Air Quality Assessment

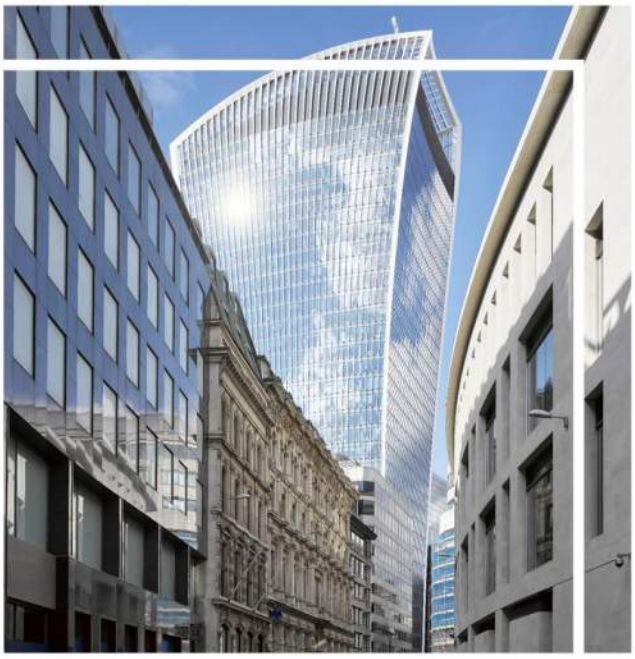
151 Shaftesbury Avenue

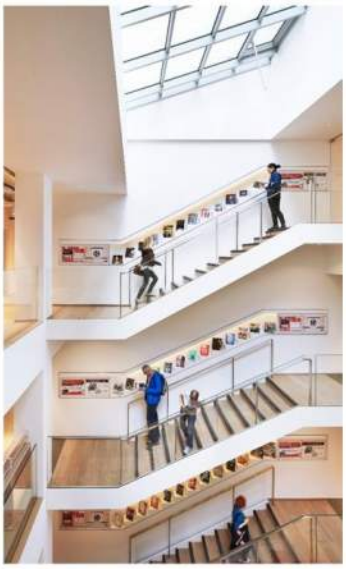
Royal London Mutual Insurance Society Limited

30 May 2024

32099-HML-XX-XX-RP-U-820001

Issue P01





Project Name:	151 Shaftesbury Avenue
Report Name:	Air Quality Assessment
Issue Status:	Final
Reference:	32099-HML-XX-XX-RP-U-820001
Date of Issue:	30 May 2024
Issue:	P01
Author:	Rose Gibbon
Checker:	Sian Grimsley
Approver:	Chris Birch
HM Project No:	32099

HM Office:

The Hub
Fowler Avenue
Farnborough Business Park
Hampshire
GU14 7JF

T: +44 (0)1252 550 500
hilsonmoran.com
@HilsonMoran
hilson_moran
Hilson Moran

Document History:

Issue	Date	Details
P01	30/5/2024	ISSUED FOR PLANNING

Contents

1. Executive Summary

Hilson Moran has been instructed by Royal London Mutual Insurance Society Limited (RLMIS Ltd), to undertake an Air Quality Impact Assessment (AQIA) in support of the Proposed Development at 151 Shaftesbury Avenue, London.

The Proposed Development Comprises of a full refurbishment of the existing building and the addition of a single storey and recreational roof area.

The report presents the findings of the air quality assessment, which addresses the potential air quality impacts during both the construction and operational stages of the Proposed Development. The assessment has been undertaken in line with the relevant policy and guidance, and where necessary outlines the required mitigation measures to minimise impacts.

A qualitative assessment of construction phase impacts has been carried out. There is a low risk of dust soiling during earthworks, construction and track out activities. With regards to fugitive PM_{10} emissions during the construction phase the risk is classified as low for all phases. Through good site practice, the implementation of suitable mitigation measures, the impact of dust and PM_{10} releases will be minimised. The residual effect of the construction phase on air quality is therefore not significant.

A quantitative road traffic assessment has been scoped out as the proposed development does not meet the required threshold.

Overall, with the recommended mitigation measure in place (for the construction phase only), the proposals would be compliant with legislation and policy.

2. Introduction

Hilson Moran have been appointed by RLMIS Ltd to undertake an AQA for the Proposed Development at 151 Shaftesbury Avenue, London. The development is located in the London Borough of Camden (LBC) and illustrated in **Figure 2.1**, hereafter referred to as the 'Proposed Development' or 'Application Site'.

*Figure 2.1 **Application Site Boundary** (OpenStreetMap Sources)*

2.1. Proposed Development

2.2. Potential Impacts

This report presents the findings of the AQA for both the operational and construction phases. During the construction phase, activities on the Application Site could give rise to dust, which, if transported beyond the site boundary, could have an adverse effect on local air quality and cause a statutory 'nuisance'. During the operational phase, emissions generated have the potential to affect local pollution levels, both within and surrounding the Application Site. For both phases the impacts are identified and the mitigation measures that should be implemented to minimise the impact are described.

Furthermore, an Air Quality Neutral Assessment (AQNA) will be undertaken in accordance with the London Plan.

A glossary of terms is provided in **Appendix A**.

2.3. Limitation and Copyright

This report has been prepared on behalf of and for the exclusive use of RLMIS Ltd for whom the services were undertaken and is subject to and issued in connection with the provisions of the agreement set out by Hilson Moran Partnership Ltd. Hilson Moran Partnership Ltd accepts no liability or responsibility whatsoever for or in respect of any use of or reliance upon this report by any third party. Furthermore, this report is subject to the following limitations:

- The concepts and information contained in this document are the property of Hilson Moran Partnership Ltd. Use or copying of this document in whole or in part without the written permission of Hilson Moran Partnership Ltd constitutes an infringement of copyright.
- Hilson Moran Partnership Ltd accept no responsibility for the completeness or accuracy of any information or documents upon which this report is based and which were provided to us by RLMIS Ltd (or any other third parties).
- The contents of and findings of this report are relevant as of the original date of the report and do not incorporate any facts or information which may have come into existence after the date of the report.
- Hilson Moran Partnership Ltd has not taken any steps to update this report since it was produced and it accept no liability for any part of this report that has or may become inaccurate as a result of circumstances that have occurred or arisen in relation to the project after the date of this report.

3. Legislation, Policy and Guidance

3.1. Legislation

A Summary of the relevant air quality legislation is provided below.

3.1.1. Air Quality Strategy for England, Scotland, Wales and Northern Ireland

The Government's policy on air quality within the UK is set out in the Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland[1], most recently updated in 2023. The AQS sets out a framework for reducing hazards to health from air pollution and ensuring that the European Union and International agreements are met in the UK.

The AQS covers the following air pollutants: ammonia (NH_3), benzene (C_6H_6), 1,3 butadiene (C_4H_6), carbon monoxide (CO), lead (Pb), oxides of nitrogen (NO_X) (including nitrogen dioxide (NO_2)), particulate matter (PM_{10} and $PM_{2.5}$), sulphur dioxide (SO_2), ozone (O_3) and polycyclic aromatic hydrocarbons (PAHs).

The AQS sets standards and objectives for the listed pollutants for the protection of human health, vegetation and ecosystems. The standards are based on recommendations by the Expert Panel on Air Quality Standards (EPAQS) and the World Health Organisation (WHO) based on current understanding and scientific knowledge about the effects of air pollution on health and the environment. The air quality objectives are policy based targets set by the UK Government that are often expressed as maximum concentrations not to be exceeded either without exception or with a limited number of exceedances within a specified timescale.

For the pollutants considered in this assessment, there are both a long-term (e.g. annual mean) and short-term (e.g. one hour mean) standard. In the case of NO_2, the short-term standard is for a 1-hour averaging period (no more than 18 exceedances of 200 µg/m^3 per year), whereas for PM_{10} it is a 24-hour averaging period (no more than 35 exceedances of 50 µg/m^3 per year). The variation in time period reflects the varying impacts on health of differing exposures to pollutants.

Updates to the Air Quality Strategy in 2023 sets a framework which includes updated targets for fine particulate matter ($PM_{2.5}$).

The legislation has set 2 new legally binding $PM_{2.5}$ targets, each with an interim target:

- 10 µg/m^3 annual mean concentration $PM_{2.5}$ nationwide by 2040, with an interim target of 12 µg/m^3 by January 2028; and,
- 35% reduction in average population exposure by 2040, with an interim target of a 22% reduction by January 2028, both compared to a 2018 baseline.

3.1.2. Air Quality Standards Regulations

The air quality objectives in the AQS are statutory in England with the Air Quality (England) Regulations 2000[2] and the Air Quality (England) (Amendment) Regulations 2002[3] for the purpose of Local Air Quality Management (LAQM).

The Regulations require likely exceedances of the AQS objectives to be assessed in relation to:

'…the quality of air at locations which are situated outside of buildings or other natural or man-made structures, above or below ground, and where members of the public are regularly present…'

The Air Quality Standards (Amendment) Regulations 2016[4] transpose the European Union Ambient Air Quality Directive (2008/50/EC) into law in England, with the Air Quality (Amendment of Domestic Regulations) (EU Exit) Regulations 2019 ensuring continuation of the transposition of the Directive. This Directive sets legally binding limit values for concentrations in outdoor air of major air pollutants that impact public health such as NO_2, PM_{10} and $PM_{2.5}$. The limit values for NO_2 and PM_{10} are the same concentration levels as the relevant AQS objectives and the limit value for $PM_{2.5}$ is a concentration of 20 µg/m^3. The relevant air quality objectives are presented in Table 3.1.

Table 3.1 Air Quality Objectives for Relevant Pollutants

Pollutant	Concentration	Measured as
NO_2	200 µg/m^3	1-hour mean, not to be exceeded more than 18 times a year (99.79 %ile)
	40 µg/m^3	Annual mean
PM_{10}	50 µg/m^3	24-hour mean, not to be exceeded more than 35 times a year (90.41 %ile)
	40 µg/m^3	Annual mean
$PM_{2.5}$	20 µg/m^3	Annual mean

3.1.3. Environment Act 1995

Part IV of the Environment Act 1995[5] requires local authorities to periodically review and assess the quality of air within their administrative area. The reviews have to consider both the air quality at the time of review and likely future air quality during the 'relevant period' and whether any air quality objectives prescribed in regulations are being achieved or are likely to be achieved in the future. Where the objectives are not likely to be achieved, an authority is required to designate an Air Quality Management Area (AQMA). For each designated AQMA the local authority is required to produce an Air Quality Action Plan (AQAP) that works to ensure compliance with the objectives by implementing a number of air quality improvement measures.

3.1.4. Environment Act 2021

Part 11 of the Environment Act 2021[6] sets out the amendments made from the Environment Act 1995. The principles remain consistent in that the Environment Act 2021 requires local authorities to periodically review and assess the quality of air within their administrative area. Where the objectives are not likely to be achieved, an authority is required to designate an AQMA. For each designated AQMA the local authority is required to produce an Air Quality Action Plan (AQAP) that works to ensure compliance with the objectives by implementing a number of air quality improvements measures.

3.1.5. Environmental Protection Act 1990

Section 79 of the Environmental Protection Act 1990 (as amended)[7] makes provision for the identification and control of statutory nuisances. The Act identifies statutory nuisance, in relation to air quality, as:

- *'Any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance'; and,*
- *'Any accumulation or deposit which is prejudicial to health or a nuisance'.*

As a result, the level at which a nuisance occurs is highly variable and dependent on perception, with effects influenced by existing conditions and the degree of change that has occurred.

Where a statutory nuisance has been demonstrated the local authority must serve an abatement notice, non-compliance with which would constitute a legal offence. The abatement notice may prevent or restrict occurrence or re-occurrence of the nuisance, or the local authority may, itself, undertake action to abate the nuisance and recover any associated expenses.

3.1.6. WHO Guidelines

Table 3.2 states the World Health Organisation (WHO) Air Quality Guidelines for NO_2, PM_{10} and $PM_{2.5}$. Whilst these guidelines are not targeted in the UK there is a push meet them guidelines and be more stringent with air quality control.

Table 3.2 WHO Air Quality Guidelines

Pollutant	Concentration	Measured as
NO_2	25 µg/m^3	24-hour mean, not to be exceeded more than 3-4 times a year (99.79 %ile)
	200 µg/m^3	1 hour mean, not to be exceeded more than 3-4 times a year (99.79 %ile)
	10 µg/m^3	Annual mean
PM_{10}	45 µg/m^3	24-hour mean, not to be exceeded more than 35 times a year (90.41 %ile) for UK, not to exceeded more than 3 to 4 times a year (99th %ile) under WHO
	15 µg/m^3	Annual mean
$PM_{2.5}$	15 µg/m^3	24-hour mean, not to exceeded more than 3 to 4 times a year (99th %ile)
	5 µg/m^3	Annual mean

3.2. Planning Policy

A summary of the national and local planning policy relevant to air quality and the Proposed Development is detailed below.

3.2.1. National

3.2.1.1. National Planning Policy Framework

The National Planning Policy Framework (NPPF)[8] sets out policies, which apply to the preparation of local plans and to development management decisions. This framework sets out the Government's economic, environmental and social planning policies for England. Taken together, these policies articulate the Government's vision of sustainable development, which should be interpreted and applied locally to meet local aspirations.

The NPPF sets out the Government's planning policies on the conservation and enhancement of the natural environment, with the following paragraphs relating to air quality:

- Paragraph 8c, which states *'to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy'*;
- Paragraph 55, which *states 'Local planning authorities should consider whether otherwise unacceptable development could be made acceptable through the use of conditions or planning obligations. Planning obligations should only be used where it is not possible to address unacceptable impacts through a planning condition';*
- Paragraph 105, which states *'the planning system should actively manage patterns of growth in support of these objectives. Significant development should be focused on locations, which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making';*
- Paragraph 174e, which states '*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. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans';*
- Paragraph 186, which states '*Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach*

and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan';

- Paragraph 188, which states '*The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities';* and,
- Paragraph 211c, which states '*ensure that any unavoidable noise, dust and particulate emissions and any blasting vibrations are controlled, mitigated or removed at sources, and establish appropriate noise limits for extraction in proximity to noise sensitive properties'*.

3.2.1.2. Clean Air Strategy

The Clean Air Strategy[9] sets out a wide range of actions by which the UK Government will seek to reduce pollutant emissions and improve air quality. Actions are targeted at four main sources of emissions: Transport, Domestic, Farming and Industry. At this stage, there is no straightforward way to take account of the expected future benefits to air quality within this assessment.

3.2.1.3. Reducing Emissions from Road Transport: Road to Zero Strategy

The Office for Low Emission Vehicles (OLEV) and DfT published a Policy Paper[10] in July 2018 outlining how the government will support the transition to zero tailpipe emission road transport and reduce tailpipe emissions from conventional vehicles during the transition. This paper affirms the Government's pledge to end the sale of new conventional petrol and diesel cars and vans by 2040, and states that the Government expects the majority of new cars and vans sold to be 100% zero tailpipe emission and all new cars and vans to have significant zero tailpipe emission capability by this year, and that by 2050 almost every car and van should have zero tailpipe emissions. It states that the Government wants to see at least 50%, and as many as 70%, of new car sales, and up to 40% of new van sales, being ultra-low emission by 2030.

The paper sets out a number of measures by which Government will support this transition but is clear that Government expects this transition to be industry and consumer led. The Government has since announced that the phase-out date for the sale of new petrol and diesel cars and vans will be brought forward to 2030 and that all new cars and vans must be fully zero emission at the tailpipe from 2035. If these ambitions are realised then road traffic-related nitrogen oxide (NO_X) emissions can be expected to reduce significantly over the coming decades, likely beyond the scale of reductions forecast in the tools utilised in carrying out this air quality assessment.

3.2.1.4. National Air Quality Plan

Defra has produced an Air Quality Plan to tackle roadside NO_2 concentrations in the UK[11]; a supplement to the 2017 Plan[12] was published in October 2018 and sets out the steps Government is taking in relation to a further 33 local authorities where shorter-term exceedances of the limit value were identified. Alongside a package of national measures, the 2017 Plan and the 2018 Supplement require those identified English Local Authorities (or the Greater London Authority (GLA) in the case of London Authorities) to produce local action plans and/or feasibility studies. These plans and feasibility studies must have regard to measures to achieve the statutory limit values within the shortest possible time, which may include the implementation of a Clean Air Zone (CAZ).

There is currently no straightforward way to take account of the effects of the 2017 Plan or 2018 Supplement in this assessment; however, consideration has been given to whether there is currently, or is likely to be in the future, a limit value exceedance in the vicinity of the Proposed Development. This assessment has principally been carried out in relation to the air quality objectives, rather than the EU limit values that are the focus of the Air Quality Plan.

3.2.2. Regional

3.2.2.1. Clearing the Air: The Mayor's Air Quality Strategy (December 2010)

The Mayor's Air Quality Strategy[13] is focused on delivering improvements to London's air quality and identifies road traffic as the largest contributor to air pollution. The strategy sets out a framework for improving air quality and details a number of measures to reduce emissions in London, these include:

- Development of electric vehicle infrastructure;
- Congestion charging and the London Low Emission Zone (LEZ);
- Smarter travel initiatives to encourage a shift to greener modes of transport;
- Funding and supporting car clubs (especially hybrid and electric cars);
- Maintaining roads in good repair to reduce the contribution of particulate matter from road surface wear;
- Smoothing traffic;
- Bus emissions programme, so that older buses have been fitted with particulate traps and diesel-electric hybrid buses are introduced as quickly as possible; and
- Publication and implementation of the London Best Practice Guidance for controlling dust and emissions from construction.

Regarding new developments, the Strategy plans to make use of the existing planning system to ensure that any new development does not have a negative impact on air quality in London by stating 'new developments in London shall as a minimum be 'air quality neutral' through the adoption of best practice in the management and mitigation of emissions'. It also aims to implement the Construction Best Practice Guidance on all construction sites across London.

3.2.2.2. The London Plan: Spatial Development Strategy for Greater London (March 2021)

Planning policy in respect of development planning and air quality management is also presented in the London Plan[14], which is a material consideration in the planning determination process. Policy SI1 on improving air quality states that:

- *To tackle poor air quality, protect health and meet legal obligations:*
  1. *Development proposals should not:*
     - i. *Lead to further deterioration of existing poor air quality;*
     - ii. *Create any new areas that exceed air quality limits, or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits;*
     - iii. *Create unacceptable risk of high levels of exposure to poor air quality.*
  2. *In order to achieve the above requirements, as a minimum:*
     - i. *Development proposals must be at least Air Quality Neutral;*
     - ii. *Development proposals should use design solutions to prevent or minimise increase exposure to existing air pollution and make provision to address local problems of air quality in preference to post-design or retro-fitted mitigation measures;*
     - iii. *Major development proposals must be submitted with an Air Quality Assessment. Air quality assessments should show how the development will meet the requirements of part 1;*

Development proposals in Air Quality Focus Areas or that are likely to be used by large numbers of people particularly vulnerable to poor air quality, such as children or older people, should demonstrate that design measures have been used to minimise exposure.

- *Masterplans and development briefs for large-scale development proposals subject to an Environmental Impact Assessment should consider how local air quality can be improved across the area of the proposal as part of an air quality positive approach. To achieve this a statement should be submitted demonstrating:*
  - *a) How proposals have considered ways to maximise benefits to local air quality; and,*
  - *b) What measures or design features will be put in place to reduce exposure to pollution, and how they will achieve this.*
- In order to reduce the impact on air quality during the construction and demolition phase development proposals must demonstrate how they plan to comply with the Non-Road Mobile Machinery Low Emission Zone and reduce emissions from the demolition and construction of buildings following best practice guidance;
- Development proposals should ensure that where emissions need to be reduced to meet the requirements of Air Quality Neutral or to make the impact of the

development on local air quality acceptable, this is done on-site. Where it can be demonstrated that emissions cannot be further reduced by on-site measures, off-site measures to improve local air quality may be acceptable, provided that equivalent air quality benefits can be demonstrated within the area affected by the development.

3.2.2.3. London Environment Strategy

The London Environment Strategy was published in May 2018[15]. The strategy considers air quality in Chapter 4; the Mayor's main objective is to create a *"zero emission London by 2050"*. Policy 4.2.1 aims to *"reduce emissions from London's road transport network by phasing out fossil fuelled vehicles, prioritising action on diesel, and enabling Londoners to switch to more sustainable forms of transport"*. The strategy sets a target to achieve, by 2030, the guideline value for $PM_{2.5}$ which was set by the World Health Organisation (WHO) in 2005. An implementation plan for the strategy has also been published which sets out what the Mayor will do between 2018 and 2023 to help achieve the ambitions in the strategy.

3.2.2.4. Mayor's Transport Strategy

The Mayor's Transport Strategy[16] sets out the Mayor's policies and proposals to reshape transport in London over the next two decades. The Strategy focuses on reducing car dependency and increasing active sustainable travel, with the aim of improving air quality and creating healthier streets. It notes that development proposals should *"be designed so that walking and cycling are the most appealing choices for getting around locally".*

3.2.3. Local

3.2.3.1. London Borough of Camden Local Plan (2017)

The Camden Local Plan[17] sets out the Council's planning policies. It ensures that Camden continues to have robust, effective and up to-date planning policies that respond to changing circumstances and the borough's unique characteristics and contribute to delivering the Camden Plan and other local priorities. The Local Plan covers the period from 2016-2031.

The policies of interest within the local plan include: Policy CC4 – Air Quality, which states:

'The Council will ensure that the impact of development on air quality is mitigated and ensure that exposure to poor air quality is reduced in the borough.

The Council will take into account the impact of air quality when assessing development proposals, through the consideration of both the exposure of occupants to air pollution and the effect of the development on air quality. Consideration must be taken to the actions identified in the Council's Air Quality Action Plan.

Air Quality Assessments (AQAs) are required where development is likely to expose residents to high levels of air pollution. Where the AQA shows that a development would cause harm to air quality, the Council will not grant planning permission unless measures are adopted to mitigate the impact. Similarly, developments that introduce sensitive

receptors (i.e. housing, schools) in locations of poor air quality will not be acceptable unless designed to mitigate the impact.

Development that involves significant demolition, construction or earthworks will also be required to assess the risk of dust and emissions impacts in an AQA and include appropriate mitigation measures to be secured in a Construction Management Plan'.

In addition to Policy CC4, this Plan also actively supports the improvement of air quality in Camden by:

- Requiring all new development in the borough to be 'car-free' (see Policy T2 Parking and car-free development);
- Maintaining and increasing green infrastructure (see Policy A2 Open space);
- Reducing emissions associated with new development (see Policy CC1 Climate change mitigation); and,
- Supporting and encouraging sensitive energy efficiency improvements to existing buildings (see Policy CC1 Climate change mitigation).

3.2.3.2. Camden Clear Air Strategy & Action Plan

The Camden Clean Air Action Plan[18] has been produced as part of the borough's duty to London Local Air Quality Management. It outlines the action they will take to improve air quality in Camden between 2019 and 2026. The Clean Air Action Plan (CAAP) is split across seven themes:

- Building Emissions;
- Construction Emissions;
- Transport Emissions;
- Communities and Schools;
- Delivery, Servicing and Freight;
- Public Health and Awareness; and,
- Lobbying.

The CAAP has been developed in recognition of the role local authorities have under the Environment Act to meet the air quality obligations. Camden's role in this includes:

- Working to reduce emissions from their own estate and operations;
- Helping residents and visitors to reduce emissions and exposure;
- Using planning policy and regulation to reduce air pollution;
- Implementing innovative projects across the borough to improve air quality;
- Using their influence to lobby for increased financial and regulatory support for the mitigation of air pollution;
- Maintaining a monitoring network and ensuring the data is freely accessible; and,

- Raising awareness on how to reduce emissions and exposure.

The CAAP is support by a number of other plans and strategies (including Camden 2025, Our Camden Plan, Green Action for Change 2010 – 2020, Camden's Parking and Enforcement Plan, Camden's Transport Strategy 2019 – 2022 and the Joint Strategic Needs Assessment) with the overarching aim if improving air quality in the borough of Camden.

3.3. Guidance

A summary of the publications referred to in undertaking the air quality assessment is provided below.

3.3.1. National

3.3.1.1. National Planning Practice Guidance

The National Planning Practice Guidance[19] outlines how the planning process can address potential air quality impacts associated with new development. It provides guidance on the level of detail required, how impacts can be mitigated and also provides information on how local authorities may take air quality as a specific consideration in a planning decision.

3.3.1.2. Land-Use Planning and Development Control: Planning for Air Quality

Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) have published guidance[20], which offers advice as to when and air quality assessment may or may not be required. The guidance document details what should be included within an assessment, how to determine the significance of air quality impacts and the likely mitigation measures required to minimise the impacts.

3.3.1.3. Guidance on the Assessment of Dust from Demolition and Construction

This document[21], published by the IAQM, provides guidance on how to assess the impact of construction activities on air quality associated with new developments. The methodology prescribed within the document allows the impacts to be categorised based on risk (with particular reference to dust and PM_{10} on sensitive human and ecological receptors) and, where applicable identify mitigation measures associated to the risk classification determined.

3.3.2. Regional

3.3.2.1. Local Air Quality Management Review and Assessment Technical Guidance

The Department for Environment, Food and Rural Affairs (Defra) has published technical guidance for use by local authorities. This technical guidance, identified as LAQM.TG (Updated in August 2022)[22], is for use by local authorities for their review and assessment work and has been applied where appropriate to this assessment.

3.3.2.2. London Local Air Quality Management Technical Guidance

The Mayor of London has published guidance for use by the London boroughs in their review and assessment work[23]. The guidance is referred to as LLAQM.TG(16) and has been appropriately used within this assessment.

3.3.2.3. London Council's Guidance for Air Quality Assessment

The London Councils have published guidance[24] for undertaking air quality assessments in the London Boroughs, the majority of which have declared AQMA's. The guidance sets out suggested methodologies for undertaking air quality assessments and sets out criteria for determining the impacts of a new development on air quality.

3.3.2.4. Mayor of London's Supplementary Planning Guidance for the Control of Dust and Emissions during Construction and Demolition

The Supplementary Planning Guidance (SPG)[25] builds on the London Councils guidance to establish best practice when mitigating impacts on air quality during construction and demolition. The SPG, offers further detail and seeks to address emissions from Non-Road Mobile Machinery (NRMM) through the use of a Low Emission Zone, which was introduced in 2015.

The SPG provides a methodology for assessment the impacts on air quality of the construction and activities following the same procedure set out in the IAQM guidance. It identifies the potential impacts and risks to sensitive receptors and details the relevant control measures required to mitigate any adverse impacts.

3.3.2.5. Air Quality Neutral London Plan Guidance (2023)

Policy SI 1 of the London Plan includes requirements for new development to be Air Quality Neutral. To assist developers, boroughs and others involved in designing and planning new development, draft London Plan Guidance on Air Quality Neutral has been prepared. The Air Quality Neutral London Plan Guidance[26] sets air quality benchmarks for all development, in order to ensure that their transport and building emissions do not worsen air quality in London. The guidance also outlines a simplified approach for minor developments.

3.3.2.6. Camden Planning Guidance – Air Quality

The Camden Planning Guidance on Air Quality[27] forms a Supplementary Planning Document that supports the policies contained within the Local Plan, providing information on key air quality issues within the borough. The guidance outlines what the Council requires in relation to air quality for a planning application, what an air quality assessment should cover, and what measures can be implemented to minimise pollutant and protect public exposure. This guidance has been used to inform this assessment where appropriate.

4. Assessment Methodology

4.1. Scope of the Assessment

The scope of the assessment has been determined in the following way:

- Consultation with the Environmental Health Officer (EHO) at LBC to agree the scope of the assessment and the methodology to be applied;
- Review of the air quality data for the area surrounding the Application Site, including LBC, Defra, the London Air Quality Network (LAQN) and the London Atmospheric Emissions Inventory (LAEI);
- Desk study to confirm the locations of nearby existing receptors that may be sensitive to changes in local air quality, and a review of the plan for the Proposed Development to establish the location of new sensitive receptors; and,
- Review of the traffic data provided by Hilson Moran (project transport consultants).

It is understood that the proposals do not incorporate onsite combustion plant such as Combined Heat and Power (CHP) Units, boilers, or generators for the provision of heating and hot water – this is to be provided via all-electric approach.

4.2. Construction Phase

Assessment of the risk of impact associated with the generation of dust during the construction phase of the Proposed Development and determination of subsequent mitigation measures necessary has been undertaken following IAQM guidelines.

The assessment is based on a series of steps: screening the requirement for a detailed assessment, classification of the likely magnitude of dust emissions; characterisation of the area of influence and establishment of its sensitivity to dust; and establishment of the overall risk of impact. The risk of impact from dust emissions from the Proposed Development considers effects on human health, nuisance as a result of dust soiling and ecological receptors from four main activities: demolition; earthworks; construction; and trackout. The potential for dust emissions from each activity should be considered, unless any of them are not relevant to the Proposed Development.

The guidelines identify appropriate screening criteria for the identification of potential receptors, based on a conservative approach and in consideration of the exponential decline in both airborne concentrations and the rate of deposition with distance. A detailed assessment of the impact of dust from construction sites will be required where:

- A ‘human receptor’ is located within 350m of the boundary of the Site or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the Site entrance;
- An ‘ecological receptor’ is located within 50m of the boundary of the Site or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the Site entrance.

4.2.1. Establishing Risk

The magnitude of dust emissions for each activity is classified as small, medium or large depending upon the scale of the works proposed, materials involved and level of activity required. The IAQM guidelines provide examples of how the magnitude of emission can be defined, which are identified in Table 4.1. The Proposed Development is unlikely to satisfy all criteria within the examples, therefore professional judgement and site specific information are used to identify appropriate emission magnitude.

Table 4.1 ***Dust Emission Magnitude*** *(Source: IAQM Guidance, v2.2 Updated January 2024)*

Activity	Small	Medium	Large
Demolition	• Total building volume <12,000m^3 • Construction material with low potential for dust release (e.g. metal cladding or timber) • Demolition activities <6m above ground level • Demolition during wetter months	• Total building volume 12,000 – 75,000m^3 • Potentially dusty construction material • Demolition activities 6-12m above ground level	• Total building volume >75,000m^3 • Potentially dusty construction material (e.g. concrete) • On-site crushing and screening • Demolition activities >12m above ground level
Earthworks	• Total site area <18,000m^2 • Soil type with large grain size (e.g. sand) • <5 heavy earth moving vehicles active at any one time • Formation of bunds <3m in height	• Total site area 18,000 – 110,000m^2 • Moderately dusty soil type (e.g. silt) • 5 – 10 heavy earth moving vehicles active at any one time • Formation of bunds 3 – 6m in height	• Total site area >110,000m^2 • Potentially dusty soil type (e.g. clay) • >10 heavy earth moving vehicles at any one time • Formation of bunds >6m in height
Construction	• Total building volume <12,000m^3 • Construction material with low potential for dust (e.g. metal cladding or timber)	• Total building volume 12,000 – 75,000m^3 • Potentially dusty construction material (e.g. concrete) • On-site concrete batching	• Total building volume >75,000m^3 • On-site concrete batching, sandblasting.
Trackout	• <20 HDV (>3.5t) outward movements* in any one day# • Surface material with low potential for dust release • Unpaved road length <50m	• 20 – 50 HDV (>3.5t) outward movements* in any one day# • Moderately dusty surface material (e.g. high clay content) • Unpaved road length 50 – 100m	• >50 HDV (>3.5t) outward movements* in any one day# • Potentially dusty surface material (e.g. high clay content) • Unpaved road length >100m

* A vehicle movement is a one way journey, i.e. from A to B, and excludes the return journey.

HDV movements during a construction project vary over its lifetime, and the number of movements is the maximum not the average.

Consideration is given to the likely sensitivity of the area to the impacts of dust, establishing a sensitivity of low, medium or high for dust soiling, human health and ecological receptors. The sensitivity of the area considers a number of factors, including the specific sensitivities of receptors in the area, the proximity and number of those receptors, local baseline conditions such as background concentrations and site specific factors.

The first step in identifying the sensitivity of the area is to establish the sensitivity of the receptor, based on the presence or level of activity associated with the area influenced by the Proposed Development. Professional judgement and site specific information are used to assign an appropriate level of receptor sensitivity using the principles outlined in Table 4.2. Following this, the sensitivity of the area can be established from Tables 4.3 to 4.5 based on the sensitivity of the receptor, number of receptors (in the case of human health and dust soiling) and the distance from source.

Table 4.2 ***Receptor Sensitivity Definitions*** *(Source: IAQM Guidance, v2.2 Updated January 2024)*

Activity	Low	Medium	High
Dust Soiling	• Enjoyment of amenity would not reasonably be expected; • There is property that would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; • Transient exposure, where people or property is only expected to be present for limited periods of time as part of the normal pattern of use; • Indicative examples including playing fields, farmland, footpaths, short-term car parks and roads.	• Users would expect to enjoy a reasonable level of amenity, but not reasonably at same level as in their home; • The appearance, aesthetics or value of property could be diminished by soiling; • Indicative examples include parks and places of work.	• Users can reasonably expect enjoyment of a high level of amenity; • The appearance, aesthetics or value of property would be diminished by soiling, and continuous or regularly extended periods of presence expected during normal pattern of land use; • the people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. • Indicative examples include dwellings, museum and other culturally important collections, medium and long-term car parks and car showrooms.

Activity	Low	Medium	High
Human Health	• Locations where human exposure is transient; • Indicative examples include public footpaths, playing fields, parks and shopping streets.	• Locations where the people exposed are workers#, and exposure is over a time period relevant to the air quality objective for PM_{10}*; • Indicative examples include office and shop workers, but not those occupationally exposed to dust.	• Locations where members of the public are exposed over a period of time relevant to the air quality objective for PM_{10}*; • Indicative examples include residential properties, hospitals, schools and residential care homes.
Ecological	• Locations with a location designation where the features may be affected by dust deposition, *e.g.* Local Nature Reserve. • indicative example is a local Nature Reserve with dust sensitive features.	• Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; • Locations with a national designation where the features may be affected by dust deposition, e.g. Site of Special Scientific Interest. • indicative example is a Site of Special Scientific Interest (SSSI) with dust sensitive features	• Locations with an international or national designation and the designated features may be affected by dust soiling, e.g. Special Area of Conservation with acid heathland; • Location where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List for Great Britain. • indicative examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.

* In the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day, following Defra guidance.

Workers are considered to be less sensitive than the general public as a whole because the most sensitive to the effects of air pollution, such as young children, are not normally workers.

Table 4.3 Sensitivity of the Area to Dust Soiling Effects on People and Property
(Source: IAQM Guidance, v2.2 Updated January 2024)

Receptor Sensitivity	Number of Receptors	Distance from Source			
		<20m	*<50m*	*<100m*	*<350m*
High	>100	High	High	Medium	Low
	10 – 100	High	Medium	Low	Low
	1 – 10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table 4.4 ***Sensitivity of the Area to Human Health Impacts*** *(Source: IAQM Guidance, v2.2 Updated January 2024)*

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from Source			
			<20m	*<50m*	*<100m*	*<250m*
High	>32 µg/m³	>100	High	High	High	Medium
		10 – 100	High	High	Medium	Low
		1 – 10	High	Medium	Low	Low
	28 – 32 µg/m³	>100	High	High	Medium	Low
		10 – 100	High	Medium	Low	Low
		1 – 10	High	Medium	Low	Low
	24 - 28 µg/m³	>100	High	Medium	Low	Low
		10 – 100	High	Medium	Low	Low
		1 – 10	Medium	Low	Low	Low
	<24 µg/m³	>100	Medium	Low	Low	Low
		10 – 100	Low	Low	Low	Low
		1 – 10	Low	Low	Low	Low
Medium	>32 µg/m³	>10	High	Medium	Low	Low
		1 – 10	Medium	Low	Low	Low
	28 - 32 µg/m³	>10	Medium	Low	Low	Low
		1 – 10	Low	Low	Low	Low
	24 - 28 µg/m³	>10	Low	Low	Low	Low
		1 – 10	Low	Low	Low	Low
	<24 µg/m³	>10	Low	Low	Low	Low
		1 – 10	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low

Table 4.5 ***Sensitivity of the Area to Ecological Impacts*** *(Source: IAQM Guidance, v2.2 Updated January 2024)*

Receptor Sensitivity	Distance from Source	
	<20m	*<50m*
High	High	Medium
Medium	Medium	Low
Low	Low	Low

4.2.2. Establishing Significance

The risk of dust related impacts from the Proposed Development is established from the sensitivity of the area and the likely dust emission magnitude. The risk should be established, on the worst-case area sensitivity and in the absence of mitigation, for each of the construction related activities (demolition, earthworks, construction and trackout) following the matrix in **Table 3.6.**

Table 4.6 ***Risk of Dust Impacts from Each Activity*** *(Source: IAQM Guidance, v2.2 Updated January 2024)*

Sensitivity of Area	Activity	Dust Emission Magnitude		
		Large	Medium	Small
High	Demolition	High Risk	Medium Risk	Medium Risk
	Earthworks	High Risk	Medium Risk	Low Risk
	Construction	High Risk	Medium Risk	Low Risk
	Trackout	High Risk	Medium Risk	Low Risk
Medium	Demolition	High Risk	Medium Risk	Low Risk
	Earthworks	Medium Risk	Medium Risk	Low Risk
	Construction	Medium Risk	Medium Risk	Low Risk
	Trackout	Medium Risk	Low Risk	Negligible
Low	Demolition	Medium Risk	Low Risk	Negligible
	Earthworks	Low Risk	Low Risk	Negligible
	Construction	Low Risk	Low Risk	Negligible
	Trackout	Low Risk	Low Risk	Negligible

The IAQM guidelines identify a range of mitigation measures intended to reduce the emission and effects of dust from construction sites, and identify their likely applicability to a development based on the level of impact risk attributed. Consideration is given to

these in the development of mitigation measures, with the significance of the residual effect based on professional judgement.

4.3. Operational Phase

4.3.1. Road Traffic Emissions

Following consultation with the transport consultant, it is understood that the Proposed Development is car free and there are no predicted trips associated with the staff or residents of the Proposed Development. The current office use would result in 4-5 deliveries/collections during a typical week with approximately one on a typical working day. This would likely occur within the morning between 08:00–13:00. On this basis, it is predicted that the Proposed Development will not lead to an increase in two-way AADT.

In accordance with the EPUK & IAQM air quality planning guidance, the additional vehicle trips generated by the Proposed Development, do not breach the criteria detailed in Table 7.2 for development sites located within an AQMA (+/- 100 LGV AADT and/or +/- 25 HGV AADT). On this basis, a detailed road traffic assessment of development-generated traffic has been scoped out.

Whilst a detailed assessment of development generated road traffic has been scoped out, an assessment to consider the existing air quality in the vicinity of the Application Site will be undertaken using local monitoring data from LBC and the LAEI.

4.3.2. Combustion Plant

It is understood that there is no onsite proposed combustion plant for the provision of heating and hot water, with an all-electric approach being adopted through ASHP located at roof level.

As part of the Proposed Development there is an onsite diesel fired life-safety generator which will run in case of emergencies, this will be located at roof level. The generator that is proposed is a is a 640kW/800kVA, 400volt, 50Hz, 3-phase Diesel Prime Rated Generator Set. The generator will be tested monthly and will run for 2-3 minutes, in addition to a yearly load test where it will run for 3-4 hours. Based on the information, planned usage of this generator should not exceed 5-6 hours per year.

Under the MCPD back up emergency generators are excluded from the specified generator controls if compliance of the following is met:

- Balancing services (whether procured or not) are not provided;
- Demand side response operations such as triad avoidance or fast frequency response are provided; and
- Testing of this generator does not exceed 50 hours per year.

Based on the above, it is understood that the operation of the proposed generator will be compliant with the MCPD criteria and therefore a detailed assessment of this plant has been scoped out.

4.4. Air Quality Neutral Assessment

In line with Policy SI1 of the London Plan (2023) an Air Quality Neutral Assessment (AQNA) is required for all new developments. An AQNA provides an approach to assessing whether a development is air quality neutral. The approach is to compare the expected emissions from the building's energy use and vehicle trips against defined benchmarks for buildings and transport in London.

The benchmarks for heating and energy plant termed 'Building Emissions Benchmarks' or 'BEBs' and 'Transport Emissions Benchmarks' ('TEBs') are set out in Table 1 and Table 2 in **Appendix B**.

The average trip length and average emission per vehicle are required if there is a need to calculate offset payments. The values given by GLA are set out in Table 3 and Table 4 in **Appendix B**.

4.5. Significance Criteria

The EPUK and IAQM provide guidance for establishing the significance of air quality impacts arising as a result of the Proposed Development. The magnitude of impact on individual receptors is dependent upon the long-term average pollutant concentrations at the receptor in the assessment year and the percentage change relative to the Air Quality Assessment Level (AQAL). As a detailed assessment has been scoped out and subsequently a magnitude of impact cannot be defined the London Councils Air Pollution Exposure Criteria (APEC) criteria has been utilised to determine if any new receptors are likely to be exposed to air quality concentrations that exceed the AQS objectives and the level of mitigation required. The APEC criteria are identified in Table 4.7.

Table 4.7 London Council's Significance Criteria

APEC Level	Applicable Range Annual Average NO_2	Applicable Range PM_{10}	Recommendation
A	>5% below national objective	Annual Mean: >5% below national objective 24-hour Mean: >1 day less than the national objective	No air quality grounds for refusal, however mitigation of any emissions should be considered.
B	Between 5% below or above national objective	Annual Mean: Between 5% below or above national objective. 24-hour Mean: Between 1 day above or below the national objective.	May not be sufficient air quality grounds for refusal, however appropriate mitigation must be considered – *e.g.* maximise distance from pollution source, proven ventilation systems, parking considerations, winter gardens, internal layout considered and internal pollutant emissions minimised.

APEC Level	Applicable Range Annual Average NO_2	Applicable Range PM_{10}	Recommendation
C	>5% above national objective	Annual Mean: > 5% above national objective 24-hour Mean: >1 day more than the national objective	Refusal on air quality grounds should be anticipated unless the Local Authority has a specific policy enabling such land use and ensure best endeavours to reduce exposure are incorporated. Worker exposure in commercial/industrial land uses should be considered further. Mitigation measures must be presented with air quality assessment, detailing anticipated outcomes of mitigation measures.

4.6. Limitations & Assumptions

Professional judgement has been used in the completion of the construction phase dust assessment for the Proposed Development.

It is assumed that the information provided by the transport consultants and M&E engineers is accurate to scope out detailed assessments.

Hilson Moran consider the assumptions made in the assessment to be reasonable and robust.

5. Baseline Conditions

5.1. Local Air Quality Information

Between 1998 and 2000, the London Borough of Camden (LBC) undertook its first round of review and assessment for air quality. Following this review, it was concluded that a borough wide AQMA warranted designation due to exceedances of the AQS objectives for annual mean of NO_2 and PM_{10} concentrations and 24-hour PM_{10} concentrations, predominantly brought about by road transport emissions. The Application Site is also located in close proximity to an Air Quality Focus Area (AQFA) 153, which encompasses Oxford Street, from Marble Arch to Bloomsbury. The extent of this and the AQMA is identified in **Figure 5.1**.

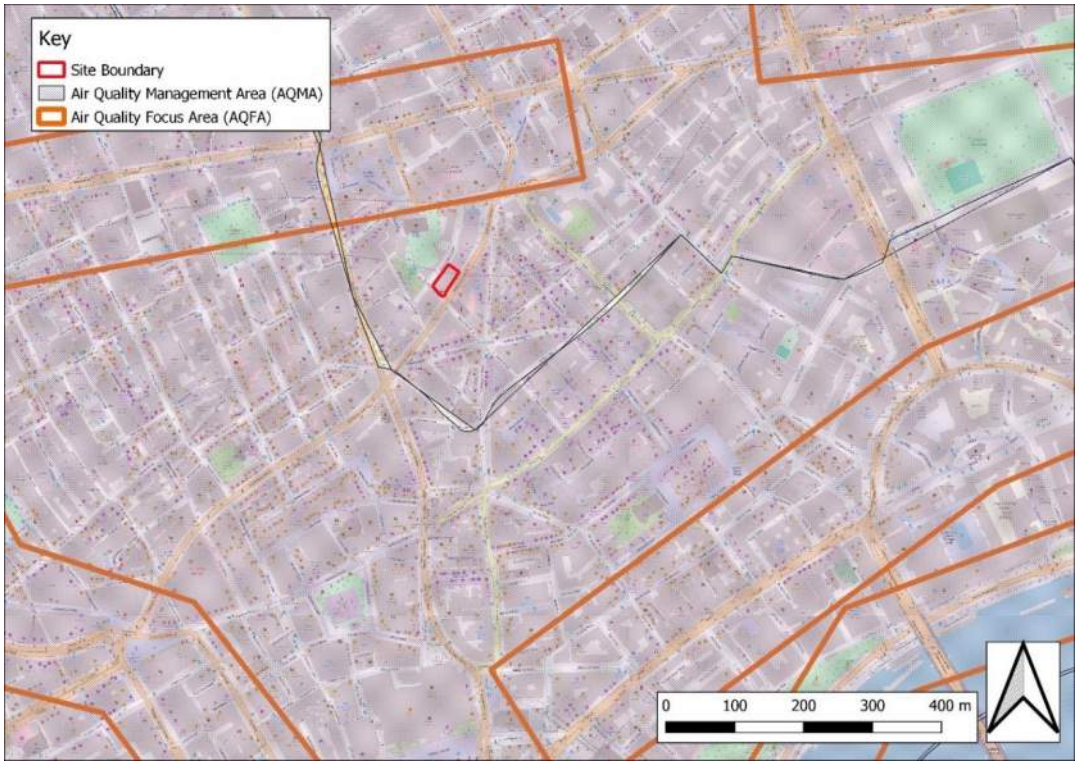


Figure 5.1 AQMA & AQFA (OpenStreetMap Sources)

5.1.1. Defra Background Concentrations

The Defra background concentrations for NO_2, PM_{10} and $PM_{2.5}$ for the 1x1km grid square (529500, 181500) in which the Proposed Development is located are presented in Table 5.1 below.

Table 5.1 Defra Background Concentrations (µg/m3)

	Pollutant	2019	2026
529500, 181500	**NO_2**	**41.2**	35.1
	PM_{10}	20.1	18.4
	$PM_{2.5}$	13.1	11.9
*Bold indicates an exceedance of the relevant AQS objective.			

The Defra background concentrations for NO_2 exceed the AQS objective in 2019 (40µg/m^3). The 2026 future baseline scenario indicates that NO_2 concentrations are on a downward trend, and will be compliant with the AQS objectives in the future.

PM_{10} and $PM_{2.5}$ background concentrations for 2019 are below the relevant AQS objectives (40µg/m^3 for PM_{10}, and 20µg/m^3 for $PM_{2.5}$).

5.1.2. Local Air Quality Monitoring Data

The Site is Located within the London Borough of Camden (LBC) whose monitoring network comprises of four continuous monitoring stations and 33 passive diffusion tube locations. The Site is also in close proximity to Westminster City Council (WCC), whose monitoring network comprises 26 passive diffusion tube locations and 10 Automatic Monitoring Locations.

The latest monitoring report for Camden[28] and Westminster[29], published in 2022 identified that within the borough, air quality has gradually been improving, year on year. However, there are still areas where concentrations remain above the relevant AQS objectives.

A summary of the monitoring sites within most representative of the Site (<1km) from Westminster City Council (WCC) and London Borough of Camden (LBC) are detailed below and illustrated on **Figure 5.2**. It should be noted that monitoring data collected in 2020 should be treated with caution as significant reductions in air pollution levels occurred as a result of COVID-19 during national lockdowns leading to reductions in road traffic, thus do not accurately represent current air quality levels.

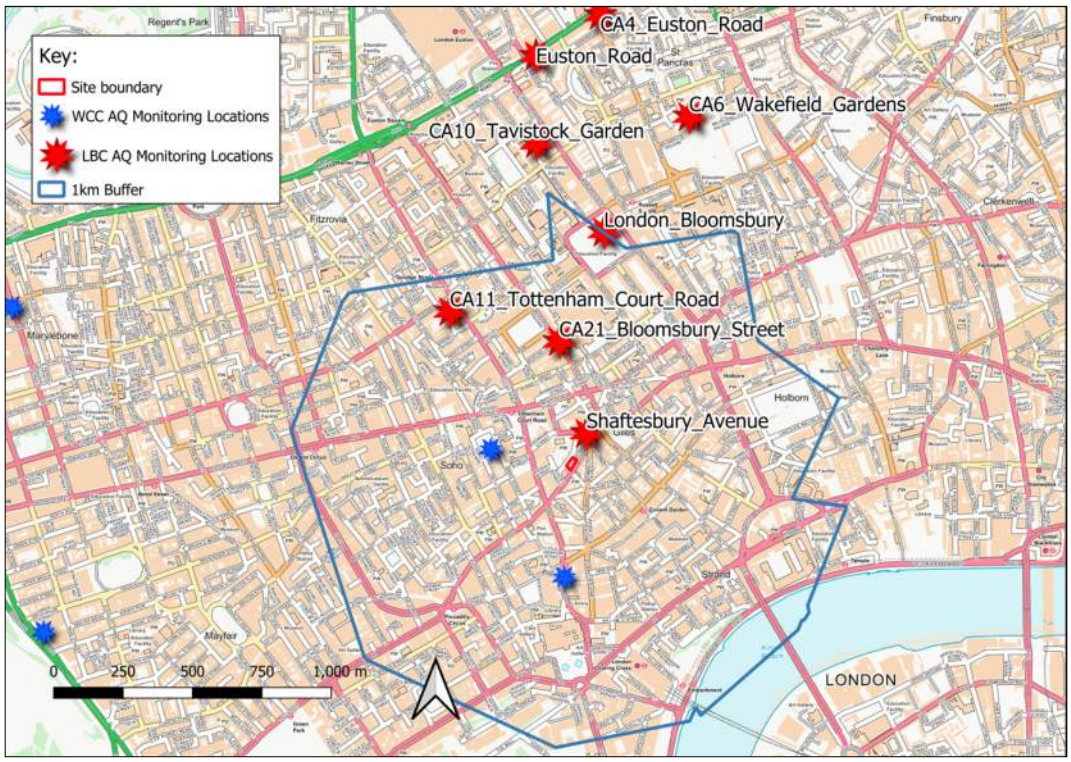


Figure 5.2 LBC Monitoring Locations near the Application Site *(Contains Ordnance Survey Data © Crown copyright database right 2023)*

5.1.2.1. Nitrogen Dioxide

The annual mean NO_2 concentrations and the number of exceedances of the 1-hour NO_2 objective at automatic monitoring sites are presented in **Tables 5.2** and **5.3,** respectively.

As identified in Table 5.2, NO_2 concentrations were compliant with the annual mean AQS objective (40µg/m^3) at London Bloomsbury, Oxford Street and Covent Garden in 2021 . Concentrations at Swiss Cottage & Euston Road exceeded the AQS objective in 2021.

The WHO air quality guideline for annual mean NO_2 concentrations (10µg/m^3) is exceeded all five monitoring locations. All three monitors are located at urban background, kerbside or roadside locations within an existing AQMA and the monitors at Euston, Oxford Street & Covent Garden are located within a LAEI focus area. Therefore, concentrations at these locations are expected to be elevated; comparatively, we would expect concentrations to be reduced at the Application Site.

As identified in Table 5.3, all 5 automatic monitors were compliant with the hourly NO_2 objective (>200µg/m^3 no more than 18 times per year) from 2017-2021.

Table 5.2 LBC Continuous Monitoring Results – Annual Mean NO_2

Site ID	X, Y	Type	Annual Mean (µg/m^3)							
			2014	*2015*	*2016*	*2017*	*2018*	*2019*	*2020 **	***2021***
London Bloomsbury (Russell Square Gardens) (BLO)	530123 182014	UB	**45**	**48**	**42**	38	36	32	28	27
Swiss Cottage	526629 184391	K	**66**	**61**	**66**	**53**	**54**	**43**	33	**44**
Euston Road	529878 182648	R	**98**	**90**	**88**	**83**	**82**	**70**	**43**	**48**
Oxford Street**	529493 181331	R	-	**135**	**87**	**72**	**63**	**55**	34	34
Covent Garden **	530444 180903	R	-	-	-	37	39	39	21	24

Bold indicates an exceedance of the AQS objective.
UB = Urban Background, K – Kerbside, R = Roadside.
*Concentrations are unlikely to be a true representation of reality due to traffic reduction as a result of COVID-19.
** WCC Automatic Monitors

Table 5.3 LBC Continuous Monitoring Results – 1-Hour Mean NO_2

Site ID	X, Y	Type	1 Hour Mean (µg/m³) Number > 200µg/m³							
			2014	*2015*	*2016*	*2017*	*2018*	*2019*	*2020 **	*2021*
London Bloomsbury (Russell Square Gardens) (BLO)	530123 182014	UB	0	0	0	0	0	0	0	0
Swiss Cottage	526629 184391	K	14	11	37	1	2	1	0	2
Euston Road	529878 182648	R	**221**	**54**	**39**	**25**	18	7	0	1
Oxford Street**	529493 181331	R	-	**168**	1	3	0	0	0	0
Covent Garden **	530444 180903	R	-	-	-	0	0	0	0	0
Bold indicates an exceedance of the AQS objective. UB = Urban Background, K – Kerbside, R = Roadside. *Concentrations are unlikely to be a true representation of reality due to traffic reduction as a result of COVID-19. ** WCC Automatic Monitors										

Table 5.4 presents the annual mean NO_2 concentrations at the diffusion tube monitoring sites within a kilometre of the Application Site. These monitoring sites include diffusion tubes from both LBC and WCC. The WCC sites have only been operation since 2021, so only a years worth of ratified results are available.

All automatic monitors except for Tottenham Court Road were compliant with the AQS NO_2 objective (40µg/m³) in 2021. Tottenham Court Road has shown exceedances of the objective continuously from 2014-2021, it has however shown a pattern of reduction in NO_2 levels from 2014-2021

The WHO air quality guideline for 1-hour mean NO_2 concentrations (200µg/m³ no more that 3-4 times per year) is met at all monitoring locations. The WHO guideline for Annual Mean NO_2 (10µg/m³) is exceeded at all monitoring locations in 2021.

Table 5.4 LBC & WCC Diffusion Tube Results - NO_2 Annual Mean Concentrations

Site ID	X, Y	Type	Annual Mean (µg/m³)							
			2014	*2015*	*2016*	*2017*	*2018*	*2019*	*2020 **	*2021*
Bloomsbury Street (CA21)	529962 181620	R	**81**	**71**	**72**	**71**	**59**	**48**	29	33
Tottenham Court Road (CA11)	528568 181728	K	**87**	**86**	**84**	**74**	**66**	**61**	**42**	**44**
Tavistock Garden (CA10)	529880 182334	UB	**47**	**45**	**40**	**46**	35	33	26	22
41 Charing Cross Road (WCC7)	529980 180770	K	-	-	-	-	-	-	-	39
13 Soho Square (WCC8)	529715 181231	K	-	-	-	-	-	-	-	25
Bold indicates an exceedance of the AQS objective. UB = Urban Background, K – Kerbside, R = Roadside. *Concentrations are unlikely to be a true representation of reality due to traffic reduction as a result of COVID-19.										

5.1.2.2. Particulate Matter

The annual mean PM_{10} concentrations and the number of exceedances of the 24-hour PM_{10} objective at all automatic monitoring sites in LBC and sites within 1km of the Proposed Development in WCC are presented in Tables 5.5 and 5.6.

PM_{10}

As identified in Table 5.5, the annual mean AQS objective for PM_{10} (40 µg m³) was met with compliance at all four monitoring locations in between 2014-2020.

The WHO air quality guideline for annual mean PM_{10} (20 µg m³) has also been met with compliance at three of the four monitoring locations in 2021. PM_{10} levels at Oxford Street exceed the WHO guidelines in 2021. This monitoring location is located within a LAEI focus area. Therefore, concentrations at this location is expected to be elevated; comparatively, we would expect concentrations to be reduced at the Application Site.

Table 5.5 LBC Continuous Monitoring Results – Annual Mean PM_{10}

Site ID	X, Y	Type	Annual Mean (µg/m³)							
			2014	*2015*	*2016*	*2017*	*2018*	*2019*	*2020**	*2021*
London Bloomsbury (Russell Square Gardens) (BLO)	530123 182014	UB	20	22	20	19	17	18	16	16

Site ID	X, Y	Type	Annual Mean (µg/m³)							
			2014	*2015*	*2016*	*2017*	*2018*	*2019*	*2020**	*2021*
Swiss Cottage	526629 184391	K	22	20	21	20	21	22	18	16
Euston Road	529878 182648	R	29	18	24	20	21	22	18	19
Oxford Street**	529493 181331	R	-	-	-	-	28	27	22	34

Bold indicates an exceedance of the AQS objective.
UB = Urban Background, K – Kerbside, R = Roadside.
*Concentrations are unlikely to be a true representation of reality due to traffic reduction as a result of COVID-19.
** WCC Automatic Monitors

The 24 hour mean objective for PM_{10} (>50 µg m^3 over the permitted 35 days per year) were compliant at all monitoring locations from 2014-2021.

The WHO air quality guideline for 24-hour mean PM_{10} (45µg/m^3) is met at all monitoring locations in 2021 with the exception of Oxford Street. The WHO guidelines for annual mean PM_{10} (15 µg/m^3) is exceeded at all monitoring locations in 2021.

Table 5.6 LBC Continuous Monitoring Results – Daily Mean PM_{10}

Site ID	X, Y	Type	Number of Daily Means >45µg/m^3 (99th percentile (3-4 exceedance days per year).)							
			2014	*2015*	*2016*	*2017*	*2018*	*2019*	*2020**	*2021*
London Bloomsbury (Russell Square Gardens) (BLO)	530123 182014	UB	11	6	9	6	1	9	4	0
Swiss Cottage	526629 184391	K	12	8	7	8	4	8	3	0
Euston Road	529878 182648	R	5	5	10	3	2	8	2	2
Oxford Street**	529493 181331	R	-	-	-	-	3	17	6	6

Bold indicates an exceedance of the AQS objective.
UB = Urban Background, K – Kerbside, R = Roadside.
*Concentrations are unlikely to be a true representation of reality due to traffic reduction as a result of COVID-19.
** WCC Automatic Monitors

$PM_{2.5}$

Table 5.7 presents the annual mean $PM_{2.5}$ concentrations for all three automatic monitoring sites in LBC. There were no automatic monitoring sites within 1km of the Site in WCC.

At London Bloomsbury and Swiss Cottage, annual mean $PM_{2.5}$ concentrations (Table 5.7) comply with the AQS objective (10µg/m^3 by 2040) in 2021. Euston Road exceeds this objective in 2021. The automatic monitor at Euston is located within a LAEI focus area. Therefore, concentrations at these locations are expected to be elevated; comparatively, we would expect concentrations to be reduced at the Application Site

$PM_{2.5}$ concentrations in 2021 at all three monitoring sites exceed the WHO guideline of 5 µg/m^3.

Table 5.7 LBC Continuous Monitoring Results – Annual Mean $PM_{2.5}$

Site ID	X, Y	Type	Annual Mean (µg/m^3)							
			2014	*2015*	*2016*	*2017*	*2018*	*2019*	*2020**	*2021*
London Bloomsbury (Russell Square Gardens) (BLO)	530123 182014	UB	-	11	12	13	10	11	9	9
Swiss Cottage	526629 184391	K	-	12	15	16	11	11	10	9
Euston Road	529878 182648	R	-	17	17	14	15	14	11	11
Bold indicates an exceedance of the AQS objective. UB = Urban Background, K – Kerbside, R = Roadside. *Concentrations are unlikely to be a true representation of reality due to traffic reduction as a result of COVID-19.										

5.2. Sensitive Receptors

Defra provides guidance on locations where the air quality objectives should apply and Table 5.8 and professional judgement have been used to select receptors where likely significant exposure to pollutant concentrations may occur.

Table 5.8 Examples of where the Air Quality Neutral Objectives may or may not apply

Averaging Period	Objectives Should Apply	Objectives Should Generally Not Apply
Annual Mean	All locations where members of the public might be regularly exposed. Building facades of residential properties, schools, hospitals, care homes etc.	Building facades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building façade), or any other locations where public exposure is expected to be short term.
24-hour Mean	All locations where the annual mean objective would apply, together with hotels. Gardens of residential properties.	Kerbside sites (as opposed to locations at the building façade), or any other locations where public exposure is expected to be short term.
1-hour Mean	All locations where the annual mean and 24 -hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets) Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations where members of the public might reasonably expected to spend one hour or longer.	Kerbside sites where the public would not be expected to have regular access.
15-minute Mean	All locations where members of the public might reasonably be exposed for a period of 15 minutes or longer.	-

6. Effects Appraisal and Site Suitability

6.1. Construction Phase

6.1.1. Assessment of Potential Dust Emission Magnitude

The likely magnitude of dust emissions from the Approved Development for the four main activities has been assessed, as identified in Table 6.1.

Table 6.1 Predicted Magnitude of Dust Emissions from Approved Development

Activity	Magnitude	Justification
Demolition	Small	At this stage it is understood that the works will consist of refurbishment of existing office area and the extension of one story. Parts of the frame as well as the façade will be removed. The demolition works proposed are classified as Small.
Earthworks	Small	The total site area is estimated to be circa 3,000m^2. The soil type is potentially dusty. At this stage, the extent of earthworks activities at the Site is thought to be minimal. The number of heavy earth moving vehicles is not known at this stage, however based on Site locale it is estimated to be <5 at any one time. On the basis of some uncertainty, the Site has been classified as Small.
Construction	Medium	The total building volume is estimated to be circa 80,000m^2 based up on the indicative floor areas and elevation drawings, which corresponds in the IAQM Guidance as medium threshold. It is understood that much of the existing structure will be retained with construction works consisting of modifications to existing floors, the construction of an additional floor on the 8th story and the addition of a pavilion recreational space at roof level. Based on the above, construction impacts have been classified as Medium.
Trackout	Small	There are no proposed haul roads, with trackout movements taking place on existing roads adjacent the Site. It is estimated that there will be between 10 and 50 HDV movements per day. On this basis, Trackout activities have been classified as Small.

6.1.2. Sensitivity of the Area

A wind rose for London City Airport for 2019, provided in **Appendix C**, indicate that the prevailing wind direction is predominantly from the south west. Therefore, existing receptors that are located to the north east are most likely to fall within the area of influence from dust emissions generated by the construction phase at the site.

The majority of dust generated by the construction stage is likely to be deposited in close proximity to the source (within 350m) – **Figure 6..1** indicates the construction zone of influence.

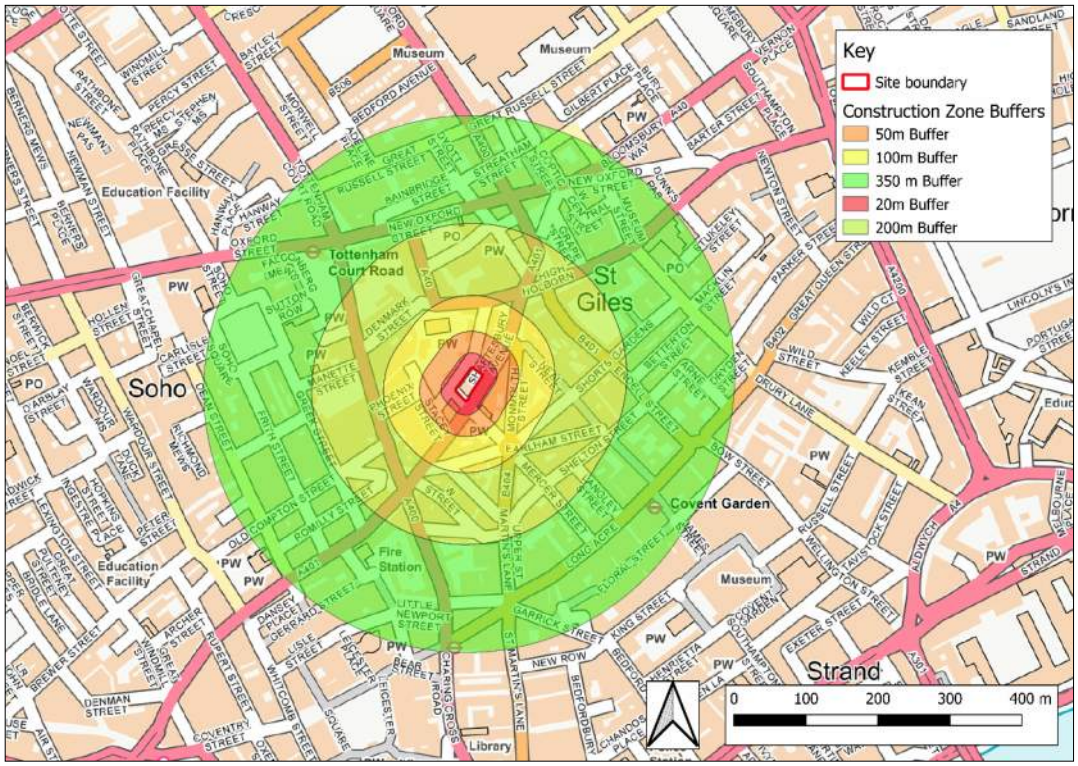


Figure 6.1 ***Zone of Construction Influence*** *(Contains Ordnance Survey Data © Crown copyright database right 2023)*

The majority of existing buildings surrounding the Application Site are office, hotel, commercial, residential and retail in nature (see **Figure 6.1**) – which are classified as medium to high sensitivity receptors. It is estimated that within 50m of the Site boundary there are >100 high sensitivity receptors to dust soiling effects.

There are no ecological receptors located within 50 m of the Site, or within 50 m of the likely construction traffic route for 500 m from the site boundary, and therefore consideration of these receptors has been scoped out.

The 2019 PM_{10} concentration for the Application Site taken from the Defra background maps is 20.41µg/m^3, which is well below the annual mean AQS objective.

6.1.3. Receptor Sensitivity

The sensitivity of the area to each of the previously identified impact types associated with the Application Site are identified in Table 6.2.

Table 6.2 Sensitivity of Receptors to Dust Emission Effects

Impact Type	Sensitivity of Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Low	Low	Medium	Low
Human Health	Low	Low	Low	Low
Ecological	N/A	N/A	N/A	N/A

The sensitivity of the surrounding area for dust soiling is classified as medium, and for human health the sensitivity is classified as low.

6.1.4. Risk of Impact

To determine the risk of impacts prior to the implementation of mitigation the dust emission magnitude and the sensitivity of the area have been combined and professional judgement applied. Table 6.3 below summarises the potential risk of impacts during the construction phase.

Table 6.3 Risk of Dust Related Impacts

Impact Type	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Low	Low	Medium	Negligible
Human Health	Low	Negligible	Negligible	Negligible
Ecological	N/A	N/A	N/A	N/A

The risk of dust related impacts from the Proposed Development on existing receptors in the vicinity of the Application Site ranges from Medium to Low risk. The risk of dust related impacts on human health during the construction phase is Negligible.

6.1.5. Construction Road Traffic & Non-Road Mobile Machinery (NRMM)

The greatest impact on air quality due to construction traffic and NRMM is likely to be along roads in the vicinity of the Application Site. It is likely that construction traffic will enter the application site via New Compton Street. It is anticipated that the volume of construction traffic will be low compared to the existing traffic flows.

Based on the current local air quality in the area, the proximity of sensitive receptors to the roads likely to be used by construction vehicles, the impacts are therefore considered to be slight/adverse without the implementation of mitigation (see Section 6).

6.2. Operational Phase

As the road traffic generated by the Proposed Development does not breach the threshold detailed in the IAQM and EPUK Air Quality Planning Guidance (see Table 4.7) and there is no on-site combustion plant proposed for the purpose of heating and hot water detailed modelling has been scoped out of the assessment.

However, a summary of the current and potential future baseline concentrations using information from the LAEI for 2019 (updated in July 2023) in the vicinity of the Application Site has been provided below. Furthermore, a trend analysis assessment has been undertaken using LBC air quality monitoring data to determine if there are any significant downward trends in local air quality.

6.2.1. LAEI Baseline Concentrations (2019 (updated in 2023))

The LAEI includes dispersion model results for the whole of London for 2019 (updated in 2022). Estimated ground level annual mean concentrations for NO_2, PM_{10} and $PM_{2.5}$ in the vicinity of the Application Site are presented in **Figures 6.2** to **6.4**.

6.2.1.1. NO_2

Figure 6.2 presents the 2019 LAEI baseline concentrations for annual mean NO_2 in the vicinity of the Application Site. This indicates elevated ground level concentrations in excess of 40µg/m^3 along Shaftesbury Avenue (typically ~66-79 µg/m^3) adjacent to the Application Site. Within the boundary of the Application Site, annual mean NO_2 concentrations also exceed 40µg/m^3 (typically ~38-63 µg/m^3).

Using the 2025 future baseline data, the LAEI indicates that NO_2 concentrations within the boundary of the site will be compliant with the AQS objective of 40µg/m^3 with concentrations typically between ~28-38 µg/m^3. The 2030 future baseline concentrations indicate that NO_2 concentrations within the site boundary are typically between ~22-28 µg/m^3.

Therefore, future users of the Proposed Development are likely to be exposed to NO_2 concentrations which comply with the annual mean AQS objective.

To determine compliance with the 1-hour mean objective for NO_2 the approach detailed in Defra's LAQM.TG(22) guidance has been followed. It suggests that where annual mean NO_2 concentrations do not exceed 60µg/m^3 then it is likely that exceedances of the 1-hour mean concentrations do not occur. The 2019 LAEI baseline data indicates annual mean NO_2 concentrations along Shaftesbury Avenue sometimes exceed 60µg/m^3, however concentrations within the boundary of the site mostly remain below, and future baseline scenarios demonstrate a dramatic reduction in concentrations, therefore the risk of exceeding the 1-hour mean AQS objective at the Application Site is unlikely.

Figure* 6.2** ***NO_2 LAEI Baseline Concentrations *(Contains Ordnance Survey Data © Crown copyright database right 2022)*

PM_{10}

Figure 6.3 presents the 2019 LAEI baseline concentrations for annual mean PM_{10} in the vicinity of the Application Site. This indicates ground level concentrations which exceed 25µg/m³ (typically ~9-35 µg/m³) along Shaftesbury Avenue adjacent to the Application Site. Estimated Annual Mean PM_{10} concentrations are generally below 25µg/m³ (typically ~9-10 µg/m³) within the footprint of the Application Site. It is therefore unlikely that future users of the Proposed Development would be exposed to annual mean PM_{10} concentrations that exceed the annual mean AQS objective.

Using the 2025 future baseline data, the LAEI indicates that PM_{10} concentrations within the boundary of the site will be partially compliant with the AQS objective of 15µg/m³ with concentrations typically between ~8-18 µg/m³. The 2030 future baseline concentrations indicate that $PM_{2.5}$ concentrations within the site boundary are compliant, typically between ~6-14 µg/m³.

Therefore, future users of the Proposed Development are likely to be exposed to PM_{10} concentrations which comply with the annual mean AQS objective.

Figure 6.3 ***PM_{10} LAEI Baseline Concentrations*** *(Contains Ordnance Survey Data © Crown copyright database right 2023)*

$PM_{2.5}$

Figure 6.4 presents the 2019 LAEI baseline concentrations for annual mean $PM_{2.5}$ in the vicinity of the Application Site. This indicates ground level concentrations occasionally exceeding 15 µg/m^3 in some locations (typically ~14-17 µg/m3) on Shaftesbury Avenue adjacent to the Application Site. Within the boundary of the Application Site estimated annual mean $PM_{2.5}$ concentrations are generally below 15µg/m^3 (typically ~14-15 µg/m^3) within the footprint of the Application Site.

Using the 2025 future baseline data, the LAEI indicates that $PM_{2.5}$ concentrations within the boundary of the site will be compliant with the AQS objective of 15µg/m^3 with concentrations typically between ~12-14 µg/m^3. The 2030 future baseline concentrations indicate that $PM_{2.5}$ concentrations within the site boundary are typically between ~11-13 µg/m^3.

Therefore, future users of the Proposed Development are likely to be exposed to $PM_{2.5}$ concentrations which comply with the annual mean AQS objective.

Figure 6.4 ***$PM_{2.5}$ LAEI Baseline Concentrations*** *(Contains Ordnance Survey Data © Crown copyright database right 2023)*

Based on GLA and Defra forecasts on expected emission reductions estimated ground level annual mean concentrations for NO_2, PM_{10} and $PM_{2.5}$ in the future may be less than those for 2019. With the introduction of the Real Driving Emissions (RDE) testing, the expansion of the ULEZ zone and the likely improvement in cleaner vehicle technologies (in particular EURO 6 (VI) a, b, c and d fleet categories – which are substantially cleaner than the previous EURO 5 (V), and the uptake of electric/hybrid vehicles) delivering improvements in vehicle emissions, in particular NO_x emissions then ambient pollutant concentrations could potentially be lower in the future. It is important to note that such improvements would depend upon traffic growth, congestion and the implementation of government/ local authority air quality initiatives and policy.

6.2.2. Trend Analysis of Local Authority Monitoring Data

Trend analysis has been undertaken for annual mean monitoring data for NO_2, PM_{10} and $PM_{2.5}$ using the Mann-Kendall Test and Sen's Slope Estimates for the Trend of Annual Data (version 1.0) available from the Finnish Meteorological Institute[30].

There are four tested significance levels, and the following symbols are used to signify the level of significance:

- *** if trend at α = 0.001 level of significance (*i.e.,* 99.9%);
- ** if trend at α = 0.01 level of significance (*i.e.,* 99%);
- * if trend at α = 0.05 level of significance (*i.e.,* 95%); and,
- + if trend at α = 0.1 level of significance (*i.e.,* 90%).

The annual mean data utilised is presented in Tables 5.2, 5.4 & 5.5 Monitoring data collected in 2020 has been excluded due to the impact COVID-19 had on concentrations during these years.

6.2.2.1. Annual Mean NO_2

The trend analysis undertaken for annual mean NO_2 based on the monitoring data identified in Table 5.2 indicates that whilst pollution concentrations are lower year on year the outcome the trend offers different levels of significance dependent on the monitoring location.

At Bloomsbury and Swiss Cottage a significant downward trend was recorded (at a 0.1 significance level or 90% confidence interval) in annual mean NO_2 concentrations between 2014-2019.

Euston Road and Tavistock Gardens measured concentrations that show a downward trend in a higher level of significance (0.05 significance level or 99% confidence interval).

6.2.2.2. Annual Mean PM_{10}

The trend analysis undertaken for annual mean PM_{10} based on the monitoring data identified in Table 5.4 indicates that there is a downward trend in data recorded, however it is not significant at any location.

All measured data is well below the AQS objective for PM_{10} of 40µg/m^3 in all years monitored.

6.2.2.3. Annual Mean $PM_{2.5}$

The trend analysis undertaken for annual mean $PM_{2.5}$ based on the monitoring data identified in Table 5.6 indicates that the outcome is not statistically significant. As identified in Table 5.6, $PM_{2.5}$ concentrations have stayed relatively static with only minor changes between 2015-2019.

All measured data is well below the AQS objective for $PM_{2.5}$ of 25µg/m^3 in all years monitored.

6.2.2.4. Summary

Of primary concern is the measured data for NO_2 as this is the only pollutant where exceedances of the AQS objectives are recorded, the measured PM_{10} and $PM_{2.5}$ data indicates compliance with the relevant AQS objectives.

The trend analysis undertaken for PM_{10} and $PM_{2.5}$ did not demonstrate statistically significant trends. However, for NO_2 the data presented in Table 4.2 indicates that pollution concentrations are lower year on year, and a significant downward trend was found at Bloomsbury and Swiss Cottage between 2014-2019.

Based upon the above findings, it is reasonable to expect that future pollution concentrations should continue to decrease with the implementation of local air quality initiatives and plans (as set out in LBC Clean Air Action Plan – see Section 3.2.3.2) and the expansion of the ULEZ.

6.2.3. Air Quality Neutral Assessment

6.2.3.1. Building Emissions

The Proposed Development does not include any combustion plant for the provision of electricity, heating or hot water, therefore not direct building emissions are expected.

6.2.3.2. Transport Emissions

The Transport Emission Benchmarks (TEBs) are based on the number of car trips generated by different land-use classes, together with the associated trip lengths and vehicle emission rates.

The Project Transport Consultant confirmed that the Proposed Development will generate a total of 1,043 trips per year – the trips are associated with refuse removal, servicing and delivery vehicles. Table 1 in Appendix B provides the Benchmark Trip Rates for each land use category based on the Gross Internal Area (GIA) of different land uses. The GIAs for the Proposed Development have been provided by the project architects. Table 6.4 shows the calculations of the TEB for the Proposed Development.

A summary of the findings of the AQNA are presented in 5.4 below.

Table 6.4 Calculation of TEB for the Proposed Development

Land Use Class	GIA (m^2)	Benchmark	
		Trips/dwelling/year or Trips/m^2/year	Trips/year
Office (Class E)	6,847	1	6,847

The total Proposed Development trip rate is less than the TEB, therefore the Proposed Development was found to be compliant in relation to building and transport emissions when compared to the respective benchmarks, therefore the Proposed Development is air quality neutral and mitigation or additional off-setting is not required.

7. Mitigation

7.1. Construction Phase

The IAQM guidelines provide an indication of the mitigation measures that would be appropriate for inclusion within the Proposed Development, based on the level of risk of dust related impacts identified for each of the activities. Consequently, the following mitigation measures should be incorporated into the Proposed Development, and delivered through the implementation of a Construction Environment Management Plan (CEMP).

Mitigation measures that are generic to each of the activities, and therefore should be implemented for the duration of the construction related works where applicable are identified in Table 7.1, whilst activity specific mitigation measures are identified in Table 7.2.

Table 7.1 Mitigation to be implemented during the Construction Phase

Development Element	Mitigation Measure
Communication	Develop and implement a stakeholder communications plant that includes community engagement before work commences on site. Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager. Display the head or regional office contact information.
Planning	Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the measures recommended in this table.
Site Management	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. Make the complaints log available to the local authority when asked. Record any exceptional incidents that cause dust and/or emissions, either on- or off- site, and the action taken to resolve the situation in the log book.
Monitoring	Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100m of the site boundary, with cleaning provided if necessary. Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked. Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if at a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.

Development Element	Mitigation Measure
Preparing and Maintaining the Site	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site. Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period. Avoid site run-off of water or mud. Keep site fencing, barriers and scaffolding clean using wet methods. Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
Operating Vehicle/ Vehicle Movements	Ensure all vehicles switch off engines when stationary – no idling vehicles. Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable. Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials. Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking and car-sharing).
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, *e.g*. suitable local exhaust ventilation systems. Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate. Use enclosed chutes and conveyors and covered skips. Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fin water sprays on such equipment wherever appropriate. Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Waste Management	Avoid bonfires and burning of waste materials.

Table 7.2 Activity Specific Mitigation Measures to be implemented during the Construction Phase

Development Element	Mitigation Measure
Construction	Avoid scabbling (roughening of concrete surfaces) if possible. Ensure sand and other aggregates are stored in bunds in areas that are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place. For small supplies of fine powder materials, ensure bags are sealed after use and stored appropriately to prevent dust.
Trackout	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use. Avoid dry sweeping of large areas. Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport. Record all inspections of access roads and any subsequent action in a site log book. Access gates to be located at least 10m from receptors where possible.

7.1.1. Residual Effects

The residual effects of dust and PM_{10} generated by construction activities following the

application of the mitigation measures described above and good site practice is not significant.

The residual effects of emissions to air from construction vehicles and NRMM on local air quality is not significant following the implementation of the recommended mitigation measures.

7.2. Operational Phase

7.2.1. Mitigation

The LAEI includes dispersion model results for the whole of London for 2019, 2025 and 2030 (updated in 2023).

The 2019 LAEI baseline data indicates annual mean NO_2 concentrations above 40µg/m^3 along Shaftesbury Avenue adjacent to the Application Site. Within the boundary of the Application Site, annual mean NO_2 concentrations are typically above 40µg/m^3.

In accordance with the Defra and IAQM guidance, the annual mean NO_2 AQS objective is not typically applicable to office land uses, which comprises floors ground-eighth of Proposed Development. The hourly mean NO_2 AQS objective (60µg/m^3) is more applicable to office land uses. The LAEI concentrations at the Application Site are below 60µg/m^3.

The 2025 LAEI dispersion model estimates NO_2 concentrations well below the AQS objective of 40µg/m^3, within the Site boundary and on the adjacent highways.

The 2019, 2025 & 2030 LAEI baseline annual mean PM_{10} and $PM_{2.5}$ concentrations are well below the relevant AQS objectives (40 and 20µg/m^3, respectively), within the Site boundary and on adjacent roads.

Trend analysis has been undertaken for annual mean monitoring data for NO_2, PM_{10} and $PM_{2.5}$ using the Mann-Kendall Test and Sen's Slope Estimates for the Trend of Annual Data (version 1.0).

The trend analysis undertaken for PM_{10} and $PM_{2.5}$ did not demonstrate a statistically significant trends due to limited data available. However, for NO_2 the data presented in Table 5.2 indicates that pollution concentrations are lower year on year, and a statistically significant downward trend was found at Oxford Street between 2015-2019.

Based on the results of the LAEI review and the trend analysis, mitigation to protect future occupiers of the Proposed Development from elevated NO_2, PM_{10} and $PM_{2.5}$ concentrations is not likely to be required.

7.2.2. Summary

Based upon the above findings, it is reasonable to expect that pollution concentrations would decrease in the future with the implementation of local air quality initiatives and plans (as set out in LBC Clean Air Action Plan – see Section 3.2.3.2) than those concentrations presented for the current baseline. With the proposed LBC plans in tandem with the extended ULEZ zone, as well as the increased uptake in electric vehicles and the reduction in fossil fuel led provisions for heating and hot water future

concentrations are likely to be somewhat lower in the opening year, than currently presented in the baseline. Therefore, it is not anticipated that mitigation would be required in the future to protect future occupiers.

However, this does not deter from best practice design and the following design recommendations are made:

- Be mindful when siting air intakes at roof level – where roof level intakes are necessary it is important to consider existing flues (energy plant/kitchen extracts) associated with any neighbouring buildings and any exhausts (kitchen or ventilation) associated the Proposed Development itself. This will reduce the likelihood of recirculating 'dirty' air. Where possible air intakes should be located approximately 20m from an exhausts (See Part F of the Building Regulations).

The Proposed Development is air quality neutral, therefore mitigation or additional off-setting is not required.

7.2.3. Residual Effects

The residual effects of dust and PM_{10} generated by construction activities following the application of the mitigation measures described above and good site practice is not significant.

The residual effects of emissions to air from construction vehicles and NRMM on local air quality is not significant following the implementation of the recommended mitigation measures.

8. Conclusion

A qualitative assessment of construction phase impacts has been carried out. There is a low risk of dust soiling during earthworks and construction, negligible risk during trackout activities. With regards to fugitive PM_{10} emissions during the construction phase the risk is classified as negligible risk for construction, earthwork and trackout activities. Through good site practice, the implementation of suitable mitigation measures, the impact of dust and PM_{10} releases will be minimised. The residual effect of the construction phase on air quality is therefore not significant.

As the road traffic generated by the Proposed Development does not breach the threshold detailed in the IAQM and EPUK Air Quality Planning Guidance (see Table 3.7) and there is no on-site combustion plant proposed for the provision of heating and hot water, detailed dispersion modelling was scoped out of the assessment. A summary of the current and potential future baseline concentrations using information from the LAEI for 2019, 2025 and 2030 (updated in 2023) and LBC air quality monitoring data has been undertaken.

The findings of this reviewing indicate:

- Ground level LAEI baseline data for NO_2 indicates compliance with the hourly mean AQS objective (60 µg/m^3) in the vicinity of the Application Site;
- Ground level LAEI baseline data for PM_{10} and $PM_{2.5}$ indicate that concentrations are below the relevant AQS objectives (40 and 20 µg/m^3) in the vicinity of the Application Site;
- The trend analysis undertaken for NO_2 identified a statistically significant trend at Oxford Street in close proximity to the Application Site; and,
- The trend analysis undertaken for $PM_{2.5}$ and PM_{10} did not demonstrate a statistically significant trends due to limited data available, however, for PM_{10} the data presented in indicates that pollution concentrations are decreasing.

In summary, the Proposed Development is unlikely to have a significant impact on existing receptors in the vicinity of the Application and on future occupiers of the Proposed Development therefore mitigation is not required.

The Proposed Development is air quality neutral, therefore mitigation or additional off-setting is not required.

The residual effect is not significant.

Overall, with the recommended mitigation measure in place (construction phase only), the proposals would be compliant with legislation and policy.

Appendix A - Glossary

Term	Definition
AADT - Annual Average Daily Traffic	A daily total traffic flow (24 hrs), expressed as a mean daily flow across all 365 days of the year.
Air Quality Objective	Policy target generally expressed as a maximum ambient concentration to be achieved, either without exception or with a permitted number of exceedances within a specific timescale (see also air quality standard).
Air Quality Standard	The concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. The standards are based on the assessment of the effects of each pollutant on human health including the effects on sensitive sub groups (see also air quality objective)
Ambient Air	Outdoor air in the troposphere, excluding workplace air.
Annual Mean	The average (mean) of the concentrations measured for each pollutant for one year.
AQMA	Air Quality Management Area.
Conservative	Tending to over-predict the impact rather than under-predict.
Data Capture	The percentage of all the possible measurements for a given period that were validly measured.
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport.
Dust	Dust comprises particles typically in the size range 1-75 micrometres (µm) in aerodynamic diameter and is created through the action of crushing and abrasive forces on materials.
Exceedance	A period of time where the concentrations of a pollutant is greater than the appropriate air quality standard.
HDV/HGV	Heavy Duty Vehicle/Heavy Goods Vehicle
LAQM	Local Air Quality Management
NO_2	Nitrogen dioxide
NO_X	Nitrogen oxides
PM_{10}	Particulate matter with an aerodynamic diameter of less than 10 micrometres (µm)
$PM_{2.5}$	Particulate matter with an aerodynamic diameter of less than 2.5 micrometres (µm)
Trackout	The transport of dust and dirt from the construction/demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when heavy duty vehicles (HDVs) leave the construction/ demolition site with dusty materials, which may then spill onto the road, and/or when HDV's transfer dust and dirt onto the road having travelled over muddy ground on site.
ULEZ	24 hour Ultra Low Emission Zone in and around London

Appendix B – Air Quality Neutral Benchmarks

The GLA's London Plan Guidance: Air Quality Neutral provides an approach to assessing whether a development is air quality neutral. The approach is to compare the expected emissions from the building's energy use and vehicle trips against defined benchmarks for buildings and transport in London.

The benchmarks for heating and energy plant (termed 'Building Emissions Benchmarks' or 'BEBs') are set out in Table 1, while the 'Transport Emissions Benchmarks' ('TEBs') are set out in Table 2.

The average trip length and average emission per vehicle are required if there is a need to calculate offset payments. The values given by GLA are set out in Table 3 and Table 4, respectively.

Table 1:Building Emissions Benchmark NO_x Emission Rates ($gNO_x/m^2/annum$)

Land Use	Individual Gas Boilers	Gas Boiler Network	CHP + Gas Boiler Network	Heat Pumps + Gas Boiler Network
Residential (including student accommodation and large-scale purpose-built shared living development)	3.5	5.7	7.8	5.7
Retail	0.53	0.97	4.31	0.97
Restaurants and bars	1.76	3.23	14.34	3.23
Offices	1.43	2.62	11.68	2.62
Industrial	1.07	1.95	8.73	1.95
Storage and distribution	0.55	1.01	4.5	1.01
Hotel	9.47	15.42	38.16	15.42
Care homes and hospitals	9.15	14.9	36.86	14.9
Schools, nurseries, doctors' surgeries, other non-residential institutions	0.9	1.66	7.39	1.66
Assembly and leisure	2.62	4.84	21.53	4.84

a Solid and liquid biomass appliances also emit fine particulate matter in addition to NOx. The benchmark emission rate for particulate matter is zero.

b Separate use classes for commercial uses, including retail and offices, have now been replaced by use class E. If these separate uses are specified in the development proposal, they should be used for this assessment. Where the intended use is not specified, or where use class E has been specified, the benchmark for retail should be used.

Table 2: Benchmark Trip Rates

Land Use	Annual trips per	Benchmark Trip Rates		
		Central Activities Zone (CAZ)	Inner London (excluding CAZ)	Outer London
Residential (including student accommodation and large-scale purpose-built shared living development)	dwelling	68	114	4 4 7
Office / Light Industrial	m^2 (GIA)	2	1	1 6
Retail (Superstore)	m^2 (GIA)	39	73	216
Retail (Convenience)	m^2 (GIA)	18	139	274
Restaurant / Café	m^2 (GIA)	64	137	170
Drinking establishments	m^2 (GIA)	0.8	8	N/A
Hot food takeaway	m^2 (GIA)	N/A	32.4	590
Industrial	m^2 (GIA)	N/A	3.9	16.3
Storage and distribution	m^2 (GIA)	N/A	1.4	5.8
Hotels	m^2 (GIA)	1	1.4	6.9
Care homes and hospitals	m^2 (GIA)	N/A	1.1	19.5
Schools, nurseries, doctors' surgeries, other non-residential institutions	m^2 (GIA)	0.1	30.3	44.4
Assembly and leisure	m^2 (GIA)	3.6	10.5	47.2

Table 3: Emission factors per vehicle-km

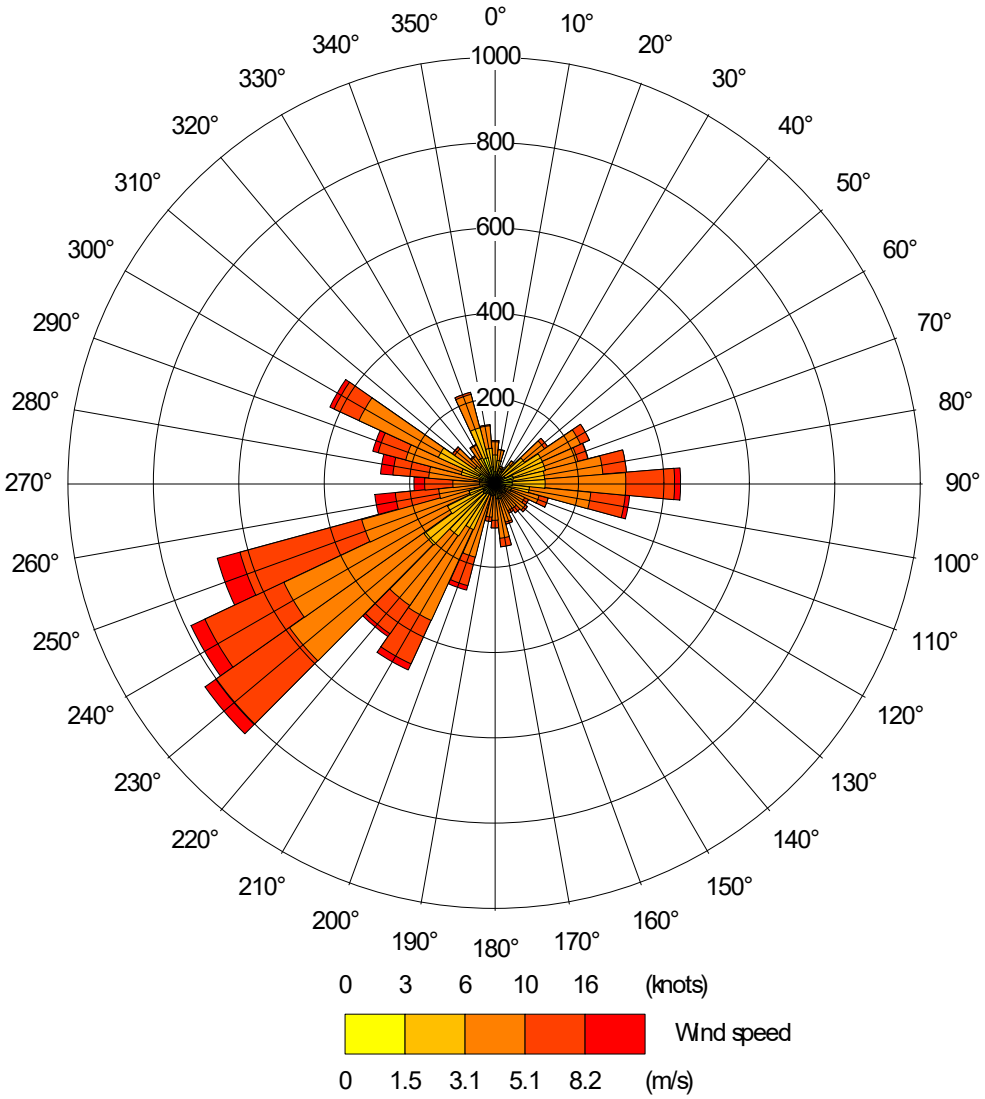
Pollutant	Emission factors (g/veh-km)		
	Central Activities Zone (CAZ)	Inner London [a] (excluding CAZ)	Outer London [a]
NO_x	0.48	0.39	0.35
$PM_{2.5}$	0.036	0.032	0.028

a Inner London and Outer London as defined in the LAEI.

Table 4: Average Distance Travelled by Car per Trip

Land use	Distance (km)		
	Central Activity Zone	Inner	Outer
Residential	4.2	3.4	11.4
Office	3.0	7.2	10.8
Retail	9.2	5.5	5.4

Appendix C – Wind Rose, City of London 2019



References

[1] Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2023).
[2] The Air Quality (England) Regulations 2000 – Statutory Instrument 2000 No. 928.
[3] The Air Quality (England) (Amendment) Regulations 2002 – Statutory Instrument 2002 No. 3043.
[4] The Air Quality Standards (Amendment) Regulations 2016 – Statutory Instrument 2016 No. 1184
[5] The Environment Act 1995.
[6] The Environment Act 2021.
[7] The Environmental Protection Act 1990.
[8] Department for Communities and Local Government (December 2023). National Planning Policy Framework.
[9] Defra (2019) Clean Air Strategy 2019, Defra.
[10] DfT (2018) The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy.
[11] Defra (2017) Air quality plan for nitrogen dioxide (NO_2) in the UK.
[12] Defra (2018) Supplement to the UK plan for tackling roadside nitrogen dioxide concentrations.
[13] Mayor of London: Cleaning London's air, The Mayor's Air Quality Strategy (December 2010)
[14] Mayor of London. The London Plan (March 2021).
[15] GLA (2018) London Environment Strategy.
[16] GLA (2018) Mayor's Transport Strategy.
[17] London Borough of Camden. Local Plan (Adopted 2017).
[18] London Borough of Camden. Draft Clean Air Action Plan (2019-2022).
[19] Ministry of Housing, Communities and Local Government (2021). National Planning Practice Guidance – Air Quality. Updated June 2021.
[20] Environmental Protection UK and Institute of Air Quality Management (Version 1.2 Updated January 2017). Land Use Planning & Development Control: Planning for Air Quality
[21] Institute of Air Quality Management (Version 2.2 Updated January 2024). Guidance on the Assessment of Dust from Demolition and Construction
[22] Defra Local Air quality Management. Technical Guidance (February).
[23] Mayor of London (May 2016) London Local Air Quality Management (LLAQM) Technical Guidance (LLAQM.TG(16))
[24] London Councils (January 2007). Air Quality and Planning Guidance – Revised Version.
[25] Mayor of London (July 2014): The Control of Dust and Emissions during Construction and Demolition – Supplementary Planning Guidance
[26] Greater London Authority (November 2021) Air Quality Neutral London Plan Guidance Consultation Draft.
[27] London Borough of Camden (2021) Camden Planning Guidance – Air Quality. January 2021.
[28] London Borough Camden. Air Quality Annual Status Report for 2021 (August 2022).
[29] Westminster City Council. Air Quality Annual Status Report for 2021 (2022)
[30] Mann-Kendall Test and Sen's Slope Estimates for the Trend of Annual Data (2002). Available at: https://en.ilmatieteenlaitos.fi/makesens. Accessed 11/09/2023.