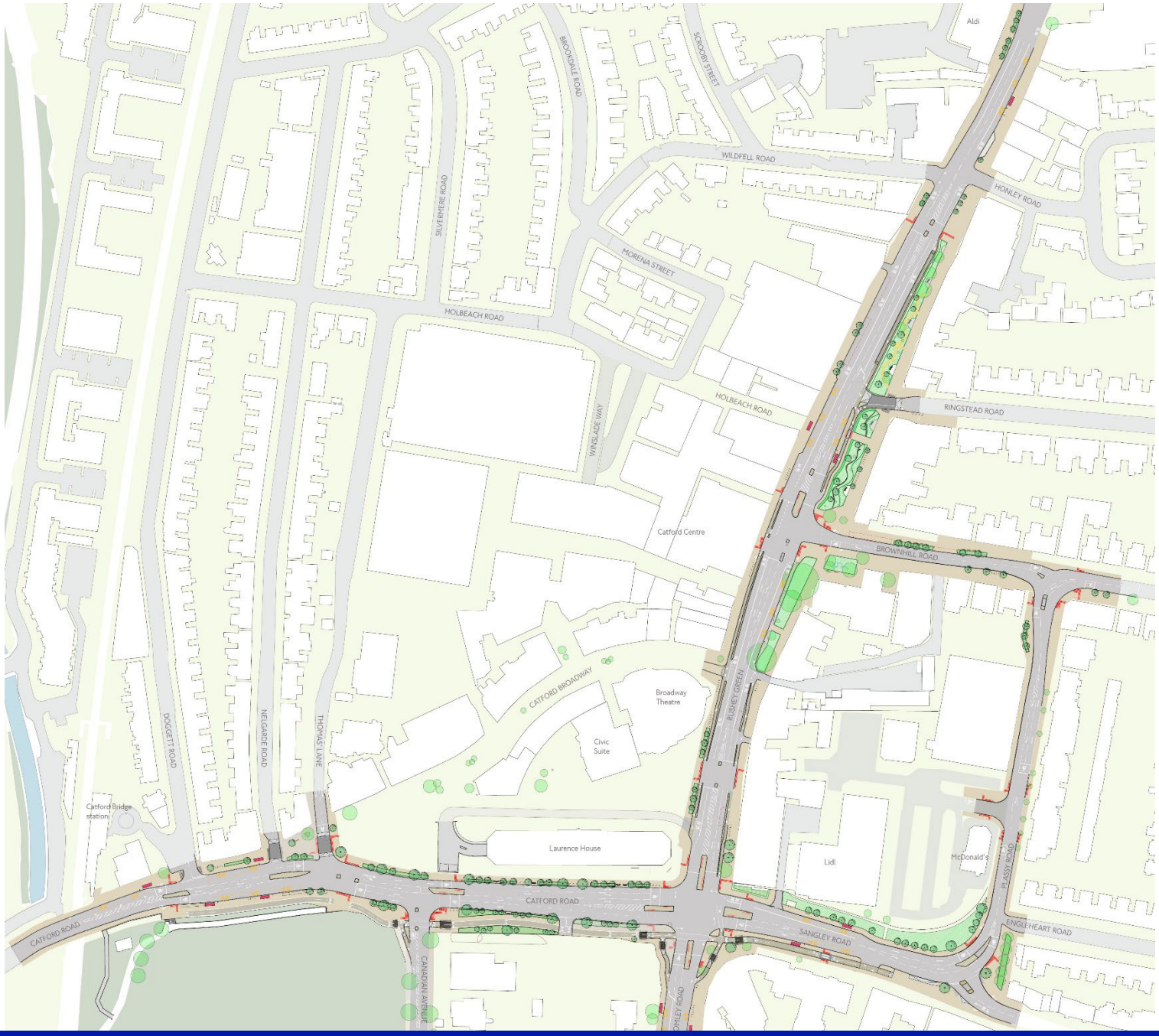

Town and Country Planning Act 1990

Catford Town Centre Highway Realignment

Air Quality and Noise Modelling Assessment Report

December 2023

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Catford Town Centre Highway Realignment

Air Quality and Noise Modelling Assessment

Transport for London

Project number: 60704426

December 2023

Delivering a better world

Quality information

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Table of Contents

Figures

Tables

Glossary of Terms

AADT	Annual Average Daily Traffic
ADMS	Atmospheric Dispersion Modelling System
AQMA	Air Quality Management Area
AQFA	Air Quality Focus Area
AQAP	Air Quality Action Plan
AQS	Air Quality Strategy
ASR	Annual Status Report
CAFE	Clean Air for Europe
CEMP	Construction Environmental Management Plan
CO_2	Carbon dioxide
CTRN	Calculation of Road Traffic Noise
dB	Decibels (of noise)
Defra	UK Department of Environment, Food and Rural Affairs
DM	Do Minimum
DMRB	Design Manual for Roads and Bridges
DMLP	Development Management Local Plan
DfT	Department for Transport
DS	Do Something
EFT	Emissions Factors Toolkit published by Defra
END	European Unition Assessment and Management of Noise Directive
EPUK	Environmental Protection UK
EV	Electric Vehicle
GHG	Greenhouse Gas
GLA	Greater London Authority
HAM	Highway Assignment Model
HDV	Heavy Duty Vehicle, >3.5 tonnes
HGV	Heavy Goods Vehicle; e.g. lorry
IAQM	Institute of Air Quality Management
LAEI	London Atmospheric Emissions Inventory
LAQM	Local Air Quality Management
LBL	London Borough of Lewisham

LIP	Local Implementation Plan
LDV	Light Duty Vehicle, <3.5 tonnes
LGV	Light Goods Vehicle; e.g. commercial van
LOAEL	Lowest Observable Adverse Effect Level
NIR	Noise Insulation Regulations
NOEL	No Observed Effect Level
NO_X	Oxides of Nitrogen
NO_2	Nitrogen Dioxide
NPPF	National Planning Policy Framework
NPSE	Noise Policy Statement for England
OEP	Office for Environmental Protection
PM_{10}	Fine particulate matter with an aerodynamic diameter of 10 µm or less
$PM_{2.5}$	Fine particulate matter with an aerodynamic diameter of 2.5 µm or less
PPG	Planning Policy Guidance
SOAEL	Significant Observed Adverse Effect Level
TfL	Transport for London
ULEZ	Ultra Low Emission Zone
WHO	World Health Organisation

1. Non-Technical Summary

1.1 This report provides the results of an assessment of road traffic related air pollution and noise impacts due to the Transport for London (TfL) Catford Town Centre highway realignment scheme (referred to as the Proposed Development).

1.2 The proposals would see Catford Road (part of the South Circular) move to a new position south of Laurence House on the site of Canadian Avenue, with the removal of the one-way system around Plassy Island, making it a two-way road. Moving the road in this way would give access to more space around the relocated road to make improvements for all road users, including cyclists and pedestrians. These include new and improved pedestrian crossings, wider pavements, and new segregated cycle lanes.

1.3 The assessment is based on predicted traffic flows and speeds for scenarios both with and without the Proposed Development for the year 2026. Based on the predicted changes to traffic and road layout with the Proposed Development in place, changes in pollutant concentrations are provided for selected residential properties and schools (known as receptors) within a defined study area. The selected receptors are located close to the road as these are the locations most likely to be affected by changes in air pollution.

1.4 There are some areas where there are reductions and increases in annual mean NO_2 concentrations due to the realignment of the A205 but the vast majority of receptors are predicted to experience negligible changes. The overall impact of the Proposed Development on annual mean nitrogen dioxide (NO_2) concentrations is considered to be not significant.

1.5 Changes in particulate concentrations due to the Proposed Development are small or imperceptible at all receptors and therefore the changes have a negligible impact.

1.6 There is an increase in carbon in the wider study area due to the increase in vehicle kilometres travelled with the Proposed Development in place. In the context of national emissions, this change is small and can be considered negligible.

1.7 The majority of receptors are predicted to experience a negligible change in road traffic noise. The receptors where a negligible increase occurs are mostly on the A205 to the west and east of the Proposed Development and Hither Green Lane. Two receptors are predicted to experience a minor increase in road traffic noise. One receptor located on Culverly Road and one located on the A205. Four receptors are predicted to experience a minor decrease in road traffic noise; one on Davenport Road, one on Sangley Road and two on the A21. One receptor on the A205 between the A21 and Sangley Road is predicted to experience a moderate decrease in road traffic noise levels. These changes are not considered to lead to significant effects.

1.8 One receptor on the junction of Thomas' Lane and the A205 is predicted to experience a major decrease in road traffic noise levels. This is considered a significant beneficial effect.

1.9 One receptor located along the A21 to the south of the Proposed Development is predicted to experience a moderate increase in road traffic noise levels due to the Proposed Development. This is due to the fact that the north façade of this receptor is close to the realigned A205. This is considered a significant adverse effect. This could be mitigated through the installation of a noise barrier adjacent to the north facing façade of the property. However, given the adverse visual impact of such a barrier, which would obscure light and views from the windows on the north facing façade and not be in keeping with the local townscape, together with the high cost to benefit ratio of installation, such a measure is not considered to be a sustainable solution. It is possible that the property would qualify for the offer of insulation under the Noise Insulation Regulations. A Noise Insulation Regulations (NIR) assessment will be carried out within the first six months of opening of the Proposed Development, in accordance with the regulations, and a noise insulation package offered to any qualifying properties.

1.10 Overall, there is little change in the number of receptors exposed to high road traffic noise levels and slightly more receptors expected to experience a decrease in road traffic noise than an increase.

2. Introduction

2.1 Overview

2.1 AECOM Limited (AECOM) has been appointed by Transport for London (TfL) to assess the impact on air quality and noise as a result of the Proposed Development which involves changes to the A21 and A205 Intersection and the one-way gyratory system. The study areas for air quality and noise are shown in Figure 3 and Figure 4 (Appendix A) respectively.

2.2 The scope of this assessment is as follows:

- Identify a selection of the closest potentially sensitive receptors to the Proposed Development and affected roads in a wider study area. This approach follows accepted good practice for this type of development;
- Predict concentrations of the main road traffic pollutants nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$) at the identified receptors with and without the Proposed Development based on traffic data for the year 2026;
- Predict annual emissions of carbon with and without the Proposed Development for the year 2026 and future year of 2030; and
- Predict road traffic noise levels at the selected receptors with and without the Proposed Development for the year 2026.

2.3 Construction impacts are not included in the scope of works but will be dealt with separately through a Construction Environmental Management Plan (CEMP) and any relevant planning conditions.

2.2 Proposed Development

2.4 The Site is located within Catford within the London Borough of Lewisham (LBL). The site encompasses the centre of Catford including parts of the roads around it including the A205 South Circular and A21.

2.5 The main works included in the Proposed Development are:

- Converting the existing A205 South Circular one-way gyratory system to two-way working;
- Re-aligning the A205 approach from the west, so that the main through route is further south of the current Catford town centre and making provision for the creation of a public space by the London Borough of Lewisham on the existing alignment of Catford Road east of Thomas Lane;
- Highway improvements to reduce collisions and severance; improve pedestrian and cycle safety and ambience; protect bus journey times and reliability and maintain road capacity for other road users;
- Comprehensive landscaping and public realm improvements; and
- Provision of replacement access to the St Dunstan's College Jubilee Ground sports fields from Canadian Avenue and Fordmill Road.

2.6 The key objectives are:

- Improve safety for vulnerable road users by providing additional, improved crossings, wider pavements where possible and new segregated cycle routes;
- Increase active travel by providing segregated cycle facilities, improved way-finding and improved walking and cycling links; e.g. to Catford Bridge station;
- Support travel by sustainable modes by protecting bus journey times and reliability through the town centre;
- Contribute to the creation of a greener and more climate resilient town centre by planting trees, shrubs and introduction of a Sustainable Urban Drainage Scheme; and

- Support economic growth and the viability of the emerging town centre development proposals by removing severance between Laurence House and the town centre and making passive provision for the creation of a new public space by the London Borough of Lewisham.

3. Air Quality Planning Policy and Legislation

3.1 National Policy

3.1 This section identifies and describes the relevant legislation and policy (national, regional and local) to be considered when assessing the air quality effects of the Proposed Development.

3.1.1 National Legislation and Policy

Air Quality Standards Regulations (as amended) (2016)

3.2 The principal air quality legislation within the United Kingdom is the Air Quality Standards Regulations (as amended 2016) (The Statutory Office Limited, 2016) including amendments 'The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020 (UK Statutory Instruments, 2020).

3.3 The UK is no longer a member of the European Union, however, EU legislation as it applied to the UK on 31st December 2020 is now a part of UK domestic legislation, under the control of the UK's Parliaments and Assemblies. The Clean Air for Europe (CAFE) programme consolidated and replaced (with the exception of the 4th Daughter Directive) preceding EU directives with a single legal act, the Ambient Air Quality and Cleaner Air for Europe Directive 2008/50/EC ('EU Air Quality Framework Directive') (Council for European Communities, 2008). This directive is transcribed into UK legislation by the Air Quality Standards Regulations 2010 which came into force on 11th June 2010. The 2010 Regulations were amended by the Air Quality Standards Regulations 2016, which came into force on 31st December 2016. The limit values defined therein are legally-binding and are considered to apply everywhere (with the exception of the carriageway and central reservation of roads and any locations where the public do not have access).

Environment Act (2021)

3.4 The Environment Act 2021 (HM Government, 2021) amends the Environment Act 1995 (HM Government, 1995). On 9th November 2021, the Act was approved after being first introduced to Parliament in January 2020 to address environmental protection and the delivery of the Government's 25-year environment plan following Brexit. It includes provisions to establish a post-Brexit set of statutory environmental principles and ensure environmental governance through an environmental watchdog, the Office for Environmental Protection (OEP). Part IV of the Environment Act (2021) requires the Government to produce a new national Air Quality Strategy (AQS) which contains standards, objectives and measures for improving ambient air quality. The AQS proposes for the Secretary of State to publish a report reviewing the AQS every five years (as a minimum and with yearly updates to Parliament). The Act also included a proposal that the government set two targets by October 2022: the first on the amount of $PM_{2.5}$ pollutant in the ambient air and a second long-term target set at least 15 years ahead to encourage stakeholder investment. The targets are: an annual mean concentration target of 10 $\mu g/m^3$ to be achieved by 2040; and a 35% reduction in population exposure to $PM_{2.5}$ by 2040 (compared to a base year of 2018).

National Air Quality Strategy

3.5 The UK National AQS was initially published in 2000 (Defra, 2000) under the requirements of the Environment Act. An addendum was published in 2003 (Defra, 2003) which tightened several of the existing objectives and introduced a new objective. A revised AQS was published in 2007 (Defra, 2007) which set objectives for key pollutants as a tool to help Local Authorities manage local air quality.

3.6 In 2019, the UK Government released its Clean Air Strategy 2019, part of its 25 Year Environment Plan (Defra, 2019). The Strategy places greater emphasis on improving air quality in the UK than has been seen before and outlines how it aims to achieve this (including through the development of new enabling legislation).

3.7 Air quality management focus in recent years has primarily related to one pollutant, NO_2, and its principal source in the UK, road traffic. However, the 2019 Strategy broadens the focus to other sources, including domestic emissions from wood burning stoves and from agriculture.

3.8 In April 2023, a new AQS was published. It sets out how local authorities should support the delivery of the new national $PM_{2.5}$ targets but that there is no statutory duty on them to do so (Defra, 2023).

3.9 The assessment criteria applicable to the protection of human health and Local Air Quality Management (LAQM) are outlined in the UK's AQS 2007 and AQS 2023. The objectives set out in the AQS for the pollutants of relevance to this assessment are summarised in Table 1.

Table 1. Relevant AQS Objectives (for the Protection of Human Health)

Pollutant	AQS Objective Concentration (µg/m^3)	Measured as
Nitrogen dioxide (NO_2)	40	Annual mean
	200	1-hour mean, not to be exceeded more than 18 times a year (i.e. 99.79th percentile)
Particulate Matter (PM_{10})	40	Annual mean
	50	24-hour mean, not to be exceeded more than 35 times a year (i.e. 90.4th percentile)
Particulate Matter ($PM_{2.5}$)	20*	Annual mean
Particulate Matter ($PM_{2.5}$) (2023 AQS)	12**	Annual mean; interim target to be achieved by January 2028
	10**	Annual mean; target to be achieved by 2040

**Note an amendment of the Air Quality Standards Regulations was released in 2020 updating the $PM_{2.5}$ limit value ('The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020).*

***Note New legally binding $PM_{2.5}$ targets as published in the Air Quality Strategy April 2023 (Defra, 2023).*

National Planning Policy Framework (2021)

3.10 The National Planning Policy Framework (NPPF) (H.M Government, 2018) sets out the Government's environmental, economic and social planning policies for England and how these are expected to be applied. The revised Framework replaces the previous National Planning Policy Framework published in March 2012, revised in July 2018 and updated in February 2019.

3.11 2.11 Paragraphs 174, 185, 186, and 188 of the NPPF provide advice on when air quality should be a material consideration in development management decisions. In particular, paragraph 186 states that:

"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."

Planning Practice Guidance (2019)

3.12 The Planning Practice Guidance (PPG) was launched in March 2014 and was updated on 1st November 2019 (Ministry of Housing, Communities and Local Government, 2019) with specific reference to air quality. The PPG states that the planning system should consider the potential effect of new developments on air quality where relevant limits have been exceeded or are near the limit. Concerns also arise where the development is likely to adversely affect the implementation of air quality strategies and action plans.

3.13 In addition, air quality may also be considered to be material if there is poor air quality in the vicinity. The PPG states:

"Whether air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to have an adverse effect on air quality in areas where it is already known to be poor, particularly if it could affect the implementation of air quality strategies and action plans and/or breach legal obligations (including those relating to the conservation of habitats and species). Air quality may also be a material consideration if the proposed development would be particularly sensitive to poor air quality in its vicinity."

3.1.2 London Policy

The London Plan – Spatial Development Strategy for Greater London

3.14 The London Plan represents the overall strategic plan for London, and it sets out a fully integrated economic, environmental, transport and social framework for the development of the capital to 2031. It forms part of the development plan for Greater London as published by the Greater London Authority (GLA). London boroughs' local plans need to be in general conformity with the London Plan. The latest version of the London Plan was published in March 2021 (GLA, 2021). The London Plan considers air quality in Policies SI1 (Improving air quality), SI2 (Minimising greenhouse gas emissions) and SI3 (Energy infrastructure). In relation to air quality, it is stated in Chapter 9: Sustainable Infrastructure that:

"The Mayor is committed to making air quality in London the best of any major world city, which means not only achieving compliance with legal limits for Nitrogen Dioxide as soon as possible and maintaining compliance where it is already achieved, but also achieving World Health Organisation targets for other pollutants such as Particulate Matter."

3.15 The London Environment Strategy was published by the Mayor of London in May 2018 and sets out the Mayor's vision of London's environment to 2050 (GLA, 2018). The London Environment Strategy includes a number of policies and aspirations, with an accompanying implementation plan, setting out actions the Mayor is prioritising for the next five years to help implement the aims of this strategy.

3.16 Chapter 4 of the Strategy relates to air quality. This chapter of the Strategy supersedes the 2010 Mayor's Air Quality Strategy and sets the ambitious target for London to have the best air quality of any major world city by 2050 and goes one step further than the previous strategy by requiring developments to be 'air quality positive' (GLA, 2010). To date, however, the underpinning guidance outlining the method of assessment and the effective approaches to be taken to ensure that larger developments are 'air quality positive', has not been published. Therefore, the minimum requirement remains for proposed developments to be air quality neutral. This does not apply to road schemes.

Mayor's Transport Strategy and Transport Action Plan

3.17 In 2017, TfL produced 'Healthy Streets for London' (TfL, 2017). The Action Plan recognises that poor air quality is an issue, particularly in inner London, and that road transport is a key source. A range of measures are outlined to improve air quality including bringing forward and expanding the Ultra Low Emission Zone (ULEZ), tightening of ULEZ standards for lorries, buses and coaches, use of hybrid buses and retiring the oldest and most polluting taxis.

3.18 The Mayor of London published a new Transport Strategy for London (GLA, 2018) in 2018. This strategy is based on a Healthy Streets Approach that prioritises human health by changing the

mix of transport in London to encourage walking, cycling and public transport. The Mayor aims for 80% of Londoners' trips to be made by public transport, cycling or walking by 2041. The Strategy was revised in 2022 and stated that significant progress had been made since 2018 in reducing NO_2 and PM and improving air quality for Londoners, owing mostly to the expansion of the ULEZ (GLA, 2022).

The Mayor's Air Quality Focus Areas (AQFA)

3.19 There are 160 AQFA in London which have been identified by the Mayor of London as areas that exceed the EU annual mean limit value for NO_2 and have high human exposure (London Atmospheric Emissions Inventory, 2019a). These are priority areas for action by the GLA and boroughs.

3.20 The Proposed Development is located within AQFA 110, which covers the Catford Gyratory.

3.1.3 Local Policy

Local Plan

3.21 LBL's existing Local Plan is currently made of several documents as outlined below.

3.22 The Council now are in the process of reviewing and updating these documents, consolidating them into a single document to cover a twenty-year period, looking ahead to 2040 (LBL, 2023).

Lewisham Core Strategy

3.23 The Lewisham Core Strategy (LBL, 2011) sets out the vision, objectives, strategy and policies to provide guidance to public and private sectors for management, development and regeneration in the borough for the period of 2011 to 2026. The strategic objectives outlined in the Core Strategy are grouped into five main themes:

- regeneration and growth areas;
- providing new homes;
- growing the local economy;
- environmental management; and
- building a sustainable community.

3.24 The strategy states in paragraph 2.43 under section 2.7, 'Environment':

"The Council's third review and assessment (Updating and Screening Assessment) of air quality was conducted in July 2006. There is a risk of the annual mean objective being exceeded for nitrogen dioxide and for particles of PM_{10}. The detailed assessment concluded that the Council should maintain the designated AQMAs, continue the programme of monitoring and consider an expansion of the current monitoring stations to locations where fugitive sources are known to be an issue."

Site Allocations

3.25 The site Allocations local plan (LBL, 2013) identifies sites likely to be developed during the lifetime of the Lewisham Local Development Framework, 2011 – 2026.

3.26 The key objectives of the plan are as follows:

- To facilitate development by allocating sites to meet the Core Strategy's strategic objectives and priorities and implement its spatial strategies;
- To facilitate development which protects and enhances the amenity of the local area, identifying key environmental, historic and cultural features;
- To ensure a high standard of design from new developments;
- To create safe and attractive environments; and
- To secure development that helps create a more sustainable Lewisham.

Development Management Local Plan

3.27 The LBL Development Management Local Plan (DMLP) (LBL, 2014) sets out the Council's planning policies for managing development in LBL and the DMLP will be used to guide and assess planning applications.

3.1.4 Transport Strategy and Local Implementation Plan

3.28 The LBL Transport Strategy and Local Implementation Plan (LIP) (LBL, 2019) seeks to meet the following objectives:

- Travel by sustainable modes will be the most pleasant, reliable and attractive option for those travelling to, from and within Lewisham;
- Lewisham's streets will be safe, secure and accessible to all;
- Lewisham's streets will be healthy, clean and green with less motor traffic; and
- Lewisham's transport network will support new development whilst providing for existing demand.

3.29 The plan also includes specific outcome indicators to aid the delivery of LIP objectives, which are as follows:

- Improved network of cycling and walking routes with links to town centres and improved east-west connections;
- Reduced ownership and use of private motor vehicles;
- 100% of all feasible bus stops will be brought to TfL accessible standards;
- Increase number of step-free rail stations;
- Reduce air pollution from road traffic; and
- Walking, cycling and public transport will be prioritised in new developments as the best options.

3.1.5 Local Air Quality Management

3.30 The latest Council's Annual Status Report (ASR) for LBL covers monitoring and activities to improve air quality during 2021 (LBL, 2022a). There are currently two Air Quality Management Areas (AQMAs) within LBL, the Lewisham AQMA and the Crofton Park and Honor Oak Park AQMA. The Lewisham AQMA was declared in 2001 for exceedances of the annual NO_2 mean concentrations and the 24-hour PM_{10} mean concentrations, it encompasses the northern part of Lewisham above the A205 as well as some of the major roads in the borough including the A21, Southend Lane and Sydenham Road. This AQMA encompasses the Proposed Development. The Crofton Park and Honor Oak Park AQMA was declared in 2013 for exceedances in annual NO_2 mean concentrations and resides in the western side of LBL and encompasses the area surrounding Honor Oak Park.

3.31 LBL's Air Quality Action Plan (AQAP) was published in 2022 (LBL, 2022b) and sets out priorities to help achieve the objectives set out in the local planning documents and transport strategy. These priorities include: Communication and Raising Public Health and Awareness, Minimising emissions from new developments, Expanding the Council's Sustainable Transport Infrastructure and Collaboration with the GLA and other London Boroughs on Air Quality Initiatives.

3.32 The AQAP includes a total of 25 actions that were outlined across the following categories: Monitoring and core statutory duties; Emissions from developments and buildings; Public health and awareness raising; Delivery servicing and freight; Borough fleet actions; Localised solutions; and Cleaner transport.

3.33 These actions include promoting and delivering energy efficiency and zero carbon retrofitting projects in workplaces and homes, the completion and adoption of a LBL School Action Plan and continuing campaigns to increase the number of electric vehicle (EV) charging points throughout the city.

4. Noise Planning Policy and Legislation

4.1 Overview

4.1 This section identifies and describes relevant legislation and policy (national, regional and local) relating to road traffic noise.

4.1.1 National Planning Policy Framework (NPPF)

4.2 Paragraph 185 of the NPPF (MoH, 2021) states that planning policies and decisions should:

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

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

4.1.2 Planning Practice Guidance (PPG)

4.3 In March 2014, the Department for Levelling Up, Housing and Communities (DLUHC) predecessor department DCLG released its Planning Practice Guidance (PPG) (DLUHC, 2019) web-based resource to support the NPPF. The guidance advises that local planning authorities should consider:

a. Whether or not a significant adverse effect is occurring or likely to occur.

b. Whether or not an adverse effect is occurring or likely to occur.

c. Whether or not a good standard of amenity can be achieved.

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

4.1.3 Noise Policy Statement for England

4.5 The Noise Policy Statement for England (NPSE) (Defra, 2010) sets out the long-term vision of the government's noise policy, which is to *"promote good health and a good quality of life through the effective management of noise within the context of policy on sustainable development".* This long-term vision is supported by the three aims, and is designed to enable decisions to be made regarding what is an acceptable noise burden to place on society.

4.6 The Explanatory Note within the NPSE introduces the following concepts to aid in the establishment of likely significant environmental effects:

a. No Observed Effect Level (NOEL): the level below which no effect can be detected. Below this level no detectable effect on health and quality of life due to noise can be established.

b. Lowest Observable Adverse Effect Level (LOAEL): the level above which adverse effects on health and quality of life can be detected.

c. Significant Observed Adverse Effect Level (SOAEL): the level above which significant adverse effects on health and quality of life occur.

4.7 The NPSE recognises that *"it is not possible to have a single objective noise-based measure that is mandatory and applicable to all sources of noise in all situations".* The levels are likely to be different for different noise sources, for different receptors and at different times of the day.

Noise Important Areas

4.8 The UK Government Environmental Noise (England) Regulations 2006 (as amended 2008, 2009, 2010) (SIN.2238,2006) were introduced in England to implement European Union Assessment and Management of Noise Directive (END) 2002/49/EC (EU Parliament, 2002).

4.9 As part of the END strategic noise mapping of major roads, railways, airports and agglomerations has been completed across the UK, including London. In Defra's subsequent Draft Noise Action Plan 2013 (Defra, 2013), it was decided that Noise Important Areas, with respect to noise from major roads, would be defined as the location of the 1% of the population affected by the highest noise levels from major roads according to the strategic mapping. The document states that "…it is anticipated that the relevant highway authority will examine each Important Area having regard to any ongoing noise mitigation initiatives, schemes and plans". The results of round 3 of the noise mapping process were released by Defra in 2019. The locations of Noise Important Areas near to the Proposed Development are shown in Figure 2.

Land Compensation Act 1973

4.10 In general, noise is recognised as both a common law nuisance (either private or public) and a statutory nuisance. However, this does not apply to noise from road traffic. As a result, the Land Compensation Act 1973 (The Stationary Office, 1973) and The Noise Insulation Regulations 1975 (as amended 1988) (The Stationary Office, 1988) are used in respect of road traffic noise.

4.11 The Land Compensation Act 1973 Part I (The Stationary Office, 1973) provides a means by which compensation can be paid to owners of land or property which has experienced a loss in value caused by the use of public works, such as new or altered roads. Noise and vibration are two of the factors which would be considered in any claim for compensation; however the claim should consider all changes and effects, including betterment.

The Noise Insulation Regulations 1975 (as amended 1988)

4.12 The Noise Insulation Regulations 1975 (NIR) (The Stationary Office, 1988) were made under Part II of The Land Compensation Act 1973 (The Stationary Office, 1973). Regulation 3 imposes a 'duty', and Regulation 4 a 'power', on the relevant highway authority to undertake, or make a grant in respect of the cost of undertaking, noise insulation work in eligible buildings affected by a new or altered highway. This is subject to meeting a range of criteria relating to road traffic noise levels and distance from the works as specified in the Regulations. Regulation 5 also provides discretionary powers to undertake, or make a grant in respect of the cost of undertaking, noise insulation work in eligible buildings with respect to construction noise.

4.2 London Policy

The London Plan – Spatial Development Strategy for Greater London

4.13 In the London Plan (GLA, 2021) Policy D14 in Chapter 3 Design, Noise, states that "*In order to reduce, manage and mitigate noise to improve health and quality of life, residential and other non-aviation development proposals should manage noise by:*

a. avoiding significant adverse noise impacts on health and quality of life.

b. Reflecting the Agent of Change principle as set out in Policy D13 Agent of Change.

c. Improving and enhancing the acoustic environment and promoting appropriate soundscapes (including Quiet Areas and spaces of relative tranquillity).

d. Separating new noise-sensitive development from major noise sources (such as road, rail, air transport and some types of industrial use) through the use of distance, screening, layout, orientation, uses and materials – in preference to sole reliance on sound insulation.

e. Where it is not possible to achieve separation of noise-sensitive development and noise sources without undue impact on other sustainable development objectives, then any potential adverse effects should be controlled and mitigated through applying good acoustic design principles.

f. Promoting new technologies and improved practices to reduce noise at source, and on the transmission path from source to receiver."

Mayor's Transport Strategy and Transport Action Plan

4.14 Key proposals impacting traffic noise can be found in Proposal 48 of the Mayor's Transport Strategy and Action Plan (TfL, 2017). These include reducing traffic volumes and speeds, low-noise road surfacing where appropriate, monitoring noise levels close to major road corridors, facilitating quiet deliveries and working with DfT to reduce noise from the loudest vehicles.

4.3 Local Policy

Development Management Local Plan

4.15 LBL's DMLP (LBL, 2014) refers to noise in Policy 26 'Noise and Vibration'. Policy 26 states that *'The aim of this policy is to reduce excessive noise or vibration which can be detrimental to human health and well-being and can impact negatively on natural habitats.'*

4.16 Paragraph 2.198 states *'The policy is also consistent with the principles identified in the NPPF (paragraph 123) which encourages the identification and proper management of new and existing noise generating developments.'*

4.17 Paragraph 2.198 states '*It is important for the mental health and wellbeing of the people of Lewisham that noise is monitored and managed to the right levels in the right areas. The borough contains both noise generating uses and locations that are sensitive to noise and thus DM Policy 26 is required to ensure the interaction between such areas is avoided if possible and mitigated if not.'*

5. Baseline Conditions

5.1 Local Authority Air Quality Monitoring Data

5.1 A review of existing baseline air quality around the Proposed Development has been undertaken. NO_2 monitoring data for sites within the study area for the last five years are shown in Table 2 below and in Figure 3 in Appendix A. LBL does not monitor for particulates within the study area.

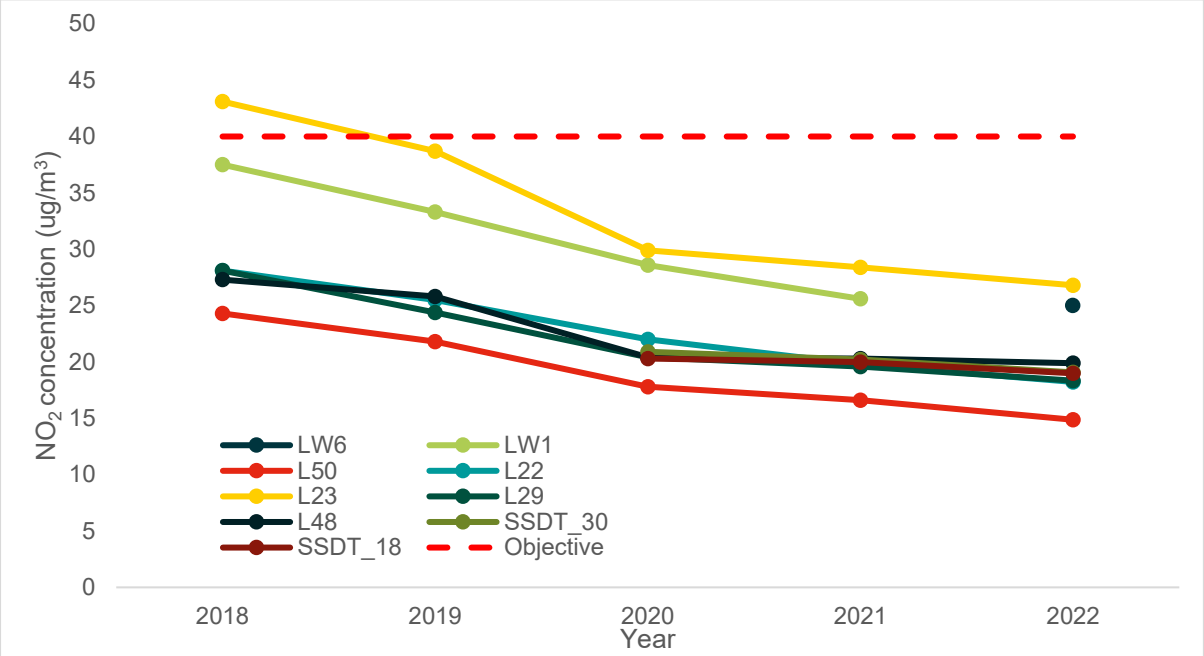
5.2 The data, represented in Figure 1, shows that the annual mean concentrations of NO_2 have decreased at all monitoring sites in recent years, with the most recent exceedance occurring in 2019 only at site L51.

Table 2. Annual Mean NO2 Concentrations at Monitoring Sites in Catford Town Centre

Site ID	Site Name	X	Y	Location Type	Distance to Site (m)	Annual Mean NO_2 Concentration (µg/m^3)				
						2018	2019	2020	2021	2022
LW1	Lewisham1 (Catford)	537675	173689	Urban Background (Automatic)	10	37.5	33.3	28.6	25.6	N/A
LW6	Lewisham (Laurence House, Catford)	537588	173606	Roadside (Automatic)	0	-	-	-	N/A	25.0
L22	Ringstead Road	538060	173816	Urban Background	170	28.1	25.5	22.0	19.8	18.0
L23	Catford Hill	537178	173365	Roadside	220	**43.1**	38.7	29.9	28.4	26.5
L29	Holy Cross, Sangley Road	538165	173406	Roadside	320	28.1	24.4	20.4	19.6	18.1
L48	Holbeach Primary School	537433	173965	Urban Background	330	27.3	25.8	20.4	20.3	19.6
L50	Rushey Green Primary School	537836	173400	Urban Background	70	24.3	21.8	17.8	16.6	14.7
SSDT_28	119 Sandhurst Road	538723	173345	Roadside	860	-	-	25.5	25.3	22.5
SSDT_30	7 Fordmill Road	537530	173095	Roadside	420	-	-	20.9	20.2	18.8
SSDT_19	193 George Lane	538589	174189	Roadside	730	-	-	16.7	18.5	17.3
SSDT_18	George Lane, Holy Trinity Church	538313	174269	Roadside	500	-	-	20.3	20.0	18.8
L47	Rathfern Primary School	536839	173211	Roadside	580	27.5	24.8	20.4	17.7	17.4
SSDT_27	51 Polstead Road	536753	173603	Roadside	570	-	-	19.1	18.5	17.6
SSDT_17	112 Crofton Park Road	536666	174206	Roadside	920	-	-	18.5	18.1	17.1
SSDT_16	140 Chudleigh Road	536975	174537	Roadside	1040	-	-	21.9	20.7	18.8
L51	290 Brownhill Rd South Circular	538803	173683	Roadside	900	**53.5**	**44.9**	34.0	33.3	30.4
SSDT_15	185 Hither Green Lane	538562	174494	Roadside	840	-	-	22.2	22.7	20.0

Numbers in bold show the concentrations exceeding the annual mean objective of 40 µg/m^3.

Figure 1. Annual Mean NO_2 Concentrations at 10 closest monitoring locations to the Proposed Development



5.2 Background Concentrations

5.3 Background concentrations have been taken from Defra's 2018 based background maps for the assessment.

Table 3. Defra Mapped Pollutant Concentrations at Site

Defra Grid Square	Year	Pollutant	Mapped Annual Mean Background Concentration (µg/m³)
537500, 173500	2019	NO_2	23.6
		PM_{10}	18.9
		$PM_{2.5}$	12.5
	2026	NO_2	17.7
		PM_{10}	17.4
		$PM_{2.5}$	11.5

5.4 Table 3 shows that the background NO_2 and particulate concentrations are below the AQS objectives and 2019 background NO_2 levels are similar to those measured at background sites e.g. L22, L48, L50 (Table 2).

5.5 The London Atmospheric Emissions Inventory (LAEI) shows that the main source of pollutants is the A205 Circular Road, with NO_2 concentrations above the AQS objective close to the roadside. PM_{10} and $PM_{2.5}$ concentrations are still well below the AQS objectives with no exceedances observed close to Proposed Development in 2019 (London Atmospheric Emissions Inventory, 2019b).

6. Air Quality Methodology

6.1 Traffic Data

6.1 Suitable forecast traffic flows and speeds within the study area (see Figure 3 and Figure 4 in Appendix A) were provided from TfL's Highway Assignment Model (HAM).. AECOM's traffic specialists applied factors to convert the traffic model peak hour data into 24-hour Annual Average Daily Traffic flows (AADT), composition light vehicles (e.g. cars, taxis and light goods vehicles (LGV)), heavy duty vehicles (HDV) (e.g. buses, heavy goods vehicles (HGV)) and speed (kph).

6.2 Traffic count data from nearby TfL automatic traffic counts and Department for Transport (DfT) have been used in this conversion. Specific factors were applied to roads where data are available, and a generic factor applied to all other roads.

6.3 The Traffic data have been provided for the following scenarios:

- **2016 Baseline** – Baseline situation to align with traffic model year;
- **2026 Do Minimum (DM)** – Contains committed schemes, except the Catford Town Centre highway realignment; and
- **2026 Do Something (DS) –** Contains committed schemes, including the Catford Town Centre highway realignment.

6.4 The AADT traffic data were screened following criteria in the Design Manual for Roads and Bridges (DMRB) LA105 Air Quality Guidance to identify those roads that were predicted to have a change between DM and DS of either more than 1000 vehicles a day or more than 200 HDVs as a two-way flow (Highways England, 2019). The study area focused on these roads likely to be affected by the Proposed Development and was extended to include all roads within 200m of the modelled receptors.

6.2 Receptors

6.5 The concentration of road traffic emitted pollutants at the roadside or at sensitive receptors is influenced by a number of factors. These include background pollution levels and the amount of traffic emissions, which is dictated by traffic flow rates, fleet composition and speed.

6.6 The air quality objectives for pollutants associated with road traffic were set by the Expert Panel of Air Quality Standards (and subsequently adopted as UK AQS Objectives) at a level below the lowest concentration at which the more sensitive members of society have been observed to be adversely affected by exposure to each pollutant. Therefore, all receptors that represent exposure of the public are of equal sensitivity as any member of the public could be present at those locations.

6.7 Commercial properties are not considered sensitive to changes in ambient pollutant concentrations and are legislated separately as part of occupational health and safety regulations. These are therefore not included in the assessment and the focus is on proposed and existing residential buildings and sensitive receptors, such as schools, hospitals and nursing homes.

6.8 The air quality predictions have been completed for a selection of receptors close to the roadside at sensitive locations within the Proposed Development extent and within the wider study area. The receptors have been selected using the current AddressBase Ordnance Survey data in conjunction with a review of aerial photography and publicly available mapping. Each of the receptors chosen represents the maximum level of exposure that could be experienced at other receptors in their vicinity.

6.9 Details of the selected receptors are shown in Table 4.

6.10 Receptors have been modelled at a height representative of relevant exposure, e.g. 1.5m for ground floor level receptors, 4.5m for 1st floor. The locations of the modelled receptors are also presented in Figure 2.

Table 4. Summary of Selected Receptors

ID	X	Y	Address	Receptor Type	Modelled Height (m)
R1	537801	173307	Rushey Green Primary School	Educational	1.5
R2	538143	173355	Holy Cross Roman Catholic Primary School	Educational	1.5
R3	537908	174064	Family Learning School A21 / Rosenthal Road,	Educational	1.5
R4	537970	174758	St Mary's Lewisham CofE Primary School	Educational	1.5
R5	538476	173620	St Fillans Road / Elmer Road	Educational	1.5
R6	537439	173905	Holbeach Primary School	Educational	1.5
R7	537124	174876	Gordonbrock Primary School	Educational	1.5
R8	537108	174226	Prendergast Ladywell School	Educational	1.5
R9	536586	173302	Faith Montessori Nursery A205 / Northwood Road	Educational	1.5
R10	537044	173013	Little Acorns Day Nursery, Exbury Road	Educational	1.5
R11	538523	174583	Horizons Day Nursery and Pre-School, Hither Green Lane	Educational	1.5
R12	539061	173401	Sandhurst Primary School	Educational	1.5
R13	537699	172999	Elysium Health Care, Bromley Road Hospital	Medical	1.5
R14	537887	174482	Lewisham Hospital	Medical	1.5
R15	538706	174237	Wooldands Health Centre, Hither Green Lane	Medical	1.5
R16	537323	174954	Hilly Fields Medical Centre, Ladywell Road	Medical	1.5
R17	538176	173677	A205 / Laleham Road	Residential	1.5
R18	539380	173726	A205 / Hither Green Lane	Residential	1.5
R19	539002	174336	Springbank Road / Brightside Road	Residential	1.5
R20	538039	174943	A21 / B236	Residential	4.5
R21	536940	174461	Manwood Road / Bexhill Road	Residential	1.5
R22	536918	173284	A205 / Beechfield Road	Residential	1.5
R23	537127	173395	A205 / Stanstead Road	Residential	1.5
R24	537418	173607	Doggett Road	Residential	1.5
R25	537555	173511	Canadian Avenue	Residential	1.5
R26	537874	173628	A205 gyratory	Residential	1.5

ID	X	Y	Address	Receptor Type	Modelled Height (m)
R27	538929	173663	A205 / Torridon Road	Residential	1.5
R28	538335	174163	Farley Road / Davenport Road	Residential	1.5
R29	537813	172835	A21 / Arran Road	Residential	1.5
R30	536651	173510	Ravensbourne Road / Blythe Hill	Residential	1.5
R31	537726	173776	A205 / A21 gyratory	Residential	4.5
R32	536730	174543	Manwood Road / Crofton Park Road	Residential	1.5
R33	536442	173954	Codrington Hill / Brockley View	Residential	1.5
R34	537712	173536	A205 gyratory	Residential	1.5
R35	537490	173613	A205 / Thomas' Lane	Residential	4.5
R36	537701	173701	A205 gyratory	Residential	4.5
R37	537710	173606	A21 gyratory	Residential	4.5
R38	537881	173752	A205 gyratory	Residential	1.5
R39	538058	173037	Inchmery Road / Penerley Road	Residential	1.5
R40	538380	173356	Sangley Road / St Filland Road	Residential	1.5
R41	539074	173912	Hither Green Lane / Torridon Road	Residential	1.5
R42	538346	174920	Courthill Road / Hither Green Lane	Residential	1.5
R43	537859	173492	Sangley Road	Residential	1.5
R44	537370	172778	Fordmill Road / Grangemill Road	Residential	1.5
R45	537229	173459	A205	Residential	1.5
R46	537062	173892	Ravensbourne Park / Iona Close	Residential	1.5
R47	537652	173511	A205 / Bromley Road	Residential	1.5

6.3 Modelling Methodology

Air Quality Dispersion Input Data and Model Conditions

6.11 This assessment has used the dispersion model software 'ADMS-Roads' (5.0.1.3) to quantify pollution levels at selected receptors due to road traffic emissions. ADMS-Roads is a modern dispersion model that has an extensive published track record of use in the UK for the assessment of local air quality impacts, including model validation and verification studies (Cambridge Environmental Research Consultants, 2013).

6.12 Details of general model conditions set up in ADMS-Roads are provided in Table 5. Some of these conditions are summarised in detail below.

Table 5. General ADMS-Roads Model Conditions

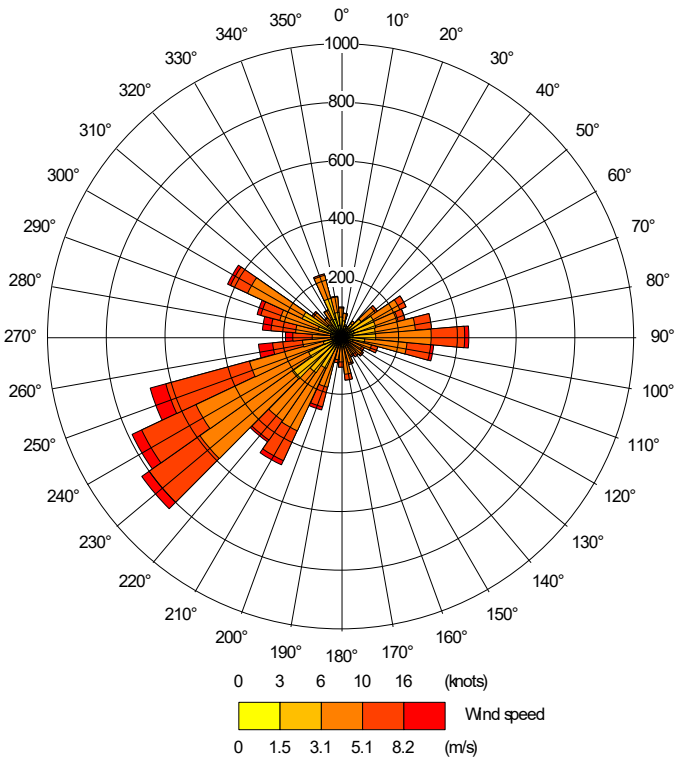
Variables	ADMS-Roads Model Input: Road Traffic Model
Surface roughness at source	1.0 m
Surface roughness at meteorological site	0.75 m
Minimum Monin-Obukhov length for stable conditions	100 m
Receptor location	x, y coordinates determined by GIS, z = various.
Emissions	NO_x, PM_{10}, $PM_{2.5}$, CO_2
Emission factors	Emissions Factors Toolkit (EFT) Version 11.0
Meteorological data	1 year (2019) hourly sequential data from London City Airport meteorological station.
Receptors	Facades of selected receptors only
Model output	Long-term (annual) mean NO_x concentrations.
	Long-term (annual) mean PM_{10} concentrations.
	Long-term (annual) mean $PM_{2.5}$ concentrations.

Meteorological Data

6.13 One year (2019) of hourly sequential observation data from London City Airport meteorological station has been used in this assessment. The station is located approximately 8 km north-east of the Proposed Development and experiences meteorological conditions that are representative of those experienced in inner London and within the air quality study area.

6.14 A wind rose for this site is presented in Figure 2.

Figure 2. Wind Rose for London City Airport Meteorological Site in 2019



Background Data

6.15 Background data for NO_2, NO_X, PM_{10} and $PM_{2.5}$ concentrations for 2026 have been sourced from Defra's 2018-based background maps for receptors within the nearest 1 km x 1 km grid square. For grid squares containing contributions from Primary A roads, Trunk roads and Minor roads, these have been removed from the background to avoid double counting of these emissions.

NO_2 Hourly Mean Objective

6.16 Research projects completed on behalf of Defra and the Devolved Administrations by Laxen and Marner (Marner, 2003) and AEA Technology in 2008 (AEAT, 2008) concluded that the hourly average NO_2 AQS Objective is unlikely to be exceeded if annual average concentrations are predicted to be less than 60 µg/m^3. Therefore, this assessment has evaluated the likelihood of exceeding the hourly average NO_2 objective by comparing predicted annual average NO_2 concentrations at all receptors to an annual average equivalent threshold of 60 µg/m^3. Where predicted concentrations are below this value, it can be concluded that the hourly average NO_2 Objective is likely to be achieved.

PM_{10} 24-hour Mean Objective

6.17 Local Air Quality Management Technical Guidance (LAQM.TG(22)) (Defra, 2022b) provides a calculation method to estimate the number of exceedances of the 24-hour mean PM_{10} objective given the annual mean concentration. This method has been used to assess the predicted effect of the Proposed Development with respect to the 24-hour mean PM_{10} objective.

Model Verification

6.18 Predicted results from an air quality dispersion model may differ from measured concentrations for several reasons, including uncertainties associated with traffic flows and emission factors, meteorology and limitations inherent to the modelling software. In light of this, and in accordance with advice in LAQM.TG(22), for roads-based air quality assessments it is best-practice to perform a comparison of modelled results with local monitoring data to minimise these modelling uncertainties. This provides a verification factor, by which the output of the ADMS-Roads model is adjusted, to gain greater confidence in the results. The verification of the modelling output was carried out as prescribed in LAQM.TG(22). Details of the model verification are provided in Appendix B.

6.4 Assessment of Significance

6.19 With regard to road traffic emissions, the change in pollutant concentrations with respect to future baseline concentrations has been described at receptors that are representative of exposure to impacts on local air quality within the study area. The absolute magnitude of pollutant concentrations in the "with" and "without" development scenarios are also described and used to consider the risk of the air quality objectives being exceeded in each scenario.

6.20 For consideration of a change in annual mean concentration of a given magnitude, the Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) have published recommendations for describing the effects of such impacts at individual receptors as set out in Table 6 and Table 7 (EPUK & IAQM, 2017).

Table 6. Effects Descriptors at Individual Receptors – Annual Mean NO_2 and PM_{10}

Long Term Average Concentration at Receptor in Assessment Year (µg/m^3)	Change in Concentration Relative to Air Quality Assessment Level (AQAL) – NO_2 and PM_{10} (µg/m^3)				
	<0.2 (Imperceptible)	0.2 - <0.6 (Very Small)	0.6 - <2.2 (Small)	2.2 -<=4.0 (Medium)	>4.0 (Large)
<30.2	Negligible	Negligible	Negligible	Slight	Moderate
30.2 - <37.8	Negligible	Negligible	Slight	Moderate	Moderate

Long Term Average Concentration at Receptor in Assessment Year (µg/m^3)	Change in Concentration Relative to Air Quality Assessment Level (AQAL) – NO_2 and PM_{10} (µg/m^3)				
	<0.2 (Imperceptible)	0.2 - <0.6 (Very Small)	0.6 - <2.2 (Small)	2.2 -<=4.0 (Medium)	>4.0 (Large)
37.8 - <41.0	Negligible	Slight	Moderate	Moderate	Substantial
41.0 - <43.8	Negligible	Moderate	Moderate	Substantial	Substantial
≥43.8	Negligible	Moderate	Substantial	Substantial	Substantial

Table 7. Effects Descriptors at Individual Receptors – Annual Mean $PM_{2.5}$

Long Term Average Concentration At Receptor In Assessment Year (µg/M^3)	Change in concentration relative to Air Quality Assessment Level (AQAL) – $PM_{2.5}$ (µg/m^3)				
	<0.1 (Imperceptible)	0.1 - <0.4 (Very Small)	0.4 - <1.4 (Small)	1.4 -<=2.5 (Medium)	>2.5 (Large)
<18.9	Negligible	Negligible	Negligible	Slight	Moderate
18.9 - <23.6	Negligible	Negligible	Slight	Moderate	Moderate
23.6 - <25.6	Negligible	Slight	Moderate	Moderate	Substantial
25.6 - <27.4	Negligible	Moderate	Moderate	Substantial	Substantial
≥27.4	Negligible	Moderate	Substantial	Substantial	Substantial

6.21 The IAQM/ EPUK guidance states that the descriptors are for individual receptors only and that overall significance is determined using professional judgement. It also states that it is unwise to ascribe too much accuracy to incremental changes or background concentrations, and this is especially important when total concentrations are close to the objective value. For a given year in the future, it is impossible to define the new total concentration without recognising the inherent uncertainty, which is why there is a category that has a range around the objective value, rather than being exactly equal to it.

6.22 An impact that is 'Negligible', given normal bounds of variation, would not be capable of having a direct effect on local air quality that could be considered to be significant. A 'slight' impact is also likely to be very difficult to distinguish from the inter-annual effects of varying meteorological conditions and are therefore not considered likely to be capable of having a direct effect on local air quality that could be considered to be significant. 'Moderate' impacts do not necessarily constitute a significant effect, where they do not contribute to an exceedance or risk of an exceedance of an air quality objective, particularly where such impacts relate to a small minority of receptors with the majority experiencing lesser impacts. A 'Substantial' impact will almost certainly constitute a significant effect that will require additional mitigation to address.

6.5 Vehicle Based Carbon Emissions

6.23 The carbon assessment considers changes in annual road transport emissions of CO_2 that may be brought about by the Proposed Development in the opening year (2026) and into the future. The EFT v11.0 has been used in the estimation of these CO_2 emissions using the traffic data supplied.

7. Noise Methodology

7.1 Traffic Data

7.1 The opening year traffic data described in the Air Quality Traffic Data section paragraphs 3 to 6.4 was also used for the road traffic noise assessments, in the format of 18-hour annual average weekday traffic (AAWT).

7.2 Receptors

7.2 The receptors outlined in Chapter 6 and listed in Table 4 have also been used in the road traffic noise assessment. Road traffic noise levels have been calculated at each floor of each receptor. Noise levels at receptors R1, R7, R8, R16 and R33 have not been included in the noise assessment. This is because they are greater than 600m away from the Proposed Development and/or from initial calculations the nearest road traffic noise source is not predicted to change by more than a negligible amount between the Do-Minimum Opening Year and Do-Something Opening Year.

7.3 Traffic Noise Prediction Methodology

7.3 Noise from a flow of road traffic is generated by both vehicles' engines and the interaction of tyres with the road surface. The traffic noise level at a receptor, such as an observer at the roadside or occupants of a building, is influenced by a number of factors including traffic flow, speed, composition (percentage heavy duty vehicles), gradient, type of road surface, distance from the road and the presence of any obstructions between the road and the receptor.

7.4 Noise from a stream of traffic is not constant; therefore, to assess the noise impact a single figure estimate of the overall noise level is necessary. The index adopted by the Government in 'The Calculation of Road Traffic Noise' (CRTN) (DoT & the Welsh Office, 1988) to assess traffic noise is $L_{A10,18h}$. This value reflects the noise level exceeded 10% of the time between 06:00 and 24:00. A reasonably good correlation has been shown to exist between this index and residents' perception of traffic noise over a wide range of exposures.

7.5 CRTN provides the standard methodology for predicting the $L_{A10,18h}$ road traffic noise level in the UK. Noise levels are predicted at a point 1 m measured horizontally externally from the façade of the building and therefore are 'façade' rather than 'free-field' levels. Façade levels include the reflection of noise from the building façade. CRTN applies a standard 'façade correction' of +2.5 dB to convert free-field levels (unaffected by façade reflections) to 'façade' levels (including façade reflections).

7.6 The CRTN methodology applies a ‘low flow’ correction between 18-hour vehicle flows of 1,000 and 4,000. The low flow correction procedure amplifies the impact of changes in traffic flows that are already low, in particular at receptors very close to the road. The 1,000 18-hour flow cut-off is the lower limit of the reliability of the CRTN prediction.

7.7 Based on the provided information noise models of the ‘with’ and ‘without’ the Proposed Development have been developed using the SoundPLAN (v8.2) noise mapping software. SoundPLAN implements the standard UK CRTN road traffic noise prediction methodology. Further details of the traffic noise modelling approach are provided in Appendix C.

7.4 Assessment of Significance

7.8 In accordance with DMRB LA 111 (Highways England, 2020), traffic noise levels have been calculated using CRTN with modifications according to DMRB LA 111, to determine the traffic noise change due to the Proposed Development for:

a. Short-term: Do-Minimum Opening Year (DMOY 2026) compared against the Do-Something Opening Year (DSOY 2026).

6.1 The SOAEL and the LOAEL for road traffic noise used in this assessment for all noise sensitive receptors for the time periods when they are in use, are detailed in Table 8 and taken from DMRB LA 111.

Table 8. Traffic noise SOAEL and LOAEL for all receptors

Time period	SOAEL	LOAEL
Daytime	68 dB $L_{A10,18h}$ (façade) 63 dB $L_{Aeq,16h}$ (free-field)	55 dB $L_{A10,18h}$ (façade) 50 dB $L_{Aeq,16h}$ (free-field)
Night	55 dB $L_{night,outside}$ (free-field)	40 dB $L_{night,outside}$ (free-field)

7.9 For daytime, the SOAEL is set at 68 dB $L_{A10,18h}$ (façade), which is consistent with the daytime trigger level in the Noise Insulation Regulations (NIR) (The Stationary Office, 1988). The NIR threshold has a history of use in UK noise policy as it has previously been incorporated into planning guidance on the acceptability of sites for new residential developments.

7.10 The daytime LOAEL is set at 50 dB $L_{Aeq,16h}$ (free-field), based on the guidance provided in the 1999 World Health Organisation (WHO) Guidelines for Community Noise regarding the onset of moderate community annoyance (WHO, 1999).

7.11 For night-time, the SOAEL is set at 55 dB $L_{night,outside}$ (free field), which corresponds to an internal level with a closed single glazed window, which would be slightly below the night-time criteria of 30 dB $L_{Aeq,8h}$ specified in BS 8233 (BSI,2014) as desirable for sleeping in bedrooms.

7.12 The 2018 WHO Environmental Noise Guidelines for the European Region (WHO, 2018) complement the WHO 2009 Night Noise Guidelines for Europe (WHO, 2009) and suggest a recommended 45 dB L_{night} for road traffic noise based on a 3% risk of being highly sleep disturbed.

7.13 The WHO 2009 *Night Noise Guidelines for Europe* explicitly identify the night-time LOAEL as 40 dB $L_{Aeq,8h}$ (free-field). Therefore, this LOAEL has been adopted in the assessment. Levels between 40 and 55 dB $L_{Aeq,8h}$ are identified in the guidelines as 'slight adverse' but not 'substantial adverse', where health effects are observed among the exposed population. 55 dB $L_{Aeq,8h}$ is identified in the guidelines as the level at which the risk of cardiovascular disease increases.

7.14 Table 9 is adapted from the DMRB classification of the magnitude of impact in the short term i.e. the year of opening.

Table 9. Road Traffic Noise Magnitude of Impact Criteria

Change in Traffic Noise Level $L_{A10,18h}$ dB	Magnitude of Impact
0	No change
0.1-0.9	Negligible
1.0-2.9	Minor
3.0-4.9	Moderate
5.0+	Major

7.15 Negligible changes in the short-term would not cause changes to behaviour or responses to noise, and as such would not give rise to significant effects. For short-term minor, moderate and major changes, *DMRB LA 111* outlines a range of additional factors that are considered in identifying final significant effects, these are adopted as follows:

- Where the magnitude of change in the short-term lies relative to the boundaries between the bands in Table 9. In some circumstances a change within 1 dB of the top of the minor range may be appropriate to be considered a likely significant effect. Conversely a change within 1 dB of the bottom of the moderate range, may in some circumstances be more appropriate to be considered as not likely to be a significant effect.
- The magnitude of change in the long-term is different to that in the short-term. If the short-term change is minor (not significant), but the long-term change is moderate (significant), it may be more appropriate to be considered as a likely significant effect. Conversely, a smaller magnitude of change in the long-term compared to the short-term may indicate that it is more appropriate to be considered as not likely to be a significant effect.
- The absolute noise levels relative to the SOAEL - if the DS traffic noise levels are high (above the SOAEL), a traffic noise change in the short-term opening year of 1.0 dB or more may be considered as a likely significant effect.
- The location of noise sensitive parts of a receptor - a receptor may contain areas which are more or less sensitive than others e.g. office spaces or kitchens in a school would be considered less sensitive than classrooms. Conversely, if the sensitive parts of the receptor are exposed to the noise source, it can be more appropriate to conclude a minor change in the short term and/or long term is a likely significant effect.
- The acoustic context, if a Proposed Development changes the acoustic character of an area - if a scheme introduces road noise into an area where road noise is not currently a major source, it may be appropriate to conclude a minor short-term change is a likely significant effect.
- The likely perception of a traffic noise change - if a Proposed Development results in obvious changes to the landscape or setting of a receptor, it is likely the traffic noise level changes would be more acutely perceived, and it may be more appropriate to conclude a minor short-term change is a likely significant effect. Conversely if a Proposed Development is not visible it can be more appropriate to conclude a moderate change is not a likely significant effect.

7.5 Noise Insulation Regulations

7.31 *The Noise Insulation Regulations 1975* (The Stationary Office, 1988) were made under Part II of the Land Compensation Act 1973 and provide for the insulation of buildings against road traffic noise and provide for ventilation and solar control.

7.32 Under the Regulations the highway authority has a duty to carry out insulation work or to offer grants for the work at eligible properties if certain criteria are met when either a new highway or an additional carriageway (located completely outside the extents of any existing highway) is to be constructed.

7.33 The four noise criteria set out in the Noise Insulation Regulations are:

a. The building must be within 300m of the nearest point on the highway to which the Regulations apply;

b. The combined maximum traffic noise level in the first 15 years after opening, the ‘relevant noise level’, from the new or altered highway(s), together with any other traffic in the vicinity, must not be less than the specified noise level of 68 dB $L_{A10,18h;}$

c. The relevant noise level must be at least 1.0 dB(A) more than the ‘prevailing noise level’, defined as the total traffic noise level existing immediately before the highway works were begun; and

d. The ‘new/additional highway’ must make an effective contribution to the relevant noise level of at least 1.0 dB(A).

7.34 Both the ‘relevant noise level’ and the ‘prevailing noise level’ are calculated at 1 m from the façade of any windows or doors in ‘eligible rooms’ within an ‘eligible building’.

7.35 Under the Regulations, an ‘eligible building’ is defined as a residential property or other building used for residential purposes, such as nursing homes and student flats, within 300 m of the Proposed Development. Offices and commercial buildings are not ‘eligible’ buildings, as defined in the Regulations.

7.36 Within an eligible building, only certain rooms are eligible for noise insulation works. These are bedrooms and living rooms, including dining rooms and studies. In addition, the room must have a window or door in a façade at which all the noise criteria are met. Self-contained kitchens and bathrooms are not eligible. As the realigned A205 constitutes a new highway in terms of the regulations there is a duty, under Regulation 3, to complete a Noise Insulation Regulations assessment prior to the Proposed Development having been opened to traffic for six months.

7.37 An initial indication regarding potential qualification under the regulations is provided as part of this report but this work does not constitute a complete assessment. A full Noise Insulation Regulations assessment will be carried out within the first six months of opening of the Proposed Development, in accordance with the regulations, and a noise insulation package offered to any qualifying properties.

7.6 Compliance with Policy

7.38 DMRB LA111 also requires that assessments determine compliance with national noise policy.

7.39 The key policy within NPSE of relevance includes the policy aims stated in paragraph 1.7 as: *“Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:*

a. avoid significant adverse impacts on health and quality of life;

b. mitigate and minimise adverse impacts on health and quality of life; and

c. where possible, contribute to the improvement of health and quality of life.”

7.40 To maintain consistency with the DMRB terminology used throughout this report, the compliance with policy discussion refers to effects rather than impacts.

7.41 For the purpose of testing compliance with the NPSE it is necessary to demonstrate that mitigation measures have been applied to avoid exceedances of the SOAEL, to mitigate and minimise exceedances of the LOAEL, and to contribute to improvements where possible, within the context of government policy on sustainable development.

7.42 With regard to identifying sustainable noise mitigation measures, and in line with DMRB LA111 guidance, various factors are considered – these include the cost versus the benefit, engineering practicality, generation of non-acoustic impacts (such as vegetation clearance, ecological effects, landscape and visual effects), and consultation and stakeholder engagement responses.

7.43 The discussion sets out whether or not it is possible to implement mitigation measures to meet these three aims, within the context of sustainable development.

8. Predicted Impacts on Air Quality

8.1 Summary

8.1 The following sections present the results of the air quality assessment at the selected receptors, providing the predicted concentrations both with and without the Proposed Development in place and the differences due to the Proposed Development. A consideration of whether these changes are considered to be significant is provided. Impacts on vehicle based carbon emissions are also presented.

8.2 Air Quality Concentrations

8.3 The annual mean NO_2 objective of 40 µg/m^3 is not exceeded at any of the selected sensitive receptor locations in 2026 either with or without the Proposed Development. The highest annual mean concentration with the Proposed Development is along the A205 approaching Catford Station, with a maximum concentration of 30.4 µg/m^3 at R45 (residential property).

8.4 The greatest reduction in annual mean NO_2 concentration is – 4.9 µg/m^3, found at R35 (a residential property on Thomas Lane) where concentrations are predicted to decline from 31.5 µg/m^3 to 26.6 µg/m^3. The change is considered to be moderately beneficial. This property is located within the Proposed Development extent and the main reason for this reduction is that the A205 will be moved further south away from the receptor. As well as this, traffic flow is expected to decrease by just under 1,000 vehicles per day (AADT) along Thomas Lane adjacent to this receptor. There are other beneficial impacts on properties along the A205 for the same reason (including R34 and R38).

8.5 The greatest increase in annual mean NO_2 concentration is +1.7 µg/m^3, found at R25 (residential property on Canadian Avenue) where concentrations are predicted to increase from 21.8 µg/m^3 to 23.5 µg/m^3. The change predicted at R25 is negligible and is due to the changes in alignment of the A205 as the road is moved further south , nearer to the receptor. The magnitude of change at other properties along the A205 (such as the groundsman cottage at the northern end of the playing fields) will be lower than this as they are located further from the re-aligned road. This property at R25 therefore represents the worst-case situation with the Proposed Development (see Figure 3).

8.6 Most receptors are predicted to experience small improvements in annual mean NO_2 concentrations due to the introduction of the new 2-way traffic flow along the Catford loop which is predicted to increase average speeds and reduce idling. However, due to the increase in traffic flows on these two-way roads and those leading to them, a small number of receptors are predicted to experience increase in their NO_2 concentrations.

8.7 Predicted PM_{10} and $PM_{2.5}$ concentrations meet the relevant annual mean objectives of 40 µg/m^3 and 20 µg/m^3 respectively in 2026 for both scenarios. The highest annual mean PM_{10} and $PM_{2.5}$ concentration (with the Proposed Development) of 22.1 µg/m^3 and 14.1 µg/m^3 is at receptor R45 along the A205 approaching Catford Station. Changes in PM_{10} and $PM_{2.5}$ are small or imperceptible at all receptors, having a negligible impact.

8.8 Table 10 provides the modelled annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations with and without the Proposed Development, and the difference between them for each of the selected receptor locations for the model year of 2026.

8.9 Table 11 provides the results of the significance descriptors for all three pollutants at selected receptor locations.

Table 10. Annual Mean Air Quality Results With and Without Proposed Development (2026)

Receptor	NO_2 (µg/m^3)			PM_{10} (µg/m^3)			$PM_{2.5}$ (µg/m^3)		
	DM	DS	Change	DM	DS	Change	DM	DS	Change
R1	18.0	18.0	<0.1	18.0	18.0	<0.1	11.8	11.8	<0.1

Receptor	NO_2 (µg/m^3)			PM_{10} (µg/m^3)			$PM_{2.5}$ (µg/m^3)		
	DM	DS	Change	DM	DS	Change	DM	DS	Change
R2	17.4	17.5	0.1	17.5	17.5	<0.1	11.8	11.9	<0.1
R3	21.8	21.7	-0.1	18.3	18.3	<0.1	12.1	12.1	<0.1
R4	25.6	25.6	<0.1	19.7	19.8	0.1	12.9	12.9	<0.1
R5	19.8	19.9	0.1	18.2	18.2	<0.1	12.3	12.3	<0.1
R6	18.6	18.6	<0.1	18.1	18.1	<0.1	11.9	11.9	<0.1
R7	20.1	20.2	0.1	17.6	17.6	<0.1	11.7	11.7	<0.1
R8	18.0	17.9	<0.1	17.0	17.0	<0.1	11.4	11.4	<0.1
R9	21.5	21.4	-0.1	18.4	18.4	<0.1	12.1	12.1	<0.1
R10	18.4	18.3	-0.1	18.1	18.1	<0.1	11.9	11.9	<0.1
R11	23.3	23.1	-0.2	18.6	18.6	<0.1	12.3	12.3	<0.1
R12	16.4	16.4	<0.1	16.8	16.8	<0.1	11.4	11.4	<0.1
R13	19.3	19.2	-0.1	17.4	17.4	<0.1	11.6	11.6	<0.1
R14	20.7	20.8	0.1	18.0	18.0	<0.1	11.9	11.9	<0.1
R15	21.8	21.7	-0.1	18.1	18.1	<0.1	12.0	12.0	<0.1
R16	18.8	18.8	<0.1	17.2	17.2	<0.1	11.5	11.5	<0.1
R17	23.1	23.3	0.1	19.5	19.5	<0.1	13.0	13.0	<0.1
R18	28.6	27.7	-0.9	20.6	20.6	-0.1	13.5	13.5	<0.1
R19	17.4	17.3	-0.1	16.8	16.8	<0.1	11.3	11.3	<0.1
R20	24.6	24.0	-0.6	18.9	18.9	<0.1	12.5	12.5	<0.1
R21	20.6	20.7	0.1	17.6	17.6	<0.1	11.9	11.9	<0.1
R22	22.5	22.3	-0.2	18.7	18.6	-0.1	12.3	12.3	<0.1
R23	21.7	22.9	1.2	19.1	19.0	<0.1	12.4	12.4	<0.1
R24	24.7	24.7	<0.1	19.7	19.5	-0.2	12.8	12.7	-0.1
R25	21.8	23.5	1.7	19.0	19.1	0.2	12.4	12.5	0.1
R26	26.4	25.8	-0.5	20.6	20.6	<0.1	13.3	13.3	<0.1
R27	24.0	24.0	<0.1	19.6	19.6	<0.1	13.0	13.0	<0.1
R28	19.1	18.8	-0.3	17.3	17.2	-0.1	11.6	11.5	<0.1
R29	21.5	21.6	<0.1	18.3	18.3	0.1	12.1	12.1	<0.1
R30	17.6	17.5	-0.1	16.9	16.9	<0.1	11.3	11.3	<0.1
R31	23.7	21.5	-2.1	19.5	19.0	-0.4	12.7	12.4	-0.3
R32	19.9	19.9	0.1	17.4	17.4	<0.1	11.7	11.7	<0.1
R33	17.6	17.6	<0.1	16.9	16.9	<0.1	11.3	11.3	<0.1
R34	28.2	25.3	-3.0	20.7	20.4	-0.3	13.4	13.2	-0.2
R35	31.5	26.6	-4.9	20.5	19.4	-1.1	13.3	12.7	-0.6
R36	23.6	21.7	-1.9	19.5	19.0	-0.4	12.7	12.4	-0.2
R37	27.8	24.9	-2.9	20.0	19.9	<0.1	12.9	12.9	<0.1
R38	29.5	25.5	-4.0	20.9	19.9	-1.0	13.5	12.9	-0.6
R39	17.1	17.1	<0.1	17.4	17.4	<0.1	11.8	11.8	<0.1

Receptor	NO_2 (µg/m^3)			PM_{10} (µg/m^3)			$PM_{2.5}$ (µg/m^3)		
	DM	DS	Change	DM	DS	Change	DM	DS	Change
R40	21.6	21.5	-0.1	18.5	18.5	<0.1	12.5	12.4	<0.1
R41	18.4	18.2	-0.2	17.3	17.3	<0.1	11.7	11.7	<0.1
R42	20.5	20.3	-0.3	17.7	17.7	<0.1	11.8	11.8	<0.1
R43	21.5	20.6	-0.9	19.0	18.8	-0.2	12.4	12.3	-0.1
R44	16.6	16.6	<0.1	16.4	16.4	<0.1	11.1	11.1	<0.1
R45	31.0	30.4	-0.6	22.2	22.1	-0.1	14.2	14.1	-0.1
R46	18.3	18.3	<0.1	18.1	18.1	<0.1	11.9	11.9	<0.1
R47	22.3	23.4	1.1	19.1	19.4	0.4	12.4	12.7	0.2

Note that changes are rounded.

Table 11. Air Quality Significance Effects Individual Location Descriptions, Impacts with Proposed Development, Annual Mean (2026)

Receptor	Effect Descriptors		
	NO_2	PM_{10}	$PM_{2.5}$
R1	Negligible	Negligible	Negligible
R2	Negligible	Negligible	Negligible
R3	Negligible	Negligible	Negligible
R4	Negligible	Negligible	Negligible
R5	Negligible	Negligible	Negligible
R6	Negligible	Negligible	Negligible
R7	Negligible	Negligible	Negligible
R8	Negligible	Negligible	Negligible
R9	Negligible	Negligible	Negligible
R10	Negligible	Negligible	Negligible
R11	Negligible	Negligible	Negligible
R12	Negligible	Negligible	Negligible
R13	Negligible	Negligible	Negligible
R14	Negligible	Negligible	Negligible
R15	Negligible	Negligible	Negligible
R16	Negligible	Negligible	Negligible
R17	Negligible	Negligible	Negligible
R18	Negligible	Negligible	Negligible
R19	Negligible	Negligible	Negligible
R20	Negligible	Negligible	Negligible
R21	Negligible	Negligible	Negligible
R22	Negligible	Negligible	Negligible
R23	Negligible	Negligible	Negligible
R24	Negligible	Negligible	Negligible

Receptor	Effect Descriptors		
	NO_2	PM_{10}	$PM_{2.5}$
R25	Negligible	Negligible	Negligible
R26	Negligible	Negligible	Negligible
R27	Negligible	Negligible	Negligible
R28	Negligible	Negligible	Negligible
R29	Negligible	Negligible	Negligible
R30	Negligible	Negligible	Negligible
R31	Negligible	Negligible	Negligible
R32	Negligible	Negligible	Negligible
R33	Negligible	Negligible	Negligible
R34	Slight Beneficial	Negligible	Negligible
R35	Moderate Beneficial	Negligible	Negligible
R36	Negligible	Negligible	Negligible
R37	Slight Beneficial	Negligible	Negligible
R38	Moderate Beneficial	Negligible	Negligible
R39	Negligible	Negligible	Negligible
R40	Negligible	Negligible	Negligible
R41	Negligible	Negligible	Negligible
R42	Negligible	Negligible	Negligible
R43	Negligible	Negligible	Negligible
R44	Negligible	Negligible	Negligible
R45	Negligible	Negligible	Negligible
R46	Negligible	Negligible	Negligible
R47	Negligible	Negligible	Negligible

8.3 Vehicle Based Carbon Emissions

8.10 Table 12 details the predicted annual emissions with and without the Proposed Development of carbon for the study area in 2026. These values are associated with changes due to traffic emissions as a result of the Proposed Development in the study area and do not include embedded carbon related to construction or operation of the Proposed Development (for example for traffic signals or street lighting). These emissions are outside the scope of the assessment and will be managed through the design process.

Table 12. Carbon Emissions Across Study Area

Pollutant	2019	2026			2030		
	Base Year	DM	DS	Change	DM	DS	Change
Carbon (CO_2)	24,495.8	22,085.9	21,172.4	913.5	20,379.8	19,536.1	843.7

Values are reported in tonnes /year

8.11 In the study area, the modelling predicts that in 2026, annual emissions of carbon will decrease by 913.5 tonnes per year with the Proposed Development in place, compared to the situation

without the Proposed Development. This represents a decrease of 4.1% in emissions with the Proposed Development in place across all modelled roads for the opening year.

8.12 The total vehicle kilometre travelled across the study area is similar with and without the Proposed Development in place and the average speed increases slightly resulting in the small reduction in carbon.

8.13 It is also noted that one of the purposes of the Proposed Development is to promote sustainable travel, and it is therefore also likely to stimulate more active travel by people walking and cycling.

9. Predicted Impacts on Noise

9.1 Summary

9.1 The following section presents the results of the noise assessment at the selected receptors, providing the predicted levels with and without the Proposed Development and the differences in the opening year of 2026. A consideration as to whether these changes are significant is provided.

9.2 Traffic Noise

9.2 Table 13 details the predicted daytime road traffic noise levels with and without the Proposed Development, including the difference in road traffic noise between the two scenarios for the selected receptor locations. As the receptors are buildings consisting of multiple floors, the results presented are for the floor which undergoes the predicted worst case change due to the Proposed Development. Details of the location of each receptor are included in Figure 1 and the predicted change in road traffic noise levels at each selected receptor is illustrated in Figure 5 (see Appendix A).

Table 13. Traffic Noise Results

Receptor	Façade Direction	Floor	Traffic Noise Level $L_{A10,18h}$ dB (façade)		Change dB	Magnitude of Impact	Initially Significant
			DM	DS			
R2	S	GF	51.0	53.2	2.2	Minor Increase	No
R3	W	F 1	71.6	71.9	0.3	Negligible Increase	No
R4	W	GF	74.3	74.5	0.2	Negligible Increase	No
R5	W	F 1	62.9	63.1	0.2	Negligible Increase	No
R6	W	GF	56.1	56.1	0.0	No Change	No
R9	NW	GF	73.7	73.6	-0.1	Negligible Decrease	No
R10	W	GF	64.5	64.5	0.0	No Change	No
R11	SW	GF	72.4	72.3	-0.1	Negligible Decrease	No
R12	S	F 1	60.0	60.1	0.1	Negligible Increase	No
R13	NE	GF	71.3	71.5	0.2	Negligible Increase	No
R14	E	GF	70.7	70.9	0.2	Negligible Increase	No
R15	E	GF	70.9	70.9	0.0	No Change	No
R17	W	GF	70.9	70.8	-0.1	Negligible Decrease	No
R18	S	GF	75.7	75.6	-0.1	Negligible Decrease	No
R19	NW	GF	56.0	55.6	-0.4	Negligible Decrease	No
R20	SW	GF	72.8	72.9	0.1	Negligible Increase	No
R21	SE	GF	69.8	70.1	0.3	Negligible Increase	No
R22	E	F 1	72.7	72.6	-0.1	Negligible Decrease	No
R23	NE	GF	70.8	70.7	-0.1	Minor Decrease	No
R24	W	GF	65.2	64.7	-0.5	Negligible Decrease	No
R25	W	F 2	67.1	67.8	0.7	Negligible Increase	No
R26	W	F 3	73.5	75.0	1.5	Minor Increase	No

Receptor	Façade Direction	Floor	Traffic Noise Level $L_{A10,18h}$ dB (façade)		Change dB	Magnitude of Impact	Initially Significant
			DM	DS			
R27	E	GF	72.0	72.1	0.1	Minor Increase	No
R28	N	F 1	65.0	63.9	-1.1	Minor Decrease	No
R29	N	F 1	66.6	66.7	0.1	Negligible Increase	No
R30	W	F 1	57.7	57.5	-0.2	Negligible Decrease	No
R31	E	GF	75.2	73.5	-1.7	Minor Decrease	No
R32	E	F 1	64.6	64.7	0.1	Negligible Increase	No
R34	N	GF	75.5	72.4	-3.1	Moderate Decrease	Yes
R35	SE	GF	78.1	70.3	-7.8	Major Decrease	Yes
R36	SE	GF	74.9	73.7	-1.2	Minor Decrease	No
R37	W	F 1	74.6	75.0	0.4	Negligible Increase	No
R38	S	GF	76.2	75.7	-0.5	Negligible Decrease	No
R39	N	GF	57.1	57.7	0.6	Negligible Increase	No
R40	S	GF	73.2	73.2	0.0	No Change	No
R41	SE	GF	66.4	66.3	-0.1	Negligible Decrease	No
R42	NE	GF	70.5	70.1	-0.4	Negligible Decrease	No
R43	N	GF	72.6	71.0	-1.6	Minor Decrease	No
R44	SE	GF	63.7	63.6	-0.1	Negligible Decrease	No
R45	SE	GF	77.9	77.8	-0.1	Negligible Decrease	No
R46	W	F 1	63.6	63.5	-0.1	Negligible Decrease	No
R47	N	GF	67.1	70.5	3.4	Moderate Increase	Yes

9.3 Generally, road traffic noise levels along major roads such as the A205 running east-west through the centre of Catford, the A21 running north-south through the centre of Catford and Hither Green Lane on the eastern edge of the study area near R15, are relatively high. The majority of receptors close to these roads have predicted $L_{A10,18h}$ noise levels in excess of 70 dB. Receptors along all other roads in the noise model tend to have predicted noise levels of below 65 dB.

9.4 The majority of receptors experience a negligible change in road traffic noise as a result of the Proposed Development.

9.5 Negligible decreases in road traffic levels are expected on Hither Green Lane to the east of the Proposed Development at receptor R15 and on the A205 to the west of the Proposed Development at receptors R17 and R38. These are a result of a decrease in percentage HDV in the Do-Something scenario.

9.6 Negligible increases are expected on the A21. This is a result of an increase in the number of vehicles using the A21 in the northerly and southerly direction as well as an increase in percentage HDV with the Proposed Development in place.

9.7 Further negligible increases are expected at other receptors such as R5, on St Fillans Road, R12, on the A205 between Ardgowan Road and Minard Road, R21, on Manwood Road, R25, on Canadian Avenue, R27, on the A205 next to Torridon Road, R32, on Manwood Road and R39, on Penerley Road. These are a result of an increase in the number of vehicles using these roads and an increase in percentage HDV with the Proposed Development in place.

9.8 In addition to these negligible changes some receptors are expected to experience minor changes in road traffic noise as described in the following paragraphs.

9.9 R28, a residential property on Davenport Road, is predicted to experience a minor decrease in road traffic noise levels. The noise level decrease is a result of an expected reduction in the number of vehicles using Davenport Road.

9.10 R43, a residential property on Sangley Road, is predicted to experience a minor decrease in road traffic noise levels. The noise level decrease is a result of a decrease in the number of vehicles expected to be using Sangley Road with the Proposed Development in place.

9.11 R36, a residential property on the A21, is predicted to experience a minor decrease in road traffic noise levels at the south-eastern facade. This receptor is located on the A21 in close proximity to Catford Broadway which is due to be closed to traffic as part of the Proposed Development and the proposed pedestrianised areas of the A205.

9.12 R31, a residential property on the A21, is also predicted to experience a minor decrease in road traffic noise levels. This receptor located along the A21 to the north of the Proposed Development where a reduction in traffic volume is expected.

9.13 R2, a school on Culverly Road, is predicted to experience a minor increase in road traffic noise levels. The noise level increase is a result of an increase in the number of vehicles using Culverly Road. However, as the school is set back from the road, absolute traffic noise levels at the school are expected to remain relatively low, below 55 dB.

9.14 R26, a residential property on the A205, is predicted to experience a minor increase in road traffic noise levels. The noise level increase is a result of an increase in the number of vehicles using the A205 due to it becoming a two-way road with the Proposed Development in place.

9.15 Overall, it’s unlikely that these receptors would perceive the difference in road traffic noise levels with the Proposed Development in place. There are minimal alterations to the road network next to these receptors. The exception being R36 where Catford Broadway and the A205 is being pedestrianised. Traffic levels on the A205 to the east of this receptor however are still dominating this receptor's noise levels. Overall, properties which are either experiencing a minor decrease or increase are predicted to not be significantly affected.

9.16 Two receptors are predicted to experience a moderate or major decrease in road traffic noise levels.

9.17 R34, a property on the A205 between the A21 and Sangley Road is predicted to experience a moderate decrease in road traffic noise levels. This is the result of the edge of the carriageway moving further away from the receptor due to the addition of a two-way cycle lane taking up some of the existing road. However, due to the inclusion of a two-way road outside the location of the receptor and the realignment of the A205 to the junction near this receptor this reduction is unlikely to be perceived. Additionally, the road traffic noise reduction only just falls into the moderate change band. Taking these factors into account no final significant beneficial effects at this receptor are expected.

9.18 R35, located on the junction of Thomas' Lane and the A205 is predicted to experience a major decrease in road traffic noise levels. This is a result of the A205 being moved away from this receptor. This reduction in noise levels results in a significant beneficial effect at this receptor.

9.19 One receptor is predicted to experience changes in road traffic noise that results in a moderate increase in road traffic levels.

9.20 R47, located along the A21 to the south of the Proposed Development is predicted to experience a moderate increase in road traffic noise levels. The north façade of this receptor is now closer to the A205 than without the Proposed Development resulting in an increase in road traffic noise levels at this façade. Although the north façade is predicted to experience a moderate increase in road traffic noise levels the eastern façade experiences the higher absolute noise level, due to traffic on the A21. Overall, there is a significant adverse effect due to the Proposed Development at this receptor.

9.21 Due to the north façade of R47 seeing a moderate increase of 3 dB and a road traffic noise level over 68 dB, this receptor may qualify for an offer of insulation under noise insulation regulations. A further assessment for noise insulation regulations should be completed in line with the timescales set out within the regulations.

9.22 The potential noise increase at other properties along the A205 will be lower than this as they are located further west from the re-aligned road. For example, road traffic noise levels at the groundsman's cottage at the northern end of the playing fields are expected to remain around 62 dB $L_{A10, 18h}$ within the grounds of the property. No significant effects in terms of noise are expected at these locations.

9.3 Compliance with Policy

9.23 For the purpose of assessing policy compliance, NPSE states that significant adverse effects on health and quality of life from noise should be avoided above the SOAEL (aim 1), whilst adverse effects should be minimised where traffic noise levels are between the LOAEL and SOAEL (aim 2) within the context of the government policy on sustainable development. The requirement of the third aim of the NPSE, to contribute to improvements to health and quality of life through the effective management and control of noise where possible, applies to all traffic noise levels.

9.24 The first aim of the NPSE is to avoid significant adverse impacts on health and quality of life from noise as a result of a new development. However, many properties would experience noise levels above the SOAEL with or without the Proposed Development, so it is important to consider the extent to which these noise levels are occurring as a result of the development. To help assess policy compliance with aim 1, this section explains which properties would experience noise levels above the SOAEL or a change in noise levels from above the SOAEL to below it once the Proposed Development is operational.

8.1 Table 14 the number of chosen receptors which would have one or more facades above the daytime or night-time SOAEL for the two assessment scenarios.

Table 14. Number of residential buildings above the SOAEL

Scenario	Day	Night
2026 Do-Minimum	25	31
2026 Do-Something	26	30

9.25 Little change in the number of receptors above the SOAEL, in the opening year, is anticipated due to the Proposed Development. The majority of receptors which are above the SOAEL, in either the daytime or night-time, are in close proximity to the roads in the study area with the greatest amount of traffic such as the A205, A2 and Hither Green Lane. With the Proposed Development in operation there is a decrease in road traffic noise predicted at 21 receptors in the study area. These reductions however are primarily negligible decreases with only four receptors expected to experience minor decreases and two predicted to see a moderate and major decrease respectively. An increase in road traffic noise levels is predicted at 16 receptors within the study area. These increases are mainly negligible increases with two receptors seeing minor increases and one moderate. One of the receptors predicted to experience a minor increase is above the SOAEL in the Do-Minimum scenario. The rest of the receptors expected to experience negligible increases are either already experiencing road traffic noise levels above the SOAEL or the increase in noise doesn't result in their noise level increasing to above the SOAEL.

9.26 The one receptor predicted to experience a moderate increase in road traffic noise, results in the road traffic noise level at that facade increasing to above the SOAEL with the Proposed Development in place. This could be mitigated through the installation of a noise barrier adjacent to the north facing façade of the property. However, given the adverse visual impact of such a barrier, which would obscure light and views from the windows on the north facing façade, together with the high cost to benefit ratio of installation, such a measure is not considered to be sustainable solution. It is possible that the property would qualify for the offer of insulation under the Noise Insulation Regulations. A full Noise Insulation Regulations assessment will be carried out within the first six months of opening of the Proposed Development, in accordance with the regulations, and a noise insulation package offered to any qualifying properties.

9.27 A greater number of receptors are expected to experience a decrease in road traffic noise levels than are expected to experience an increase in road traffic noise as a result of the Proposed Development. Therefore, it is considered that the first NPSE aim to avoid significant adverse impacts on health and quality of life, within the government policy on sustainable development, as a result of the new development has been met.

9.28 With regard to the second aim, 13 receptors would experience negligible increase and two a minor increase in road traffic levels. These increases don't result in a significant adverse impact on these receptors. It would be difficult to incorporate mitigation, such as noise barriers, into the Proposed Development due to the proximity of these receptors to the road. One receptor predicted to experience a moderate increase in road traffic levels would result in a significant effect. As discussed above a barrier would not be a sustainable mitigation measure for this property.

9.29 On this basis, it is considered that the second NPSE aim to mitigate and minimise adverse impacts on health and quality of life from noise as a result of the new development has been met as actions to mitigate the noise within Government policy on sustainable development have been explored.

9.30 With regard to the third NPSE aim to 'improve where possible', the Proposed Development would result in 21 of the chosen receptors experiencing a decrease in road traffic levels, 11 of which are inside noise important areas and 16 receptors experiencing an increase in road traffic levels, 4 of which are inside noise important areas. With there being a majority decrease in road traffic levels and the majority of receptors inside noise important areas are experiencing a decrease in road traffic levels. TFL's Corporate Environment Plan 2021 (TfL, 2021) also has a target which is "aim to meet 'no net increase in noise' in Defra 'noise important areas' for our schemes". From the predicted road traffic noise levels, it is likely that this target will be achieved for this Proposed Development. On this basis, it is considered that the third NPSE aim has been met.

10. Conclusions

10.1 Air Quality

10.1 In 2026, modelled annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations are predicted to be below the objective values with and without the Proposed Development at all selected receptors. Annual mean $PM_{2.5}$ concentrations are above the proposed target of 10 µg/m^3 at all receptors, both with and without the Proposed Development. This is due to the high background levels in London. The hourly mean objective for NO_2 is predicted to be met at all receptors.

10.2 The greatest reduction in annual mean NO_2 concentration is predicted at R35 (a residential property on Thomas Lane) as the A205 is to be moved further south away from the receptor due to the Proposed Development. As well as this, traffic flow is expected to decrease by just under 1,000 vehicles per day (AADT) along Thomas Lane. The greatest increase is predicted at R25 (residential property on Canadian Avenue) as the aligned route of the A205 is closer to the receptor with the Proposed Development.

10.3 The majority of the receptors are predicted to have negligible changes or experience small improvements in annual mean NO_2 concentrations due to the introduction of the new 2-way traffic flow along the Catford loop which is predicted to increase average speeds and reduce idling.

10.4 Changes in PM_{10} and $PM_{2.5}$ due to the Proposed Development are small or imperceptible at all receptors and therefore the changes have a negligible impact.

10.5 Overall, the Proposed Development is not significant in terms of air quality impacts.

10.6 Based on the results of the assessment of the magnitude and changes to NO_2, PM_{10} and $PM_{2.5}$ concentrations, no specific mitigation measures related to the Proposed Development are required.

10.7 There is a small decrease in carbon dioxide in the wider study area as a result of the Proposed Development.

10.2 Noise

10.8 The majority of receptors are predicted to experience a negligible change in road traffic noise. The receptors where a negligible increase occurs are mostly receptors along the A205 to the west and east of the Proposed Development and Hither Green Lane.

10.9 Two receptors are predicted to experience a minor increase in road traffic noise. Receptors R2 located along Culverly Road and R26 located along the A205. Four Receptors are predicted to experience a minor decrease in road traffic noise. R28, along Davenport Road, R43, along Sangley Road, R31 and E46 both along the A21. These changes are not considered to lead to significant effects.

10.10 One receptor on the A205 between the A21 and Sangley Road is predicted to experience a moderate decrease in road traffic noise levels. However, given the context of the location, this is not considered to lead to a significant beneficial effect.

10.11 R35 located on the junction of Thomas' Lane and the A205 is predicted to experience a major decrease in road traffic noise levels, which is expected to lead to a significant beneficial effect.

10.12 R47 located along the A21 to the south of the Proposed Development is predicted to experience a moderate increase in road traffic noise levels due to the Proposed Development as the north façade of this receptor is now closer to the A205. This change in road traffic noise levels as a result of the Proposed Development results in a significant adverse effect at this receptor. A noise barrier is not considered a sustainable mitigation measure as it is expected that the cost and adverse visual impact on the occupier would outweigh the noise benefit provided. It is noted that this property may qualify for an offer of insulation under the NIR. A full NIR assessment will be carried out within the first six months of opening of the Proposed

Development, in accordance with the regulations, and a noise insulation package offered to any qualifying properties.

10.13 Overall, there are expected to be more receptors experiencing a reduction in road traffic noise than an increase and there is little change in the number of receptors exposed to high road traffic noise levels.

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Appendix A Figures

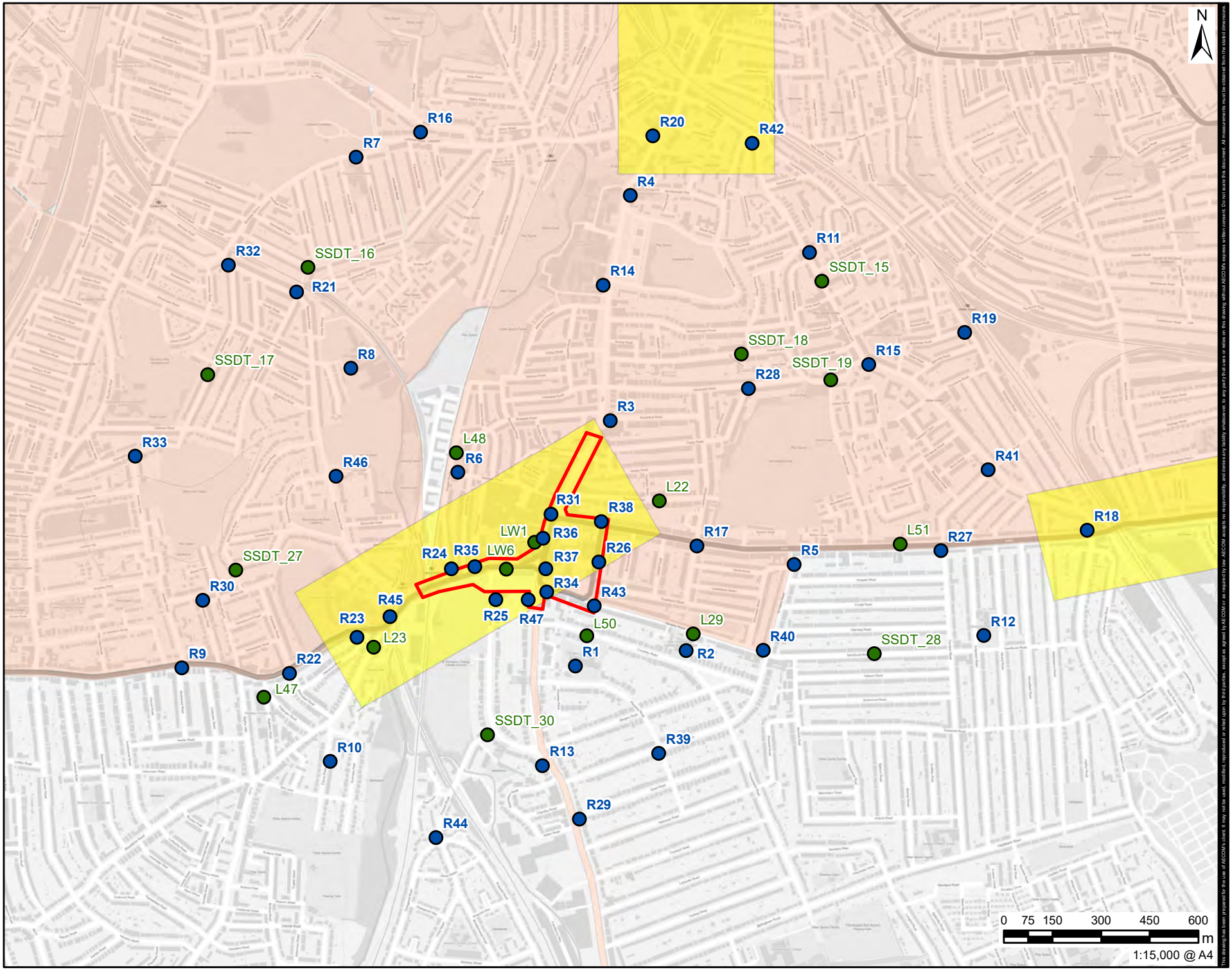
Figure 3. Air Quality Study Area

Figure 4. Noise Study Area

Figure 5. Annual Mean NO_2 Concentrations in 2026 with the Proposed Development

Figure 6. Change in Annual Mean NO_2 Concentrations in 2026 with and without the Proposed Development

Figure 7. Change in $L_{A10,18h}$ noise levels in 2026 between with and without the Proposed Development



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LEGEND

Modelled Receptors

- Modelled Receptors
- Local Authority Monitoring Locations
- Catford Town Centre Development
- AQMA
- Air Quality Focus Areas

NOTES

ISSUE PURPOSE

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PROJECT NUMBER

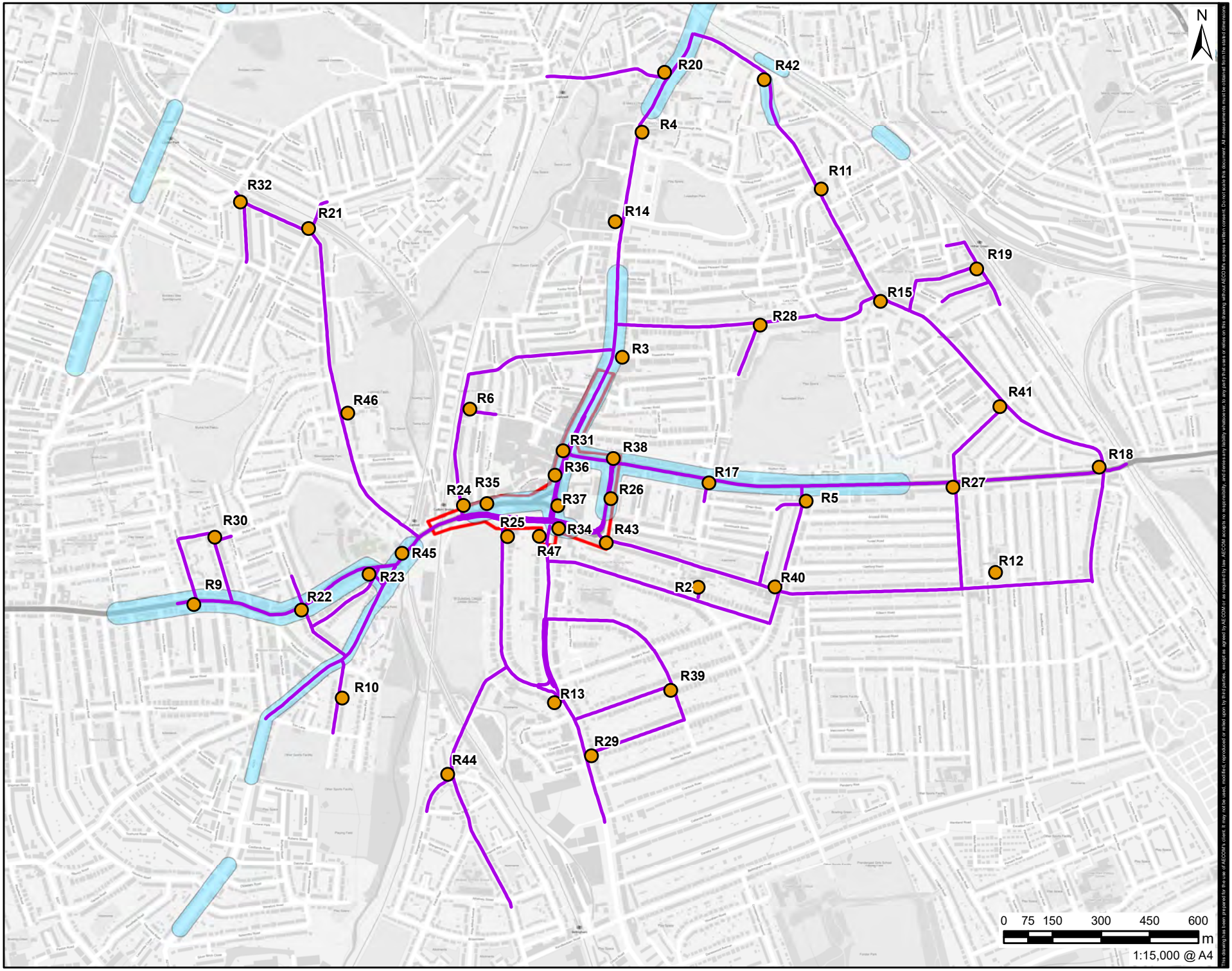
60704426

SHEET TITLE

Air Quality Study Area

SHEET NUMBER

Figure 3



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LEGEND
- Modelled Receptors
- Modelled Road Network
- Noise Important Areas
- Catford Town Centre Development

NOTES
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ISSUE PURPOSE
FINAL

PROJECT NUMBER
60704426

SHEET TITLE
Noise Study Area

SHEET NUMBER
Figure 4

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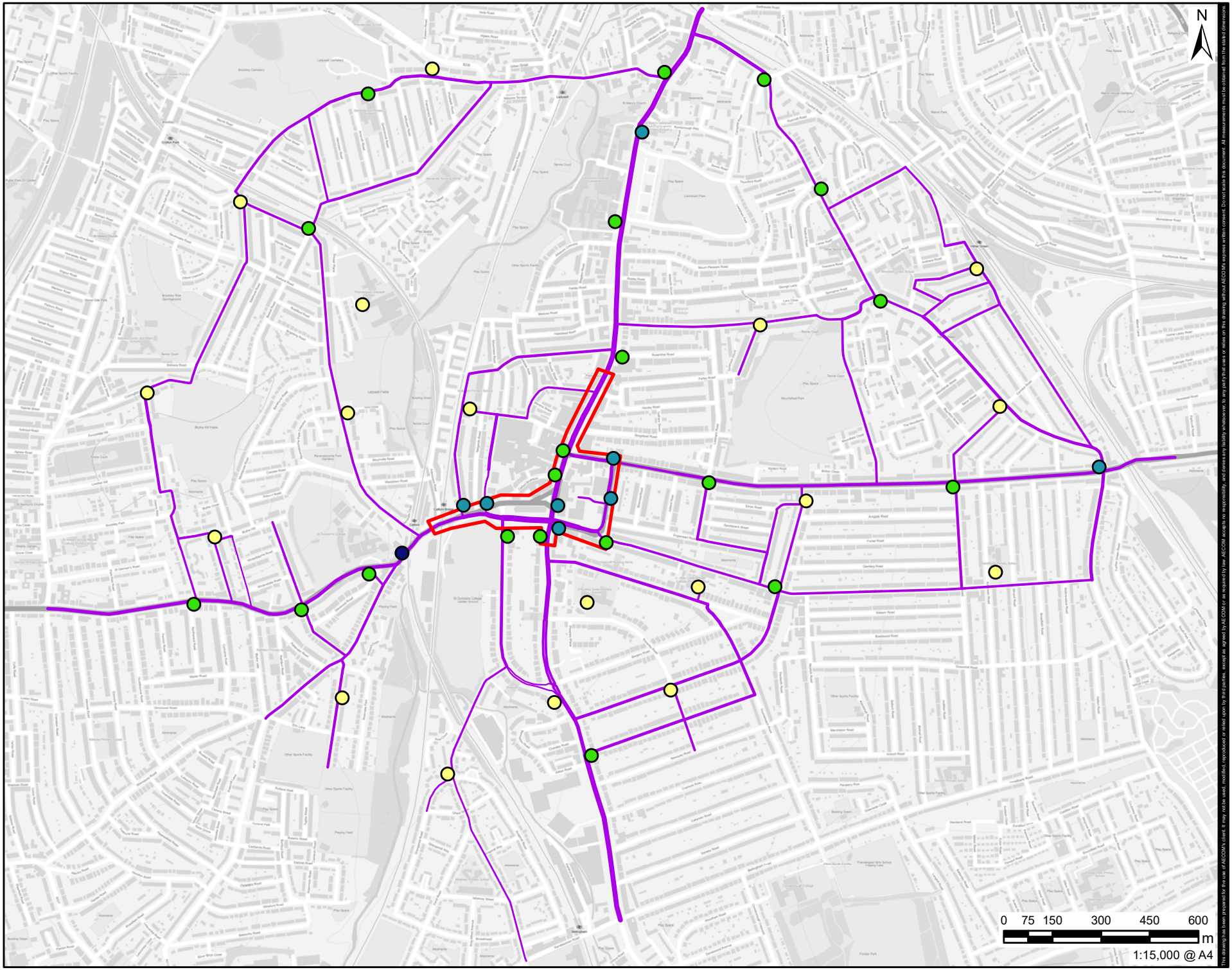

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LEGEND

NO_2 Concentrations ($\mu g/m^3$)

- 16 - 20
- 20 - 24
- 24 - 28
- 28 - 32

Modelled Road Network

Catford Town Centre Scheme

NOTES

ISSUE PURPOSE

FINAL

PROJECT NUMBER

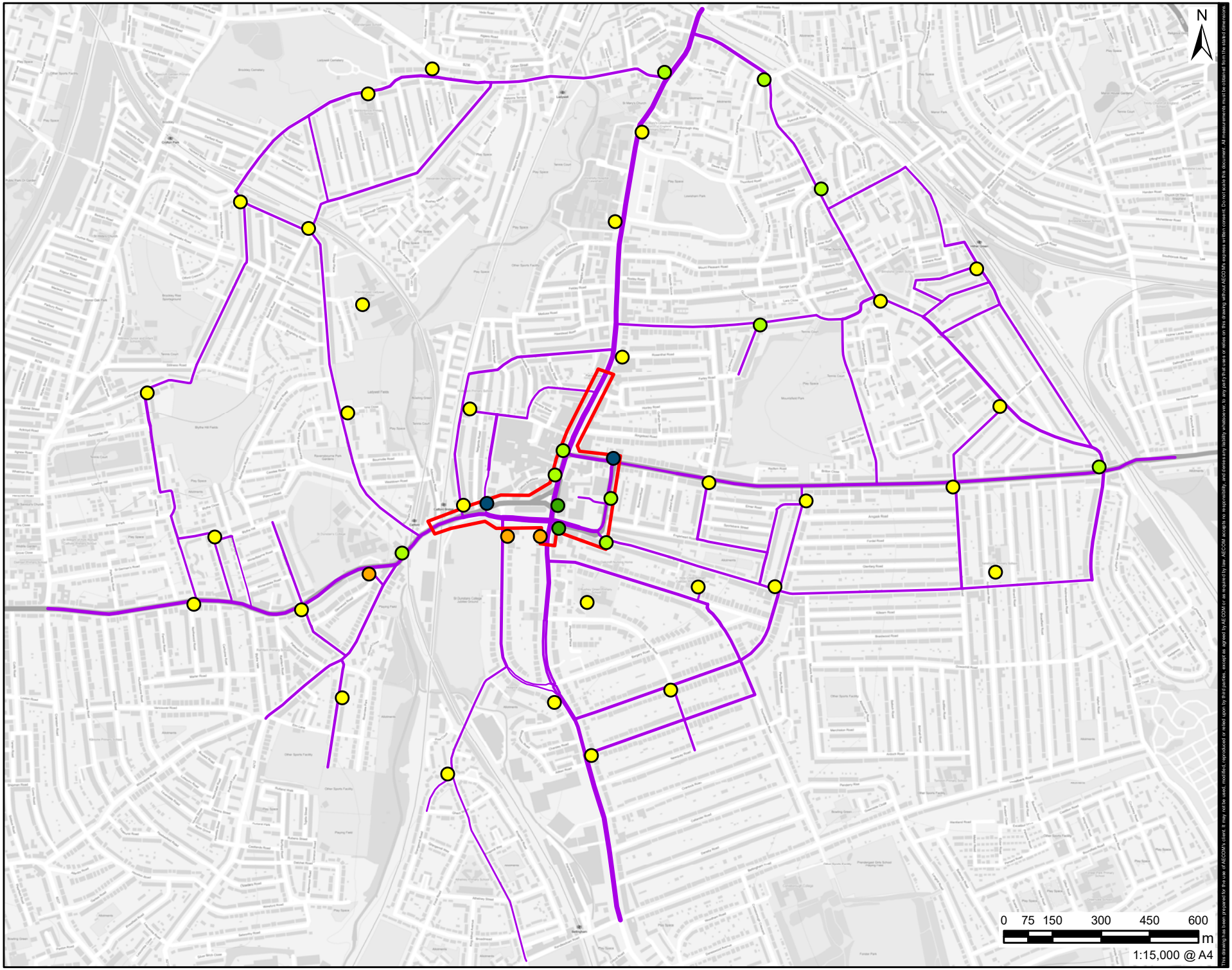
60704426

SHEET TITLE

Annual Mean NO_2 Concentrations in 2026 with the Scheme

SHEET NUMBER

Figure 5



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LEGEND

NO_2 Concentration Change ($\mu g/m^3$)

- -5.0 - -4.0
- -4.0 - -2.2
- -2.2 - -0.2
- -0.2 - 0.2
- 0.2 - 2.2

Modelled Road Network

Catford Town Centre Scheme

NOTES

ISSUE PURPOSE

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PROJECT NUMBER

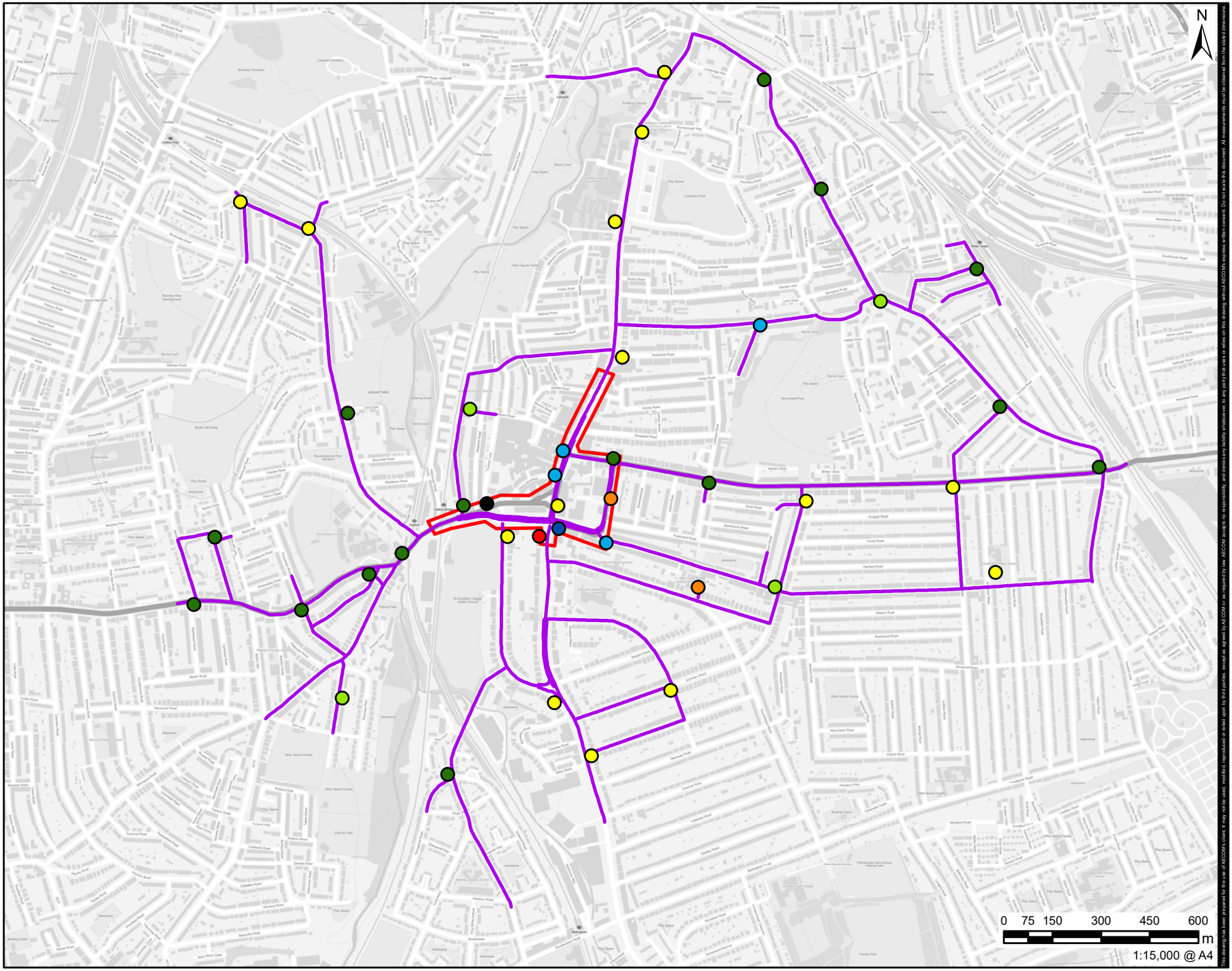
60704426

SHEET TITLE

Change in Annual Mean NO_2 Concentrations in 2026 with and without the Scheme

SHEET NUMBER

Figure 6



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LEGEND

Change in $LA_{10,\ 18h}$(dB)

- < -5
- -4.9 - -3
- -2.9 - -1
- -0.9 - 0
- Equal to 0
- 0 - 0.9
- 1 - 2.9
- 3 - 4.9
- Modelled Road Network
- Catford Town Centre Development

NOTES

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60704426

SHEET TITLE

Modelled change in $LA_{10,\ 18h}$ with and without the scheme

SHEET NUMBER

Figure 7

Appendix B Air Quality Model Verification

8.2 When using modelling techniques to predict concentrations, it is necessary to make a comparison between the modelling results and the monitoring data, to ensure that the model is reproducing actual observations. The accuracy of the future year modelling results are relative to the accuracy of the base year results, therefore greater confidence can be placed in the future year concentrations if good agreement is found for the base year.

8.3 Modelling results are subject to systematic and random error; such errors arise due to many factors, such as uncertainty in the traffic data and the composition of the vehicle fleet, and uncertainty in the meteorological dataset. This can be taken into account by factoring the modelled results against monitoring data.

8.4 This process is referred to as model verification. The first step of which is to consider the performance of the model, prior to any adjustment, by comparing modelled and measured total NO_2 concentrations predicted and gathered at the same locations.

8.5 From these sites, only those representative of modelled sensitive receptor locations and with sufficient data capture were considered suitable for the purposes of model verification. Following detailed analysis of each monitoring location a total of five monitoring sites were taken forward in the model verification process. Table 15 details the sites removed from the verification process, whilst Table 16 details the sites used in verification.

Table 15. Monitoring sites excluded from model verification

Site ID	Reason for exclusion from verification
L22	On a road not present within the traffic model
L50	On a lamppost under an overhanging tree
L47	On a road not present within the traffic model

Table 16. Monitoring sites used in model verification

Site ID	Site location
LW1	Ringstead Road
L23	Catford Hill
L29	Sangley Road
L48	Doggett Road
L51	Brownhill Road

8.6 Following Defra's Technical Guidance LAQM.TG(22), model performance was analysed at these five monitoring sites. It was found that three sites had modelled NO_2 concentrations which underpredicted the monitored concentrations by more than 25%, and the fractional bias (a statistic indicating the tendency of the model to over-predict or under-predict concentrations) was 0.2, indicating a tendency to under-predict. Therefore, an adjustment factor was calculated to bring modelled concentrations into line with the monitored data. The adjustment factor calculated was a factor of 2.82. A factor of this magnitude of is consistent with other similar roads assessments.

8.7 The factor was applied to modelled road NO_X contributions as summarised in Table 17 and following adjustment, no locations showed modelled NO_2 concentration greater than +25% of

the corresponding monitored concentrations. LAQM.TG(22) indicates that an RMSE within 10% of the AQO (4 µg/m^3) is ideal; the model performance is the therefore considered to be robust.

Table 17. Verification Details

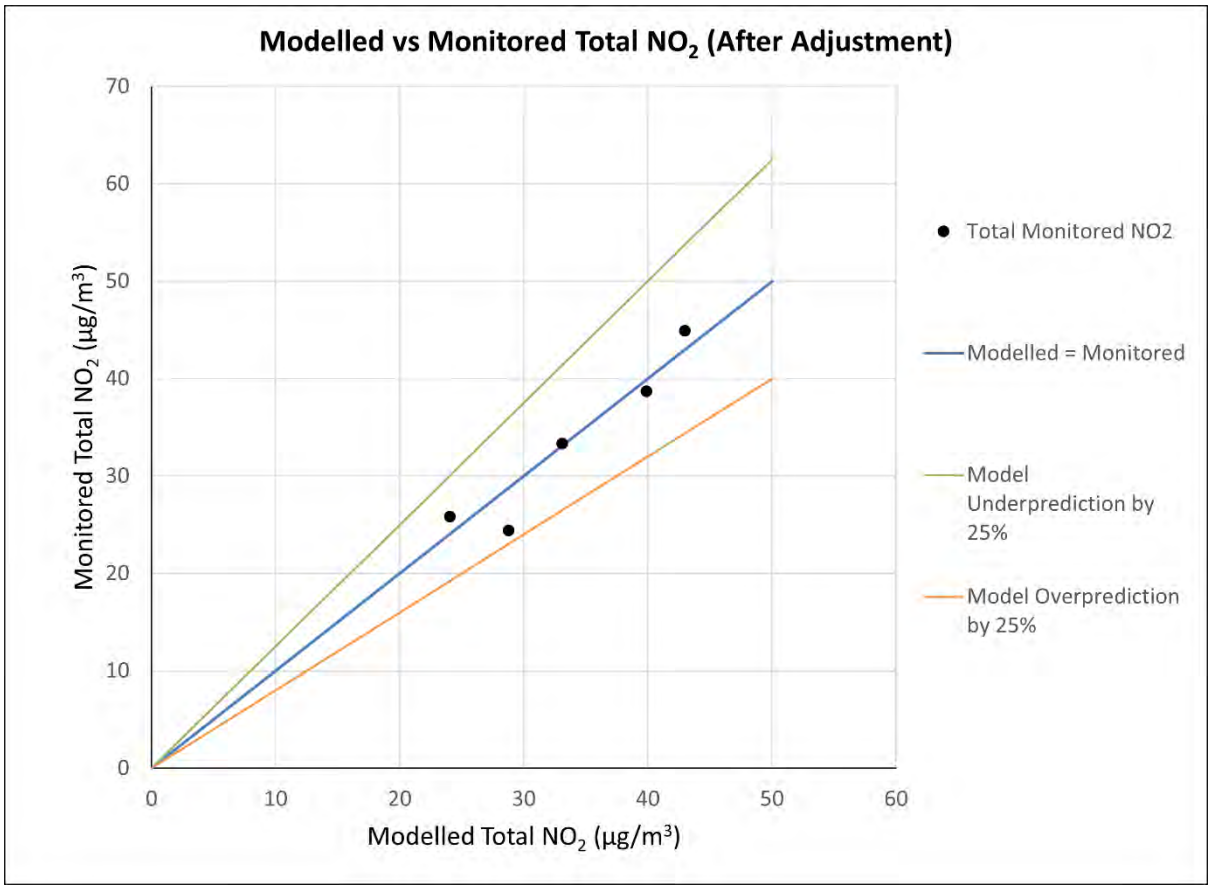
Number of Sites	Number of Monitoring Sites within ±10% of the Monitored Concentration Pre-Adjustment	RMSE pre-adjustment (µg/m^3)	Fractional Bias pre adjustment)	Model Adjustment Factor	Number of Sites within ±10% of the Monitored Concentration Post Adjustment	RMSE post adjustment (µg/m^3)	Fractional Bias post adjustment)
5	1	7.8	0.2	2.82	4	2.3	0.0

The relationship between modelled and monitored NO_2 before and after adjustment at each monitoring site is shown in Table 18.

Table 18. Monitoring Data used in Model Verification

Site	Monitored total NO_2 (µg/m^3)	Monitored Road NO_X (µg/m^3)	Modelled Adjusted Road NO_X (µg/m^3)	Modelled Total NO_2 Before Adjustment (µg/m^3)	Modelled Total NO_2 After Adjustment (µg/m^3)
LW1	33.3	27.7	9.7	25.1	33.1
L23	38.7	40.6	15.4	27.8	39.9
L29	24.4	9.0	6.5	23.2	28.8
L48	25.8	11.1	2.6	21.7	24.1
L51	44.9	57.5	18.6	28.9	43.0

Figure 8. Modelled vs Monitored Total NO_2 (After Adjustment)



Appendix C Data and Assumptions

Data Provided

- 2022 OS mapping files from MasterMap® including TOPO layer from TfL in March 2023;
- AddressBase® layer with building points and uses provided by TfL in March 2023;
- Road scheme layout provided by TfL in pdf and .DWG format in March 2023; and
- AM, IP and PM peak traffic data from HAM model extracted by AECOM in April 2023 for a base year of 2016 and 2026 for a future-base (DM) and sensitivity case (DS).

Air Quality Assumptions

- Traffic data converted to 24-hour AADT format based on existing traffic count data in the study area provided by TfL and DfT.
- 2016 traffic data used for a 2019 base assessment year. No traffic growth applied following discussion with TfL.
- NOx, PM_{10} and $PM_{2.5}$ and CO_2 vehicle emission factors assumed for 2019 for base and 2026 for opening year as per information in Defra's latest Emissions Factors Toolkit v11.0;
- Background NOx, NO_2, PM_{10} and $PM_{2.5}$ concentrations for the year 2019 and 2026 taken from Defra's 2018-based background maps unadjusted based on comparison with local monitoring data;
- Residential accommodation is assumed for ground floor (1.5m height); and
- The assessment is based on traffic on roads modelled within the HAM model. As this is a strategic model it does not include all minor roads in the area, so these have not been included in the air quality model.

Noise Modelling Assumptions

- Traffic data converted to 18-hour AAWT format based on existing traffic count data in the study area provided by TfL and DfT.
- Ground conditions taken from available OS mapping where manmade and water ground types are set to hard ground and natural ground types are set to soft ground.
- Road surface correction: all traffic speeds in the study area less than 75 km/h, therefore road surface correction of -1 dB applied to all roads in accordance with guidance in DMRB LA111 and CRTN for impervious road surfaces.
- Buildings where heights have been provided the height has been set accordingly. For all buildings where heights are not available the building heights have been set to 8m. Visual checks were made on receptors to correct them to a height which was seen as more representative of the true building height with the correct number of floors.
- The assessment is based on traffic on roads modelled within the HAM model. As this is a strategic model it does not include all minor roads in the area, so these have not been included in the noise model.