

Technical note

Project:	Slough MRT	To:	Dunstan Westbury
Subject:	Environmental scoping	From:	Rid Hollands
Date:	10 June 2014	cc:	

Overview

- 1.1. This report provides an appraisal of the environmental issues that are relevant to the SMaRT scheme and sets out which of the TAG environmental aspects are relevant to the Environment Objective.
- 1.2. The scoping method follows the principles set out in the TAG A3 Environmental Impacts guidance¹ which requires assessments to be proportionate. The guidance identifies the following eight environmental aspects which should be considered in the appraisal of the Environment Objective:
 - Noise
 - Air quality
 - Greenhouse gasses
 - Landscape
 - Townscape
 - Historic environment
 - Biodiversity
 - Water environment
- 1.3. For each of these eight environmental aspects, an appraisal of the scheme has been undertaken to identify whether significantly beneficial or adverse environmental effects are likely to arise. Where it is considered that there is a reasonable possibility that significant environmental effects could arise, the environmental aspect would be scoped into the business case for further consideration. Environmental aspects that are unlikely to be affected either beneficially or adversely would not be considered further.
- 1.4. Consideration of whether a particular environmental aspect would experience significant effects has been undertaken using a range of assessment methods. For noise, air quality and greenhouse gasses, calculations based on surveyed and forecasted traffic flows provide an indication of the likely impacts. These are compared to criteria set out in the TAG guidance to determine the likely effects.
- 1.5. The other environmental aspects have been assessed more qualitatively. For these aspects professional judgement using the environmental capital approach as set out in the TAG guidance has been undertaken¹.
- 1.6. The appraisal of the environmental aspects has been undertaken using a combination of existing published data and site visits.

Noise

- 1.7. The noise aspect considers the effects of the Proposed Scheme on the noise climate and, where appropriate, any consequential annoyance within the vicinity of the Scheme. At the scoping stage, a noise assessment is undertaken based upon the scoping assessment guidance provided

¹ <https://www.gov.uk/government/publications/webtag-tag-unit-a3-environmental-impact-appraisal>

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in DMRB 11.3.7, which provides threshold values against which changes in noise due to the project should be compared, and assessed in both the short-term (on scheme opening) and in the long-term (over the design period, typically 15 years after scheme opening).

- 1.8. Changes in noise level may affect residential buildings and other sensitive receptors such as schools, hospitals, places of worship and community facilities located in proximity to the Scheme.
- 1.9. The objective of an assessment at this level is to establish an appreciation of the likely noise and vibration consequences associated with the project.
- 1.10. The threshold criteria for traffic noise assessment during the day time period is a permanent change in magnitude of at least 1dB(A) LA10, 18hr in the short-term, or of at least 3dB(A) LA10,18hr in the long-term. Additionally, for night-time noise impacts, a threshold criterion of a change in magnitude of at least 3dB(A) Lnight, outside applies, but only where an Lnight, outside greater than 55dB is predicted in any scenario.
- 1.11. For an increase in noise level of 1dB LA10,18-hour, the predicted change in traffic flow would have to increase by 25% or decrease by 20%, while a 3dB LA10,18-hour change would correspond to an increase in traffic of at least 100% or a decrease of at least 50%. Changes to traffic of this magnitude would result in a need for a detailed noise assessment to be undertaken.
- 1.12. To determine if an assessment should continue beyond the scoping (basic assessment) stage is to identify if the threshold values are likely to be met or exceeded. If it is clearly evident that the threshold values will be exceeded then assessment should progress to a detailed stage assessment.
- 1.13. For this assessment, traffic data has been provided to indicate the likely traffic characteristics of roads for scenarios with and without the Scheme in the opening year (2015) and the design year (2025). This data includes the 18-hour traffic flow (AAWT), the traffic flow composition, and the average speed for each traffic link. Table 1.1 details the selected links representing sections of road along the Scheme corridor.

Table Error! No text of specified style in document..1 Road links assessed

Road link	Geographical Location
A	A4 Bath Rd (west of Dover Rd)
B	A4 Bath Rd (Dover Rd to Leigh Rd)
C	A4 Bath Rd (Leigh Rd to Galvin Rd)
D	A4 Bath Rd (Galvin Rd to Tuns Lane)
E	A4 Bath Rd (Tuns Lane to William St)
F	A4 Wellington St (William St to Queensmere Rd)
G	Wellington St (Queensmere Rd to A412)
H	Wellington St (Queensmere Rd to Langley Rd)
I	London Rd (Langley Rd to Upton Court Rd)
J	London Rd (Upton Court Rd to High Street Langley)
K	London Rd (High Street Langley to M4 J5)
L	London Rd (east of M4 J5)

- 1.14. The Proposed Scheme is expected to increase the number of buses using the A4, but reduce the number of car vehicle journeys due to a modal shift.
- 1.15. It is anticipated that the operational phase of the Proposed Scheme would result in a number of changes to noise sources due to alteration of the alignment of the running lanes and differences

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in the flow, speed and composition of traffic which could impact upon receptors in proximity to the A4.

- 1.16. A summary of the traffic data for these traffic links is provided in Table Error! No text of specified style in document..2.

Table Error! No text of specified style in document..2 Summary of traffic data for noise assessment

Link	Do Minimum 2015 (DM 2015)			Do Something 2015 (DS 2015)			Do Minimum 2025 (DM 2025)			Do Something 2031 (DS 2025)		
	AAWT	%HGV	KPH	AAWT	%HGV	KPH	AAWT	%HGV	KPH	AAWT	%HGV	KPH
A	20557	1.99	30.7	20458	1.85	30.5	22486	5.42	30.8	23732	5.35	22.2
B	12714	1.55	29.5	12521	0.57	25.8	14384	4.46	29	15099	3.47	29.1
C	11413	1.26	27.5	11268	0.72	27.5	13024	5.48	27.5	13877	4.73	24.3
D	15480	3.28	38.3	15431	2.89	42.9	16628	4.89	38.1	13744	3.21	28.9
E	38980	1.74	49.6	39325	1.58	49.4	39194	3.47	53.8	42262	3.37	53.8
F	27041	2.6	36.9	27352	2.33	37	26834	3.87	32.7	28843	3.7	33.3
G	43796	1.78	34	44466	1.59	33.8	43068	3.13	34.2	46808	3.07	34.3
H	31532	3.29	64	31810	3.09	64	31326	3.59	64	33709	3.57	64
I	16818	4.85	29	16802	4.59	29	16610	4.97	28.5	17707	4.96	28.5
J	25579	3.58	40.1	25716	3.36	42.8	25977	3.98	46.2	27853	3.97	44.9
K	39269	5.92	23.5	39210	5.54	23.5	39661	4.23	23.9	42716	4.13	23
L	33243	5.78	52.5	33315	5.46	52.6	36764	6.65	51.9	39301	6.57	44.3

- 1.17. The basic noise level (BNL) expected to be experienced in each scenario has been calculated in accordance with the methodology as set out in the Department for Transport document 'Calculation of Road Traffic Noise 1988' (CRTN). The differences between the BNLs for each scenario may then be compared to present the expected noise impacts arising from the Scheme in the short term and the long term.

- 1.18. The BNL predicted for each of the scenarios is presented in Table Error! No text of specified style in document..3, along with both the short-term and long-term impacts predicted with the implementation of the Scheme.

Table Error! No text of specified style in document..3 Predicted noise levels

Road Link	Predicted BNL L _{A10} dB				Change and impact significance			
	DM 2015	DS 2015	DM 2025	DS 2025	Short term	DMRB Impact	Long term	DMRB Impact

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A	67.7	67.5	69.9	70.1	-0.2	Negligible	2.4	Negligible
B	65.3	64.4	67.5	67.0	-0.9	Negligible	1.7	Negligible
C	64.6	64.1	67.5	67.3	-0.5	Negligible	2.7	Negligible
D	67.4	67.6	68.6	66.5	0.2	Negligible	-0.9	Negligible
E	71.9	71.8	73.2	73.2	-0.1	Negligible	1.3	Negligible
F	69.5	69.4	70.1	70.0	-0.1	Negligible	0.5	Negligible
G	71.0	71.0	71.9	71.9	0.0	No change	0.9	Negligible
H	72.9	72.9	73.2	73.2	0.0	No change	0.3	Negligible
I	68.1	68.0	68.4	68.3	-0.1	Negligible	0.2	Negligible
J	69.9	70.0	70.9	70.8	0.1	Negligible	0.9	Negligible
K	72.4	72.2	72.0	72.0	-0.2	Negligible	-0.4	Negligible
L	72.7	72.6	73.6	73.0	-0.1	Negligible	0.3	Negligible

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- 1.19. The results in Table Error! No text of specified style in document..3 shows that it is not expected that the threshold values will be exceeded on any of the assessed traffic links as a result of the implementation of the Scheme.
- 1.20. The second step in assessing if an assessment should continue beyond scoping (basic assessment) stage is to identify the extent of the study area and establish if any noise sensitive receptors (dwellings, hospitals, schools, community facilities, or designated areas such as AONB, SAC, SPA, SSSI etc) exist within the study area.
- 1.21. The DMRB requires calculations of noise impacts at locations within 600m of both a scheme boundary, and within 600m of any other affected routes within 1km of a scheme boundary – this area is referred to as the detailed calculation area. For affected routes outside of this area where noise calculations have been undertaken, the study area is defined as 50m either side of the centreline of these routes. A route is affected where a change in noise of more than 1 dB(A) on opening or of more than 3 dB(A) over the design period is predicted – these routes are referred to as the wider road network, and form the wider calculation area.
- 1.22. DMRB notes that if any sensitive receptors are identified within the study area then the assessment must continue to at least a simple stage assessment, depending on the expected potential for noise and vibration impacts.
- 1.23. The study area contains a significant number of residential receptors and commercial buildings. Some sensitive receptors have been identified in the study area, namely Thames Valley University, Salt Hill Park, Slough Community Leisure Centre, Upton Court Grammar School, Upton Hospital, Kedermister Park, Langley Grammar School, and The Langley Academy.
- 1.24. The preceding scoping assessment indicates that the impacts arising from changes in road traffic noise on the local road traffic network are not expected to exceed DMRB threshold criteria. Road traffic noise impacts on the local road network may therefore be scoped out from further assessment.

Air quality

- 1.25. In most urban areas, including Slough, the main source of pollution is road traffic. Emissions from motor vehicle exhausts contain a number of pollutants including oxides of nitrogen, carbon monoxide, hydrocarbons and particulate matter.
- 1.26. The local air pollutants of most concern are nitrogen dioxide (NO₂) and small particles known as PM₁₀ (particulate matter less than 10 micrometres in diameter). It is known from air quality assessments across the UK that these pollutants are the most likely to be present at concentrations close to or above statutory criteria, particularly in urban environments. The relevant local air pollutants requiring consideration are NO₂ and PM₁₀. The criteria that relate to these pollutants are summarised in Error! Reference source not found..

Table Error! No text of specified style in document..4 Relevant Local Air Quality Criteria

Pollutant	Criteria
NO ₂	Hourly average concentration should not exceed 200 µg/m ³ more than 18 times a year
	Annual mean concentration should not exceed 40 µg/m ³
PM ₁₀	24-hour mean concentration should not exceed 50 µg/m ³ more than 35 times a year
	Annual mean concentration should not exceed 40 µg/m ³
µg/m ³ = micrograms per cubic metre	

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Existing Knowledge and Data

- 1.27. The air quality study area for scoping has been defined as within 200m of the Scheme corridor (i.e. within 200m of the A4 between the Dover Road and M4 junction 5).
- 1.28. The air quality study area is within the boundaries of Slough Borough Council. Slough Borough Council have carried out regular reviews and assessments of local air quality, in common with many other authorities across the UK, the councils have shown that the UK AQS objective and EU limit value thresholds most likely to be exceeded are for annual mean NO₂ due to road traffic emissions.
- 1.29. There are 3 (no.) air quality management areas (AQMA) within the air quality study area:
- Slough AQMA No. 1 – An area encompassing land adjacent to the M4 motorway along the north carriageway between junctions 5 and 7, and along the south carriageway between junction 5 and Sutton Lane.
 - Slough AQMA No. 3 – An area incorporating the A355 Tuns Lane from junction 6 of the M4 motorway in a northerly direction to just past its junction with the A4 Bath Road and A355 Farnham Road, known as the Three Tuns.
 - Slough AQMA No. 4 – An area incorporating the A4 Bath Road from the junction with Ledgers Road/Stoke Poges Lane, in an easterly direction, along Wellington Street, up to Sussex Place junction.
- 1.30. Air quality monitoring is undertaken in the air quality study area by Slough Borough Council. Monitoring data indicates that in 2012 there was an exceedance of the annual mean NO₂ UK AQS objective and EU limit value thresholds at sites on the A4 between Tuns Lane and Yew Tree Road within Slough AQMA No. 4 and at sites around the M4 junction 5 within Slough AQMA No. 1. There are not expected to be exceedances of PM₁₀ UK AQS objective and EU limit value thresholds
- 1.31. On the basis of the available baseline information, there is a risk of exceedances of the annual mean NO₂ UK AQS objective and EU limit value at human health receptors adjacent to the A4 between Tuns Lane and Yew Tree Road.

Likely Impacts

- 1.32. The need for assessment of effects of a Scheme on air quality is determined in accordance with traffic change criteria set out in HA207/07 DMRB Volume 11 Section 3 Part 1, based on comparing without scheme (Do-Minimum) and with scheme (Do-Something) scenarios in the opening year. Any road link that meets one or more criterion is scoped in as having potential to cause a change in air quality and included in an affected road network that requires further assessment. The traffic change criteria are:
- road alignment will change by 5m or more, or
 - daily traffic flows will change by 1,000 annual average daily traffic (AADT) or more, or
 - HDV (Heavy Duty Vehicle) flows will change by 200 AADT or more, or
 - daily average speed will change by 10 km/hr or more, or
 - peak hour speed will change by 20 km/hr or more.

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- 1.33. According to the DMRB guidance, there may be a change in air quality within 200m of roads in the affected road network of a Scheme. The changes in air quality may affect residential properties, other sensitive receptors (schools, hospitals, elderly care homes), and designated ecological sites within 200m of affected roads.
- 1.34. Traffic changes have been determined from traffic model data for the study area. Changes in AADT and HDV are shown in Table Error! No text of specified style in document..5 for selected links representing sections of roads along the Scheme corridor. It can be seen that none of the road links meet the AADT flow or HDV change, nor did any roads meet the speed change criteria and these are not shown.

Table Error! No text of specified style in document..5 Traffic Data used to scope the air quality assessment

Road Link	2015 Traffic Data				2015 DS- DM Change		
	DM AADT	DM HDV	DS AADT	DS HDV	AADT	AADT %	HDV
A4 Bath Rd (west of Dover Rd)	19,212	382	19,120	379	-92	-0.5%	-3
A4 Bath Rd (Dover Rd to Leigh Rd)	11,883	184	11,702	71	-180	-1.5%	-112
A4 Bath Rd (Leigh Rd to Galvin Rd)	10,666	134	10,531	81	-136	-1.3%	-54
A4 Bath Rd (Galvin Rd to Tuns Lane)	14,467	474	14,422	446	-45	-0.3%	-28
A4 Bath Rd (Tuns Lane to William St)	36,430	635	36,752	620	322	0.9%	-15
A4 Wellington St (William St to Queensmere Rd)	25,272	657	25,563	638	290	1.1%	-18
Wellington St (Queensmere Rd to A412)	40,931	730	41,557	709	626	1.5%	-21
Wellington St (Queensmere Rd to Langley Rd)	29,470	969	29,729	982	259	0.9%	12
London Rd (Langley Rd to Upton Court Rd)	15,717	763	15,703	771	-15	-0.1%	8

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London Rd (Upton Court Rd to High Street Langley)	23,905	856	24,033	864	128	0.5%	7
London Rd (High Street Langley to M4 J5)	36,700	2,171	36,645	2,172	-54	-0.1%	2
London Rd (east of M4 J5)	31,068	1,796	31,136	1,818	68	0.2%	22

- 1.35. Road widening to accommodate bus lanes would be required in a number of locations. These are summarised below with reference to the location of air quality sensitive receptors:
- On the A4 eastbound carriageway between Dover Road and Leigh Road – this section of the A4 is adjacent to industrial units and there are no adjacent residential properties;
 - On the A4 eastbound carriageway between Galvin Road and Salt Hill Avenue – the closest residential properties (Salt Hill Mansions) are subject to a compulsory purchase order. Remaining residential properties on the north and south side of the A4 are 30 metres away from the road centreline. These receptors could be affected by a change in air quality as a result in widening, but are not located in an area of expected exceedance of annual mean NO2 UK AQS objective and EU limit value thresholds. On this basis there is not expected to be risk of exceedance as a result of the Scheme;
 - On the A4 between Brunel Way and HTC roundabout – this section of the A4 is adjacent to Tesco supermarket and shopping centre and there are no adjacent residential properties; and
 - On the A4 eastbound and westbound carriageways between Upton Court Road/Blandford Road and Ditton Road/Langley High Street – residential properties on the north and south side of the A4 are over 35 metres away from the road centreline. These receptors could be affected by a change in air quality as a result in widening, but are not located in an area of expected exceedance of annual mean NO2 UK AQS objective and EU limit value thresholds. On this basis there is not expected to be risk of exceedance as a result of the Scheme.
- 1.36. Given the expected changes in traffic due to the Scheme and the location of air quality sensitive receptors relative to road widening, local air quality can be scoped out of the next stage of assessment as the Proposed Scheme is not expected to affect air quality.

Greenhouse Gases

Existing Knowledge and Data

- 1.37. Baseline greenhouse gas emissions data specifically for the Scheme Corridor is not currently available, but there are not expected to be constraints related to greenhouse gases.

Likely Impacts

- 1.38. The greenhouse gases assessment is concerned with changes in emissions of carbon dioxide (CO2).
- 1.39. The need for assessment of effects of a Scheme on greenhouse gases is determined in accordance with traffic change criteria set out in HA207/07 DMRB Volume 11 Section 3 Part 1, based on comparing without scheme (Do-Minimum) and with scheme (Do-Something) scenarios in the opening year. The traffic change criteria are:
- daily traffic flows will change by 1,000 annual average daily traffic (AADT) or more, or

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- HDV flows will change by 200 AADT or more, or
- daily average speed will change by 10 km/hr or more, or
- peak hour speed will change by 20 km/hr or more.

1.40. As shown in Table 1.5, none of the road links meet the AADT flow or HDV change, nor do any roads meet the speed change criteria and these are not shown. Given the expected changes in traffic due to the Scheme greenhouse gases can be scoped out of the next stage of assessment.

Landscape

1.41. Landscape in TAG is defined as a result of the physical and cultural characteristics of the land itself. As the Slough MRT scheme is entirely located within an urban townscape, all landscape issues are considered in the Townscape aspect. The landscape aspect has been scoped out of further assessment.

Townscape

1.42. The definition of townscape is outlined within the TAG guidance as the physical and social characteristics of the built and non-built urban environment.

1.43. The potential for townscape effects are likely from the following activities:

- Loss of habitat through loss of mature/semi-mature horse chestnut trees along A4 Bath Road;
- Scale of the proposals to remove trees along A4 Bath Road. The 'chestnut avenue' is a well-known feature of the area and the removal of a considerable number of these trees will impact on the distinctive local character;
- Potential adverse effects on remaining trees due to loss of rooting area; and
- Baseline changes in relation to the wider development, including through the introduction of new layouts, associated signage and highways design on visual amenity.

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- 1.44. As the proposals at this stage mainly consist of amendments within the footprint of the existing road/service road, a proportionate study area is localised at close range to the site. Therefore, Townscape is to be scoped in for further assessment.

Historic environment

- 1.45. Due to being heavily bombed during World War II, Slough's heritage and historic resources tend to be scattered on the outskirts of the town; however Slough has 96 listed buildings remaining. Within the Scheme corridor historic resources tend to be in the form of mileposts, of which three remain in the central verges of the A4.
- 1.46. It is also unlikely that any surviving archaeological remains from previous features would be disturbed as these are likely to have been removed previously.
- 1.47. The potential for affecting the historic environment is therefore low and the historic environment should therefore be scoped out for further assessment.

Biodiversity

- 1.48. The biodiversity aspect considers the effects of the Proposed Scheme on biodiversity and earth heritage (geological) features. The majority of the Scheme is on existing hard standing areas devoid of any vegetation or biodiversity value. However, the proposals to remove trees along the 'chestnut avenue' would have an affect on biodiversity as this would remove habitat for nesting birds or bats. The removal of roadside verges would have a small, localised impact on biodiversity.
- 1.49. There are no geological features within the site that would be affected by the Proposed Scheme.
- 1.50. In light of the unknown potential for protected species/nesting birds to be present in trees proposed for felling and without ecological walkover survey data, it is proposed to undertake a further assessment due to the potential presence of protected species. The biodiversity aspect has been scoped in for further assessment.

Water environment

- 1.51. The water environment aspect considers the effects of the Proposed Scheme on surface and ground water quality, and flood risk.
- 1.52. The proposed drainage is likely to be kerbs and gullies with some retention built in with oversize carrier pipes. Drainage during operation has the potential to impact on water quality due to increased traffic flows and the increased potential this has on pollutant loading from road runoff. By extending hard surface area of the carriageway, increased volumes of water are collected that can exacerbate flooding.
- 1.53. The majority of the Scheme is not located in an area designated by the Environment Agency as at risk from flooding. Where there is a risk, this is classed as a very low risk This is the lowest possible flood risk and means that each year, this area has a chance of flooding of less than 1 in 1000 (0.1%).
- 1.54. The water environment aspect has been scoped in for further assessment as it is necessary to determine if drainage to the surface or ground will impact on the receiving water environment.

Environmental scoping summary

- 1.55.

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- 1.56. Table 6.6 summarises the scope of the environment assessment. For each of the environmental aspects which have been scoped in, a TAG workbook will need to be produced and the appropriate rows of the TAG Appraisal Summary Table (AST) would be completed. For those environmental aspects which have been scoped out, a qualifying statement will need to be provided for the AST explaining why detailed assessment has not been undertaken.

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Table 6.6 Summary of environmental scoping

Environmental aspect	Scoped in (✓) / out (✗)
Noise	✗
Air quality	✗
Greenhouse gasses	✗
Landscape	✗
Townscape	✓
Historic environment	✗
Biodiversity	✓
Water environment	✓