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Old London Road, Washington

Residential Noise Assessment

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1 INTRODUCTION

1.1 Entran Ltd has been commissioned to undertake a noise assessment for a proposed residential development at Old London Road (the 'proposed development') in Washington, near Pulborough.

1.2 The assessment has been undertaken to consider the noise levels at the proposed development. The assessment considers the existing ambient noise and the suitability of the site for residential use.

1.3 The potential noise impacts are assessed in accordance with the most relevant national and local standards and guidelines.

1.4 The noise levels are assessed using criteria provided within BS 8233:2014 and the WHO Guidelines. This report is necessarily technical in nature and contains terminology relating to acoustics and noise. Therefore, a glossary together with a brief introduction to the subject of noise has been provided in Appendix A.

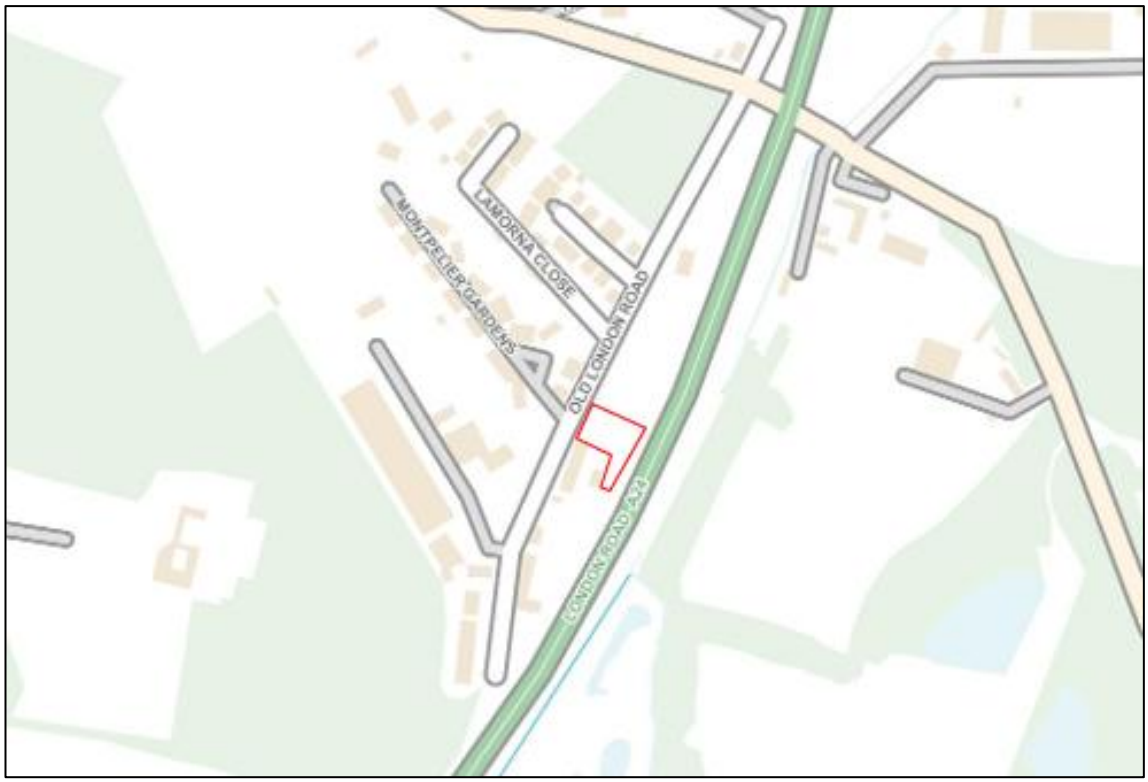
2 SITE DESCRIPTION

2.1 The site is situated between existing residential dwellings and a recently consented residential development. The A24 London Road runs approximately 10m east of the site at the closest boundary. Old London Road runs the west of the site and serves as an access to existing residential dwellings. A small commercial site is located to the north-west of the site; no noise was observed from the commercial site during site visits.

2.2 The existing noise climate within the vicinity of the proposed development was observed to be dominated by road traffic on the A24 London Road.

2.3 The proposed development location and indicative boundary are indicated in Figure 1.

Figure 1 – Site Location



3 ASSESSMENT METHODOLOGY

National Planning Policy Framework (NPPF) (Dec 2024)

3.1 The National Planning Policy Framework (NPPF) sets out the Government's economic, environmental and social planning policies for England. It attempts to summarise in a single document all previous national planning policy advice. Taken together, these policies articulate the Government's vision of sustainable development, which should be interpreted and applied locally to meet local aspirations.

3.2 Under Section 15; Conserving and enhancing the natural environment, the following is stated in paragraph 187:

"Planning policies and decisions should contribute to and enhance the natural and local environment by: …

preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability…"

3.3 The NPPF goes on to state in paragraph 198 that:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason"

Noise Policy Statement for England NPSE (March 2010)

3.4 The Government is committed to sustainable development and the Department for Environment Food and Rural Affairs (Defra) plays an important role in this by working to secure a healthy environment in which current and future generations can prosper. One

aspect of meeting these objectives is the need to manage noise for which Defra has the overall responsibility in England.

3.5 In March 2010, the Noise Policy Statement for England (NPSE) set out the long-term vision of Government noise policy as to:

'Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.'

3.6 The long-term vision is supported by the following aims:

'Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *Avoid significant adverse impacts on health and quality of life;*
- *Mitigate and minimise adverse impacts on health and quality of life: and,*
- *Where possible, contribute to the improvement of health and quality of life.'*

3.7 The explanatory note to the policy statement emphasises that sustainable development is a core principle underpinning all government policy. In this respect, there is a need to integrate consideration of the economic and social benefit of the activity under examination with proper consideration of the adverse environmental effects.

3.8 To achieve these objectives the NPSE sets out three noise conditions to be determined by the assessor:

NOEL - No Observed Effect Level

3.9 This is the level below which no effect can be detected. In simple terms, below this level there is no detectable effect on health and quality of life due to the noise.

LOAEL - Lowest Observed Adverse Effect Level

3.10 This is the level above which adverse effects on health and quality of life can be detected.

SOAEL - Significant Observed Adverse Effect Level

3.11 This is the level above which significant adverse effects on health and quality of life occur.

3.12 The NPSE considers that noise levels above the SOAEL would be seen to have, by definition, significant adverse effects and would be considered unacceptable.

3.13 Where the assessed noise levels fall between the LOAEL and the SOAEL noise levels, the NPSE requires that:

'All reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development…. This does not mean that such adverse effects cannot occur.'

3.14 No objective values are offered within the NPSE, as the document does indicate that each site should be considered on its own merits. Consequently, consideration of the observed effects is made through an assessment methodology as detailed below.

British Standard BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings (2014)

3.15 The scope of BS 8233 is the provision of recommendations for the control of noise in and around buildings. It suggests appropriate criteria and limits for different situations, which are primarily intended to guide the design of new or refurbished buildings undergoing a change of use rather than to assess the effect of changes in the external noise climate.

3.16 This Standard suggests suitable internal noise levels within different types of buildings, including residential dwellings. It suggests that an internal noise level of 30 dB $L_{Aeq, T}$ within bedrooms is a 'desirable' standard. For living areas during the daytime, the standard recommends 35 dB $L_{Aeq, T}$ as a desirable standard for resting.

3.17 Whilst BS 8233 recognises that a guideline value may be set in terms of SEL or L_{AFmax} for the assessment of regular individual noise events that can cause sleep disturbance during the night-time, a specific criterion is not stipulated. Accordingly, reference has been made in this assessment to the World Health Organisation (WHO) 1999: *Guidelines for Community Noise*.

3.18 The Standard also states that "*where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved*."

The Institute of Environmental Management & Assessment (IEMA) Guidelines for Environmental Noise Impact Assessment (2014)

3.19 The Institute of Environmental Management and Assessment (IEMA) published the '*Guidelines for Environmental Noise Impact Assessment*'. The guidelines are applicable to noise impact assessment for any scale of development proposal, including core principles to achieve effectively integration with the EIA, and provide advice on the issues that need to be

considered in a noise impact assessment and whether the appropriate conclusions are being reached. The factors include:

- The appropriateness of the noise parameters used for the situation;
- The reference time period used in making the assessment;
- The level, character and frequency content of the noise sources under investigation; and,
- How the predicted noise levels relate to relevant Standards and guidelines.

3.20 The guidelines also recommend that the assessor should determine the degree of impact based on evidence derived from the assessment.

The Professional Practice Guidance on Planning and Noise (2017)

3.21 The '*Professional Practice Guidance on Planning and Noise'* (ProPG) was produced by a Working Group consisting of representatives of the Association of Noise Consultants (ANC), Institute of Acoustics (IOA) and Chartered Institute of Environmental Health (CIEH) to provide acoustical practitioners with guidance on the management of noise within the planning system in England.

3.22 The reparation of the ProPG acknowledges and reflects the Government's overarching NPSE, the NPPF and Planning Practice Guidance (including PPG-Noise), as well as other authoritative sources of guidance. It provides advice for Local Planning Authorities (LPAs) and developers, and their respective professional advisers which complements Government planning and noise policy and guidance and, in particular, aims to:

- advocate full consideration of the acoustic environment from the earliest possible stage of the development control process;
- encourage the process of good acoustic design in and around new residential developments;
- outline what should be taken into account in deciding planning applications for new noise-sensitive developments;
- promote appropriate noise exposure standards; and,
- assist the delivery of sustainable development.

4 ENVIRONMENTAL NOISE MEASUREMENTS

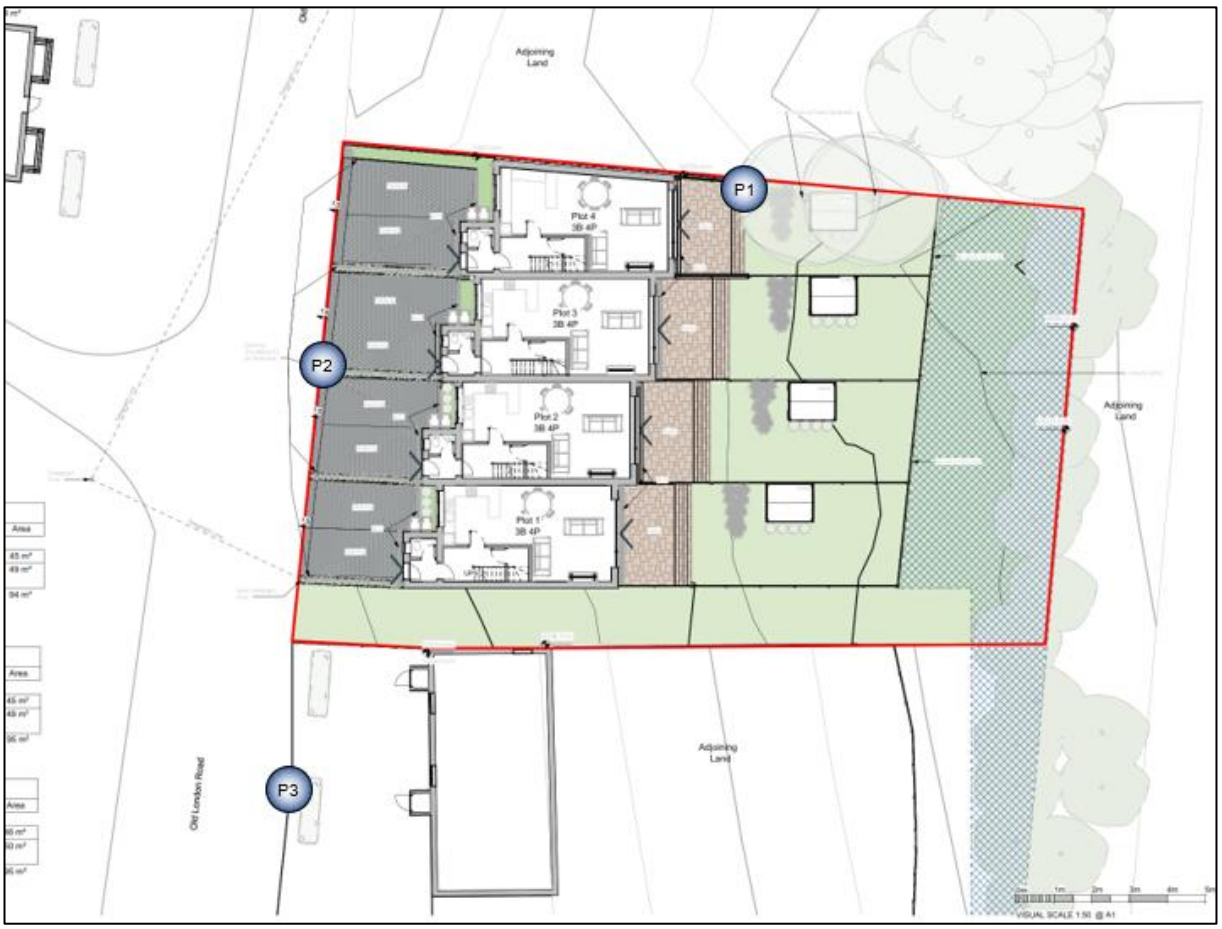
4.1 Noise conditions in the vicinity of the proposed development have been determined by an environmental noise survey conducted between 5th and 10th February 2025.

Monitoring Positions

4.2 Unattended measurements were obtained to the east of the site, at the closest proposed façade position to the A24. Attended measurements were obtained at positions to the west of the site, both at the site boundary and at a position screened by existing residential dwellings.

4.3 The monitors were situated approximately 1.8 m above local ground level. The monitoring positions in relation to the indicative masterplan are indicated in Figure 2.

Figure 2 – Monitoring Locations and Site Layout



Unattended Measurements

4.4 A summary of the unattended survey is provided in Table 1 and graphical representation of the unattended results is presented in Figure B1 of Appendix B.

Table 1: Summary of Unattended Noise Measurements

Date	Measured Free-Field Sound Pressure Level, dB re. $2x10^{-5}$ Pa.					
	Day Time (07:00 - 23:00)			Night-time (23:00 - 07:00)		
	$L_{Amax,F}$	$L_{Aeq,T}$	$L_{A90,T}$	$L_{Amax,F}$	$L_{Aeq,T}$	$L_{A90,T}$
05/02/2025	83.0	65.0	54.2	78.8	60.4	36.1
06/02/2025	92.7	65.9	56.1	79.0	59.7	35.8
07/02/2025	83.2	67.7	58.3	76.9	59.4	34.4
08/02/2025	91.4	67.7	57.3	85.9	58.6	33.7
09/02/2025	88.2	66.8	55.6	85.3	62.6	40.9

Maximum levels represent the highest $L_{Amax,F}$ sound level during the given period.
The period $L_{Aeq,T}$ is obtained from the logarithmic average of measured sound levels.
The period $L_{A90,T}$ is obtained from the average of the measured sound levels.

4.5 The unattended noise monitoring was undertaken to allow assessment in accordance with BS 8233 and to determine the likelihood of adverse effects relating to the proposed development.

Attended Measurements

4.6 Attended measurements were undertaken at positions adjacent to Old London Road, both with a line of site to the A24 and at a position screened by existing buildings; to provide an indication of the reduction achieved due to the intervening structures.

4.7 The attended measurements at P2 and P3, and comparison against measurements obtained at P1, are presented in Table 2.

Table 1: Summary of Unattended Noise Measurements

Position	Date Time	Attended			Unattended		
		$L_{Amax,F}$	$L_{Aeq,T}$	$L_{A90,T}$	$L_{Amax,F}$	$L_{Aeq,T}$	$L_{A90,T}$
P2	05/02/2025 13:30	73.3	63.5	58.9	79.1	66.5	59.7
	05/02/2025 14:00	73.0	62.9	58.3	76.3	66.4	59.6
	05/02/2025 14:30	72.3	64.1	59.8	80.5	67.1	61.1
	Summary	*73.3*	*63.5*	*59.0*	*80.5*	*66.7*	*60.1*
P3	05/02/2025 13:45	68.9	57.3	54.9	75.2	66.1	59.8
	05/02/2025 14:15	71.1	57.7	55.0	75.5	66.8	60.7
	05/02/2025 14:45	69.7	57.4	54.8	76.9	66.7	60.5
	Summary	*71.1*	*57.5*	*54.9*	*76.9*	*66.5*	*60.3*

4.8 Measurements at P3 are likely to be representative of levels at future west facing facades, due to the attenuation afforded by the intervening structures. A difference of -9 dB was observed between Position P1 and P3, which will be adopted to obtain representative long term noise levels at proposed west facing facades. A +3 dB correction will be included to account for uncertainty. The resulting correction of -6 dB will be applied to obtain noise levels for assessment at west facing facades.

4.9 All noise measurements were undertaken by competent individuals with experience in environmental noise monitoring. Measurements were obtained in accordance with the principles of BS 7445: 2003: '*Description and measurement of environmental noise'*.

4.10 All acoustic measurement equipment used during the noise surveys conformed to Type 1 specification of British Standard 61672: 2003: *Electroacoustics. Sound level meters. Part 1 Specifications*. The microphones were fitted with a protective windshield and the sound level meters were situated in a weatherproof case. The noise measurement equipment used during the survey was calibrated at the start and end of the measurement period. There was no significant drift in calibration measurements observed during the survey period.

5 NOISE ASSESSMENT

5.1 Existing noise levels at the site have been assessed by comparing the results of the environmental noise survey with the guidance provided in BS 8233 and the WHO Guidelines. The measured ambient noise levels have been averaged to obtain representative day and night-time noise levels.

5.2 An indicative assessment of internal ambient noise levels has been presented using the typical façade reductions due to attenuated ventilation and insulated double glazing as detailed in BS 8233. The reduction from a façade is taken to be 15 dB and 33 dB for partially open windows and for windows closed, respectively.

5.3 Daytime and night-time noise levels calculated at the site are presented in Table 2, including a correction to account for the reduction due to the proposed buildings.

Table 2 – External and Internal Ambient Noise Levels

Monitoring Position	Period	Sound Pressure Level, $L_{Aeq,T}$ dB re. $2x10^{-5}$ Pa.		
		External	Internal (Windows Partially Open)	Internal (Windows Closed)
P1	Day	67	52	34
	Night	60	45	27
P3 (Old London Road, screened)	Day	61	46	28
	Night	54	39	21

5.4 The ambient noise levels at P1 indicate that during the day and night-time the average ambient noise levels are 67 dB $L_{Aeq,16\ hr}$ and 60 dB $L_{Aeq,8hr}$ respectively. Resultant noise levels at P3 are 61 dB $L_{Aeq,16\ hr}$ and 54 dB $L_{Aeq,8hr}$ respectively.

5.5 The typical façade reduction afforded by insulated double glazing and attenuated trickle ventilation is given within BS 8233 as 33 dB. For partially open windows the reduction is given as 15 dB. BS 8233:2014 provides guideline values for external amenity areas and internal rooms during the day and night.

5.6 The reductions provided within BS 8233 indicate that the internal criteria would be achieved with closed windows. Suitable glazing and ventilation options should be incorporated at these façades to allow windows to remain closed.

5.7 The minimum required reduction to achieve the BS 8233 internal criteria is presented in Table 3.

Table 3 – Required Level of Attenuation

Monitoring Position	Reduction Required to Achieve BS 8233 Criteria, dB R_w+C_{tr}		
	Living Rooms & Bedrooms (daytime)	Dining Areas	Bedrooms (night time)
Criterion Noise Level	*35*	*40*	*30*
P1	-32	-27	-30
P3	-26	-21	-24

** Ventilation Dnew+Ctr should achieve the presented values + 5dB, items should include Ctr road traffic correction*

5.8 The minimum required reduction at P1 and P3 is 32 and 26 dB R_w+C_{tr}, respectively. Glazing should be specified to achieve these reductions for east facing and west facing facades, respectively, to ensure that suitable internal noise levels are attained.

5.9 Ventilation should achieve values of 37 dB and 31 dB $D_{new}+C_{tr}$ when open, to allow ventilation to the dwelling. Windows are not required to be sealed and may remain openable to be used at the discretion of occupants.

5.1 To ensure the R_W values take account of possible low frequency noise, the sound reduction index of each element should include a correction for the C_{tr} urban traffic noise spectrum. Additionally, the glazing and ventilation installation must maintain the integrity of the façade with regard to noise insulation.

5.2 The WHO Guidelines states that indoor noise levels should not exceed approximately 45 dB L_{Amax} more than 10-15 times a night to ensure there are no negative health effects related to sleep disturbance. Considering the sound reduction required to meet the BS 8233 criteria, maximum night-time noise levels would fall below the WHO criteria, when assessed over 2-minute periods.

5.3 Daytime noise levels indicate that existing levels exceed the upper guideline noise level. However, the applicant has proposed screening to the east of the site in order to mitigate levels within garden areas as far as practicable. Future noise levels may therefore be up to 10 dB lower than those obtained during the survey.

5.4 BS 8233 recognises that the *"guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas … a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited."*

6 MITIGATION

6.1 Internal ambient noise levels are considered to satisfy the criteria provided within BS 8233 and WHO with the incorporation of suitable glazing and attenuated ventilation. Glazing and ventilation should be selected with reference to the values as presented below. Selected items should include correction for the C_{tr} urban road traffic spectrum.

Table 4 – Glazing/Ventilation Requirements

Position	Minimum Required Reduction	
	Glazing R_w+C_{tr}	Ventilation $D_{new}+C_{tr}$
P1 (facades facing A4 London Road)	32	37
P3 (facades facing Old London Road)	26	31

6.2 Any ventilation should achieve this value when open, to allow ventilation to the dwelling. Additionally, the glazing and ventilation installation must maintain the integrity of the façade with regard to noise insulation. Windows are not required to be sealed and may remain openable to be used at the discretion of occupants.

6.3 Acoustic screening is proposed to be installed to the east of the site in order to mitigate noise from London Road as far as practicable. Suitable barriers can typically reduce noise levels by up to 10 dB.

6.4 To provide adequate acoustic screening any barrier material should have a mass per unit of surface area in excess of 12 kg/m^2 and be of a continuous or close-boarded construction with a minimum thickness of 15 mm. If wooden, the barrier should also be suitably treated to prevent warping and rot due to weathering.

7 CONCLUSIONS

7.1 An assessment of the potential noise impacts attributable to the existing ambient environment has been undertaken for the proposed residential development at Old London Road in Washington, near Pulborough.

7.2 Noise measurements were undertaken to obtain sound levels representative of the existing environment for assessment in accordance with BS 8233:2014 and the WHO Guidelines for Community Noise.

7.3 The assessment indicates that the BS 8233 internal criteria would be achieved following implementation of adequate insulated glazing and attenuated ventilation, as specified within Table 4.

7.4 Noise levels may exceed the upper guideline noise level within external amenity areas. However, screening is proposed to be installed to the east of the site in order to mitigate noise from London Road as far as practicable.

7.5 BS 8233 states that within higher noise areas *"development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited".*

APPENDIX A – INTRODUCTION TO NOISE

In order to assist the understanding of acoustic terminology and the relative change in noise, the following background information is provided.

The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0 dB (the threshold of hearing) to over 120 dB.

The ear is less sensitive to some frequencies than to others. The A-weighting scale is used to approximate the frequency response of the ear. Levels weighted using this scale are commonly identified by the notation dB(A).

A noise impact on a community is deemed to occur when a new noise is introduced that is out of character with the area, or when a significant increase above the pre-existing ambient noise level occurs. For levels of noise that vary with time, it is necessary to employ a statistical index that allows for this variation. These statistical indices are expressed as the sound level that is exceeded for a percentage of the time period of interest.

In the UK, traffic noise is measured as the L_{A10}, the noise level exceeded for 10% of the measurement period. The L_{A90} is the level exceeded for 90% of the time and has been adopted to represent the background noise level in the absence of discrete events. An alternative way of assessing the time varying noise levels is to use the equivalent continuous sound level, L_{Aeq}. This is a notional steady level that would, over a given period of time, deliver the same sound energy as the actual fluctuating sound.

To put these quantities into context, where a receiver is predominantly affected by continuous flows of road traffic, a doubling or halving of the flows would result in a just perceptible change of 3dB, while an increase of more than 25%, or a decrease of more than 20%, in traffic flows represent changes of 1dB in traffic noise levels (assuming no alteration in the mix of traffic or flow speeds).

Note that the time constant and the period of the noise measurement should be specified. For example, BS 4142 specifies background noise measurement periods of 1 hour during the day and 5 minutes during the night. The noise levels are commonly symbolised as $_{A90(1hour)}$ and $L_{A90(5mins)}$. The noise measurement should be recorded using a 'FAST' time response equivalent to 0.125 ms.

Table A1: Glossary of Terms

Term	Definition
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by 20 log10 (s1/s2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20μPa.
A-weighting, dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
$L_{eq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,F}$	A noise level index defined as the maximum noise level during the period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{90,T}$	A noise level index. The noise level exceeded for 90% of the time over the period T. L_{90} can be considered to be the 'average minimum' noise level and is often used to describe the background noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m
Ambient Noise Level	The totally encompassing sound in a given situation at a given time, usually composed of a sound from many sources both distant and near ($L_{Aeq,T}$).
Residual Noise Level	The ambient noise remaining at a given position in a given situation when specified sources are suppressed to a degree such that they do not contribute to the ambient noise level ($L_{Aeq,T}$)
Specific Noise Level	The equivalent continuous A-weighted sound pressure level at the assessment position produced by the specific noise source (the noise source under investigation) over a given time interval ($L_{Aeq,T}$)
Rating Noise Level	The specific noise level plus any adjustment for the characteristic features of the noise ($L_{Ar,Tr}$).

APPENDIX B – GRAPHICAL REPRESENTATION OF NOISE MEASUREMENT RESULTS

Figure B1: Unattended Survey Results at Position 1