10 Traffic Noise and Vibration

10.1 Introduction

10.1.1 Background

This section provides the traffic noise and vibration assessment for the proposed A68 Improvement Scheme.

Section 3, Part 7 of DMRB Volume 11 provides guidance on the assessment of traffic noise and vibration. This guidance has been used as the basis of the traffic noise and vibration assessment for the proposed improvement scheme.

A DMRB Stage 2 Environmental Assessment Report was prepared by Young Associates on behalf of the Scottish Executive (now Transport Scotland) in November 2005. The Stage 2 report considered two potential scheme options and the results of the assessment have shown that the residual impacts of the proposed improvements to the A68 on noise and vibration levels are predicted to have no significant adverse impact at the representative properties within 300m of the proposed scheme.

The Stage 2 report did indicate that there would be a significant reduction (moderate beneficial significance) in noise levels at Riggsyde. However, it should be noted that the existing noise level at Riggsyde is calculated to be above 65 dB(A) $L_{10\ 18\ hour}$ which suggests that the 68dB(A) threshold, used in the Noise Insulation (Scotland) Regulations 1975, could be breached if calculated in accordance with the method set out in the Regulations. This applies even with the reduction resulting from the scheme implementation.

The following Stage 3 assessment does not consider either of the two possible scheme options included in the Stage 2 report; however Option 2 is very similar to the chosen scheme considered for the Stage 3 assessment.

10.1.2 The Proposed Scheme and Existing Road Network

The location of the section of the A68 proposed for the Soutra South Road Improvement Scheme is shown in Figure 1.1 and covers a length of approximately 2.15km. The chosen scheme alignment is shown on Figures 2.1 a – c.

The chosen A68 Soutra South scheme comprises a new alternating WS2+1 carriageway with dedicated overtaking opportunity constructed on the existing alignment between an existing climbing lane and a DAL.

Widening will be on the eastern side at the northern end of the scheme to avoid the residential property at Riggsyde and then on the western side to tie in with the existing widening for the DAL at the southern end.

The proposed road improvement scheme will not cause changes in traffic flows on the A68 route of +25%/-20%, which are the DMRB Volume 11 criteria for Stage 3 assessment of the selected option. However, the scheme will result in changes in average traffic speeds on the A68 and the scheme will incorporate a new side road and some alterations to the alignment and at several junctions where roads connect to the existing A68.

The stretch of the A68, which is relevant to the proposed scheme, has several small roads that connect to it. These are shown in Figures 2.1 a – c and comprise:

- The D47/5 Road;
- The C83 Road (leading to the D1/5 and the D8/5); and
- The C84 Road (leading into the village of Oxton).

A new side road (as shown on Figures 2.1 b and c) is also proposed to connect the C83 Road to the C84 Oxton.

As part of the A68 Soutra South scheme, several of these routes will be affected by the proposed option. Traffic data provided by SIAS Ltd / SBC confirms the following changes in traffic flows:

- The Kirktonhill C83 Junction will be stopped up. There will be no traffic on the section of the C83 adjacent to the A68 prior to the D1/5 junction i.e. the reduction in flows will be greater than 20%.
- On the C83 between the D1/5 junction and the C83/C84 junction in Oxton traffic flows will decrease by less than 20%.
- A proposed new side road will be constructed to link up the C83 (at the junction of the D1/5 Kirktonhill) with the C84 (just south west of the A68 junction). The side road will prevent the closure of the Kirktonhill C83 Junction from increasing traffic flows through the centre of Oxton on the C83/C84.
- The traffic flows within the village of Oxton on the C83 and C84 will both be affected by the closure of the C83 at the A68. Traffic data provided by SIAS/SBC confirms that on the short section of the C84 between the A68 and side road junction there will be increase in traffic flows of >25%.
- On the C84 between the side road junction and the C83 junction in the centre of Oxton there will be an overall decrease in the total traffic flow (of less than 20%).
- On the C83 link which meets the C84 in Oxton there will be an overall decrease in traffic flow (of less than 20%).

- The D47/5 will be realigned at its junction with the A68 to provide improved access onto the trunk road for people on the Carfrae side of the A68. This new realigned length of side road will need to be assessed in relation to its possible impact on The Shieling property.

- The existing private access to Riggsyde will be stopped up and a new means of private access will be provided off the proposed new side road which will be located approximately 40 metres south of the Riggsyde property. The new side road will need to be assessed in relation to its possible impact at the Riggsyde property.

The changes in traffic flows in Oxton and on the C83/C84 are shown on Figure 10.1 (Existing & predicted total traffic flows in & around Oxton with new side road). The traffic flows shown on the figure are for a 13 hour period and were predicted by SBC. However the traffic data used in the noise assessment are 18 hour flows taken from information provided by SBC and SIAS Transport Consultants.

10.2 Methods

10.2.1 Traffic Noise Assessment

This traffic noise assessment has been carried out with reference to the following documents:

- The Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3, Part 7: Traffic Noise and Vibration (August 1994);

- The Noise Insulation (Scotland) Regulations 1975;

- Memorandum on the Noise Insulation (Scotland) Regulations 1975; and

- Calculation of Road Traffic Noise (CRTN) 1988.

The assessment follows the requirements of a Stage 3 assessment, as detailed in DMRB Volume 11, Section 3, Part 7, and considers the chosen scheme alignment.

When considering predicted noise levels it is useful to have some idea of the range of sound levels that are commonly found in the environment. An indication of the range is provided in Table 10.1 below.

Table 10.1. Indication of the range of common sound levels.

Sound Level dB(A)	Location
20 to 30 dB(A)	Quiet bedroom at night
40 to 45 dB(A)	Living room during the day
50 to 60dB(A)	Typical Office

Sound Level dB(A)	Location
50 to 60 dB(A)	Inside a car
60 to 70 dB(A)	Typical high street
70 to 90 dB(A)	Inside factory
100 to 110 dB(A)	Burglar alarm at 1m away
110 to 130 dB(A)	Jet aircraft taking off.

Further examples are provided in Figure 1 of DMRB Volume 11, Section 3, Part 7 Traffic Noise and Vibration.

10.2.2 Identification of Sensitive Receptor Locations

The Stage 3 assessment requires that a noise assessment is completed for all properties and other relevant locations where existing traffic is likely to be increased by at least 25% or reduced by 20%.

The traffic data provided by SIAS/SBC confirms that the short section of the C84 between the A68 and new side road will experience an increase in traffic flows greater than 25%. There are 10 properties located within 300 metres of the junction of the new side road with the C84 (all properties lie between 150 and 300 metres). The new side road will also lie 40 metres to the south of Riggsyde.

The 10 properties located within 300 metres of the junction of the new side road with the C84 are Leaderbank, 2 Station Road, Trostan, Leaderview, Lynend, Lydden House, The Granary, Nether Howden, Howden Mill and Redstone Lodge. These receptors are therefore relevant to the assessment.

There are also two properties adjacent to the alignment of the A68 which may be affected.

- The Shieling property will potentially be affected by the new link connecting the D47/5 with the A68 and the changing alignment of the A68.

- The Riggsyde property, which is located 4.5 metres from the existing alignment, will potentially be affected by the changing alignment of the A68 and also the proposed new side road.

The sensitive receptors considered in this assessment are therefore the 10 receptor locations identified, Riggsyde and The Shieling property. In total 12 receptor locations have therefore been assessed (Figures 10.2a and b). Due to the insignificant changes in traffic flows in Oxton village it has not been considered necessary to assess any other receptors adjacent to the C84, C83 or properties in Oxton village, further.

10.2.3 Noise Survey

To characterise the existing ambient noise levels at the 10 receptor locations identified, Riggsyde and The Shieling property, a noise survey was carried out by SBC in June 2008.

This noise survey has been carried out at the following locations:

1. Riggsyde
2. The Shieling
3. Trostan
4. Howden Mill

The noise monitoring locations are shown on Figure 10.3. The noise monitoring carried out at Trostan and Howden Mill indicates the dominant sources of noise at the 10 properties adjacent to the C84.

Noise monitoring at each of the four locations was carried out using a Type 1 integrating sound level meter (B&K Type 2260 and Norsonic Nor121). The measurements were carried out in accordance with the Shortened Measurement Procedure detailed in Technical Memorandum 'Calculation of Road Traffic Noise' 1988.

This requires that measurements of L_{10} be made over any three consecutive hours between 1000 and 1700 hours. Using the L_{10} (3 hour) as the arithmetic mean of the three consecutive values of hourly L_{10}, the current value of L_{10} (18 hour) can then be calculated from the relation: L_{10} (18 hour) = L_{10} (3 hour) – 1 dB(A).

The noise survey results are included in section 10.3.1 of this Chapter.

10.2.4 Noise Predictions

Information relating to traffic flow, speed and composition has been provided by SIAS and SBC. The traffic data used as the basis of the noise assessment is included in Appendix 11.

There are two areas to consider which may be affected by changes in traffic flows and speeds; these are adjacent to the A68 and the new side road / C84. Noise predictions should be carried out for receptors adjacent to these routes using procedures set out in CRTN (1988).

It is possible to predict the noise levels due to the A68 at all of the 12 receptors; however it is not possible to use CRTN to predict noise levels from the new side road and the C84 because the traffic flows on these routes are very low i.e. below the 1000 vehicles per 18 hour threshold set out in CRTN.

The traffic flows on the new side road and C84 are shown in Appendix 11. The only traffic flows on these routes which are above 1000 are the C84 (between the new side road and A68) in 2025 for the Do Something scenario. However this information does not allow prediction of noise levels at the 10 receptors adjacent to the C84 because the flows on the C84 (south of the new road junction) and the new side road still remain below the 1000 vehicles per 18 hour threshold.

To consider the significance of the traffic flows on the C84 at the 10 properties adjacent to the route, the noise survey results have been compared to the results of predictions carried out for noise from the A68 only. Because the flows on the C84 are very low, compared to the A68, it is considered likely that the C84 traffic would not significantly influence the $L_{10\ 18\ hour}$ levels at any of the 10 properties.

The noise survey results for Trostan and Howden Mill obtained by SBC are 49.9 dB $L_{10\ 18\ hour}$ and 50.1 dB $L_{10\ 18\ hour}$ respectively. The noise predictions included in Appendix 12 have been carried out to assess the noise levels from the A68 at these two properties. The noise survey was carried out in 2008 and the baseline noise predictions have been carried out for the year 2010 (Do Minimum scenario) therefore it is expected that there may be some very minor discrepancy in the noise levels.

The noise predictions indicate noise levels at Trostan and Howden Mill of 51.6 dB $L_{10\ 18\ hour}$ and 52.1 dB $L_{10\ 18\ hour}$, respectively. These predicted levels show a very good correlation with the measured levels of 49.9 and 50.1 dB $L_{10\ 18\ hour}$ and suggest that the A68 is the dominant influence on the $L_{10\ 18\ hour}$ noise levels at Trostan and Howden Mill.

A similar comparison has been made for The Shieling property. The property is located close to the A68 and the D47/5. The baseline 2010 noise predictions for The Shieling, taking into consideration the A68, give an $L_{10\ 18hour}$ of 56.3 dB(A). The noise survey at this property gave a noise level of 58.3 dB(A) $L_{10\ 18\ hour}$. Again these predicted noise levels show a very good correlation with the measured noise levels and confirm, as expected, that the A68 is the dominant influence on the $L_{10\ 18\ hour}$ at The Shieling.

For the purposes of this noise assessment therefore it is considered appropriate to predict the 2010 and 2025 Do Minimum and Do Something noise levels at each of the 12 properties, taking into consideration the noise levels from the A68 only. It is considered that this is the dominant contributor to the $L_{10\ 18\ hour}$ noise levels at each of the 12 properties. Further information regarding the noise survey is detailed in section 10.3.1 of this chapter.

The Riggsyde property will be affected by both the A68 and new side road for the Do Something scenario. This property is less than 300 metres from the new side road; however due to the low flows on this route it is not possible to carry out predictions in accordance with CRTN. Because the Riggsyde property is adjacent to the A68, noise from this route is dominant, and therefore the very low flows on the new side road are not likely to significantly affect the $L_{10\ 18\ hour}$ at this property. Noise predictions carried out at Riggsyde therefore take into consideration the A68 only.

With regards to The Shieling, this property will be affected by both the A68 and new alignment of the D47/5 for the Do Something scenario. This property is less than 300 metres from the realignment of the D47/5; however due to the low flows on this route it is not possible to carry out predictions in accordance with CRTN. Because The Shieling property is adjacent to the A68, noise from this route is dominant and therefore the very low flows on the D47/5 are not likely to significantly affect the $L_{10\ 18\ hour}$ at this property. Noise predictions carried out at The Shieling therefore take into consideration the A68 only.

The predictions at all 12 properties have been carried out using the procedures set out in CRTN (1988) and these predictions take into consideration the A68 data only. The CRTN procedure entails predicting noise levels at a distance from the highway taking into account such factors as traffic flow, speed and composition, road configuration, intervening ground cover between source and receptor, screening, angle of view of traffic and reflections from facades.

It is recognised that the assessment of noise from the A68 will not be entirely accurate and that the predicted noise levels will be approximate only. However taking into consideration the very low flows on the new side road, D47/5 and the C84 Station Road and the noise survey information which supports the fact that the $L_{10\ 18\ hour}$ flows are dominated by noise from the A68, it is considered that any inaccuracies should not be significant.

10.2.5 Significance Criteria

The changes in noise levels at each of the 12 receptors have been assessed against a set of significance criteria. The criteria provided in Table 10.2 have been derived from information contained in DMRB (Volume 11 Section 3 Part 7). DMRB indicates that in the period following a change in traffic flows, people may find benefits or disbenefits when the noise changes are as small as 1 dB(A).

Table 10.2. Road Traffic Noise Assessment Significance Criteria.

Change in Noise Level	Potential Impact
<1 dB(A)	Imperceptible
1<3 dB(A)	Perceptible Impact
3<5 dB(A)	Minor Impact
5<10 dB(A)	Moderate Impact
>10 dB(A)	Major Impact

The significance of an environmental impact will be determined not only by the magnitude of the impact but also by the sensitivity of the receptor, as shown in Table 10.3.

Table 10.3. Methodology for Determining Sensitivity.

Sensitivity	Examples of Receptor
High	The receptor / resource has little ability to absorb change without fundamentally altering its present character, or is of international or national importance.
Moderate	The receptor / resource has moderate capacity to absorb change without significantly altering its present character, or is of high importance.
Low	The receptor / resource is tolerant of change without detriment to its character, is of low or local importance.

The sensitive locations considered in this noise assessment are residential. The existing receptors are considered to be moderately sensitive. Premises such as hospitals and nursing homes would be identified as highly sensitive; however there are no premises of this type in the area surrounding the site.

The significance of an environmental impact from road traffic noise is determined by the interaction of magnitude and sensitivity. The impact significance matrix used in this assessment is shown in Table 10.4.

Table 10.4. Impact Significance Matrix.

Magnitude	Sensitivity		
	High	Moderate	Low
Major Impact	Major Adverse /Beneficial	Major-Moderate Adverse/Beneficial	Moderate-Minor Adverse/Beneficial
Moderate Impact	Major-Moderate Adverse/Beneficial	Moderate-Minor Adverse/Beneficial	Minor Adverse/Beneficial
Minor Impact	Moderate-Minor Adverse/Beneficial	Moderate-Minor Adverse/Beneficial	Minor-Insignificant
Perceptible Impact	Minor Adverse/Beneficial	Minor-Insignificant Adverse/Beneficial	Insignificant Adverse/Beneficial
Imperceptible	Insignificant Adverse/Beneficial	Insignificant Adverse/Beneficial	Insignificant Adverse/Beneficial

10.2.6 Noise and Vibration Nuisance Assessment

Using the predicted changes in noise levels for each of the 12 residential properties a noise and vibration nuisance assessment has been carried out. A noise nuisance assessment is only required where the change in noise is 1 dB(A) or more. The number of properties subject to the following changes in the percentage bothered by noise should then be identified: <10%, 10-<20%, 30-<40% and 40% or more.

Where necessary comments regarding traffic induced vibration have also been included.

10.2.7 Assessing the Need for Noise Mitigation

The results of the DMRB assessment should identify the ambient and predicted noise levels for all relevant properties and other locations taking into account any agreed mitigation. With respect to the Soutra South Road Improvement Scheme no mitigation is proposed.

The Noise Insulation (Scotland) Regulations 1975 are used to indicate those properties, which may be eligible for statutory insulation.

Residential properties that are considered to be entitled to insulation against road traffic noise must satisfy the following criteria stipulated in The Noise Insulation (Scotland) Regulations, 1975 and the Memorandum on the Noise Insulation (Scotland) Regulations 1975. Regulations 3 and 6 require that:

- They are situated within 300 metres of the altered carriageway;
- The properties lie within the triangular area at the terminal point of the new highway, the apexes of which are 50m along the centre-line of the existing highway from the terminal points and the bases of which extend from points 300m on either side of the highway to the nearest point on the carriageway at right angles to the centre line of the carriageway.
- A straight line can be drawn from any point of the property to a point on the carriageway without passing through another building
- The use of the highway causes or is expected to cause noise at a level not less than 68 dB(A) $L_{10\ 18\ hour}$; and
- They will experience noise levels exceeding the prevailing noise level by at least 1.0 dB(A).

The noise level is calculated for the most exposed window on the property façade in question, based on the layout and traffic flow immediately before the road works commence. This is defined as the ‘prevailing noise level’. A similar exercise is then carried out based on the revised road layout, using actual levels of traffic noise measured at intervals (1,5,10 and 15 years after opening as specified in the Memorandum on the Noise Insulation (Scotland) Regulations 1975).

The Regulations prescribe a method for predicting noise levels. This method is set out in the Memorandum. It is recognised that CRTN is not the calculation method intended for use with the Noise Insulation (Scotland) Regulations and due to the difference in prediction methods a figure of 65 dB(A) has been used to suggest possible eligibility,

where the CRTN procedure is used. This is to allow for any potential variation caused by using the different method.

For this traffic noise assessment noise levels at each of the 12 properties are predicted using CRTN. The entitlement for insulation at each of the properties is assessed against a noise level of 65 dB(A) $L_{10\ 18\ hour}$.

10.2.8 Vibration Assessment

The DMRB methodology requires that an assessment be made of the annoyance due to traffic induced airborne vibration caused by vehicle engines and exhausts. The survey of vibration nuisance, used as the basis for determining the percentage of people bothered very much or quite a lot by vibration in DMRB was restricted to properties within 40m of the carriageway where there were no barriers to traffic noise.

The $L_{A10\ 18h}$ index is among the physical variables most closely associated with average disturbance ratings. DMRB recognises that the relationship between the percentage of people bothered by largely airborne vibration and this noise exposure index is similar to that for noise nuisance except that the percentage of people bothered by vibration is lower at all exposure levels. For the purpose of predicting vibration nuisance DMRB requires that Figure 2 in Volume 11, Section 3, Part 7 'Traffic Noise and Vibration' is used, with a suitable adjustment, to predict vibration nuisance.

DMRB confirms that for a given level of noise exposure the percentage of people bothered very much or quite a lot by vibration is 10% lower than the corresponding figure for noise nuisance. On average, traffic induced vibration is expected to affect a very small percentage of people at exposure levels below 58 dB(A) and therefore zero percent should be assumed in these cases.

A nuisance assessment has been undertaken and the predicted noise levels (for Do Minimum and Do Something scenarios) have been used to determine the levels of vibration nuisance. Given the low traffic flows and the distance of most of the properties from the A68 it is likely that zero percent of people would potentially be bothered by vibration. The only property likely to experience noise levels greater than 58 dB(A) would be Riggsyde, due to the proximity of the A68.

Ground-borne vibration is generated by irregularities in the road surface and is much less likely to be a cause of disturbance than airborne vibration when considering disturbance from new roads. Mouchel has indicated that the road improvement scheme will be designed and constructed to ensure that there are no significant irregularities in the road which will ensure that ground-borne vibration levels are minimised. It is not therefore necessary to assess ground-borne vibration.

10.3 Assessment of Impacts

10.3.1 Noise Survey Results

The results of the noise survey carried out by SBC are shown in Table 10.5. The noise monitoring locations are shown on Figure 10.3.

During each noise survey the dominant source of noise noted was the continuous flow of traffic from the A68. Intermittent noise only was noted from vehicles on the C84 at locations 3 and 4.

The noise monitoring results at Riggsyde suggest that the property currently experiences noise levels in excess of 65 dB $L_{10\ 18\ hour}$.

Table 10.5. Noise Survey Results.

Monitoring Location	L_{A10} dB(A)
Location 1: Garden of Riggsyde 23-06-08	
1400-1500 hours	68.8
1500-1600 hours	68.9
1600-1700 hours	69.1
$L_{10\ 18\ hour}$	**67.9**
Location 2: Grounds of The Shieling facing the A68 30-06-08	
1200-1300 hours	59.4
1300-1400 hours	59.4
1400-1500 hours	59.1
$L_{10\ 18\ hour}$	**58.3**
Location 3: Garden of Trostan between house and Station Road 23-06-08	
1400-1500 hours	50.7
1500-1600 hours	51.9
1600-1700 hours	50.0
$L_{10\ 18\ hour}$	**49.9**
Location 4: Garden of Howden Mill 30-06-08	
1400-1500 hours	51.6
1500-1600 hours	51.0
1600-1700 hours	50.6
$L_{10\ 18\ hour}$	**50.1**

10.3.2 Changes in noise levels

DMRB states that in the period following a change in traffic flow, people may find benefits or disbenefits when the noise changes are as small as 1 dB(A) – equivalent to

an increase in traffic flow of 25% or decrease in traffic flow of 20%. DMRB therefore considers that changes in noise levels of 1 dB(A) or greater may be perceptible as indicated in the significance criteria detailed in Table 10.2 of this assessment.

The noise predictions carried out for receptors 1 to 12 are included in Appendix 12. For each of the four scenarios, 2010 Do Minimum and Do Something and 2025 Do Minimum and Do Something, each of the 12 locations has been classified according to their predicted ambient levels. The results for 2010 and 2025 are included in Tables 10.6 to 10.9.

It should be noted that the predicted noise levels include noise from the A68 only. It is possible that some very small changes may occur if noise from the C84, D47/5 and new side road were included. However it is considered that these changes would most likely be insignificant.

Table 10.6. Predicted Ambient Noise Levels for the 2010. Do Minimum Scenario.

Ambient Noise Level	Number of Properties experiencing noise level
≥70 dB(A)	1 (Riggsyde)
60-<70 dB(A)	
50-<60 dB(A)	8
<50 dB(A)	3

Table 10.7. Predicted Ambient Noise Levels for the 2025. Do Minimum Scenario.

Ambient Noise Level	Number of Properties experiencing noise level
≥70 dB(A)	1 (Riggsyde)
60-<70 dB(A)	
50-<60 dB(A)	10
<50 dB(A)	1

Table 10.8. Predicted Ambient Noise Levels for the 2010. Do Something Scenario.

Ambient Noise Level	Number of Properties experiencing noise level
≥70 dB(A)	1 (Riggsyde)
60-<70 dB(A)	
50-<60 dB(A)	8
<50 dB(A)	3

Table 10.9. Predicted Ambient Noise Levels for the 2025. Do Something Scenario.

Ambient Noise Level	Number of Properties experiencing noise level
≥70 dB(A)	1 (Riggsyde)
60-<70 dB(A)	
50-<60 dB(A)	10
<50 dB(A)	1

By comparing the Do Minimum and Do Something scenarios the number of properties subject to the following increases and decreases have been determined: 1-<3 dB(A), 3-5<dB(A), 5-<10 dB(A), 10-15 dB(A) and over 15 dB(A). The results for the 2025 design year are shown in Table 10.10.

Table 10.10. Predicted Change in Ambient Noise Levels for the 2025. Design Year.

Change in noise level	Number of Properties experiencing change in noise level
Increase	
1-<3 dB(A)	
3-<5 dB(A)	
5-<10 dB(A)	
10-15 dB(A)	
>15 dB(A)	
Total Experiencing an increase	
Decrease	
1-<3 dB(A)	
3-<5 dB(A)	
5-<10 dB(A)	
10-15 dB(A)	
>15 dB(A)	
Total Experiencing a decrease	
Total experiencing a change less than 1 dB(A)	12

The results for the design year indicate that all 12 properties will experience a change in noise levels <1 dB(A).

The changes in noise levels at the 12 properties are not therefore likely to be perceptible (imperceptible in accordance with Table 10.2) and the impact will be insignificant. Taking into account the sensitivity of these receptors (moderate as per Table 10.3) the impact will remain insignificant adverse (Table 10.4).

It is recognised that the predicted changes in noise levels are approximate only, due to the fact that only the A68 has been included, in the noise predictions. However the low flows on the new side road and the low flows and small changes in flows on the C84 do also suggest that the changes in noise levels at the 12 properties are not likely to be significant.

10.3.3 Nuisance Assessment

A nuisance assessment is only required for receptors when the change in noise levels is 1 dB(A) or more. No receptors are predicted to experience a change in noise levels of 1 dB(A) of more; therefore a nuisance assessment is not required.

10.3.4 Traffic Induced Vibration

The noise levels at all of the 12 receptors, apart from Riggsyde, are predicted to be below 58 dB(A). On average traffic induced airborne vibration caused by vehicle engines and exhausts is expected to affect a very small percentage of people at exposure levels below 58 dB(A) and therefore zero percent of people bothered very much or quite a lot by vibration should be assumed.

Noise levels predicted at the Riggsyde property indicate ambient noise levels above 58 dB(A). A reduction in noise levels of 1 dB(A) or more is also predicted therefore it has not been considered necessary to assess vibration or vibration nuisance as some significant beneficial changes may occur.

Using Figure 2 (DMRB Volume 11 Section 3 Part 7) it has been possible to estimate the percent of people bothered very much or quite a lot by vibration. For the 2025 Do Minimum scenario the percentage is 37% at Riggsyde. For the 2025 Do Something Scenario this percentage drops to 35%. The reduction in noise levels at the Riggsyde property (predicted to be less than 1 dB(A)) will therefore cause a slight reduction in the percentage of people bothered by airborne vibration.

10.4 Mitigation and Residual Impacts

The traffic noise assessment indicates that a perceptible increase in traffic noise is unlikely to occur in 2010 and 2025 at any of the 12 receptors assessed.

Predictions have been carried out which indicate that traffic noise levels may exceed 65 dB(A) $L_{10\ 18\ hour}$ at the Riggsyde property. The baseline noise monitoring carried out in 2008 also confirms this. However the proposed scheme will not cause a perceptible increase in noise levels at this receptor. It is not therefore likely to be eligible for compensation in accordance with the Noise Insulation (Scotland) Regulations 1975.

At this stage it is not considered necessary to recommend any measures to mitigate noise at any of the receptor locations assessed. The residual impacts therefore remain the same as those identified above.