

# **A1 in Northumberland: Morpeth to Ellingham**

**Scheme Number: TR010041**

## **6.8 Environmental Statement – Appendix 6.10 Noise and Vibration DMRB Sensitivity Test**

### **Part B**

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed  
Forms and Procedure) Regulations 2009

June 2020

Infrastructure Planning

Planning Act 2008

**The Infrastructure Planning  
(Applications: Prescribed Forms and  
Procedure) Regulations 2009**

**The A1 in Northumberland: Morpeth to Ellingham  
Development Consent Order 20[xx]**

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**Environmental Statement - Appendix**

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## 1. INTRODUCTION

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### 1.1. PURPOSE OF THIS SENSITIVITY TEST

- 1.1.1. The Design Manual for Roads and Bridges (DMRB) LA 111 Noise and vibration Revision 0 (LA 111) (**Ref. 1.1**) was released in November 2019 and supersedes the former DMRB HD 213/11 (**Ref. 1.2**) and Interim Advice Note 185/15 (IAN 185/15) (**Ref. 1.3**).
- 1.1.2. The purpose of this sensitivity test is to report the potential changes to the Noise and Vibration assessment presented in **Chapter 6: Noise and Vibration, Volume 3** of this Environmental Statement (ES) (**Application Document Reference: TR010041/APP/6.3**) as a result of the updated guidance.
- 1.1.3. Only operational noise and vibration is considered as the methodology used to undertake the construction Noise and Vibration assessment as set out in **Chapter 6: Noise and Vibration, Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**) generally follows the guidance proposed in LA 111. Therefore, the potential for changes to the conclusions of the construction assessment is considered to be very low.
- 1.1.4. The first part of the sensitivity test highlights the key changes in the new LA 111, with discussion on the implications for the Noise and Vibration assessment as set out in **Chapter 6: Noise and Vibration, Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**). The second part presents a brief appraisal of the potential for additional significant effects as a result of applying the new LA 111 methodology. A summary is included in Part 3 of this Appendix.

## 2. KEY UPDATES

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### 2.1. TRAFFIC SPEEDS

- 2.1.1. The requirement for speed banding has been removed but the need to ‘pivot’ speeds is retained. This also has implications for the road surface correction that is applied in the noise model to each road segment, as this is dependent not only on the pavement type but also traffic speed.
- 2.1.2. As the speeds and road surface corrections need to be adjusted in the noise model to align with the LA 111 guidance, there is the potential for additional Environmental Impact Assessment (EIA) significant effects, and so this has been considered further in Part 2 below.

### 2.2. STUDY AREA

- 2.2.1. The guidance for the derivation of the Study Area has been updated. Previously HD 213/11 referred to a ‘Calculation Area’ as well as a ‘Study Area’. The Calculation Area referred to the area within which receptor specific analysis would be undertaken and noise contour figures would be produced. The Calculation Area for was derived (based on the principles of HD 213/11) as follows:

- I. Identify the start and end points of the physical works associated with the Scheme.
- II. Define a boundary 1 km from the carriageway edge of the routes identified in (I) above.
- III. Define a boundary 600 m from the carriageway edge around the route identified in (I) above and 600 m from any other affected routes within the boundary defined in (II) above. The total area within these 600 m boundaries is termed the Calculation Area.

- 2.2.2. LA 111 has simplified this guidance and now states:

*“An operational study area defined as the following can be sufficient for most projects, but it can be reduced or extended to ensure it is proportionate to the risk of likely significant effects:*

- 1) *the area within 600 m of new road links or road links physically changed or bypassed by the project;*
- 2) *the area within 50 m of other road links with potential to experience a short term BNL change of more than 1.0 dB(A) as a result of the project.”*

- 2.2.3. The road traffic model provided for schemes such as Part B are large, and it would be impractical and disproportionate to include all buildings and roads within the 50 m buffers defined by part 2 of the above in the main noise model at the outset. Therefore, the interpretation of this guidance is that the modelled, receptor specific calculation area would initially extend 600 m from Part B. Where there is the potential for significant adverse effects, receptor specific calculations could still be undertaken at receptors within the 50 m

buffers (and outside the 600 m calculation area), however, this has not been done for the purpose of this sensitivity test.

- 2.2.4. It is likely, therefore, that the guidance contained within LA 111 would lead to a reduced Study Area (by excluding the impacts outside the 600 m area) compared to that currently adopted for Part B (based on the requirements of HD 213/11). Nevertheless, to facilitate a simple comparison of the potential significant effects resulting from following HD 213/11 and LA 111 methodologies, it is appropriate to undertake this sensitivity test within the original Study Area and Calculation Area adopted for Part B.

## 2.3. OPERATIONAL VIBRATION AND AIRBORNE VIBRATION NUISANCE

- 2.3.1. LA 111 notes that:

*“Operational vibration is scoped out of the assessment methodology as a maintained road surface will be free of irregularities as part of project design and under general maintenance, so operational vibration will not have the potential to lead to significant effects”*

- 2.3.2. The requirement and methodology for calculating airborne vibration nuisance is not present in LA 111.
- 2.3.3. As an assessment of operational vibration is scoped out of the assessment methodology in LA 111, and no operational vibration significant effects were predicted in **Chapter 6: Noise and Vibration, Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**), this requires no further consideration.

### NOISE NUISANCE

- 2.3.4. The requirement and methodology for calculating the operational noise nuisance from Part B is not present in LA 111.
- 2.3.5. As the assessment of noise nuisance is no longer required, and no significant effects were predicted in **Chapter 6: Noise and Vibration, Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**), this requires no further consideration.

## 2.4. SIGNIFICANCE OF EFFECTS

- 2.4.1. Where a building is predicted to experience different changes in noise level on different facades, LA 111 advises that the greatest magnitude of change in noise should be reported. HD 213/11 previously advised that the least beneficial change in noise level should be reported.
- 2.4.2. The least beneficial change represents the worst-case approach in that the largest adverse change in noise level would always be reported, regardless of the potential benefits on other facades. Where only beneficial changes are predicted, the smallest of these would be reported.

- 2.4.3. It should be noted that LA 111 requires that when determining the significance of effect at a particular property, the noise level changes on all facades of the building are considered rather than just the greatest magnitude change.

LA 111 also sets out more definitively how to determine if an impact gives rise to an EIA significant effect, whereby the magnitude of the short-term noise level change is considered with regard to a number of contextual factors.

### **NIGHTTIME NOISE LEVELS**

- 2.4.4. HD 213/11 previously included a 55 dB  $L_{\text{night}}$  cut-off threshold for receptors during the nighttime. This is not included in LA 111 meaning all receptors should now be considered during the nighttime. Whilst this is a change in assessment methodology and reporting of results, the removal of this threshold is unlikely to change the conclusions of **Chapter 6: Noise and Vibration, Volume 3** of this ES (**Application Document Reference TR010041/APP/6.3**). Given that the  $L_{\text{night}}$  is calculated from the daytime  $L_{A10,18h}$ , the nighttime and daytime assessments are directly linked. The differential between the calculated daytime and nighttime noise levels is such that the daytime assessment is comparable to the nighttime assessment. The assessment of significance applicable to the daytime  $L_{A10,18h}$  results is also expected to be reflective of the nighttime assessment. Consequently, including nighttime results below the 55 dB  $L_{\text{night}}$  cut-off threshold should not alter the assessment of significant effects and is unlikely to necessitate the consideration of additional mitigation. Nighttime noise levels and the threshold cut-off would therefore not be included in the appraisal which follows.

### **OTHER SENSITIVE RECEPTORS**

- 2.4.5. Consideration of nighttime short-term noise changes has been introduced for dwellings and other sensitive receptors (whereas previously it was only considered in the long-term for dwellings). LA 111 now also includes other sensitive receptors<sup>1</sup> in the long-term assessments.
- 2.4.6. Whilst these represent a change in assessment methodology and to the reporting of results, as stated above, given that the assessment of significance applicable to the daytime  $L_{A10,18h}$  results is also reflective of the night time results, the introduction of these additional requirements is unlikely to change the conclusions of **Chapter 6: Noise and Vibration, Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**). This aspect is not considered further.

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<sup>1</sup> Other sensitive receptors include hospitals, healthcare facilities, education facilities, community facilities, Environmental Noise Directive (END) quiet areas or potential END quiet areas, international and national or statutory designated sites, public rights of way and cultural heritage assets.

## 2.5. SUMMARY OF KEY CHANGES

- 2.5.1. Whilst it is acknowledged there are a number of changes which are unlikely to affect the conclusions of the operational road traffic Noise and Vibration assessment, as summarised above, the following issues warrant further consideration:
- a. Traffic Speeds and associated road surface corrections
  - b. Significance of Effects
- 2.5.2. The following section presents the findings of a proportionate appraisal of the potential implications of the change in DMRB guidance with respect to traffic data speeds and significance of effects.



## 3. APPRAISAL

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### 3.1. ABSOLUTE NOISE LEVELS

- 3.1.1. It is first pertinent to consider the potential changes in absolute noise levels resulting in the change from banded speeds to pivoted speeds. This has the potential to impact the numbers of properties above the Lowest Observed Adverse Effect Level (LOAEL) and Significant Observed Adverse Effect Level (SOAEL) thresholds, which in turn are used to assist in determining potential significant effects.
- 3.1.2. Following IAN 185/11 methodology, traffic data speeds were originally banded into the following, 20, 33, 63 and 97 kph speeds (these are the specific bands for non-motorway roads).
- 3.1.3. The general pattern for the majority of Part B is that in the Do-minimum opening year (2023) for most sections of the A1 the banded speeds are representative of the pivoted speeds. In the Do-something opening year, generally speeds were banded 'down' into the 97 kph speed band.
- 3.1.4. This means that for large sections of Part B, under the previous HD 213/11 and IAN 185/15 methodology the Do-minimum opening year and Do-something opening year speeds were the same. This is no longer the case following LA 111 methodology, with an increase in speeds along sections of the A1 generally leading to increased Do-something noise levels from the A1.
- 3.1.5. Whilst this outcome is not observed for the entire A1, and some of the local roads in the model do not follow this pattern, it is possible that the number of properties above the daytime and night time LOAEL and SOAEL would increase in the Do-something opening and future years.
- 3.1.6. The Noise Policy Statement for England (**Ref. 1.4**) notes that where properties are predicted to experience noise levels above the LOAEL and SOAEL, noise levels should be mitigated and minimised as far as possible, within the context of sustainable development.

### 3.2. NOISE LEVEL CHANGES

- 3.2.1. As the purpose of this Appendix is to report the potential changes to the noise and vibration assessment presented in **Chapter 6: Noise and Vibration, Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**), the full results tables have not been replicated.
- 3.2.2. Instead, this section focuses on the minor, moderate and major beneficial and adverse impacts, which have the potential to be significant.
- 3.2.3. LA 111 notes that the short-term noise level changes should be used initially when determining potential EIA significant effects. It is therefore appropriate to compare the results of the short-term noise level changes following both HD 213/11 and LA 111 methodology. This analysis considers the different methods of selecting a representative

noise change for each building as discussed (under Significance of Effects) above. For simplicity only the daytime results are presented in the following table for residential properties, the nighttime results follow broadly the same pattern.

**Table 3-1 - Short-term Magnitudes of Impact at Residential Properties for HD 213/11 and IAN 185/15 Methodology Compared to LA 111 Methodology**

<b>Adverse/Beneficial</b>	<b>Magnitude of Impact</b>	<b>HD 213/11 and IAN 185/15 Methodology</b>	<b>LA 111 Methodology</b>
Beneficial	Major	0	1
	Moderate	5	4
	Minor	7	20
	Negligible adverse/beneficial and no change	65	41
Adverse	Minor	0	11
	Moderate	0	0
	Major	0	0

- 3.2.4. It is clear from the above table that the LA 111 methodology results in eleven receptors falling within the minor adverse category, where previously there were no receptors falling within the minor to major adverse change categories. The use of the LA 111 methodology however does not result in receptors falling within the moderate and major adverse (**significant**) categories.
- 3.2.5. The increase in minor adverse results is likely to be caused mainly by the change from banded speeds to pivoted speeds as discussed above.
- 3.2.6. There is an increase in minor and major beneficial results which is likely to be mainly due to selecting the façade of greatest magnitude of change result for each building rather than the least beneficial change (which would always favour an adverse result over a beneficial one, regardless of the magnitude).
- 3.2.7. The Noise and Vibration assessment based on HD 213/11 methodology as presented in **Chapter 6: Noise and Vibration, Volume 3** of this ES (**Application Document**

**Reference: TR010041/APP/6.3**), for operation, concluded that there are no receptors which are predicted to experience significant adverse effects.

### **3.3. SIGNIFICANCE OF EFFECTS**

- 3.3.1. The following paragraphs focus on the potential for the LA 111 methodology to give rise to additional significant adverse noise effects which would result in a change in the conclusions as set out in **Chapter 6: Noise and Vibration, Volume 3** of this ES (**Application Document Reference : TR010041/APP/6.3**). Whilst it appears likely that LA 111 methodology would also increase the number of significant beneficial effects; these are less critical to the provision of mitigation and to the overall outcome of the assessment.
- 3.3.2. LA 111 states that receptors with a minor short-term noise level change and which are also predicted to experience noise levels above the SOAEL are likely to be significant. Following analysis of the calculated receptor noise levels, it is evident that, for the eleven receptors which are predicted to experience minor adverse short-term noise level changes, noise levels are below the SOAEL. The LA 111 methodology is therefore not expected to change the conclusions of the Noise and Vibration assessment presented within **Chapter 6: Noise and Vibration, Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**).

### **3.4. PROPOSED MITIGATION**

- 3.4.1. Given that the LA 111 methodology does not change the conclusions of the noise and vibration assessment presented in **Chapter 6: Noise and Vibration, Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**) with respect to significant adverse effects, the appraisal of mitigation measures is also not expected to change.

## 4. SUMMARY

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- 4.1.1. It is identified within **Chapter 6: Noise and Vibration, Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**) that significant adverse effects are not predicted during operation. It is expected that this assessment of significance would not change following the application of LA 111. Further assessment of mitigation is therefore expected not to be required following the application of LA 111.

## REFERENCES

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- Ref. 1.1** Highways England, Design Manual for Roads and Bridges, Sustainability & Environment Appraisal, LA 111 Noise and Vibration, Revision 1 (2020), November 2019. Available at:  
<http://origin.standardsforhighways.co.uk/ha/standards/DMRB/vol11/section3.htm>
- Ref. 1.2** Highways Agency, Scottish Government, Welsh Assembly Government and the Department for Regional Development Northern Ireland (2011), Design Manual for Roads and Bridges, Volume 11, Section 3, Part 7, HD 213/11 revision 1. Noise and Vibration.
- Ref. 1.3** Highways England (2015). Interim Advice Note (IAN) 185/15 Updated traffic, air quality and noise advice on the assessment of link speeds and generation of vehicle data into 'speed-bands' for users of DMRB Volume 11, Section 3, Part 1 'Air Quality and Volume 11, Section 3, Part 7 Noise.
- Ref. 1.4** Defra (2010). Noise Policy Statement for England (March 2010). Available at:  
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