

DD29

A453 Widening M1 Junction 24 to A52 Nottingham

PROOF OF EVIDENCE NOISE

BY

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1. INTRODUCTION

- 1.1 My name is Matthew Holford. I am a Regional Director with WYG Environment where I specialise in delivering consultancy services in air quality and environmental noise. I hold a Bachelor of Science in Environmental Science and a Masters Degree in Integrated Environmental Management. I am a member of the Chartered Institute of Environmental Health and I am a Chartered Environmental Health Practitioner.
- 1.2 I have fourteen years experience in the field of monitoring and assessment of environmental noise both as a regulator and consultant. I have been involved in the environmental assessment of the proposed A453 widening scheme since January 2008.

2. ASSESSMENT METHODOLOGY

- 2.1 In order to assess the noise and vibration effects of the proposed A453 scheme WYG undertook assessments based on the methods described in the Design Manual for Roads and Bridges Volume 11, Section 3, Part 7 (DD176). Different assessment methods have been used to quantify the effects of the scheme. These include the effects of both the construction and operational phases on local sensitive receptors, An assessment of 'key and typical sites' has been undertaken for the residential properties nearest to the proposed highway changes. A noise and vibration assessment has also been undertaken for all properties within the near proximity of the A453 corridor and roads feeding on to it and to assess the number of properties eligible for noise mitigation under the Noise Insulation Regulations 1975 (DD121).
- 2.2 In order to ensure that the model predictions are robust, its results were compared against noise monitoring data to ensure that there is a satisfactory correlation between the two. This is a process described as model verification.

NOISE SURVEY

- 2.3 Field data of existing ambient noise was obtained by monitoring noise levels at 34 different locations along the existing A453 road corridor between the M1 roundabout and Clifton during 2006. Noise at each location was monitored for three hours in accordance with the shortened form of measurement described in the Department of Transport Calculation of Road Traffic Noise (CRTN) method.

NOISE MODEL VERIFICATION

- 2.4 Noise modelling has been undertaken using CADNA noise modelling software. This model is also based on the CRTN methodology and allows for detailed prediction of noise levels to be undertaken for large numbers of receptor points and different noise emission scenarios both horizontally and vertically.
- 2.5 A baseline model was developed in CADNA of road traffic noise along the existing A453 corridor in 2006. The model requires various inputs relating to traffic data, barrier effects, road gradients, road surfacing and surrounding buildings all of which are detailed in Chapter 7 of the Environmental Impact Assessment. The model calculations produce an LA10 (18 hour) value for the receiving point of interest and in a grid across the area being assessed. This is the index commonly used when describing road traffic noise and can best be explained as the level in dB(A) exceeded for 10% of the measurement period between 06:00 and 00:00.
- 2.6 Following satisfactory verification of the model, the proposed road improvements have been used to model 'do minimum' and 'do something' scenarios for the planned year of opening in 2012 and for 15 years from opening in 2027. The 'do minimum' and 'do something' scenario take into account traffic variations associated with the M1 Road Widening, Proposed Tram Park and Ride, East Midlands Parkway and Lark Hill Retirement Village schemes.

3. CONSTRUCTION PHASE NOISE AND VIBRATION IMPACT ASSESSMENT

- 3.1 The effects of construction noise and vibration have been calculated at the nearest receptors to the proposed urban construction plant compound opposite the Man of Trent public house and at 28 receptors selected as those likely to be most affected by construction activities along the length of the scheme.
- 3.2 The highest vibration level would be predicted to arise from rotary drill piling works from which vibration is generally undetectable at 25 m distance. As there are no residential receptors within 25 m of proposed bridge piling works, I do not consider that the effects of vibration as a result of construction works would be significant.
- 3.3 The greatest construction noise will be from piling and earthmoving. Noise levels from construction works are not likely to exceed the limits specified in Advisory Leaflet 72: 'Noise Control on Building Sites (DD54) in the rural area of the scheme for any of the construction phases. In the urban area it is likely that noise from

construction above the specified limit of 75 dB(A) would be experienced by properties at the Farnborough Road junction. It is considered that the employment of temporary screening could be used to attenuate noise levels to within the noise target limit at this location. Noise levels from the urban compound are also expected to be within the specified limit.

4. OPENING YEAR AND FUTURE YEAR NOISE IMPACT ASSESSMENT

- 4.1 The assessment of 'key and typical sites' assessed the predicted effect of the scheme at 52 specific worst case sensitive receptors along the length of the proposed scheme for both the opening year and 2027.
- 4.2 The assessment criteria used are based on classifications of magnitude contained in the Design Manual for Roads and Bridges. Changes of between 1 and 2.9 dBA are described as 'slight', changes of between 3 and 4.9 dBA are 'moderate' and changes of 5 to 9.9dBA are 'large'. For the sake of putting these values into perspective a change of less than 3dBA is generally considered imperceptible to the average human ear and a change of greater than 10dBA is considered to be perceived as a doubling of loudness.
- 4.3 Changes to noise levels as a result of the proposed scheme at key receptors are mostly of 'slight negative' or 'moderate negative' magnitude. Of the 52 key receptors assessed, sixteen were predicted to have a 'moderate adverse' impact, twenty four to have a 'slight adverse' impact, nine to have a 'neutral' impact and three to have a beneficial impact. The worst affected properties are expected to be those surrounding the Farnborough Road junction. Noise levels at some properties on the Nottingham Road-Clifton Lane route to the Crusader Roundabout and on the Barton-in-Fabis turn off from the A453 would be considered of 'slight positive' to 'large positive' magnitude.
- 4.4 The greatest increase in the rural section of the scheme is predicted to be 4.9dBA in 2012 and 4.8 dBA in 2027 and is predicted to be 4.0dBA in 2012 and 4.2dBA in 2027 in the urban section. The greatest decrease in the rural section of the scheme is predicted to be -7.9dBA in 2012 and -8.9dBA in 2027 and is predicted to be -1.1dBA in 2012 and -1.8dBA in 2027 in the urban section.
- 4.5 A noise assessment has also been undertaken for all properties and other receptors (such as footpaths) within 200m of the proposed widening scheme. The worst case

noise level has been used for each property and other relevant location in all scenarios.

- 4.6 Increases in noise level for the ‘do something’ scenario mainly fall within the 1-3 dB(A) band, which would be considered a ‘slight negative’ effect. As suggested by the assessment of key receptors, 353 properties would experience increases considered to be of ‘moderate negative’ magnitude. The ‘large negative’ increases in noise only apply to the closest footpath and playing field receptors.
- 4.7 Overall the results show that the proposed scheme is predicted to increase the number of people ‘bothered very much or quite a lot’ by the scheme in comparison to the ‘do minimum’ scenario. In the ‘do something’ scenario, 5,328 receptor locations are predicted to have increases in nuisance level in comparison to 4,488 locations in the ‘do minimum’ scenario. In the ‘do something’ scenario, 377 properties and other relevant locations are predicted to have decreases in nuisance level in comparison to 487 locations in the ‘do minimum’ scenario.

5. NOISE INSULATION QUALIFICATION

- 5.1 The noise assessment shows that a maximum of 222 residences would meet the criteria to qualify for a noise insulation grant under the Noise Insulation Regulations. The relevant criteria require that the predicted noise levels at the residence be at or above 68dB(A) $L_{10(18\text{hour})}$ with the proposed scheme and that the effects of the scheme contribute at least 1dB(A) to this noise level. Of these residences, 127 are predicted to exceed 68dB(A) in 2012 due to existing traffic growth.

6. MITIGATION

- 6.1 Noise mitigation and minimisation has been considered throughout the design of the scheme and has been influential in decision making. A detailed appraisal of all possible noise barriers has been undertaken and those barriers that would be effective and not interfere with landscaping requirements, driver safety or create potential crime and disorder problems have been included in the scheme. The remainder of properties that will see an increase in noise levels as a result of the scheme will be offered noise insulation where eligible.
- 6.2 With mostly daytime works and suitable mitigation measures to be detailed in the Construction Environmental Management Plan it is not expected that there will be significant disturbance as a result of construction noise.

- 6.3 In conclusion, more noise sensitive receptors will be adversely affected by the scheme than will benefit. 222 properties will qualify for noise insulation, over half of which would be expected to be exposed to noise levels at or in excess of 68dB(A) L₁₀ even without the scheme. The greatest adverse effect of the scheme will be ‘moderate’ at key residential receptors and the greatest beneficial effect will be ‘large’ at one receptor. It is my opinion that the overall noise effect of the proposed scheme is moderately negative.