braintree Road / B1008 Main Road	Section F	14,004	0.9	14473	2.1	68.2	68.7	0.5	Negligible – **Not Significant**
Link PAR 51 - A1060 Rainsford Road / A1060 Roxwell Road	Section F	14,851	2.2	15085	3.0	67.3	67.8	0.5	Negligible – **Not Significant**
Link PAR 54 - B1002 Main Road	Section G	6,991	0.7	7124	1.5	64.0	64.5	0.5	Negligible – **Not Significant**

Access Route Name/ID	Project Section(s)	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB (Minimum to Maximum)	Outcome magnitude and effect.
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Construction Traffic (Minimum to Maximum)		
Link PAR 19 - B1113 Needham Road / B1113 Stowmarket Road	Section B	9,891	8.9	10,069	10.1	68.6	69.0	0.4	Negligible – **Not Significant**
Link PAR 40 - A120 Colchester Road	Section E	19,967	14.0	21,098	14.7	72.8	73.2	0.4	Negligible – **Not Significant**
Link PAR 49 - A414 Three Mill Hill / A1114 London Road	Section F	27,877	2.9	28,353	3.8	71.0	71.4	0.4	Negligible – **Not Significant**
Link PAR 28 - Wick Road / Grove Hill	Section C	1,593*	3.5	1,609*	4.2	57.0	57.4	0.4	Negligible – **Not Significant**
Link PAR 10 - A143 Old Bury Road	Section B	7,678	20.8	8,135	21.1	70.1	70.4	0.3	Negligible – **Not Significant**
Link PAR 50 - A1016 Waterhouse Lane / A1016 Rainsford Lane	Section F	22,698	2.0	22,932	2.6	69.1	69.4	0.3	Negligible – **Not Significant**
Link PAR 41 - B1018 Braintree Road / B1018 Witham Road	Section E	14,163	4.8	15,399	4.7	68.7	69.0	0.3	Negligible – **Not Significant**

Access Route Name/ID	Project Section(s)	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB (Minimum to Maximum)	Outcome magnitude and effect.
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Construction Traffic (Minimum to Maximum)		
Link PAR 43 - Spinks Lane / Highfields Road / Spa Road / Flora Road / Faulkbourne Road / Church Hill	Section E	5,620	2.2	5,735	2.8	63.7	64.0	0.3	Negligible – **Not Significant**
Link PAR 51 - A1060 Rainsford Road / A1060 Roxwell Road	Section F	18,251	2.3	18,485	3.0	70.8	71.1	0.3	Negligible – **Not Significant**
Link PAR 53 - A414 Greenbury Way / A414 Ongar Road	Section F	14,953	4.7	15,195	5.5	69.5	69.8	0.3	Negligible – **Not Significant**
Link PAR 53 - A414 Greenbury Way / A414 Ongar Road	Section F	15,127	3.9	15,369	4.7	70.5	70.8	0.3	Negligible – **Not Significant**
Link PAR 61 - A129 Sun Street / A129 London Road / A129 Rayleigh Road	Section G	13,714	1.1	13,835	1.6	66.4	66.7	0.3	Negligible – **Not Significant**
Link PAR 61 - A129 Sun Street / A129 London	Section G	14,929	0.8	15,050	1.2	66.5	66.8	0.3	Negligible – **Not Significant**

Access Route Name/ID	Project Section(s)	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB (Minimum to Maximum)	Outcome magnitude and effect.
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Construction Traffic (Minimum to Maximum)		
Road / A129 Rayleigh Road									
Link PAR 8 - A1066 Victoria Road / A1066 Park Road / A1066 High Road	Section A	13,965	9.3	14,220	9.6	70.0	70.2	0.2	Negligible – **Not Significant**
Link PAR 8 - A1066 Victoria Road / A1066 Park Road / A1066 High Road	Section A	8,132	15.0	8,387	15.4	68.8	69.0	0.2	Negligible – **Not Significant**
Link PAR 27 - Birchwood Road	Section C	3,261*	4.5	3,277*	4.9	61.8	62.0	0.2	Negligible – **Not Significant**
Link PAR 43 - Spinks Lane / Highfields Road / Spa Road / Flora Road / Faulkbourne Road / Church Hill	Section E	10,543	1.8	10,658	2.1	65.6	65.8	0.2	Negligible – **Not Significant**
Link PAR 50 - A1016 Waterhouse Lane / A1016 Rainsford Lane	Section F	30,709	2.6	30,943	3.0	71.3	71.5	0.2	Negligible – **Not Significant**

Access Route Name/ID	Project Section(s)	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB (Minimum to Maximum)	Outcome magnitude and effect.
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Construction Traffic (Minimum to Maximum)		
Link PAR 60 - A176 Noak Hill Road / A176 Laindon Road / A129 Southend Road (one-way system)	Section G	7,510	4.1	7,570	4.5	65.3	65.5	0.2	Negligible – **Not Significant**
Link PAR 8 - A1066 Victoria Road / A1066 Park Road / A1066 High Road	Section A	10,201	18.5	10456	18.8	70.4	70.6	0.2	Negligible – **Not Significant**
Link PAR 8 - A1066 Victoria Road / A1066 Park Road / A1066 High Road	Section A	8,835	15.9	9,090	16.3	69.4	69.6	0.2	Negligible – **Not Significant**
Link PAR 61 - A129 Sun Street / A129 London Road / A129 Rayleigh Road (one-way system)	Section G	12,412	1.1	12,472	1.4	65.9	66.1	0.2	Negligible – **Not Significant**
Link PAR 61 - A129 Sun Street / A129 London Road / A129 Rayleigh Road	Section G	14,424	3.0	14,545	3.4	67.9	68.1	0.2	Negligible – **Not Significant**

Access Route Name/ID	Project Section(s)	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB (Minimum to Maximum)	Outcome magnitude and effect.
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Construction Traffic (Minimum to Maximum)		
Link PAR 8 - A1066 Victoria Road / A1066 Park Road / A1066 High Road	Section A	19,364	8.9	19,619	9.1	71.3	71.4	0.1	Negligible – **Not Significant**
Link PAR 42 - B1389 Hatfield Road	Section E	16,548	3.1	16,663	3.3	68.3	68.4	0.1	Negligible – **Not Significant**
Link PAR 60 - A176 Noak Hill Road / A176 Laindon Road / A129 Southend Road (one-way system)	Section G	18,627	2.0	18,687	2.2	69.8	69.9	0.1	Negligible – **Not Significant**
Link PAR 50 - A1016 Waterhouse Lane / A1016 Rainsford Lane	Section F	45,183	1.3	45,417	1.6	72.4	72.5	0.1	Negligible – **Not Significant**
Link PAR 60 - A176 Noak Hill Road / A176 Laindon Road / A129 Southend Road	Section G	18,627	2.0	18,748	2.4	68.9	69.0	0.1	Negligible – **Not Significant**
Link PAR 60 - A176 Noak Hill Road / A176 Laindon Road / A129 Southend Road	Section G	16,781	2.0	16,902	2.4	69.4	69.5	0.1	Negligible – **Not Significant**

Access Route Name/ID	Project Section(s)	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB (Minimum to Maximum)	Outcome magnitude and effect.
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Construction Traffic (Minimum to Maximum)		
Link PAR 63 - B148 West Mayne	Section G	19,404	3.2	19,620	3.4	70.4	70.5	0.1	Negligible – **Not Significant**
Link PAR 65 - A128 Brentwood Road	Section H	12,678	12.7	12,829	13.1	70.4	70.5	0.1	Negligible – **Not Significant**
Link PAR 2 - Mangreen Lane	Section A	291*	1.0	749*	30.0	very low flow	very low flow	very low flow	Negligible – **Not Significant**
Link PAR 14 - Eastland Lane	Section B	39*	5.1	167*	43.1	very low flow	very low flow	very low flow	Negligible – **Not Significant**
Link PAR 18 - Mill Lane	Section B	997*	8.9	1,130*	11.9	very low flow	57.1	0.0	Negligible – **Not Significant**
Link PAR 20 - B1113 Bramford Road / B1113 Loraine Way	Section B	928*	29.6	1,350*	34.2	very low flow	61.9	0.0	Negligible – **Not Significant**
Link PAR 21 - Bullen Lane	Section B	72*	11.1	494*	39.5	very low flow	very low flow	very low flow	Negligible – **Not Significant**
Link PAR 23 - A1071	Section C	729*	100.0	2,442*	39.4	very low flow	66.5	0.0	Negligible – **Not Significant**
Link PAR 29 - Perry Lane	Section C	128*	3.9	144*	11.8	very low flow	very low flow	very low flow	Negligible – **Not Significant**

Access Route Name/ID	Project Section(s)	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB (Minimum to Maximum)	Outcome magnitude and effect.
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Construction Traffic (Minimum to Maximum)		
Link PAR 30 - Bentley Road	Section C	843*	15.5	2,882*	38.5	very low flow	67.3	0.0	Negligible – **Not Significant**
Link PAR 31 - Ardleigh Road / Little Bromley Road	Section C	109*	16.5	767*	46.7	very low flow	very low flow	very low flow	Negligible – **Not Significant**
Link PAR 34 - Turnpike Close	Section C	453*	14.8	692*	20.8	very low flow	very low flow	very low flow	Negligible – **Not Significant**
Link PAR 45 - B1008 Essex Regiment Way	Section F	752*	100.0	867*	89.7	very low flow	very low flow	very low flow	Negligible – **Not Significant**
Link PAR 47 - Chatham Hall Lane	Section F	360*	1.9	475*	16.2	very low flow	very low flow	very low flow	Negligible – **Not Significant**
Link PAR 57 - Church Lane	Section G	53*	1.9	186*	32.3	very low flow	very low flow	very low flow	Negligible – **Not Significant**
A12_6208 - A12	Section D	99,374	7.1	100,095	7.5	80.3	80.3	0.0	No change – **Not Significant**
A12_6209 - A12	Section E	74,609	9.1	74,680	9.2	79.5	79.5	0.0	No change – **Not Significant**
A14_6481 - A14	Section B	65,842	12.8	68,489	14.2	79.6	79.6	0.0	No change – **Not Significant**

Access Route Name/ID	Project Section(s)	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB (Minimum to Maximum)	Outcome magnitude and effect.
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Construction Traffic (Minimum to Maximum)		
A47_8757 - A47	Section A	46,565	5.7	47,144	6.1	76.7	76.7	0.0	No change – **Not Significant**
A12_16193 - A12	Section C	63,949	9.5	66,204	10.8	78.9	78.9	0.0	No change – **Not Significant**
A12_16194 - A12	Section D	72,280	7.9	72,351	7.9	79.1	79.1	0.0	No change – **Not Significant**
A14_18222 - A14	Section B	72,426	12.8	74,690	13.9	80.0	80.0	0.0	No change – **Not Significant**
A12_26209 - A12	Section E	79,312	8.2	79,383	8.2	79.6	79.6	0.0	No change – **Not Significant**
A127_26676 - A127	Section G	82,326	4.9	82,651	5.1	79.0	79.0	0.0	No change – **Not Significant**
A140_26697 - A140	Section B	15,408	11.1	15,763	11.7	70.7	70.7	0.0	No change – **Not Significant**
A12_27585 - A12	Section C	21,344	6.3	22,288	7.9	71.7	71.7	0.0	No change – **Not Significant**
A13_27931 - A13	Section H	95,910	12.7	96,603	12.9	81.2	81.2	0.0	No change – **Not Significant**

Access Route Name/ID	Project Section(s)	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB (Minimum to Maximum)	Outcome magnitude and effect.
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Construction Traffic (Minimum to Maximum)		
A140_28451 - A140	Section A	16,533	7.4	16,888	8.1	72.6	72.6	0.0	No change – **Not Significant**
A12_36209 - A12	Section C	62,391	9.3	64,502	10.6	78.7	78.7	0.0	No change – **Not Significant**
A12_36210 - A12	Section D	99,953	7.0	100,415	7.2	80.3	80.3	0.0	No change – **Not Significant**
A12_36212 - A12	Section F	79,109	7.5	79,694	7.9	79.4	79.4	0.0	No change – **Not Significant**
A128_36698 - A128	Section H	13,373	8.1	13,412	8.2	70.1	70.1	0.0	No change – **Not Significant**
A120_38246 - A120	Section C	47,350	6.9	48,073	7.3	77.1	77.1	0.0	No change – **Not Significant**
A47_38817 - A47	Section A	69,431	4.5	70,043	4.8	78.2	78.2	0.0	No change – **Not Significant**
A12_46209 - A12	Section E	66,467	8.9	66,538	8.9	78.9	78.9	0.0	No change – **Not Significant**
A1089_47976 - A1089	Section H	33,397	24.7	33,423	24.7	78.2	78.2	0.0	No change – **Not Significant**

Access Route Name/ID	Project Section(s)	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB (Minimum to Maximum)	Outcome magnitude and effect.
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Construction Traffic (Minimum to Maximum)		
A12_48229 - A12	Section D	45,105	10.6	46,416	11.7	77.6	77.6	0.0	No change – **Not Significant**
A13_56327 - A13	Section H	91,913	8.9	92,579	9.1	80.3	80.3	0.0	No change – **Not Significant**
A143_56562 - A143	Section B	9,019	10.0	9,230	11.3	69.6	69.6	0.0	No change – **Not Significant**
A12_57241 - A12	Section C	58,562	10.2	60,673	11.5	78.6	78.6	0.0	No change – **Not Significant**
A140_58424 - A140	Section A	23,312	5.0	23,667	5.6	71.7	71.7	0.0	No change – **Not Significant**
A13_70027 - A13	Section H	119,082	12.0	119,775	12.2	80.5	80.5	0.0	No change – **Not Significant**
A12_73503 - A12	Section C	63,900	9.5	66,011	10.7	78.9	78.9	0.0	No change – **Not Significant**
A127_75041 - A127	Section G	73,271	6.3	73,369	6.4	77.1	77.1	0.0	No change – **Not Significant**
A127_77131 - A127	Section G	71,005	4.3	71,103	4.4	78.2	78.2	0.0	No change – **Not Significant**

Access Route Name/ID	Project Section(s)	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB (Minimum to Maximum)	Outcome magnitude and effect.
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Construction Traffic (Minimum to Maximum)		
A120_80209 - A120	Section F	39,036	6.4	40,175	7.4	76.1	76.1	0.0	No change – **Not Significant**
A14_80469 - A14	Section B	72,426	12.8	74,690	13.9	80.0	80.0	0.0	No change – **Not Significant**
A14_81062 - A14	Section C	68,467	13.5	70,731	14.7	79.9	79.9	0.0	No change – **Not Significant**
A14_81063 - A14	Section B	66,708	13.6	68,972	14.8	79.8	79.8	0.0	No change – **Not Significant**
A14_81234 - A14	Section B	66,708	13.6	68,972	14.8	79.8	79.8	0.0	No change – **Not Significant**
A14_81467 - A14	Section B	49,820	15.3	53,261	17.4	78.7	78.7	0.0	No change – **Not Significant**
A14_81468 - A14	Section B	48,529	14.8	51,970	17.1	78.6	78.6	0.0	No change – **Not Significant**
A12_89085 - A12	Section D	75,268	8.7	76,579	9.4	79.4	79.4	0.0	No change – **Not Significant**
A12_89086 - A12	Section D	74,395	8.9	75,116	9.3	79.4	79.4	0.0	No change – **Not Significant**

Access Route Name/ID	Project Section(s)	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB (Minimum to Maximum)	Outcome magnitude and effect.
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Construction Traffic (Minimum to Maximum)		
A13_89103 - A13	Section H	89,637	9.3	90,303	9.5	80.3	80.3	0.0	No change – **Not Significant**
A14_89242 - A14	Section B	51,412	13.7	54,414	15.6	78.6	78.6	0.0	No change – **Not Significant**
A14_89243 - A14	Section B	47,347	14.3	50,349	16.3	78.4	78.4	0.0	No change – **Not Significant**
A14_89244 - A14	Section B	10,266	3.7	10,621	4.8	69.7	69.7	0.0	No change – **Not Significant**
A120_90143 - A120	Section D	26,286	7.0	26,819	7.8	72.1	72.1	0.0	No change – **Not Significant**
A120_90160 - A120	Section E	43,733	5.1	44,100	5.5	76.3	76.3	0.0	No change – **Not Significant**
A120_90161 - A120	Section E	25,539	5.6	26,072	6.5	73.2	73.2	0.0	No change – **Not Significant**
A140_92075 - A140	Section B	17,937	10.2	18,292	10.8	71.9	71.9	0.0	No change – **Not Significant**
A140_99081 - A140	Section B	16,180	7.4	16,535	8.1	72.5	72.5	0.0	No change – **Not Significant**

Access Route Name/ID	Project Section(s)	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB (Minimum to Maximum)	Outcome magnitude and effect.
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Construction Traffic (Minimum to Maximum)		
A11_99630 - A11	Section A	53,209	6.0	53,433	6.1	77.4	77.4	0.0	No change – **Not Significant**

Notes:
* = low flow; fewer than 4000 vehicles AAWT18h.
Very low flows are fewer than 1000 vehicles AAWT18h.

14.4 Construction Traffic Noise (Temporary Haul Roads)

Assessment Methodology

14.4.1 Once construction traffic (either light good vehicles (LGV) or HGV) leaves the public highway and enters the temporary haul roads, the noise generated is classified as construction noise and assessed accordingly as per other construction activities. This chapter details the assessment of construction traffic noise on the temporary haul roads within the Order Limits.

14.4.2 Construction traffic flows would vary on the various temporary haul roads within the Order Limits.

14.4.3 The temporary haul road traffic noise assessment has been undertaken with reference to the methods and empirical data outlined in BS 5228-1:2009+A1:2014 Code of practice for noise and vibration on construction and open sites - Part 1: Noise (British Standards Institution (BSI), 2014) (BS 5228-1). The predicted construction noise levels at a distance 10 m have been calculated for each temporary haul road section, together with the distance within which the lower noise threshold of (Category A) as detailed in Section E.3.2 of BS 5228-1 may be exceeded. The threshold is considered to represent the Significant Observed Adverse Effect Level (SOAEL); namely 65dB $L_{Aeq,T}$ during daytime periods for residential NSR. Significance at non-residential NSR is considered based on their respective sensitivity to noise.

Noise Assessment

14.4.4 The assessment is based on the following assumptions:

- A haul road speed limit of 20 mph
- An individual vehicle sound level of 80 dBA L_{max} at 10 m during pass-by based on BS 5228-1 data reference C.2.34 (Lorry) for HGV
- An individual vehicle sound level of 70 dBA L_{max} at 10 m during pass-by based on library data for light vehicles (cars and vans)
- No mitigation (e.g., screening) assumed.

14.4.5 Table A14.2.2 below presents the findings of the noise assessment of construction traffic on temporary haul roads.

14.4.6 The results indicate that there is one instance where there is an NSR within the threshold distance for potential significant adverse effects on any temporary haul roads; namely:

- Grove House, The Grove, Faulkbourne, CM8 1SH (NGR 579993, 217259) adjacent to Haul Road H25-A1.

14.4.7 However, the effect of noise can be adequately mitigated to non-significant levels with the use of best practicable means (BPM), such as screening, at this location.

14.4.8 Screening would also be applied where feasible at other haul road locations close to NSR to mitigate adverse effects as part of BPM measures.

Table A14.2.2 Construction Traffic Noise Assessment – Temporary Haul Roads

Temporary Haul Road ID	Project Section(s)	Anticipated Maximum Daily Vehicle Movements (2-way)		Construction Traffic Noise Level at 10m, dB $L_{Aeq,12h}$	Distance within which SOAEL (65 dB $L_{Aeq,12h}$) may be exceeded, m	Comment
		LGV	HGV			
H01-A1	Section A	178	258	67.8	19	No NSR within threshold distance
H01-A2	Section A	44	158	65.5	11	No NSR within threshold distance
H02-A1	Section A	45	162	65.6	11	No NSR within threshold distance
H03-A1	Section A	48	170	65.8	12	No NSR within threshold distance
H03-A2	Section A	110	170	66.0	13	No NSR within threshold distance
H04-A1	Section A	46	169	65.8	12	No NSR within threshold distance
H04-A2	Section A	46	188	66.3	13	No NSR within threshold distance
H05-A1	Section A	49	196	66.4	14	No NSR within threshold distance

Temporary Haul Road ID	Project Section(s)	Anticipated Maximum Daily Vehicle Movements (2-way)		Construction Traffic Noise Level at 10m, dB $L_{Aeq,12h}$	Distance within which SOAEL (65 dB $L_{Aeq,12h}$) may be exceeded, m	Comment
		LGV	HGV			
H05-A2	Section B	52	204	66.6	14	No NSR within threshold distance
H06-A1	Section B	118	174	66.1	13	No NSR within threshold distance
H06-A2	Section B	39	150	65.3	11	No NSR within threshold distance
H07-A1	Section B	39	158	65.5	11	No NSR within threshold distance
H07-A2	Section B	41	162	65.6	11	No NSR within threshold distance
H08-A1	Section B	120	154	65.6	11	No NSR within threshold distance
H09-A1	Section B	39	158	65.5	11	No NSR within threshold distance
H10-A1	Section B	43	186	66.2	13	No NSR within threshold distance
H10-A2	Section B	153	242	67.5	18	No NSR within threshold distance

Temporary Haul Road ID	Project Section(s)	Anticipated Maximum Daily Vehicle Movements (2-way)		Construction Traffic Noise Level at 10m, dB $L_{Aeq,12h}$	Distance within which SOAEL (65 dB $L_{Aeq,12h}$) may be exceeded, m	Comment
		LGV	HGV			
H11-A1	Section B	40	150	65.3	11	No NSR within threshold distance
H11-A2	Section C	46	150	65.3	11	No NSR within threshold distance
H12-A1	Section C	46	150	65.3	11	No NSR within threshold distance
H12-A2	Section C	238	314	68.7	23	No NSR within threshold distance
H13A-A1	Section C	0	0	3.0	0	No NSR within threshold distance
H14-A1	Section C	132	248	67.6	18	No NSR within threshold distance
H15-A1	Section C	20	126	64.5	9	No NSR within threshold distance
H16-A1	Section C	93	293	68.2	21	No NSR within threshold distance
H17-A2	Section C	309	497	70.6	36	No NSR within threshold distance

Temporary Haul Road ID	Project Section(s)	Anticipated Maximum Daily Vehicle Movements (2-way)		Construction Traffic Noise Level at 10m, dB $L_{Aeq,12h}$	Distance within which SOAEL (65 dB $L_{Aeq,12h}$) may be exceeded, m	Comment
		LGV	HGV			
H18-A1	Sections C and D	38	152	65.3	11	No NSR within threshold distance
H19-A1	Sections C and D	38	152	65.3	11	No NSR within threshold distance
H19-A2	Section D	184	598	71.3	43	No NSR within threshold distance
H20-A1	Section D	34	169	65.8	12	No NSR within threshold distance
H20-A2	Section D	48	186	66.2	13	No NSR within threshold distance
H21-A1	Section D	40	150	65.3	11	No NSR within threshold distance
H22-A1	Section D	44	162	65.6	11	No NSR within threshold distance
H23-A1	Section D	108	165	65.9	12	No NSR within threshold distance
H24-A1	Sections D and E	44	169	65.8	12	No NSR within threshold distance

Temporary Haul Road ID	Project Section(s)	Anticipated Maximum Daily Vehicle Movements (2-way)		Construction Traffic Noise Level at 10m, dB $L_{Aeq,12h}$	Distance within which SOAEL (65 dB $L_{Aeq,12h}$) may be exceeded, m	Comment
		LGV	HGV			
H24-A2	Section E	46	188	66.3	13	No NSR within threshold distance
H25-A1	Section E	49	196	66.4	14	One NSR within threshold distance
H25-A2	Sections E and F	159	248	67.6	18	No NSR within threshold distance
H26-A1	Sections E and F	42	154	65.4	11	No NSR within threshold distance
H27-A1	Sections E and F	36	150	65.3	11	No NSR within threshold distance
H28-A1	Sections E and F	34	146	65.1	10	No NSR within threshold distance
H28-A2	Section F	38	154	65.4	11	No NSR within threshold distance
H29-A1	Section F	35	150	65.3	11	No NSR within threshold distance
H29-A2	Section F	38	154	65.4	11	No NSR within threshold distance

Temporary Haul Road ID	Project Section(s)	Anticipated Maximum Daily Vehicle Movements (2-way)		Construction Traffic Noise Level at 10m, dB $L_{Aeq,12h}$	Distance within which SOAEL (65 dB $L_{Aeq,12h}$) may be exceeded, m	Comment
		LGV	HGV			
H30-A1	Section F	39	158	65.5	11	No NSR within threshold distance
H30-A2	Section F	39	158	65.5	11	No NSR within threshold distance
H31-A1	Sections F and G	43	150	65.3	11	No NSR within threshold distance
H32-A1	Section G	4	8	52.6	1	No NSR within threshold distance
H33-A1	Section G	36	174	65.9	12	No NSR within threshold distance
H33-A2	Section G	39	142	65.0	10	No NSR within threshold distance
H34-A1	Section G and H	124	146	65.4	11	No NSR within threshold distance
H35-A1	Section G and H	44	160	65.6	11	No NSR within threshold distance
H35-A2	Section G and H	8	20	56.6	1	No NSR within threshold distance

Temporary Haul Road ID	Project Section(s)	Anticipated Maximum Daily Vehicle Movements (2-way)		Construction Traffic Noise Level at 10m, dB $L_{Aeq,12h}$	Distance within which SOAEL (65 dB $L_{Aeq,12h}$) may be exceeded, m	Comment
		LGV	HGV			
H36-A1	Section H	40	142	65.0	10	No NSR within threshold distance
H37-A1	Section H	160	166	66.0	13	No NSR within threshold distance
H38-A1	Section H	213	448	70.1	32	No NSR within threshold distance
H39-A1	Section H	10	50	60.5	4	No NSR within threshold distance
H40-A1	Section H	42	0	48.6	0	No NSR within threshold distance

Abbreviations

Abbreviation	Full Reference
AAWT	Annual Average Weekday Traffic
BPM	Best Practicable Means
BNL	Basic Noise Level
BS	British Standard
BSI	British Standards Institution
CRTN	Calculation of Road Traffic Noise
DCO	Development Consent Order
DoT	Department of Transport
DMRB	Design Manual for Roads and Bridges
ES	Environmental Statement
HGV	Heavy Goods Vehicles
LGV	Light Goods Vehicles
NIA	Noise Important Areas
NSR	Noise Sensitive Receptors
SOAEL	Significant Observed Adverse Effect Levels

Glossary

Term	Definition
A-Weighted	The A Weighting corrects the variation in the ear's ability to hear different frequencies and provides a good representation of how sound is perceived by the human ear.
Basic noise level	A reference noise level at 10m from the nearside carriageway, calculated as a function of traffic flow, percentage of HGVs, average speed, road gradient and road surface.
Construction routes	These are the roads on the local road network that would be used by construction vehicles between the strategic road network and the access points within the Order Limits.
Decibel (dB)	Unit for measuring sound levels.
Equivalent Continuous Sound Level (Leq)	Equivalent continuous sound level is a notional steady sound level that causes the same A-weighted sound energy to be received as that due to the actual and possibly fluctuating sound over a period of time T. It can also be used to relate periods of exposure and noise level. For example, halving or doubling the period of exposure is equivalent in sound energy to a decrease or increase of 3dB(A) in the sound level for the original period.
Frequency Weighting Networks	Frequency weighting networks, which are generally built into sound level meters, attenuate the signal at some frequencies and amplify it at others. The A-weighting network approximately corresponds to human frequency response to sound. Sound levels measured with the A-weighting network are expressed in dB(A). Other weighting networks also exist, such as C-weighting which is nearly linear (i.e. unweighted) and other more specialised weighting networks. Variables such as L_p and L_{eq} that can be measured using such weightings are expressed as L_{pA} / L_{pC}, L_{Aeq} / L_{Ceq} etc.
Haul Roads	Another term used for the temporary access route, which is a temporary route built to carry construction vehicles within the Order Limits.
Heavy Goods Vehicle	A Heavy Goods Vehicle (HGV) is a large motor vehicle designed for transporting goods and materials. In the UK an HGV typically refers to any vehicle with a gross vehicle weight over 3.5 tonnes (3,500 kg). These vehicles include lorries, trucks, and articulated lorries.
$L_{A10,T}$	$L_{A10,T}$ refers to the level exceeded for 10% of the measurement period, T. LA10 is widely used as a descriptor of traffic noise.
$L_{Aeq,T}$	The A-weighted L_{eq} sound level measured over a specified period of time, T.
Light Goods Vehicle	A Light Goods Vehicle (LGV) is a motor vehicle designed for transporting goods, with a gross vehicle weight of 3.5 tonnes (3,500 kg) or less. These

Term	Definition
	vehicles include small vans, pickup trucks, and other light commercial vehicles commonly used for local deliveries and trades
Lowest Observed Adverse Effect Level	This is the level of noise above which adverse effects on health and quality of life can be detected.
Noise	Unwanted sound.
Noise Important Area	Determined via strategic noise maps and highlight the residential areas experiencing the highest 1% of noise levels from road and rail sources in England.
Noise and vibration sensitive receptor (NSR)	A location that is sensitive to noise and/or vibration. The sensitivity of a receptor to noise and vibration varies depending on the receptor type.
Percentile or Statistical Levels	Calculation of the noise level which is exceeded for a certain percent of a total period. Background noise is often defined as the A-weighted sound pressure level exceeded for 90% of the specified period T, expressed $L_{90,T}$. Road traffic noise is often characterised in terms of $L_{A10,18h}$.
Receptor	The physical resource or user group that would respond to an effect e.g. somebody or something adversely affected by a pollutant.
Significance	A measure of the importance or gravity of the environmental effect, defined by significance criteria specific to the environmental topic.
Significant observed adverse effect level (SOAEL)	This is the level of noise above which significant adverse effects on health and quality of life occur.
Sound	Sound is vibrations travelling through a medium (usually air) that the can be perceived by the hearing organs.

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