TAG Unit 3.3.2 – Noise

Baseline Conditions

1.1. Mott MacDonald carried out walkover and measurement surveys during summer 2009 in order to observe and record the baseline noise conditions representative of sensitive receptors potentially affected by the Scheme.

1.2. The types of receptors adjacent to the Scheme include residential, commercial, places of learning and worship.

1.3. The dominant source of noise affecting the baseline noise climate of the majority of receptors in close proximity to the Scheme is road traffic noise. Traffic noise is also a significant source in areas where the route of the Scheme deviates from the existing transport corridors where ambient noise levels can be relatively low, for example the segregated section of the North Line in Headingley.

1.4. Diesel bus vehicles used in providing existing public transport services are a significant feature of the baseline noise climate adjacent to the Scheme. Noise effects may arise from the movement of diesel bus vehicles as well as more localised effects at junctions, stops and bus lay-over areas for example at Holt Park.

1.5. Detailed descriptions of the noise climate and baseline noise levels relevant to the areas potentially affected by the Scheme will be presented in the Environmental Statement to be submitted as part of the Transport and Works Act Application for the Scheme.

Impact of Do Minimum

1.6. The noise effects of the Do Minimum scenario are expected to be described by the change in noise levels corresponding with changes in traffic parameters for the relevant transport links, for example due to the growth in traffic flows between baseline and opening year. However, changes in daily flows would need to be substantial to indicate a significant change in noise level for example a 25% increase or 20% decrease in flow corresponds with a 1 dB change in noise level. This magnitude of change in traffic volume is not expected to arise within the study area. Therefore, the noise effects of the Do Minimum scenario are not expected to be significantly different to the baseline condition.

Impact of Preferred Scheme

1.7. The potential construction noise effects of the Preferred Scheme are assessed as **slight adverse (short-term)** and the operational effects are assessed as **moderate beneficial (residual),** therefore the overall score is assessed as **slight beneficial**.

1.8. Noise impacts during the construction of the Preferred Scheme are expected to arise due to:

- demolition and enabling works;
- construction of stops, traffic signals, supporting and retaining structures; and
- pavement and highways works including the park and ride facilities at Bodington and Stourton.

1.9. Infrastructure requirements for trolleybus operations will also require:

- construction and stringing of Overhead Line Equipment (OLE);
- modifications to structure to make allowances for headroom and load-bearing requirements for OLE; and
- construction of a dedicated depot for trolleybus vehicle and seven electrical sub-stations across the NGT network.

Construction work required in implementing the Preferred Scheme is expected to generate more noise than either of the alternative Schemes. The noise impacts are expected to be short-term and some less noisy activities such as stringing OLE could be carried out at night to minimise disruption. Owing to spatial extent of the works required in installing OLE the potential noise effects are assessed overall as **slight adverse**.

1.10. The main operational noise impacts of the Preferred Scheme are identified as those arising from the movement of trolleybus vehicles along the NGT routes, and the movement of private cars and trolleybuses accessing the proposed park and ride facilities at Bodington and Stourton. Trolleybus vehicles generate significantly lower levels of noise than conventional diesel buses under all modes of operation.

1.11. Some properties adjacent to the proposed NGT route that are away from traffic noise sources (for example behind Headingley) are projected to experience moderate increases in noise levels. In these locations mitigation would be required to reduce the potential noise impact.

1.12. The WebTAG calculations have concluded that adjacent to the NGT route there will be 40 less people annoyed by road traffic noise and adjacent to the surrounding road network there will be 45 less people annoyed by road traffic noise. It should be noted that these are net changes in the number of people annoyed, i.e. as a result of both localised increases and reductions in the number of people annoyed by noise adjacent to the local road network. Therefore, in the Do Something scenario there are 85 less people annoyed by road traffic noise than in the Do Minimum.

1.13. There are expected to be a number of out of service vehicle movements during the night period between midnight and 0600. There may also be a number of out of service vehicle movements before the first services and

after the last services from or to the NGT depot. These have a potential to generate night time impacts that are outside the scope of the quantitative assessment. The significance of the impacts are expected to relate to transient noise levels and potential sleep disturbance which cannot be assessed quantitatively in accordance with the WebTAG methodology. This will be considered as part of the Environmental Impact Assessment for the Scheme.

1.14. The operational noise impacts of the Preferred Scheme are assessed qualitatively as being **moderate beneficial.**

Impact of Next Best Alternative

1.15. The potential construction noise effects of the Next Best Alternative are assessed as **slight adverse (short-term)** and the operational effects are assessed as **neutral (residual),** therefore the overall score is assessed qualitatively as **neutral**.

1.16. Noise impacts during the construction of the Next Best Alternative are expected to arise due to:

- demolition and enabling works;
- construction of stops, traffic signals, supporting and retaining structures; and
- pavement and highways works including the park and ride facilities at Bodington and Stourton and the upgrade of bus lanes.

1.17. The main operational noise impacts of the Next Best Alternative are expected to be associated with the movement of hybrid diesel/electric bus vehicles along the NGT routes, and private cars and diesel buses accessing the proposed park and ride facilities at Bodington and Stourton. Diesel bus movements along the NGT route are to be limited to existing traffic corridors and a number of new segregated sections with minimal widening within the existing carriageway boundaries. Construction noise impacts are assessed qualitatively as **slight adverse**.

1.18. In general, it is likely that the operational noise impact of the Next Best Alternative would be worse than that of the Preferred Scheme due to the fact that diesel buses are inherently noisier than electrically powered trolleybuses. However, the scheme will produce a similar reduction in road traffic noise on the surrounding road network as the Preferred Scheme. Therefore, the operational noise impacts of the Next Best Alternative are assessed qualitatively as being **neutral**.

Impact of Lower Cost Alternative

1.19. The potential construction noise effects of the Lower Cost Alternative are assessed as **neutral** and the operational effects are assessed as **neutral,** therefore the overall score is assessed qualitatively as **neutral**.

1.20. The main construction noise effects of the Lower Cost Alternative are expected to be associated with the proposed park and ride facilities at Bodington and Stourton. Increases in ambient noise levels at sensitive receptors due to construction noise impacts are expected to be short-term and reasonably localised. There is scope to mitigate construction noise impacts through best practicable means as the nearest sensitive receptors to both park and ride sites are currently exposed to relatively high levels of traffic noise and the separation distances between the works and nearest receptors are no less than around 40 metres. Therefore, the effect of construction noise impacts is assessed qualitatively as being **neutral**.

1.21. The main operational noise effects of the Lower Cost Alternative are identified as those arising from the movement of diesel bus vehicles along the NGT routes, and private cars and diesel buses accessing the proposed park and ride facilities at Bodington and Stourton. Diesel bus movements along the NGT route are to be limited to existing traffic corridors with minimal widening within the existing carriageway boundaries. Noise from diesel bus movements is a feature of the baseline noise climate. Operational noise impacts due to vehicles accessing the proposed park and ride facilities are expected to be relatively minor due to the existing levels of road traffic noise in the area of the nearest residential receptors. Therefore, the operational noise impacts of the Lower Cost Alternative are assessed qualitatively as being **neutral**.

1. WebTAG 3.3.2 Noise Assessment

Methodology

1.1. The procedure for quantifying and assessing the impacts of traffic for major transport schemes submitted for funding under the Local Transport Plans process is specified in Transport Analysis Guidance (TAG) unit 1.4. Detailed guidance on traffic noise is given in TAG unit 3.3.2 The Noise Sub-Objective (November 2006).

1.2. Two levels of appraisal are described in The Noise Sub-Objective: the Methodology for Strategies and the Methodology for Plans. The Methodology for Strategies is appropriate for the appraisal of various scheme options and is based on a spatially coarse transport model to compare the changes in noise emission affecting populated areas associated with the options in the design year, i.e. 15 years after scheme opening. This is required to make a quantitative assessment of the change in noise annoyance based on the change in the number of people annoyed by transport noise in implementing the scheme options. The Methodology for Plans is appropriate where the parameters of specific interventions are known and a detailed transport model can be used to calculate of the noise level received at each affected household under the Do Minimum and Do Something Scenarios in both the scheme opening year and the design year. This is required in order to make a quantitative assessment of the changes in noise annoyance and the monetary value of the changes in noise levels.

1.3. For the purposes of this assessment, traffic parameters have been made available from a SATURN model produced by SDG which describes conditions under the Do Minimum (without Scheme) and Do Something (NGT Preferred Scheme) scenarios in the year of scheme opening only. Therefore, it is not possible to complete the WebTAG worksheets in the prescribed way in order to determine both monetary value and the change in annoyance which requires traffic parameters in the scheme design year.

1.4. Given the spatial extent of the Scheme, the complex urban network involved and the constraints due to the traffic data it was considered that a full assessment of the Scheme at Plan level would not achieve credible results. A method based on the Strategy level is therefore considered to be the most appropriate form of assessment for noise at this stage. However, more detailed noise modelling will be undertaken as part of the full Environmental Impact Assessment, to be prepared for the scheme as part of the Transport and Works Act Application.

1.5. The assessment of the Preferred Scheme is made using traffic data from the transport model to estimate the difference in the levels of road traffic noise generated by selected links under the Do Minimum and Do Something scenarios in the year of opening. For this assessment, noise levels have been calculated from the traffic data provided using a simplification of the prediction methodology defined in the DoT technical memorandum Calculation of Road Traffic Noise (CRTN) 1988. This is supplemented with qualitative assessments with reference to the baseline conditions and a review of the noise characteristics of the NGT vehicle mode options.

1.6. The assessment of the Next Best and Lower Cost Alternatives has been made qualitatively with reference to baseline conditions and the relative noise characteristics of the NGT vehicle mode options.

1.7. The assessment approach is intended to provide an indication of any overall improvement or worsening of conditions as a result the options identifying the main contributing factors. This is consistent with the qualitative aspect of both levels of appraisal of the Noise Sub-Objective within WebTAG.

Assessment Worksheets for Noise

1.8. The WebTag worksheet for the preferred option is shown on the following page.

TAG Unit 3.3.2 - Noise: Worksheet

Calculation Sheet for Worksheet 2 Noise - Strategy Level
Calculation of Change in Estimated Population Annoyed (EPA) by Road Traffic Noise

Mott MacDonald

Option Name: __Leeds NGT Preferred Option_____ Year: __2016_____

Link Name	Description	Without scheme[(1)] Average Noise Emission Level (dB)	Strategy Option Average Noise Emission Level (dB)	Change in Average Noise Emission Level (dB)	Front line house count	Population Exposed (numbers of people)	Do Min. % Annoyed	Do Some % Annoyed	Change in % Annoyed	Do Min. people annoyed	Do Some people Annoyed	Change in number of people annoyed
		A	B	C=B-A	g	H=g*2.36	P1=100/(1+e^-u1)	P2=100/(1+e^-u2)	P2-P1	Q1=P1*H	Q2=P2*H	Q2-Q1
North 010A1	Section of NGT behind Headingley, near Deaf and Blind Centre	52.0	55.5	3.5	13	30.7	7.3	10.8	3.5	2.2	3.3	1.1
North 010A2	Section of NGT behind Headingley, near Alma Rd	61.0	63.4	2.4	6	14.2	18.8	23.6	4.7	2.7	3.3	0.7
North 014	Otley Rd (Rampart Rd to Raglan Rd)	68.9	69.9	1.0	10	23.6	37.6	40.5	2.9	8.9	9.5	0.7
North 017	Woodhouse Ln (Cavendish Rd to St Marks Rd)	67.3	62.0	-5.3	17	40.1	33.0	20.7	-12.3	13.2	8.3	-4.9
North 018	Woodhouse Ln (Cavendish Rd to Blackman Ln)	71.1	64.2	-6.8	29	68.4	43.7	25.5	-18.3	29.9	17.4	-12.5
North 019	Woodhouse Ln (Blackman Ln to Portland Way)	67.2	68.5	1.3	12	28.3	32.9	36.4	3.5	9.3	10.3	1.0
South001	NGT route parallel to National Rail corridor	55.0	57.1	2.1	25	59.0	10.2	12.7	2.6	6.0	7.5	1.5
South003	NGT route through Whitefield Square	56.0	62.4	6.4	36	85.0	11.3	21.6	10.3	9.6	18.3	8.7
South005	NGT route along Chadwick St	64.0	62.3	-1.7	128	302.1	25.0	21.4	-3.6	75.4	64.6	-10.8
South007	NGT route near to dock St (East)	60.0	51.4	-8.6	31	73.2	17.1	6.8	-10.3	12.5	5.0	-7.5
South008	NGT route near to Dock St (West)	58.0	50.9	-7.1	15	35.4	13.9	6.5	-7.4	4.9	2.3	-2.6
South009	Bridge End (The Calls to Dock St)	69.8	71.2	1.3	40	94.4	40.1	44.0	3.9	37.8	41.6	3.7
South010	Brigate south of rail bridge	65.1	66.5	1.4	18	42.5	27.5	31.1	3.6	11.7	13.2	1.5

TAG Unit 3.3.2 - Noise: Worksheet

Calculation Sheet for Worksheet 2 Noise - Strategy Level
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Mott MacDonald

Option Name: __Leeds NGT Preferred Option_____ Year: __2016_____

Link Name	Description	Without scheme[1] Average Noise Emission Level (dB)	Strategy Option Average Noise Emission Level (dB)	Change in Average Noise Emission Level (dB)	Front line house count	Population Exposed (numbers of people)	Do Min. % Annoyed	Do Some % Annoyed	Change in % Annoyed	Do Min. people annoyed	Do Some people Annoyed	Change in number of people annoyed
		A	B	C=B-A	g	H=g*2.36	P1=100/(1+e^-u1)	P2=100/(1+e^-u2)	P2-P1	Q1=P1*H	Q2=P2*H	Q2-Q1
Eastgate	Eastgate along NGT route	65.7	53.0	-12.7	53	125.1	29.0	8.2	-20.8	36.3	10.2	-26.1
Headrow	Headrow along NGT route	69.8	71.4	1.6	2	4.7	40.1	44.6	4.6	1.9	2.1	0.2
Call Lane	Call Lane along NGT route	65.5	63.4	-2.1	2	4.7	28.5	23.6	-4.8	1.3	1.1	-0.2
Kirkgate	Kirkgate along NGT route	66.9	68.1	1.2	6	14.2	32.1	35.2	3.1	4.5	5.0	0.4
Park Row	Park Row along NGT route	62.1	64.9	2.7	35	82.6	21.0	27.0	6.0	17.3	22.3	4.9
East003	NGT route along Burmantofts St (Nippet Lane to Rigton Approach)	66.0	69.8	3.8	3	7.1	29.8	40.0	10.2	2.1	2.8	0.7
2060_2063	Clarendon Rd (Woodsley Rd to Hanover Way)	61.4	63.4	2.0	66	155.8	19.6	23.6	4.0	30.6	36.8	6.2
2064_2068	Clarendon Rd (Woodhouse ln to Moorland Rd)	66.7	67.9	1.2	3	7.1	31.6	34.7	3.1	2.2	2.5	0.2
2066_2067	Blenheim Walk (st Marks Rd to Blackham Ln)	69.7	71.3	1.6	22	51.9	39.8	44.6	4.7	20.7	23.1	2.4
2066_2434	Blackman Ln	66.8	68.0	1.3	4	9.4	31.7	35.1	3.4	3.0	3.3	0.3
2094_2113	St Marks Rd/Cathcart St (Rampart Rd to servia Hill)	61.2	54.5	-6.7	42	99.1	19.2	9.6	-9.5	19.0	9.6	-9.5
2094_2136	Rampart Rd	61.0	57.7	-3.3	5	11.8	18.8	13.5	-5.3	2.2	1.6	-0.6
2109_2110	hyde park rd (alexandra rd to moorland rd)	65.2	63.4	-1.8	66	155.8	27.8	23.7	-4.1	43.2	36.9	-6.4
2110_2225	hyde park rd (moorland rd to brudenell ave)	67.9	66.1	-1.8	31	73.2	34.7	29.9	-4.8	25.4	21.9	-3.5
2115_2116	servia rd	66.0	67.1	1.1	10	23.6	29.6	32.5	2.9	7.0	7.7	0.7
2134_2224	stainbeck rd (potternewton ln to meanwood rd)	59.2	60.5	1.3	39	92.0	15.8	18.0	2.1	14.6	16.5	1.9

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		A	B	C=B-A	g	H=g*2.36	P1=100/(1+e^-u1)	P2=100/(1+e^-u2)	P2-P1	Q1=P1*H	Q2=P2*H	Q2-Q1
2135_2225	hyde park rd (woodhouse ln to brudenell ave)	65.6	62.0	-3.6	28	66.1	28.8	20.7	-8.1	19.0	13.7	-5.3
2136_6252	woodhouse st (woodhouse ln to rampart rd)	66.3	63.6	-2.6	9	21.2	30.4	24.1	-6.3	6.5	5.1	-1.3
2137_5107	Victoria rd (norwood grove to woodhouse ln)	62.6	60.3	-2.3	77	181.7	22.0	17.6	-4.4	39.9	32.0	-7.9
2138_5107	Victoria rd (norwood grove to norwood terr)	66.0	64.8	-1.1	35	82.6	29.7	26.9	-2.8	24.5	22.2	-2.3
2153_5084	St Annes Rd (otley rd to Becketts Park Drive)	55.7	53.0	-2.7	12	28.3	11.0	8.2	-2.8	3.1	2.3	-0.8
2154_2229	Grove Lane (grove Rd to Shaw Lane)	67.4	65.0	-2.3	42	99.1	33.3	27.4	-5.9	33.0	27.1	-5.9
2190_2191	weetwood ln (st Chads rd to otely rd)	64.0	61.6	-2.5	6	14.2	25.1	20.0	-5.1	3.6	2.8	-0.7
2190_6261	Weetwood ln (st Chads rd to moor rd)	66.6	65.6	-1.0	1	2.4	31.2	28.8	-2.4	0.7	0.7	-0.1
2194_5007	west park drive (spen rd to spen ln)	66.5	67.8	1.4	21	49.6	30.9	34.6	3.6	15.3	17.1	1.8
2205_6263	Otley Old Road	68.8	67.9	-1.0	66	155.8	37.3	34.6	-2.7	58.1	53.9	-4.2
2218_5009	westwood ln (foxhill av to weetwood mill ln)	60.7	58.8	-2.0	16	37.8	18.3	15.1	-3.3	6.9	5.7	-1.2
2228_2229	Grove Rd (Grove Ln to Monk bridge Rd)	63.5	60.6	-3.0	10	23.6	24.0	18.1	-5.9	5.7	4.3	-1.4
2416_9326	brookfield st	57.8	59.6	1.9	3	7.1	13.6	16.4	2.8	1.0	1.2	0.2
2418_6207	sayner rd	61.3	59.9	-1.4	2	4.7	19.4	16.9	-2.6	0.9	0.8	-0.1
2468_3128	richmond st	55.1	59.3	4.3	3	7.1	10.2	16.0	5.8	0.7	1.1	0.4

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		A	B	C=B-A	g	H=g*2.36	P1=100/(1+e^-u1)	P2=100/(1+e^-u2)	P2-P1	Q1=P1*H	Q2=P2*H	Q2-Q1
3035_9327	Carlisle Rd	65.8	61.8	-4.0	1	2.4	29.3	20.4	-8.9	0.7	0.5	-0.2
5009_6261	westwood ln (weetwood mill ln to hollin rd)	65.3	63.8	-1.4	65	153.4	27.9	24.6	-3.3	42.8	37.7	-5.1
588_2208	cookridge lane (holt lane to Otley Old Rd)	66.9	65.8	-1.1	51	120.4	32.0	29.3	-2.7	38.5	35.3	-3.3
6260_6261	St Chads Rd	60.5	62.6	2.0	6	14.2	18.0	21.9	3.9	2.5	3.1	0.5
											Change in EPA	-84.6