Adran yr Economi a'r Seilwaith
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Llywodraeth Cymru
Welsh Government

The M4 Motorway (Junction 23 (East of Magor) to West of Junction 29 (Castleton) and Connecting Roads) and The M48 Motorway (Junction 23 (East of Magor) Connecting Road) Scheme 201-

The M4 Motorway (Junction 23 (East of Magor) to West of Junction 29 (Castleton) and Connecting Roads) and The M48 Motorway (Junction 23 (East of Magor) Connecting Road) (Amendment) Scheme 201-

The London to Fishguard Trunk Road (East of Magor to Castleton) Order 201-

The M4 Motorway (West of Magor to East of Castleton) and the A48(M) Motorway (West of Castleton to St Mellons)(Variation of Various Schemes) Scheme 201-

The M4 Motorway (Junction 23 (East of Magor) to West of Junction 29 (Castleton) and Connecting Roads) and the M48 Motorway (Junction 23 (East of Magor) Connecting Road) and The London to Fishguard Trunk Road (east of Magor to Castleton) (Side Roads) Order 201-

The Welsh Ministers (The M4 Motorway (Junction 23 (East of Magor) to West of Junction 29 (Castleton) and Connecting Roads) and the M48 Motorway (Junction 23 (East of Magor) Connecting Road) and the London to Fishguard Trunk Road (East of Magor to Castleton)) Compulsory Purchase Order 201-

The M4 Motorway (Junction 23 (East Of Magor) to West of Junction 29 (Castleton) and Connecting Roads) and The M48 Motorway (Junction 23 (East Of Magor) Connecting Road) (Supplementary) Scheme 201-

The Welsh Ministers (The M4 Motorway (Junction 23 (East Of Magor) to West of Junction 29 (Castleton) and Connecting Roads) and The M48 Motorway (Junction 23 (East Of Magor) Connecting Road) and The London to Fishguard Trunk Road (East of Magor to Castleton)) Supplementary Compulsory Purchase Order 201-

Summary Proof of Evidence

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RPS Planning and Environment - Noise and Vibration

Document Reference: WG 1.14.2

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1. Introduction

1.1.1 My name is Philip Evans; I am employed by RPS Planning and Environment (RPS) as a Senior Director in Acoustics. I hold a Bachelor of Science (Honours) degree in Geology and a Master of Science degree in Acoustics, Vibration and Noise Control. I have over 25 years' experience as a consultant in acoustics and have worked for a number of leading acoustics consultancies in senior management and technical positions. I am a Member of the Institute of Acoustics (IoA) and a Fellow of the Geological Society; RPS is a member of the Association of Noise Consultants (ANC).

1.1.2 I am a member of the project team which is responsible for the delivery of the Scheme and I have been involved in the Scheme since March 2015. I provided the Environmental Statement (ES) and Supplement chapters on noise and vibration with the assistance of the Brighton Acoustics Team. I also confirm that I am familiar with the published Scheme and have visited the alignment and the area during the day, evening and night.

1.1.3 My evidence describes the noise and vibration effects during the construction and operation (use) of the Scheme on human receptors identified as sensitive to either noise or vibration in terms of either nuisance (noise and/or vibration) or damage (vibration).

1.1.4 Receptors, referred to as NVSRs (noise, including vibration, sensitive receptors), include: residential dwellings and other buildings including those in religious, educational, health care and community use; designated areas such as Special Areas of Conservation (SAC), Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR); and some public rights of way.

1.1.5 Effects upon ecology or important species or ecological protection areas, are addressed by the expert witness on ecology, Dr Keith Jones [WG 1.18.1], and others as appropriate to the species.

2. Legislation, Standards and Policy

2.1. Introduction

2.1.1. Noise and vibration can have a significant effect on the environment and on the quality of life enjoyed by individuals and communities. In this respect, the planning system promotes sustainable economic growth whilst ensuring that the quality of life is not unreasonably affected.

2.1.2. The legislation, standards and national and local planning policy relevant to traffic noise and this Scheme are described in the ES and in my full Proof of Evidence.

3. Assessment Methodology

3.1.1. The assessment methodology was fully described in the ES as revised in the Supplements and is summarised in my main evidence. I consider the significance of effects on NVSRs of operational changes in road traffic associated with the published Scheme based on noise change and absolute levels and noise nuisance, including an assessment of the effectiveness of proposed mitigation measures. This includes effects arising on the existing road network (including the existing M4 through Newport) and on the proposed new section of motorway and associated non-motorway roads.

3.1.2. This assessment is based upon a range of relevant and appropriate guidance and standards relating to construction and the subsequent use of road schemes. The construction effects of the Scheme have been assessing following the guidance in relevant British Standards.

3.2. Consultation

3.2.1. Appropriate local and national regulatory bodies have been consulted with regard to the Scheme through the environmental assessment process. Responses to this consultation have been considered and addressed where possible within the assessment.

3.3. Assessment Criteria and Assignment of Significance

3.3.1. The determination of the significance of operational effects has been based upon guidance in the DMRB which relates to the effects of the Scheme in terms of noise change in the short and the longer term, generally year of opening and 15 years hence. The determination of the significance of construction effects has been guided by the appropriate parts of BS 5228 Part 1, primarily Annex E for noise.

4. Baseline Conditions

4.1. Study Area

4.1.1. The guidance in the DMRB states that the primary study area for noise and should correspond to a band 600 m either side of the carriageway edge. However, an initial review of predicted noise changes indicated significant effects could potentially occur outside this distance, due to the scale of the Scheme and the potential quietness of the surrounding area along the alignment of the new section of motorway, and so the study area was increased to a band 1 km either side of the edge of the published Scheme and 1 km either side of the existing M4 (i.e. a 2 km corridor). This is to ensure that all potentially affected NVSRs are duly considered.

4.2. Approach to Identification of Baseline Conditions

4.2.1. The noise environments in the vicinity of the existing M4 motorway and the published Scheme have been determined and characterised by means of baseline noise monitoring. Locations were selected to be representative of areas of residential development, more isolated communities, recreational uses and sites of nature conservation value. The locations adopted are identified in Figures 1a to 1k of the ES Volume 3: Appendix 13.2, Baseline Sound Monitoring.

4.2.2. Survey location selection was based upon experience and professional judgement of myself and my acoustics team and reflects the consultation responses received from Newport City Council and Monmouthshire County Council at the time. Full details are provided in the ES.

4.2.3. In general terms, the data indicate that the daytime ambient L_{Aeq} levels range from the quietest at 40 dB(A) to the loudest at 65 dB(A) where the location was near the existing M4. For the night-time, the range is from 35 dB(A) to 60 dB(A). The lower range of levels indicates that, whilst the existing levels around the Scheme alignment are low, they are not very low.

4.3. Future Baseline Conditions

4.3.1. In the absence of the Scheme, baseline noise levels around and through Newport on the existing M4 and the surrounding areas are likely to increase in accordance with the expected traffic growth for the area.

5. Limitations And Constraints

5.1. General Limitations

5.1.1. In all assessments, it is good practice to consider uncertainty, which can arise from a number of different aspects of an assessment. Measures, as described in my full Proof of Evidence, have been taken to minimise general uncertainty in accordance with best practice.

5.2. Constraints of the Methodology

5.2.1. The assessment has been undertaken in accordance with the methodology contained within the DMRB and CRTN. However, there are a number of constraints associated with these methodologies which could result, for this particular scheme which is for a road of motorway grade and speed, in an over estimate of the predicted noise levels and hence noise change, as described in my full Proof of Evidence.

6. Environmental Commitments and Mitigation Measures Forming Part of the Scheme Design

6.1.1. Appendix R18.1 of the ES Supplement Volume 3 provides the Register of Environmental Commitments Update. With regard to noise and vibration, these cover both the construction and the subsequent operation of the Scheme to minimize adverse effects as described in my full Proof of Evidence. These take into account the consultation responses from Newport City Council in relation to the Scoping Report and Monmouthshire County Council.

6.1.2. During operation, both beneficial and adverse noise effects are anticipated as a result of the Scheme. The new section of motorway would reduce traffic and hence congestion on the existing M4. Noise measures incorporated into the design of the Scheme (embedded mitigation) include the provision of a thin road surface system, which is relatively low noise, and would reduce noise levels. The solid concrete safety barrier 0.9 m in high, along the central reservation of the new section of motorway alignment may also provide some screening of noise generated at the tyre-road interface which is the primary source of noise for vehicles at motorway speed.

6.1.3. In addition to the embedded measures, noise barriers of 2 m height are proposed in four areas along the new section of motorway. This maximum height has been assumed to minimise other non-acoustic effects of the barriers, i.e. adverse landscape and visual effects. The locations of these barriers would be subject to further definitive evaluation and confirmation at the detailed design stage.

7. Overall Summary of Effects

7.1 Introduction

7.1.1. The planning system promotes sustainable economic growth, whilst ensuring that quality of life is not unreasonably affected. I consider that the Scheme appropriately reflects these aims with regard to the noise and vibration effects associated with the construction and subsequent operation of the Scheme.

7.2 Construction

7.2.1 During the construction phase, best practicable means will be adopted to minimise noise and vibration emissions. This would include best practice in terms of construction activities and procedures, the provision of hoardings and noise barriers around construction sites and the offer of sound insulation to properties where appropriate.

7.2.2 Noise and vibration monitoring will also be carried out at residential premises at key locations during construction to check compliance with noise and vibration limits.

7.2.3 A Construction Environmental Management Plan (CEMP) will set out the controls for noise and vibration levels during construction. This will be based upon the initial draft but then finalised by the contractor prior to construction commencing. This would also be subject to agreement with Newport City Council and Monmouthshire County Council as appropriate at the time.

7.2.4 With the generic mitigation measures discussed and temporary noise barriers where appropriate, it is estimated that 213 residential NVSRs may experience a moderate or major adverse impact, leading to effects of moderate or large significance. An estimated 140 properties fall within 45 to 71 m of a construction site and would experience a minor impact, leading to a slight adverse significance of effect.

7.3 Operation

7.3.1 During operation, both beneficial and adverse noise effects are predicted to occur. The published Scheme would reduce congestion on the existing M4 potentially resulting in higher road-speeds and increased vehicle noise. As described above, measures have been incorporated into the design of the Scheme to reduce noise for receptors in proximity to the proposed new section of motorway.

7.3.2 Based on the predicted noise change, the level of significance ranges between major beneficial and major adverse in the short-term. In the long term, the range decreases to levels of significance between moderate beneficial and major adverse. Considering the difference between the situations in 2022 without the Scheme compared to the same year with the Scheme, with noise barriers, 978 receptors would experience a significant adverse effect and 2,888, a significant beneficial effect (cf. Table 8.4 of main proof).

7.3.3 When considered as a whole, the Scheme has a net benefit, with an average noise level difference of -1.3 dB per property across the 20,708 properties assessed for the opening year, when comparing the Do-Minimum scenario against the Do-Something scenario. This equates to approximately a 63,000 ‘dB·people’ improvement as a result of the Scheme.

7.3.4 The Scheme would result in a positive improvement in the noise environment surrounding the existing M4 though Newport. For the new M4, the Scheme has been designed to minimise noise effects whilst not resulting in other unacceptable environmental effects. However, it is accepted that, for some areas, significant adverse effects on local amenity will occur and are unavoidable. On balance, however, my assessment indicates that the Scheme results in a considerably greater benefit than disbenefit.

7.4 Quiet Areas and Tranquillity

7.4.1 It could be considered that the area south of the alignment of the published Scheme is an area deemed “tranquil”. Tranquillity, or the definition of what constitutes tranquillity, is not subject to precise rules. However, generally, it is an area likely to be relatively undisturbed by noise from human sources that undermine the intrinsic character of the area. Such areas are likely to be already valued for their tranquillity and are quite likely to be seen as special for other reasons including their landscape.

7.4.2 From site visits, I found that there were quieter areas but anthropogenic activity occurred throughout and across the area over the full 24 hour period. This varied from traffic to industry to farming; the existing M4 was clearly audible at some of the sites visited as was heavy industry and local commercial activity. On this basis, I would not say that this area would or should be considered tranquil and hence, on this basis, whilst the Scheme will bring more noise to this area, it will not result in loss of a tranquil area.

8. Responses to Objections

8.1.1. Objections have been received to the Scheme and these are described in my full Proof of Evidence including the responses provided.

9. Conclusions

9.1.1. For the construction of the Scheme, my evidence demonstrates that adverse effects may arise during this phase but that these can be mitigated as far as reasonably practicable mostly to an acceptable level.

9.1.2. For the operation of the Scheme, there is a clear benefit to the existing highly populated area of Newport which is currently subject to high levels of noise from the current M4. However, this benefit is offset by the adverse effects associated with the new M4 although these adverse effects relate to a limited number of receptors due to the lower population density and separation of the Scheme from receptors along the new alignment. Mitigation measures will be provided and these have been developed to provide the most appropriate levels of mitigation.

9.1.3. On balance, I have demonstrated that there is a considerable net benefit to the Scheme in that many more receptors (occupants of houses) will benefit by noise reductions than by noise increases. The Scheme is therefore clearly beneficial with regard to noise effects.