Intended for
Bupa Occupational Health Ltd

Document type
Report

Date
September 2022

BUPA PROJECT LANTERN
NOISE SURVEY PLANNING REPORT

RAMBOLL

Revision	**A**
Date	**30/09/22**
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Description	**Noise Survey Planning Report**

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1. INTRODUCTION

Ramboll Acoustics has been appointed by Gardiner & Theobald LLP on behalf of Bupa Occupational Health Ltd to provide an Acoustic Planning Report for The Lantern Building, Hampstead Road, London. The development proposals are for a new occupational health outpatient clinic in the north eastern corner of the lower ground and ground floors. The development will utilise mechanical ventilation and therefore suitable noise emission limits are proposed for this equipment.

It has been necessary to carry out a noise survey to establish the existing noise levels around the site and at the nearest noise sensitive receivers (NSR's). This report describes the methodology used for carrying out the noise survey, the measurement locations, and the measurement results.

The implications of the measured noise levels are reviewed particularly in terms of setting noise limits for the proposed new plant in line with London Borough of Camden policy.

2. LEGISLATION, POLICY AND GUIDANCE

2.1 BS 4142:2014 "Methods for rating and assessing industrial and commercial sound"

Suitable criteria for determining the magnitude of the impact from any proposed building services plant are proposed based on the guidance in BS 4142: 2014[1].

The basis of BS 4142: 2014 is a comparison between the background noise level in the vicinity of residential locations and the rating level of the noise source under consideration. The relevant parameters in this instance are as follows:

- **Background Sound Level**: $L_{A90,T}$ – defined in the Standard as the 'A' weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, and quoted to the nearest whole number of decibels (dB);
- **Specific Sound Level**: $L_{Aeq,Tr}$ – the equivalent continuous 'A' weighted sound pressure level produced by the specific sound source at the assessment location over a given time interval, T;
- **Residual Sound Level**: $L_{Aeq,T}$ – the equivalent continuous 'A' weighted sound pressure level at the assessment location in the absence of the specific sound source under consideration, over a given time interval, T; and
- **Rating Level**: $L_{Ar,Tr}$ – the specific sound level plus any adjustment made for the characteristic features of the noise. These features include tonality, impulsivity and intermittence, where a 3dB penalty will be applied.

The background level and the rating levels are compared and the standard states that:

"Typically, the greater the difference, the greater the magnitude of impact.

- *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending upon the context.*
- *A difference of around +5 dB is likely to be an indication of an adverse impact, depending upon the context.*
- *The lower the rating level is to the measured background sound level, the less likely it is that the specific sound will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending upon the context."*

The standard specifies the specific sound level as an L_{Aeq} with a one-hour assessment period during the day (07:00-23:00 hours) and a fifteen-minute assessment period at night (23:00-07:00 hours).

2.2 Camden Local Plan (2017) Policy A4

"A relevant standard or guidance document should be referenced when determining values for LOAEL and SOAEL for non-anonymous noise. Where appropriate and within the scope of the document it is expected that British Standard 4142:2014 'Methods for rating and assessing industrial and Camden Local Plan | Appendices 347 commercial sound' (BS 4142) will be used. For such cases a 'Rating Level' of 10 dB below background (15dB if tonal components are present) should be considered as the design criterion)."

2.3 Additional Legislation, Policy and Guidance

Wider, relevant local and national policies are included in Appendix 1. These include National Planning Policy Framework, Planning Practice Guidance and the 2021 London Plan.

[1] British Standards Institution,2014. BS 4142: 2014 Methods for rating and assessing industrial and commercial sound, BSI.

3. SITE DESCRIPTION

The site of the proposed development is located on Hampstead Road in London. Figure 1 below shows the wider site boundary and Bupa's development (redline) within the existing building. The proposed plant (Small ventilation units) will be located in the new tenant fit out space in ceiling voids and is expected to be ducted to the eastern façade on Hamstead Road at ground floor level.

The closest identified noise sensitive receptors are residential properties to the East of the site on Hampstead Road. These are indicated by the green shading on Figure 1.

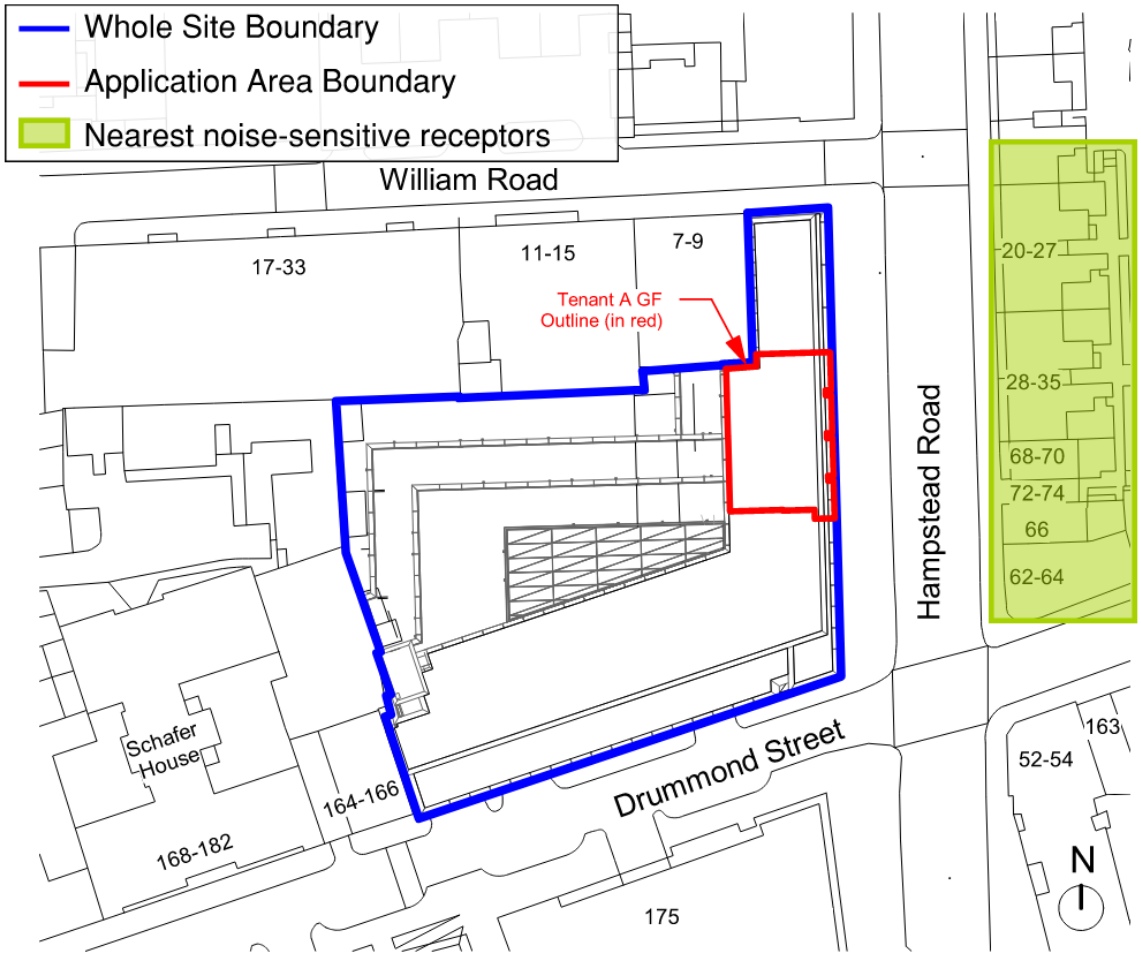

Figure 1 - Site Location of The Lantern Building

3.1 Noise climate

The noise climate at the nearest noise sensitive receptor is dominated by road traffic noise along Hampstead Road. Distant construction work and planes overheard are also audible. During the night, the road traffic noise is still dominant, with plant from surrounding buildings audible when traffic noise levels reduce.

4. SURVEY METHODOLOGY

Attended measurements were undertaken during the day and night time on Hampstead Road to assess the noise levels at the façade of the nearest noise sensitive receptors. Measurements were undertaken on Thursday 22nd and Tuesday 27th September 2022.

The sound level meters calibration was checked immediately before and after the measurement periods. No significant drift in calibration was detected.

4.1 Measurement locations

Figure 1 shows the measurement locations. ST1 was positioned approximately 2-3m from the façade of the residential receptor. Due to the height of the receptor building the measurement position is considered representative of the façade noise levels of the nearest noise sensitive receptors.

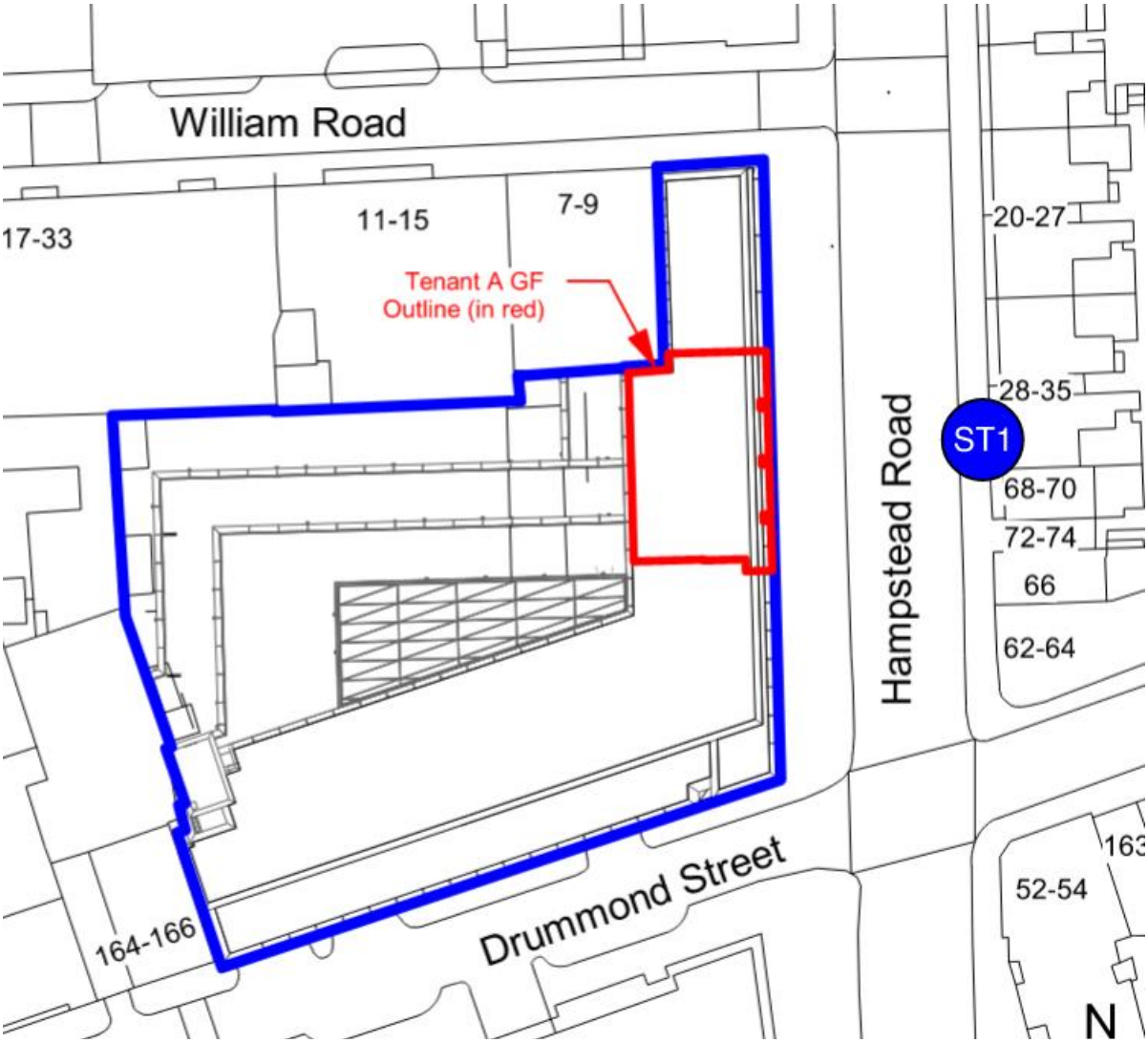

Figure 2 - Measurement locations

4.2 Equipment

The following measurement equipment was used to conduct the survey:

- 1x NTI XL2 TA Sound Level Meter (A2A-09209-E0)
- 1x CAL200 Calibrator (16089)

All measurement equipment owned or hired and operated by Ramboll Acoustics has annual calibration checks carried out by external companies traceable to national standards. Copies of all calibration records are kept and can be provided upon request.

4.3 Weather Conditions

The weather during the survey period was dry and overcast, with wind speeds below 5m/s.

5. SURVEY RESULTS

The summarised results are presented in Table 1 below. Full survey Data is presented in the appendix.

Table 1 - Summarised Attended Measurement Noise Data

		Ambient Noise Levels ($L_{Aeq,16hour}$ dB)	Representative Background Noise Level (L_{A90}, dB)
ST1	Day – 0700-2300	70	59
	Night – 2300-0700	66	50

6. NOISE ASSESSMENT

6.1 Noise emission limits

It is proposed that the rating level (in accordance with BS 4142:2014) from all plant and equipment (collectively) associated with this application should be at least 10 dB below the representative background level (L_{A90}) at 1m from the façade of the nearest noise sensitive receptors as per the expected planning condition.

Plant noise rating limits to meet these criteria are given in Table 2 below.

Location	Period	Representative Background Level L_{A90} dB	Noise Rating Limit L_{Ar} dB
Hampstead Road Receptors (ST1)	Daytime (0700h to 2300h)	59	49
	Night-time (2300h to 0700h)	50	40

Table 2 - Plant Rating Noise limits

Details of the plant selection are not fully known at this time. Noise emission from this plant will be controlled to meet the planning requirement using standard noise control measures, such as attenuators, enclosures, and acoustic louvres.

6.2 Statement of Uncertainty

Noise levels have been measured at the nearest noise sensitive receptors during the day and night periods. It is considered that the data set is sufficient to set suitable noise emission limits.

The survey took place during dry conditions with little to no wind. The weather conditions during the survey period are not considered to have had any adverse effects on the measured noise levels.

The noise meters were calibrated on-site before and after the survey period and no significant drift in sensitivity was detected.

7. CONCLUSION

The results of the baseline noise survey are considered suitable for setting plant noise rating limits at the nearest noise sensitive receptors. Rating noise limits are set so that meeting these limits will be meeting the *Lowest Observed Adverse Effect Level (LOAEL) threshold, and therefore noise is considered to be an acceptable level.* (LBC Local Plan 2017).

It is proposed that the rating level (in accordance with BS 4142:2014) from all plant and equipment (collectively) associated with this application should be at least 10 dB below the representative background level (L_{A90}) at 1m from the façade of the nearest noise sensitive receptors as per the expected planning condition.

APPENDIX 1 – FULL NOISE SURVEY MEASUREMENTS

Description	Start Time	Duration	L_{eq}	L_{max}	L_{10}	L_{90}
ST1 - Day	22 Sep 2022 11:35:10	00:15:56	69	85	72	58
ST1 - Day	22 Sep 2022 12:03:18	00:15:00	70	85	73	59
ST1 - Day	22 Sep 2022 13:02:22	00:15:10	71	89	74	60
ST2 – Rooftop of the Lantern Building	22 Sep 2022 12:37:44	00:15:00	59	77	61	55
ST1 - Rush hour	22 Sep 2022 17:18:38	00:16:39	73	95	76	62
ST1 - Rush hour	22 Sep 2022 17:35:40	00:15:00	69	87	72	57
ST1 - Night	27 Sep 2022 02:16:56	00:15:09	65	82	70	50
ST1 - Night	27 Sep 2022 02:40:32	00:15:08	65	82	69	50
ST1 - Night	27 Sep 2022 03:05:50	00:15:00	66	87	69	50

APPENDIX 2 – ADDITIONAL LEGISLATION, POLICY AND GUIDANCE

Control of Pollution Act, 1974, Part III – Noise

The Control of Pollution Act, 19742 (CPA) is a combination and refinement of earlier Acts including: The Public Health Act, 19363 (replaced by the Public Health Act 1990, Part III) and the Noise Abatement Act 19604.

Section 60 enables a Local Authority to serve a notice on a person (this includes a company) who is carrying out, or who is planning to carry out, works of construction, demolition, road-works, railway maintenance etc. in order to control the noise from those operations.

Section 61 also enables such a person to apply to the Local Authority for consent in respect of such works. The Act introduces the concept of using 'Best Practicable Means' (BPM) to control the impact of noise, where significant impacts are likely to occur. BPM refers to the selection of plant, techniques and equipment to reduce noise whilst considering local conditions, current state of technical knowledge and the financial implications. Factors such as timing, duration, location and opportunities for acoustic screening or separation are employed; to ensure that impacts are controlled in so far as is reasonably practicable. The demonstrable use of BPM can also be used as a defence to enforcement action under nuisance legislation.

The Environmental Protection Act, 1990 (as amended)

Section 79 of the Environmental Protection Act 19905 (EPA) declares that a number of matters, including noise, are to be statutory nuisances. Under the provisions of the Environmental Protection Act, the Local Authority is required to inspect its area periodically to detect any nuisance and, where a complaint of a statutory nuisance is made by a person living within its area, to take such steps as are reasonably practicable to investigate the complaint.

National Planning Policy Framework, 2021

The NPPF adopted in July 2021 in England outlines the Government's planning policies and requirements for the planning system. The NPPF forms a material consideration in planning decisions and hence must be complied with for planning permission to be granted.

Paragraph 185 of the NPPF states that the planning system should seek to:

- *"Mitigation 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".*

To achieve these aims the NPPF refers to the Noise Policy Statement for England 2010.

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[2] Secretary of State, 1974, Control of Pollution Act, HMSO. Available: http://www.legislation.gov.uk/ukpga/1974/40/contents

[3] Secretary of State, 1960, Noise Abatement Act, HMSO.

[4] Secretary of State, 1960, Noise Abatement Act, HMSO. Available: http://www.legislation.gov.uk/ukpga/1960/68/section/1/enacted

[5] Secretary of State, 1990. Environmental Protection Act 1990, The Stationary Office. Available: http://www.legislation.gov.uk/ukpga/1990/43/contents

Noise Policy Statement for England, 2010

The Noise Policy Statement[6] for England sets out the long-term vision of Government noise policy: 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.

The NPSE outlines the following three aims for the effective management and control of environmental, neighbour and neighbourhood noise:

- "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."

The guidance defines two concepts applied to noise impacts. These are:

- NOEL is defined as: "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 which is defined as: "This is the level above which adverse effects on health and quality of life can be detected."; and
- SOAEL which is defined as the level above which significant adverse effects on health and quality of life occur.

The three aims can therefore be interpreted as follows:

The first aim is to avoid noise levels above the SOAEL;

The second aim considers situations where noise levels are between the LOAEL and SOAEL. In such circumstances, all reasonable steps should be taken to mitigate and minimise the effects. However, this does not mean that such adverse effects cannot occur; and

The third aim considers situations where noise levels are between the LOAEL and NOEL. In these circumstances, where possible, reductions in noise levels should be sought through the pro-active management of noise.

The NPSE recognises that it is not possible to have single objective noise-based measures that define the SOAEL, LOAEL and NOEL that are applicable to all sources of noise in all situations. The levels are likely to be different for different noise sources, receptors and at different times of the day.

Planning Practice Guidance

The Government's PPG on noise provides guidance on the effects of noise exposure, relating these to people's perception of noise, and linking the effects to the NOEL and, as exposure increases, the LOAEL and SOAEL.

As exposure increases above the LOAEL, noise begins to have an adverse effect and consideration needs to be given to mitigating and minimising those effects, taking account of the economic and social benefits being derived from the activity causing the noise. As the noise exposure increases, it will then at some point cross the SOAEL boundary.

The LOAEL is described in PPG as the level above which "noise starts to cause small changes in behaviour and/or attitude e.g. turning up the volume of the television, speaking more loudly, or, where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life."

[6] Ministry of Housing, Communities and Local Government, 2017. Planning practice guidance. HMSO. London.

PPG identifies the SOAEL as the level above which "noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep."

For the purposes of this assessment, the magnitude of effect is assigned by reference to the guidance in PPG-Noise, as summarised in Table 3.

Table 3: PPG Guidance

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level (LOAEL)			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level (SOAEL)			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

Factors to be considered in determining if noise is a concern are identified including the absolute noise level of the source, the existing ambient noise climate, time of day, frequency of occurrence, duration, character of the noise and cumulative impacts.

The London Plan (2021)

The London Plan[7] provides strategic planning guidance for Greater London. Boroughs' local development documents have to be 'in general conformity' with the London Plan, which is also legally part of the development plan that has to be taken into account when planning decisions are taken in any part of London unless there are planning reasons why it should not.

The following policies applicable to the proposed development refer to noise:

- D13 – Agent of Change: "Development should be designed to ensure that established noise-generating venues… remain viable and can continue or grow without unreasonable restrictions being placed on them";
- D14 – Noise: "Residential and other non-aviation proposals should manage noise by:
  - Avoiding significant adverse noise impacts on health and quality of life;
  - Reflecting the Agent of Change principle as set out in Policy D13 Agent of Change;
- Mitigation and minimising the existing and potential adverse impact of noise on, from, within, as a result of, or in the vicinity of new development without placing unreasonable restrictions on existing noise-generating uses;
  - improving and enhancing the acoustic environment and promoting appropriate soundscapes (including Quiet Areas and spaces of relative tranquillity);
  - separating new noise-sensitive development from major noise sources (such as road, rail, air transport and some types of industrial use) through the use of distance, screening, layout, orientation, uses and materials – in preference to sole reliance on sound insulation;
  - where it is not possible to achieve separation of noise-sensitive development and noise sources without undue impact on other sustainable development objectives, then any potential adverse effects should be controlled and mitigated through applying good acoustic design principles;
  - promoting new technologies and improved practices to reduce noise at source, and on the transmission path from source to receiver"; and
- 'Policy T7' - "Development plans should consider noise from deliveries, servicing and construction".

Other key themes are the consideration of traffic/ transport noise, suitable façade design to limit internal noise levels and the use of emerging technologies e.g., electric vehicles to reduce noise.

[7] Greater London Authority, 2021. The London Plan. The Spatial Development Strategy for Greater London. London. GLA.