The Great Grid Upgrade

North Humber to High Marnham

NHHM-AEC-CNS-REP-0112

North Humber to High Marnham

Volume 6: Environmental Statement

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1. Construction Traffic Noise and Vibration Assessment

1.1 Introduction

1.1.1 This appendix to **Application Document 6.16 Chapter 16 Noise and Vibration** sets out the assessment of construction traffic noise and vibration on the public highway and temporary access routes at noise and vibration sensitive receptors (NSRs) due to the Project. This appendix includes the below:

- Construction traffic noise (public highways)
- Construction traffic noise (construction access tracks)
- Construction traffic vibration.

1.2 Construction Traffic Noise (Public Highway)

Assessment Methodology

1.2.1 The assessment of construction traffic noise has been conducted following the guidance detailed in Design Manual for Roads and Bridges (DMRB) LA 111 – Noise and Vibration (Highways England et al., 2020). This provides guidance for the assessment of 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 projects, particularly with regards to construction traffic noise in lieu of other guidance.

Data Sources

1.2.2 The assessment is based on traffic data and assumptions that have been produced by National Grid to support the transport assessment (as described in **Application Document 6.14 Chapter 14 Traffic and Transport**), including the proposed numbers of heavy goods vehicles (HGV).

Study Area

1.2.3 Noise from construction traffic on the existing local road network has been assessed based on the proposed construction traffic routes, as show in **Application Document 6.4.F2 Figure 4.2 Construction Traffic Routes**. The study area is defined following the guidance detailed in DMRB LA 111 (Highways England et al., 2020) 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 1dB(A)[1] or more because of the additional construction traffic to existing traffic levels.

[1] A-weighted decibels

Assessment Criteria

1.2.4 Noise from construction traffic on the public highway has been calculated in accordance with the Department of Transport (DOT) document Calculation of Road Traffic Noise (CRTN) (DoT, 1988) and assessed against the criteria detailed in DMRB LA 111 (Highways England et al., 2020). The BNL from public roads used as construction traffic routes has been calculated in accordance with CRTN (DoT, 1988) for the 'Without Development' and 'With Development' scenarios in the construction period. The calculated BNL values were compared to determine the magnitude of the impact.

1.2.5 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 (DoT, 1988).

1.2.6 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 (DoT, 1988) 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.

1.2.7 Where there are potential changes in the BNL on roads greater than or equal to 3 dB(A) a subsequent assessment of the impacts on NSRs within 50 m of routes where there are potential significant effects has been conducted. NSRs include dwellings, healthcare facilities, education facilities or other buildings where noise can cause disturbance to people using the buildings.

1.2.8 Consideration is also given to overall traffic flows. Where both the 'Without Development' and 'With Development' traffic flows are low (i.e. less than 4,000 vehicles per day), significance is determined with reference to both the magnitude of change and the resultant absolute traffic noise level. This recognises that a noticeable change in noise level does not necessarily equate to a significant adverse effect where traffic volumes, and consequently overall noise levels, remain low.

1.2.9 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 programme of works will be developed by the Mains Work Contractor(s) post consent. However, for the purpose of this assessment it is assumed that the above temporal thresholds may be exceeded, as a worst-case.

1.2.10 There are also potential significant effects where there is a small magnitude impact at NSRs 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. NIAs are shown in **Application Document 6.16.F1 Figure 16.1 Noise and Vibration Baseline**.

Noise Assessment

1.2.11 The results of the construction traffic noise assessment are provided in Table 1.1.

1.2.12 The assessment indicates that there is a small or negligible increase in noise level on all routes apart from one (Primary Access Route (PAR) 43) shown in **Application Document 6.4.F2 Figure 4.2 Construction Traffic Routes**, where a medium magnitude increase is expected. Whilst the increase in noise level is calculated to be 3.3 dB, both the baseline traffic flow (1,059 vehicles per day) and the traffic flow with construction traffic (1,306 vehicles per day) are low, resulting in low overall traffic noise levels. Taking account of both the magnitude of change and the resultant absolute noise levels, the effect is not considered to be significant.

1.2.13 Additionally, there are no small, medium or large magnitude changes in noise level on routes which would be considered potential significant on routes within NIAs.

1.2.14 In some instances, PARs are referenced in multiple rows with different assessment results. These relate to different sections of the respective PAR for which different baseline (and therefore resultant noise levels) may differ along the route.

1.2.15 In summary, the effect of construction traffic noise is **Not Significant** on all proposed routes.

Table 1.1 – Construction Traffic Noise Assessment – Public Highway

Construction Traffic Route (PAR) ID	Description	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB	Outcome magnitude and effect
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Const. Traffic		
PAR 43	B1392 Luddington Road	1,059	7.9	1,306	16.2	56.5	59.8	3.3	Medium magnitude but low traffic flows – Not Significant
PAR 13	Lambwell Hill	1,848	2.4	2,076	9.5	59.0	61.7	2.7	Small magnitude – Not Significant
PAR 136	B1392 Eastoft Road	1,034	7.5	1,184	13.1	56.1	58.5	2.4	Small magnitude – Not Significant
PAR 127	Ellerker Lane	1,062	6.5	1,178	10.9	56.1	58.0	1.9	Small magnitude – Not Significant
PAR 37	A161 Field Lane (North of Eastoft)	1,571	7.2	1,721	11.0	59.3	60.8	1.5	Small magnitude – Not Significant
PAR 57	Belton Road	1,048	10.3	1,145	13.9	56.9	58.3	1.4	Small magnitude – Not Significant
PAR 69	Brackenhill Road / East Lound Road	1,115	9.4	1,212	12.9	57.2	58.6	1.4	Small magnitude – Not Significant
PAR 49	Keadby Power Station Internal Roads / Unnamed Roads	1,848	2.4	1,905	5.3	59.0	60.1	1.1	Small magnitude – Not Significant
PAR 49	Keadby Power Station Internal Roads / Unnamed Roads	1,848	2.4	1,905	5.3	59.0	60.1	1.1	Small magnitude – Not Significant

Construction Traffic Route (PAR) ID	Description	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB	Outcome magnitude and effect
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Const. Traffic		
PAR 55	King Edward Street	1,510	7.5	1,607	10.2	59.1	60.2	1.1	Small magnitude – Not Significant
PAR 56	Bracon	1,510	7.5	1,607	10.2	59.1	60.2	1.1	Small magnitude – Not Significant
PAR 59	Melwood Hill South	1,428	8.3	1,525	11.1	58.9	60.0	1.1	Small magnitude – Not Significant
PAR 63	Melwood Hill North	1,428	8.3	1,525	11.1	58.9	60.0	1.1	Small magnitude – Not Significant
PAR 113	Hazelwood Lane	1,727	4.2	1,820	6.5	59.1	60.2	1.1	Small magnitude – Not Significant
PAR 124	Top Street / Darlton Road	1,605	4.9	1,698	7.5	58.9	59.9	1.0	Small magnitude – Not Significant
PAR 131	Staddlethorpe Lane	1,525	11.9	1,640	14.7	60.2	61.2	1.0	Small magnitude – Not Significant
PAR 115	Retford Road (North of Rampton Hospital)	1,641	5.3	1,689	8.0	59.1	60.0	0.9	Negligible magnitude – Not Significant
PAR 33	A161 King's Causeway	1,587	7.5	1,669	9.5	59.5	60.3	0.8	Negligible magnitude – Not Significant
PAR 110	Grove Road	2,029	5.6	2,122	7.6	60.6	61.4	0.8	Negligible magnitude – Not Significant

Construction Traffic Route (PAR) ID	Description	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB	Outcome magnitude and effect
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Const. Traffic		
PAR 111	Lady Well Lane	2,029	5.6	2,122	7.6	60.6	61.4	0.8	Negligible magnitude – Not Significant
PAR 131	Staddlethorpe Lane	2,740	6.4	2,856	8.2	62.6	63.3	0.7	Negligible magnitude – Not Significant
PAR 132	Thornton Dam Lane / Scalby Lane	2,723	5.0	2,838	6.9	62.2	62.9	0.7	Negligible magnitude – Not Significant
PAR 132	Thornton Dam Lane / Scalby Lane	2,744	6.4	2,859	8.2	62.6	63.3	0.7	Negligible magnitude – Not Significant
PAR 33	A161 King's Causeway	1,481	7.6	1,533	9.1	59.0	59.6	0.6	Negligible magnitude – Not Significant
PAR 44	A161 Crowle Road/Wharf Road - Eastoft to Ealand	2,459	6.6	2,556	8.3	62.1	62.7	0.6	Negligible magnitude – Not Significant
PAR 62	Rectory Street	2,520	7.6	2,617	9.3	62.5	63.1	0.6	Negligible magnitude – Not Significant
PAR 155	Retford Road East	2,284	5.5	2,331	7.4	61.3	61.9	0.6	Negligible magnitude – Not Significant
PAR 8	Little Weighton Road	2,665	4.7	2,741	5.9	62.0	62.5	0.5	Negligible magnitude – Not Significant
PAR 70	B1396 Tower Hill	3,285	5.3	3,382	6.7	63.3	63.8	0.5	Negligible magnitude – Not Significant

Construction Traffic Route (PAR) ID	Description	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB	Outcome magnitude and effect
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Const. Traffic		
PAR 101	Cross Street	2,987	5.8	3,034	7.2	62.9	63.4	0.5	Negligible magnitude – Not Significant
PAR 103	Retford Road West	3,833	7.0	3,957	8.1	64.4	64.9	0.5	Negligible magnitude – Not Significant
PAR 104	Leverton Road / Spital Hill	4,379	4.6	4,503	5.6	64.3	64.8	0.5	Negligible magnitude – Not Significant
PAR 107	Cocking Lane	2,667	4.7	2,714	6.3	62.0	62.5	0.5	Negligible magnitude – Not Significant
PAR 116	Laneham Road (South of Main Street)	2,538	9.3	2,630	10.7	62.9	63.4	0.5	Negligible magnitude – Not Significant
PAR 153	Leverton Road	3,130	6.5	3,178	7.9	63.3	63.8	0.5	Negligible magnitude – Not Significant
PAR 116	Laneham Road	3,018	8.5	3,110	9.7	63.6	64.1	0.5	Negligible magnitude – Not Significant
PAR 24B	Brough Road(South of Brantingham Road)	7,364	4.3	7,524	5.2	66.5	66.9	0.4	Negligible magnitude – Not Significant
PAR 104	Leverton Road / Spital Hill	3,751	6.0	3,875	7.2	64.1	64.5	0.4	Negligible magnitude – Not Significant
PAR 116	Laneham Road (between Retford Road and Main street)	3,302	8.0	3,395	9.2	64.0	64.4	0.4	Negligible magnitude – Not Significant

Construction Traffic Route (PAR) ID	Description	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB	Outcome magnitude and effect
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Const. Traffic		
PAR 126	Willow Flats	5,133	4.5	5,249	5.6	65.0	65.4	0.4	Negligible magnitude – Not Significant
PAR 5	Dunflat Road	3,933	4.7	4,009	5.6	63.9	64.3	0.4	Negligible magnitude – Not Significant
PAR 24A	Brough Road (Between A1034 roundabout and Brantingham Road)	7,650	4.4	7,810	5.3	66.7	67.1	0.4	Negligible magnitude – Not Significant
PAR 71	A161 Haxey Lane	4,351	10.2	4,478	11.2	65.7	66.1	0.4	Negligible magnitude – Not Significant
PAR 74	A161 Station Road	5,090	8.1	5,218	9.0	65.9	66.3	0.4	Negligible magnitude – Not Significant
PAR 98	A620 - Gainsborough Road	5,002	9.1	5,095	9.9	66.1	66.4	0.3	Negligible magnitude – Not Significant
PAR 122	Main Street	1,507	15.8	1,546	16.6	60.8	61.1	0.3	Negligible magnitude – Not Significant
PAR 7	Main Street	4,727	3.9	4,803	4.6	64.5	64.8	0.3	Negligible magnitude – Not Significant
PAR 10A	Riplingham Road (between A164/Riplingham Road junction and Rowley Road)	6,055	4.5	6,131	5.1	65.7	66.0	0.3	Negligible magnitude – Not Significant

Construction Traffic Route (PAR) ID	Description	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB	Outcome magnitude and effect
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Const. Traffic		
PAR 29	B1230 Main Road (East)	8,075	8.0	8,235	8.7	67.9	68.2	0.3	Negligible magnitude – Not Significant
PAR 41	Ox Pasture Lane	5,523	4.9	5,620	5.7	65.5	65.8	0.3	Negligible magnitude – Not Significant
PAR 65	A161 Epworth Road	7,161	8.2	7,288	8.8	67.4	67.7	0.3	Negligible magnitude – Not Significant
PAR 79	B1403 Church Street	2,452	6.6	2,486	7.1	62.0	62.3	0.3	Negligible magnitude – Not Significant
PAR 82	B1403 Gringley Road	2,304	8.5	2,338	9.1	62.1	62.4	0.3	Negligible magnitude – Not Significant
PAR 83	B1403 Fountain Hill	2,304	8.5	2,338	9.1	62.1	62.4	0.3	Negligible magnitude – Not Significant
PAR 85	B1403 Walkeringham Road	2,762	8.7	2,807	9.3	63.2	63.5	0.3	Negligible magnitude – Not Significant
PAR 92	Sturton Road	3,068	14.7	3,161	15.8	65.0	65.3	0.3	Negligible magnitude – Not Significant
PAR 93	Gainsborough Road	3,068	14.7	3,161	15.8	65.0	65.3	0.3	Negligible magnitude – Not Significant
PAR 96	Sturton Road	1,084	7.5	1,130	7.2	56.5	56.8	0.3	Negligible magnitude – Not Significant

Construction Traffic Route (PAR) ID	Description	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB	Outcome magnitude and effect
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Const. Traffic		
PAR 97	Low Street	1,084	7.5	1,130	7.2	56.5	56.8	0.3	Negligible magnitude – Not Significant
PAR 99	A620 - Between Low Street in North Wheatley to Spital Hill in Retford	7,328	5.1	7,421	5.7	66.7	67.0	0.3	Negligible magnitude – Not Significant
PAR 139	Fledborough Road	1,266	14.0	1,292	14.7	59.1	59.4	0.3	Negligible magnitude – Not Significant
PAR 150	Epworth Road South	1,117	6.5	1,162	6.3	56.5	56.8	0.3	Negligible magnitude – Not Significant
PAR 151	Burnham Road East	1,117	6.5	1,162	6.3	56.5	56.8	0.3	Negligible magnitude – Not Significant
PAR 152	Church Street	1,117	6.5	1,162	6.3	56.5	56.8	0.3	Negligible magnitude – Not Significant
PAR 10B	Riplingham Road(west of Rowley Road)	5,616	5.0	5,692	5.6	65.6	65.8	0.2	Negligible magnitude – Not Significant
PAR 29	B1230 Main Road (East)	8,991	7.5	9,151	8.2	68.3	68.5	0.2	Negligible magnitude – Not Significant
PAR 29	B1230 Main Road (East)	8,361	8.0	8,521	8.7	68.1	68.3	0.2	Negligible magnitude – Not Significant

Construction Traffic Route (PAR) ID	Description	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB	Outcome magnitude and effect
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Const. Traffic		
PAR 32	A161 Swinefleet Road	6,236	3.8	6,319	4.4	65.7	65.9	0.2	Negligible magnitude – Not Significant
PAR 51	A18 Trunk Road (East)	9,482	8.6	9,676	9.5	68.8	69.0	0.2	Negligible magnitude – Not Significant
PAR 52	A18 High Levels Bank (West)	5,668	9.6	5,796	10.4	66.8	67.0	0.2	Negligible magnitude – Not Significant
PAR 53	A161 - Between A18 and M180	6,966	9.5	7,063	10.1	67.6	67.8	0.2	Negligible magnitude – Not Significant
PAR 53	A161 - Between A18 and M180	7,103	9.7	7,200	10.3	67.8	68.0	0.2	Negligible magnitude – Not Significant
PAR 61	A161 High Street - Between King Edward Street and Blow Row	9,956	7.2	10,054	7.6	68.6	68.8	0.2	Negligible magnitude – Not Significant
PAR 65	A161 Epworth Road	7,249	8.2	7,376	8.8	67.5	67.7	0.2	Negligible magnitude – Not Significant
PAR 76	A161 Haxey Road	5,009	6.7	5,076	7.2	65.5	65.7	0.2	Negligible magnitude – Not Significant
PAR 86	A631 (Gringley on the Hill West)	10,388	11.2	10,505	11.6	69.7	69.9	0.2	Negligible magnitude – Not Significant

Construction Traffic Route (PAR) ID	Description	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB	Outcome magnitude and effect
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Const. Traffic		
PAR 99	A620 - Between Low Street in North Wheatley to Spital Hill in Retford	5,602	8.6	5,694	9.3	66.5	66.7	0.2	Negligible magnitude – Not Significant
PAR 99	A620 - Between Low Street in North Wheatley to Spital Hill in Retford	7,510	6.5	7,603	7.0	67.2	67.4	0.2	Negligible magnitude – Not Significant
PAR 117	A57 Broad Gate	9,735	10.7	9,867	11.2	69.3	69.5	0.2	Negligible magnitude – Not Significant
PAR 149	Epworth Road North	1,428	8.3	1,473	8.0	58.9	59.1	0.2	Negligible magnitude – Not Significant
PAR 134	B1392	1,435	5.5	1,482	5.3	58.2	58.4	0.2	Negligible magnitude – Not Significant
PAR 44	A161 Crowle Road/Wharf Road - Eastoft to Ealand	9,045	6.1	9,142	6.6	67.9	68.1	0.2	Negligible magnitude – Not Significant
PAR 75	Tindale Bank Road	8,075	8.0	8,172	8.3	67.9	68.1	0.2	Negligible magnitude – Not Significant
PAR 156	B1230 Main Road West	8,075	8.0	8,191	8.6	67.9	68.1	0.2	Negligible magnitude – Not Significant
PAR 12	A164 - Between A164/Riplingham Road	20,758	9.5	20,869	9.7	74.8	74.9	0.1	Negligible magnitude – Not Significant

Construction Traffic Route (PAR) ID	Description	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB	Outcome magnitude and effect
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Const. Traffic		
	Roundabout and Wingfield Farm Roundabout								
PAR 73	Stockwith Road	8,343	8.0	8,440	8.5	68.1	68.2	0.1	Negligible magnitude – Not Significant
PAR 81	A161 High Street to A161/A631 Roundabout	4,390	7.1	4,423	7.4	65.1	65.2	0.1	Negligible magnitude – Not Significant
PAR 81	A161 High Street to A161/A631 Roundabout	4,765	5.9	4,799	6.1	65.1	65.2	0.1	Negligible magnitude – Not Significant
PAR 81	A161 High Street to A161/A631 Roundabout	5,026	6.9	5,060	7.1	65.6	65.7	0.1	Negligible magnitude – Not Significant
PAR 88	A631 - Between A161/A631 Roundabout and Wood Lane	13,506	6.7	13,528	6.8	69.8	69.9	0.1	Negligible magnitude – Not Significant
PAR 118	A57 - Between Darlton Road and BM 127	9,777	11.8	9,908	12.3	69.6	69.7	0.1	Negligible magnitude – Not Significant
PAR 140	A15 (From Wingfield Farm Roundabout to A180 Interchange)	25,936	10.7	26,079	10.8	73.6	73.7	0.1	Negligible magnitude – Not Significant
PAR 14	Westoby Lane	2,531	4.5	2,568	4.5	61.6	61.7	0.1	Negligible magnitude – Not Significant

Construction Traffic Route (PAR) ID	Description	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB	Outcome magnitude and effect
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Const. Traffic		
PAR 15	Brick Dike Lane	2,222	5.2	2,259	5.2	61.1	61.2	0.1	Negligible magnitude – Not Significant
PAR 47	Main Street	2,531	4.5	2,578	4.4	61.6	61.7	0.1	Negligible magnitude – Not Significant
PAR 31	A161 Tom Pudding Way	7,655	12.8	7,738	13.1	68.7	68.8	0.1	Negligible magnitude – Not Significant
PAR 50	A161 - Between Outgate and A18 Interchange	10,374	6.6	10,503	7.1	68.7	68.8	0.1	Negligible magnitude – Not Significant
PAR 61	A161 High Street - Between King Edward Street and Blow Row	9,184	6.8	9,281	7.3	68.2	68.3	0.1	Negligible magnitude – Not Significant
PAR 81	A161 High Street to A161/A631 Roundabout	5,635	7.3	5,668	7.5	66.2	66.3	0.1	Negligible magnitude – Not Significant
PAR 105	A638 Arlington Way/London Road	14,076	5.5	14,200	5.9	69.7	69.8	0.1	Negligible magnitude – Not Significant
PAR 105	A638 Arlington Way/London Road	15,340	5.1	15,465	5.4	70.0	70.1	0.1	Negligible magnitude – Not Significant
PAR 106	A638 Great North Road - To the A1	10,769	7.1	10,893	7.5	69.0	69.1	0.1	Negligible magnitude – Not Significant

Construction Traffic Route (PAR) ID	Description	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB	Outcome magnitude and effect
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Const. Traffic		
PAR 1A	A1079 Beverley Bypass East (between A164/A1079 int and BM 001)	21,682	7.2	21,709	7.2	74.6	74.6	0.0	No change – Not Significant
PAR 1B	A1079 Beverley Bypass East (east of BM 001)	21,443	8.6	21,452	8.6	74.8	74.8	0.0	No change – Not Significant
PAR 2	A1079 Beverley Bypass West	20,989	7.1	20,998	7.1	74.5	74.5	0.0	No change – Not Significant
PAR 3	A164 - North of A1079	23,132	5.6	23,140	5.6	74.6	74.6	0.0	No change – Not Significant
PAR 4	A164 Beverley Road - Between A1079 and Dunflat Road	28,868	6.8	28,876	6.8	75.8	75.8	0.0	No change – Not Significant
PAR 6	A164 - Between Dunflat Road and B1233/A164 Roundabout	29,160	6.6	29,271	6.7	75.8	75.8	0.0	No change – Not Significant
PAR 9	A164 - Between B1233/A164 Roundabout and A164/Riplingham Road Roundabout	28,429	7.8	28,540	7.9	75.9	75.9	0.0	No change – Not Significant
PAR 16	B1230 - Hunsley Road	9,276	6.3	9,314	6.3	68.1	68.1	0.0	No change – Not Significant

Construction Traffic Route (PAR) ID	Description	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB	Outcome magnitude and effect
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Const. Traffic		
PAR 17	A1034 - Between Hunsley Road and A1079/A1034 Roundabout (North)	7,556	10.1	7,594	10.1	68.1	68.1	0.0	No change – Not Significant
PAR 18	A1034 - Between Hunsley Road and Beverley Road (South)	9,727	11.5	9,764	11.5	69.5	69.5	0.0	No change – Not Significant
PAR 19	A1034 - Beverley Road and A63	9,727	11.5	9,764	11.5	69.5	69.5	0.0	No change – Not Significant
PAR 20	Beverley Road	27,438	5.7	27,475	5.7	75.3	75.3	0.0	No change – Not Significant
PAR 22	A63 Petuaria Way (South)	42,707	16.3	42,850	16.4	79.0	79.0	0.0	No change – Not Significant
PAR 25	A63 Petuaria Way (West)	38,965	16.9	39,108	17.0	78.7	78.7	0.0	No change – Not Significant
PAR 30	M62	39,597	16.5	39,740	16.6	80.8	80.8	0.0	No change – Not Significant
PAR 34	Pennyhill Cottages	27,693	6.7	27,719	6.7	73.0	73.0	0.0	No change – Not Significant
PAR 35	Main Street	27,693	6.7	27,719	6.7	73.0	73.0	0.0	No change – Not Significant

Construction Traffic Route (PAR) ID	Description	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB	Outcome magnitude and effect
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Const. Traffic		
PAR 36	Church Lane	5,963	4.4	5,988	4.4	65.6	65.6	0.0	No change – Not Significant
PAR 54	A161 - Between M180 and Belton	11,656	7.5	11,686	7.5	69.4	69.4	0.0	No change – Not Significant
PAR 60	Blow Row	2,794	5.2	2,794	5.2	62.4	62.4	0.0	No change – Not Significant
PAR 74	A161 Station Road	5,015	8.8	5,045	8.8	66.1	66.1	0.0	No change – Not Significant
PAR 87	A631 (Gringley on the Hill East)	8,948	12.6	8,998	12.8	69.4	69.4	0.0	No change – Not Significant
PAR 87	A631 (Gringley on the Hill East)	8,945	12.8	8,967	12.9	69.4	69.4	0.0	No change – Not Significant
PAR 89	A631 - Between Wood Lane and A620/A631 Roundabout	13,653	6.6	13,674	6.7	69.9	69.9	0.0	No change – Not Significant
PAR 91	A620 - Between A620/A631 Roundabout to Saundby/Sturton/Gainsborough Road Roundabout	7,823	8.0	7,844	8.1	67.8	67.8	0.0	No change – Not Significant
PAR 100	A620 Amcott Way	20,516	4.6	20,609	4.8	71.1	71.1	0.0	No change – Not Significant

Construction Traffic Route (PAR) ID	Description	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB	Outcome magnitude and effect
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Const. Traffic		
PAR 119	A57 - Between BM 127 and BM 126 (Option 3)	9,777	11.8	9,816	11.9	69.6	69.6	0.0	No change – Not Significant
PAR 120	A57 - Between BM 126 and A57/Main Street Junction	9,777	11.8	9,816	11.9	69.6	69.6	0.0	No change – Not Significant
PAR 121	A57 - Between A57/Main Street Junction East	9,674	10.6	9,713	10.7	69.3	69.3	0.0	No change – Not Significant
PAR 141	A63 (From A15 Interchange to A1079)	58,342	11.1	58,342	11.1	79.6	79.6	0.0	No change – Not Significant
PAR 142	M62 (From A614 Interchange to M18 Interchange)	59,596	17.1	59,822	17.3	82.7	82.7	0.0	No change – Not Significant
PAR 143	M180 (Between M18 Interchange and A161)	44,572	25.1	44,636	25.1	82.2	82.2	0.0	No change – Not Significant
PAR 144	M180 (Between A161 and M181)	45,576	24.8	45,640	24.8	82.3	82.3	0.0	No change – Not Significant
PAR 145	M181	18,582	15.2	18,646	15.3	77.4	77.4	0.0	No change – Not Significant
PAR 146	M180 (Between M181 Interchange and A15)	33,011	28.0	33,074	28.0	81.2	81.2	0.0	No change – Not Significant
PAR 147	M180 (Between A15 Interchange and A180)	44,229	25.0	44,293	25.0	82.2	82.2	0.0	No change – Not Significant

Construction Traffic Route (PAR) ID	Description	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB	Outcome magnitude and effect
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Const. Traffic		
PAR 157	A18 Althorpe Bypass	9,467	8.6	9,514	8.5	68.8	68.8	0.0	No change – Not Significant
PAR 161	A1105 (From A15 Interchange)	58,342	11.1	58,484	11.2	79.6	79.6	0.0	No change – Not Significant
PAR 162	M18 (south of M62 J35)	59,596	17.1	59,725	17.2	82.7	82.7	0.0	No change – Not Significant
PAR 11	Rowley Road (between Riplingham Road/ Rowley Road junction and BM 008)	531	3.0	607	9.0	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 21	Ellerker Road	585	5.9	661	11.0	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 23	Brantingham Road	585	5.9	661	11.0	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 26	Ings Lane	313	3.3	369	2.8	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 26B	Main Street	313	3.3	369	2.8	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 27	Carr Lane	362	8.6	477	19.1	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant

Construction Traffic Route (PAR) ID	Description	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB	Outcome magnitude and effect
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Const. Traffic		
PAR 28	Tongue Lane	625	16.1	785	22.1	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 38	Luddington Road	426	13.8	452	13.0	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 39	Carr Lane	72	5.5	98	4.0	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 40	B1392 Meredyke Road	630	7.7	656	7.4	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 42	Carr Lane	32	4.6	129	39.9	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 45	Outgate (West)	724	10.1	795	9.2	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 46	Bonnyhale Dale Road	115	8.9	244	27.6	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 48	Bonnyhale Road	106	16.6	153	11.5	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 58	Hollingsworth Lane	743	10.7	789	10.0	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 64	Newland Lane	313	3.3	359	2.9	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant

Construction Traffic Route (PAR) ID	Description	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB	Outcome magnitude and effect
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Const. Traffic		
PAR 64B	Newland Lane	313	3.3	359	2.9	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 66	Burnham Road West	362	8.6	407	7.7	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 67	Church Walk	426	13.8	472	12.5	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 68	East Lound Road	661	11.4	707	10.7	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 72	Ferry Road / Main Street	975	9.6	1,072	13.5	very low flow	57.7	very low flow	Negligible magnitude – Not Significant
PAR 72	Ferry Road / Main Street	576	10.2	673	16.4	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 77	Cornley Road	133	9.6	180	20.5	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 78	Carr Lane	224	13.2	271	19.9	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 80	Cattle Road	69	14.0	91	10.5	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 80	Cattle Road	69	14.0	91	10.5	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant

Construction Traffic Route (PAR) ID	Description	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB	Outcome magnitude and effect
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Const. Traffic		
PAR 90	Wood Lane	41	11.6	63	25.9	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 94	Station Road	824	10.2	870	9.7	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 95	Wheatley Road	824	10.2	870	9.7	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 102	Springs Lane	5	11.5	53	90.9	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 108	Town Street / Forewood Lane	423	7.3	470	16.6	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 109	Wood Lane / Main Street	704	7.0	750	6.5	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 112	Main Street	522	8.0	615	14.4	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 114	Ashley Lane	77	8.4	263	38.4	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 123	Retford Road (East Drayton)	304	5.4	397	16.6	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 125	Dale Road	531	3.0	605	2.6	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant

Construction Traffic Route (PAR) ID	Description	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB	Outcome magnitude and effect
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Const. Traffic		
PAR 128	Norfolk Bank Lane	472	7.9	587	16.6	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 129	Common Road	708	6.8	824	13.1	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 130	Wallingfen Lane	682	9.1	798	15.3	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 133	Meredyke Road East (Between Carr Lane and B1392 Shore Road)	692	6.7	739	6.3	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 135	Meredyke Road West	630	7.7	780	16.1	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 137	Outgate East	115	8.9	237	25.5	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 138	Greengate	825	3.3	871	3.1	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 154	Main Street	672	14.7	719	20.3	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 158	Sands Lane	585	5.9	701	13.5	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant

Construction Traffic Route (PAR) ID	Description	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB	Outcome magnitude and effect
		Total Daily Vehicles	% HGV	Total Daily Vehicles	% HGV	Baseline	Baseline Plus Const. Traffic		
PAR 159	Landing lane	362	8.6	477	19.1	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant
PAR 160	Pasture Lane	426	13.8	479	18.0	very low flow	very low flow	very low flow	Negligible magnitude – Not Significant

1.3 Construction Traffic Noise (Construction Access Tracks)

Assessment Methodology

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

1.3.2 Construction traffic flows would vary on the various construction access tracks within the Order Limits.

1.3.3 The construction access track 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 (BS 5228-1) (BSI, 2014). The predicted construction noise levels at a distance 10 m have been calculated for each temporary haul road section.

1.3.4 Based on the results, it was identified that there are no construction access tracks where the construction SOAEL noise level would be exceeded within 30 m of the construction access tracks. A review was undertaken to identify NSRs within approximately 30 m of construction access tracks. Four such locations were identified and subsequent assessment at these locations has been undertaken to determine the impact based on their distances from the construction access track, and the likely traffic on the construction access track.

1.3.5 The results have been compared against the lower noise threshold (Category A) as detailed in Section E.3.2 of BS 5228-1 (BSI, 2014). The threshold is considered to represent the Significant Observed Adverse Effect Level (SOAEL); namely 65 dB $L_{Aeq,12h}$ during daytime periods for residential NSRs.

Assessment

1.3.6 The assessment is based on the following assumptions:

- A construction access track speed limit of 20 mph;
- An individual vehicle sound level of 80 dBA Lmax at 10 m during pass-by based on BS 5228-1 (BSI, 2014) data reference C.2.34 (Lorry) for HGV;
- An individual vehicle sound level of 70 dBA Lmax at 10 m during pass-by based on library data for light vehicles (cars and vans); and
- No mitigation (e.g. screening) assumed.

1.3.7 Table 1.2 presents the findings of the noise assessment of construction traffic on construction access tracks and their associated Bellmouth IDs, as shown in **Application Document 6.4.F3 Figure 4.3 Temporary Construction Works**.

Table 1.2 – Construction Traffic Noise Assessment – Construction Access Tracks

Construction Access Track Bellmouth ID	Route Section(s)	Anticipated Maximum Daily Vehicle Movements (2-way)		Distance to Nearest NSR, m	Construction Traffic Noise Level at Nearest NSR, dB $L_{Aeq,12h}$	Comment
		LGV	HGV			
BM-64/	C	0	57	19	59.8	Below SOAEL. Not Significant
BM-015/65/66	C	46	51	29	57.8	Below SOAEL. Not Significant
BM-129 (near)	F	13	13	13	55.4	Below SOAEL. Not Significant
BM-040/41	B	26	0	20	46.1	Below SOAEL. Not Significant

1.3.8 The assessment indicates that construction traffic noise would be below the SOAEL at all nearby NSRs for all haul construction access tracks. Construction traffic on construction access tracks is therefore **Not Significant**.

1.4 Construction Traffic Vibration

Introduction

1.4.1 This section details the assessment of construction traffic vibration on the existing public highway. However, the outcomes are equally applicable to construction traffic on the construction access tracks.

1.4.2 As described in DMRB LA 111 – Noise and Vibration (Highways England et al., 2020), construction traffic vibration is caused by irregularities in the road surface (e.g. potholes). Where the road surface is free of irregularities, levels of vibration from road traffic would be negligible or low magnitude and would not be expected to cause significant effects. It is noted that maintenance of the local road network is the responsibility of the relevant highway authority. National Grid (and their Contractor) would be responsible for the maintenance of temporary access routes. Good practice measure NV06 in **Application Document 7.3 Register of Environmental Actions and Commitments** states that the access tracks will be well maintained.

1.4.3 Determination of road surface defects along proposed construction traffic routes and temporary access routes is outside the scope of this assessment, but indicative road traffic vibration levels have been calculated for various defect depth, various vehicle speeds, and at various distances from the defect, based on the methodology described in Transport and Road Research Laboratory Research Report 246 Traffic induced vibration in buildings (DoT, 1990). The formula is shown below.

$$PPV_{max} = 0.028 \cdot a \cdot (v/48) \cdot t \cdot p \cdot (r/6)^{x} \quad \text{(Equation 3)}$$

Where:

- a = maximum height or depth of the surface defect in mm
- v = maximum expected speed of HGVs in km/h
- t = ground scaling factor
- p = wheel path correction
- r =distance of the foundation from the defect
- x = power factor

Road Traffic Vibration Assumptions

1.4.4 The following assumptions have been made:

- a = various (10 and 30 mm)
- v = various (10 to 50 km/h)
- t = 0.94 (standard sand/gravel ground)
- p = 0.75 (assumes single wheel path, e.g. pothole)
- r = various (1 to 20 m)
- x = -0.74 (standard sand/gravel ground)

Criteria

1.4.5 There are no specific criteria for construction vibration effects from road traffic. However, based on guidance from DMRB LA 111 (Highways England et al., 2020) and BS 5228-2 (BSI, 2014), the Lowest Observed Adverse Effect Level (LOAEL) can be considered to be a vibration level of 0.3 mm/s, and the SOAEL can be considered to be a vibration level of 1.0 mm/s.

Vibration Assessment

1.4.6 Equation 3 has been used to predict vibration levels from construction road traffic. The predictions are shown for various defect depths, vehicle speeds, and distances from the defect in Image 1.1, Image 1.2, and Image 1.3. The results indicate that the vibration LOAEL of 0.3 mm/s or SOAEL of 1 mm/s peak particle velocity (PPV) are not likely to be exceeded where roads are free from defects, traffic speeds are low, or where the distance from the defect is beyond a few metres, depending on the various factors. As the defect size reduces and tends towards 0 mm, the vibration level tends towards 0 mm/s PPV. This shows that construction traffic vibration is **not expected to be significant.**

Image 1.1 – Predicted Road Traffic Vibration Levels – 30 mm Defect Depth

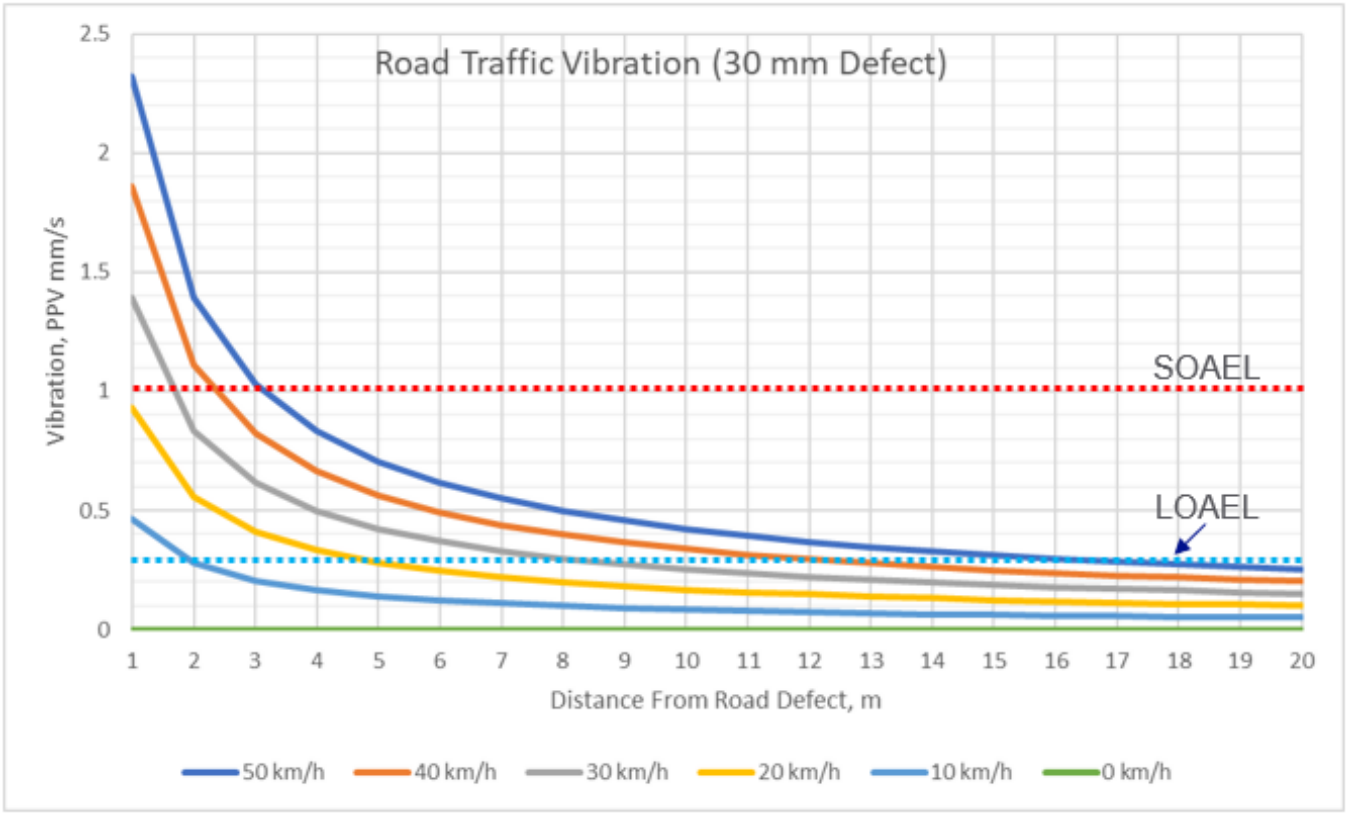


Image 1.2 – Predicted Road Traffic Vibration Levels – 10 mm Defect Depth

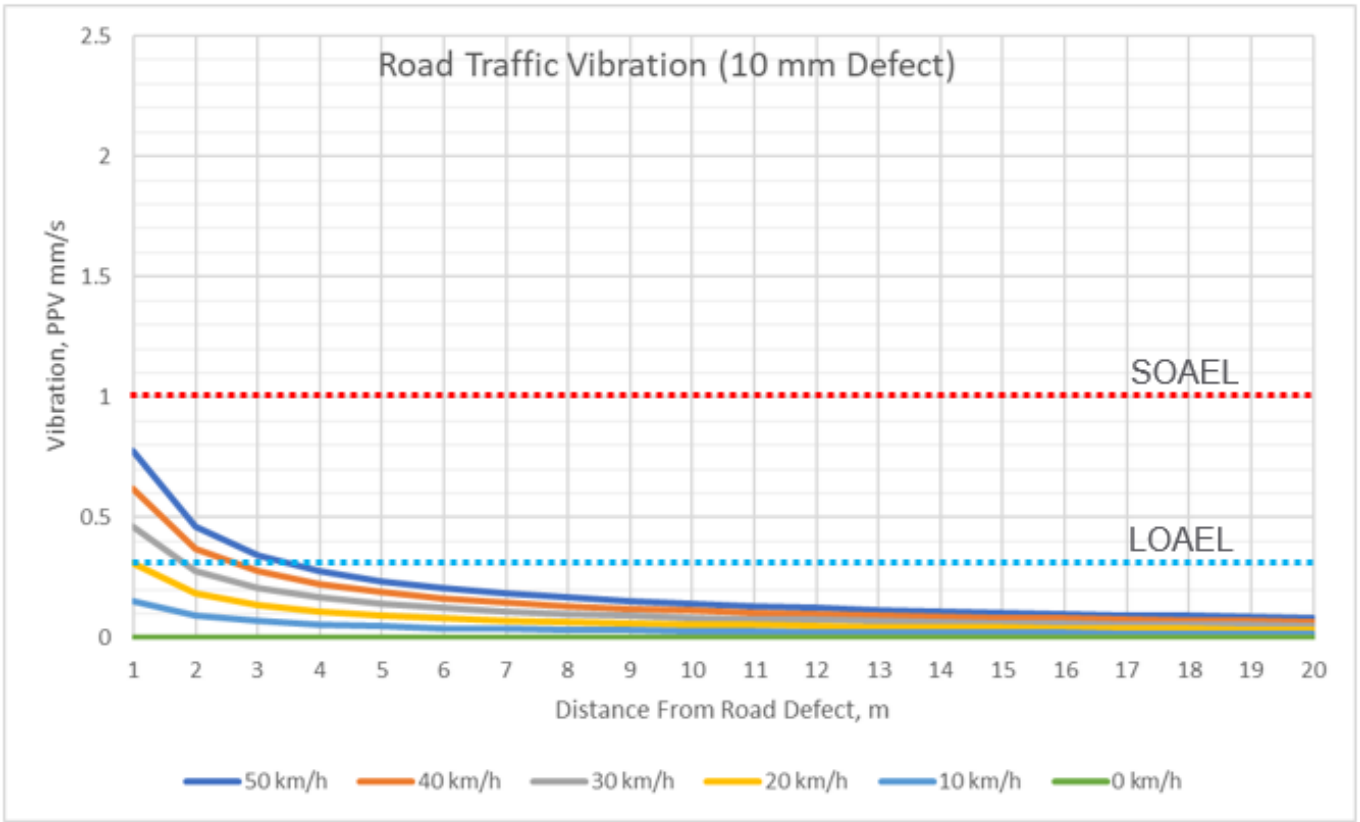
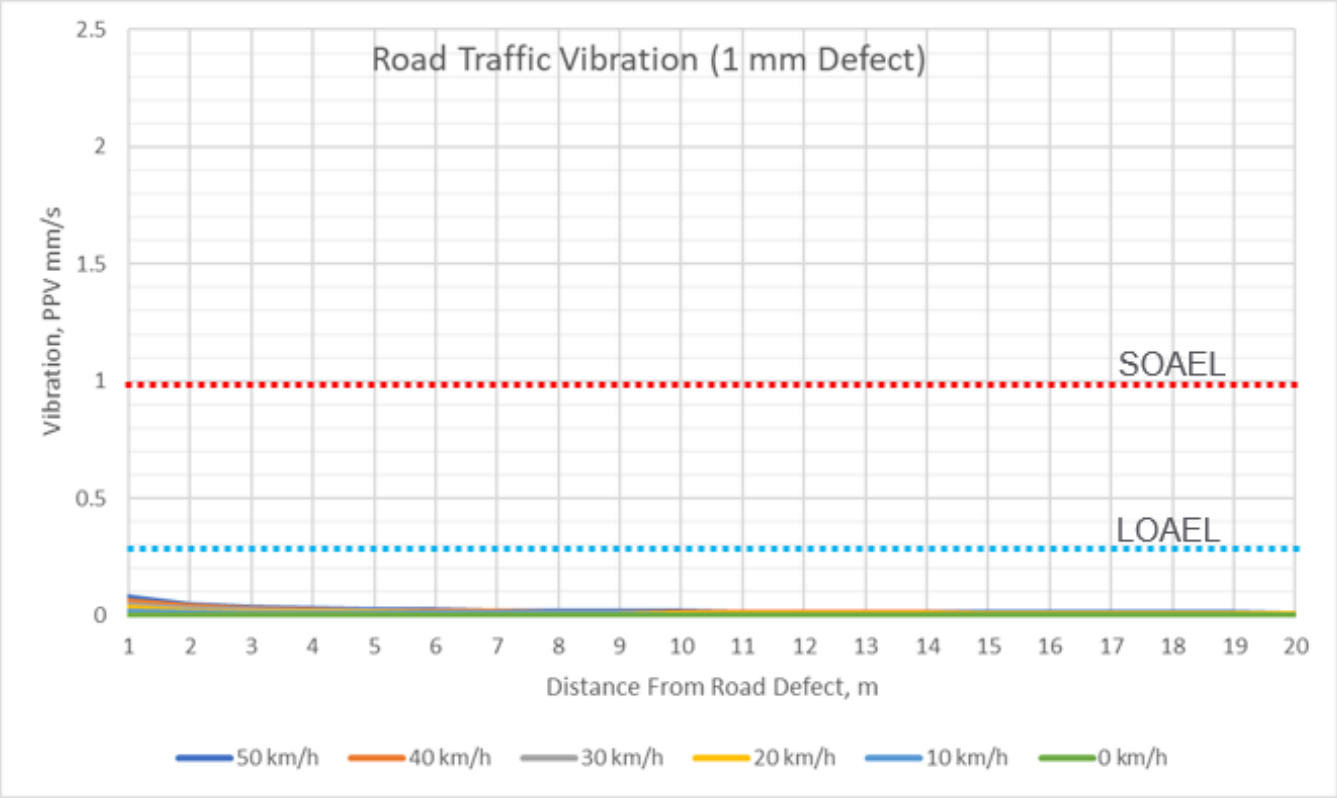


Image 1.3 – Predicted Road Traffic Vibration Levels – 1 mm Defect Depth



References

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