Brook Cottage Consultants
Specialists in Air Quality

Somers Town Neighbourhood Plan

Air Quality

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Contents

1 Introduction

1.1 Background

This report has been prepared on behalf of University College London for the Somers Town Neighbourhood Forum (STNF) to inform the development of a Neighbourhood Plan for the area. It provides information on planning and air quality legislation and policy at the national and local levels; a short introduction to air quality and a summary of local air quality data. The air quality assessments in Somers Town are reviewed with the aim of learning how they can be improved in the future.

In recent years there have been a number of major developments in Somers Town. These include the Frances Crick Institute (completed in August 2016); Central Somers Town Community Investment Programme (CIP) (under construction), the Phoenix Court Energy Centre(currently being expanded), and the Maria Fidelis Catholic School (under construction). The redevelopment of Euston Station may include high rise buildings along Eversholt Street which may impact on air quality through reducing the dispersion of the traffic emissions. Finally, British Library has announced its plans to develop its 2.8 Ha site to the north of the existing.

There has been major construction works undertaken to the north east of Somers Town at Argent's King's Cross regeneration area and to the west of Somers Town close to Euston Station as part of the High Speed Two (HS2). HS2 traffic is also predicted to have an adverse impact on the dispersion of air quality around Somers Town.

Additionally, CrossRail 2, should it go ahead, would have a station under Somers Town with ventilation shafts in Drummond Crescent and the British Library lands.

There is local concern that the cumulative impacts of these developments is causing air quality in Somers Town to deteriorate.

This report has been prepared to help inform the developing Somers Town Neighbourhood Plan. Somers Town lies between Euston and St Pancras stations, north of the Euston Road and south of Mornington Crescent and St Pancras hospital. The area covered by the Neighbour Plan is shown in Figure 1.

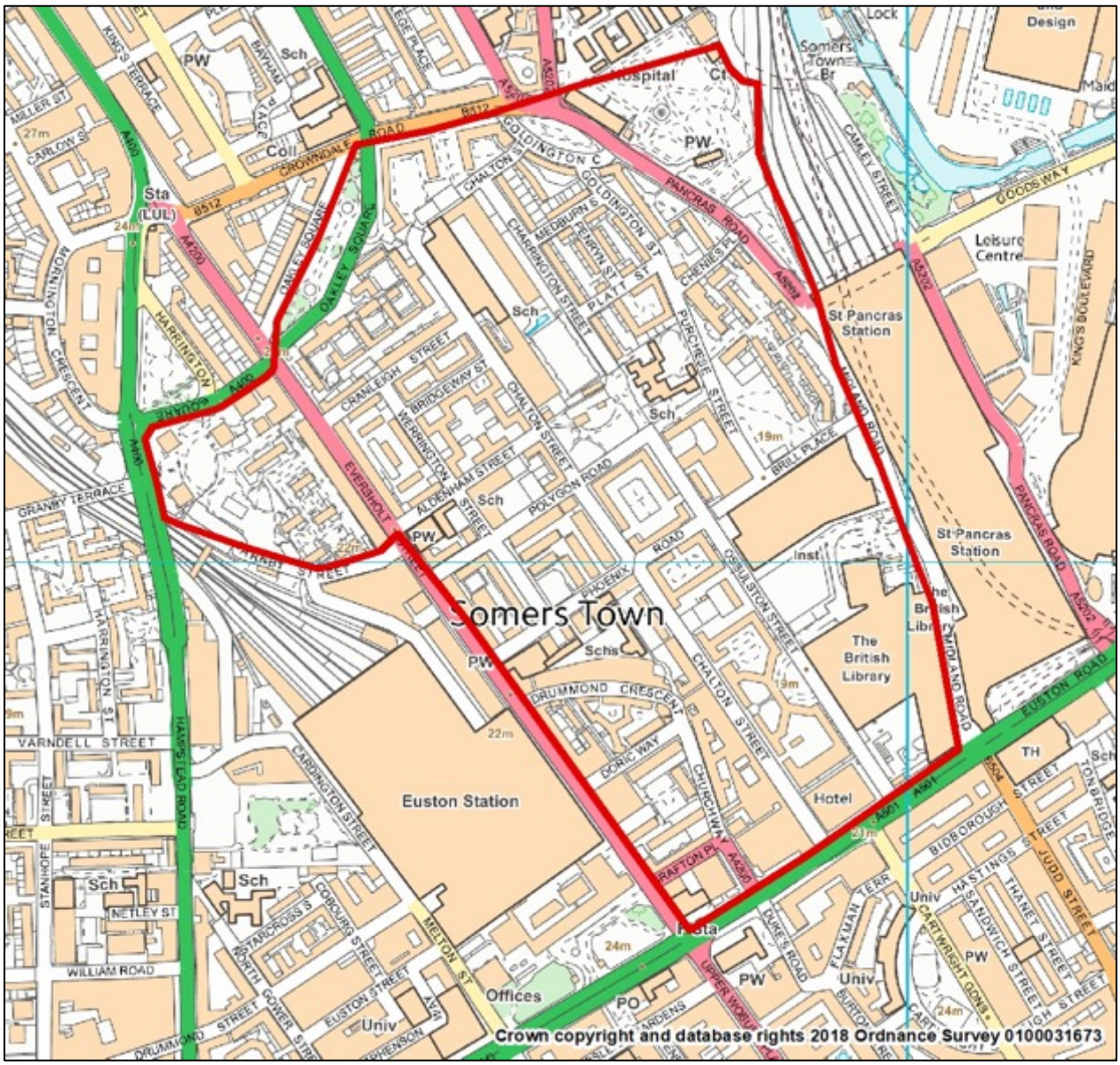


Figure 1: Somers Town Neighbourhood Plan Area

1.2 Scope of the report

This report covers the following:

a. Planning and air quality legislation and policy

b. Background on air quality

c. A review of the existing air quality data for Somers Town

d. The air quality assessments (AQAs) undertaken for the recent major developments

2 Planning policy and guidance

2.1 Introduction

Relevant planning policy is described in this section to provide the context for the consideration of air quality in Somers Town to inform the development of the Somers Town Neighbourhood Plan

2.2 National Policy

Planning law requires that applications for planning permission be determined in accordance with the policies contained within the development plan, unless material considerations indicate otherwise. The relevant development plans are the London Plan[1] and the Camden Local Plan[2]. A Somers Town Neighbourhood Plan, if adopted, would also be considered a development plan.

The National Planning Policy Framework (NPPF)[3] must be taken into account in preparing the development plan, and is a material consideration in planning decisions. Planning policies and decisions must also reflect relevant international obligations and statutory requirements.

A new NPPF was published in July 2018. It sets out what should be in a Neighbourhood Plan, for example, it should support the delivery of strategic policies contained in the London and Camden Plans; and should shape and direct development that is outside of these strategic policies. This includes the allocation of housing.

When making decisions the planning system requires the decision makers to consider the pros and cons of a proposal. Historically, air quality has been given a low priority, but with increased awareness of the health effects of poor air quality, more developments are being rejected due to air pollution.

The NPPF has relatively little to say about pollution, and air pollution in particular. Paragraph 181 states:

> 181. *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.*

The Government provides further information on considering air quality in the planning system in its Planning Practice Guidance[4]. This notes that air quality may be relevant to a planning decision when the development would:

[1] https://www.london.gov.uk/what-we-do/planning/london-plan/current-london-plan
[2] Camden Council Camden local Plan 2017, https://www.camden.gov.uk/ccm/cms-service/stream/asset/?asset_id=3681698&
[3] Ministry of Housing, Communities & Local Government, National Planning Policy, July 2018
[4] www,planningguidance.planningportal.gov.uk/blog/guidance/air-quality/when-could-air-quality-be-relevant-to-a-planning-decision/. Dated 6 March 2014.

- *Significantly affect traffic in the immediate vicinity of the proposed development site or further afield. This could be by generating or increasing traffic congestion; significantly changing traffic volumes, vehicle speed or both; or significantly altering the traffic composition on local roads. Other matters to consider include whether the proposal involves the development of a bus station, coach or lorry park; adds to turnover in a large car park; or result in construction sites that would generate large Heavy Goods Vehicle flows over a period of a year or more.*
- *Introduce new point sources of air pollution. This could include furnaces which require prior notification to local authorities; or extraction systems (including chimneys) which require approval under pollution control legislation or biomass boilers or biomass-fuelled CHP plant; centralised boilers or CHP plant burning other fuels within or close to an air quality management area or introduce relevant combustion within a Smoke Control Area;*
- *Expose people to existing sources of air pollutants. This could be by building new homes, workplaces or other development in places with poor air quality.*
- *Give rise to potentially unacceptable impact (such as dust) during construction for nearby sensitive locations.*
- *Affect biodiversity. In particular, is it likely to result in deposition or concentration of pollutants that significantly affect a European-designated wildlife site, and is not directly connected with or necessary to the management* of the site, or *does it otherwise affect biodiversity, particularly designated wildlife sites.*

It provides little detailed guidance on how to undertake an air quality assessment (AQA). Statutory guidance is provided by the Mayor of London[5], and non-statutory guidance by Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM)[6] described later in this chapter.

2.3 London Plan

The London Plan[7] includes Policy 7.14 on improving air quality. This is reproduced below.

Policy 7.14

Strategic

A. The Mayor recognises the importance of tackling air pollution and improving air quality to London's development and the health and well-being of its people. He will work with strategic partners to ensure that the spatial, climate change, transport and design policies of this plan support implementation of his Air Quality and Transport strategies to achieve reductions in pollutant emissions and minimize public exposure to pollution.

Planning decisions

B Development proposals should:

[5] London Local Air Quality Management (LLAQM) Policy Guidance 2016 (LLAQM.PG .16) and Technical Guidance 2016 (LLAQM.TG.16.

[6] London Local Air Quality Management (LLAQM) Policy Guidance 2016 (LLAQM.PG (16)).

[7] The London Plan; the spatial development strategy for London consolidated with alterations since 2011, March 2016, https://www.london.gov.uk/what-we-do/planning/london-plan/current-london-plan

a minimise increased exposure to existing poor air quality and make provision to address local problems of air quality (particularly within Air Quality Management Areas (AQMAs) and where development is likely to be used by large numbers of those particularly vulnerable to poor air quality, such as children or older people) such as by design solutions, buffer zones or steps to promote greater use of sustainable transport modes through travel plans (see Policy 6.3).

b promote sustainable design and construction to reduce emissions from the demolition and construction of buildings following the best practice guidance in the GLA and London Councils 'The control of dust and emissions from construction and demolition'.

c is at least 'air quality neutral' and not lead to further deterioration of existing poor air quality (such as areas designated as Air Quality Management Areas (AQMAs).

d. *ensures that where provision needs to be made to reduce emissions from a development, this is usually made on-site. Where it can be demonstrated that on-site provision is impractical or inappropriate, and that it is possible to put in place measures having clearly demonstrated equivalent air quality benefits, planning obligations or planning conditions should be used as appropriate to ensure this, whether on a scheme by scheme basis or through joint area-based approaches.*

e where the development requires a detailed air quality assessment and biomass boilers are included, the assessment should forecast pollutant concentrations. Permission should only be granted if no adverse air quality impacts from the biomass boiler are identified.

LDF preparation

C Boroughs should have policies that:

a. seek reductions in levels of pollutants referred to in the Government's National Air Quality Strategy having regard to the Mayor's Air Quality Strategy.

b. take account of the findings of their Air Quality Review and Assessments and Action Plans, in particular where Air Quality Management Areas have been designated.

The Mayor of London is preparing a new London Plan. It has yet to undergo examination in public and therefore is unlikely to be adopted for some time. The draft London Plan with minor suggested changes, published on 13 August 2018 contains the following policy on air quality:

Policy SI1 Improving air quality

A London's air quality should be significantly improved and exposure to poor air quality, especially for vulnerable people, should be reduced:

1) development proposals should not: a) lead to further deterioration of existing poor air quality b) create any new areas that exceed air quality limits, or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits c) reduce air quality benefits that result from the Mayor's or boroughs' activities to improve air quality d) create unacceptable risk of high levels of exposure to poor air quality.

2) development proposals should use design solutions to prevent or minimise increased exposure to existing air pollution and make provision to address local problems of air quality. Particular care should be taken with developments that are in Air Quality Focus Areas or that are likely to be used by large numbers of people particularly vulnerable to poor air quality, such as children or older people.

3) *the development of large-scale redevelopment areas, such as Opportunity Areas and master plans and development briefs for large-scale development proposals subject to an Environmental Impact Assessment should propose methods of achieving an Air Quality Positive approach through the new development. All other developments should be at least Air Quality Neutral.*

3A) *major development proposals must be at least air quality neutral and be submitted with an Air Quality Assessment.*

4) *development proposals must demonstrate how they plan to comply with the Non-Road Mobile Machinery Low Emission Zone and reduce emissions from the demolition and construction of buildings following best practice guidance [115].*

5) *Air Quality Assessments (AQAs) should be submitted with all major developments, unless they can demonstrate that transport and building emissions will be less than the previous or existing use.*

6) *development proposals should ensure that where emissions need to be reduced, this is done on-site. Where it can be demonstrated that on-site provision is impractical or inappropriate, off-site measures to improve local air quality may be acceptable, provided that equivalent air quality benefits can be demonstrated.*

2.4 Camden Council

The most recent Camden Local Plan was adopted by the Council on 3 July 2017[8]. Policy CC4 on air quality states:

> *The Council will ensure that the impact of development on air quality is mitigated and ensure that exposure to poor air quality is reduced in the borough.*
>
> *The Council will take into account the impact of air quality when assessing development proposals, through the consideration of both the exposure of occupants to air pollution and the effect of the development on air quality. Consideration must be taken of the actions identified in the Council's Air Quality Action Plan.*
>
> *Air Quality Assessments (AQAs) are required where development is likely to expose residents to high levels of air pollution. Where the AQA shows that a development would cause harm to air quality, the Council will not grant planning permission unless measures are adopted to mitigate the impact. Similarly, developments that introduce sensitive receptors (i.e. housing, schools) in locations of poor air quality will not be acceptable unless designed to mitigate the impact.*
>
> *Development that involves significant demolition, construction or earthworks will also be required to assess the risk of dust and emissions impacts in an AQA and include appropriate mitigation measures to be secured in a Construction Management Plan.*

Camden planning guidance

Camden Council adopted in March 2018 two planning guidance documents that relate to air quality. The first on amenity includes the need for major developments, and some smaller developments, to have construction management plans to reduce impacts on the local community during construction

[8] London Borough of Camden, Camden Local Plan 2017. https://www.camden.gov.uk/ccm/cms-service/stream/asset/?asset_id=3681698&

works. These should include input from the Principal Contractor and the draft should undergo neighbourhood consultation prior to submission to the Council.

The second document is on health and wellbeing. The local plan requires a health impact assessment (HIA) to be undertaken for major developments. It notes that where an AQA has been undertaken, this should not be repeated in the HIA, but reference should be made to it.

Camden Council does not currently produce planning guidance specifically on air quality.

2.5 Non-statutory guidance

Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) produce non-statutory guidance on how air quality should be addressed the planning system.[9] This provides advice on when an AQA is required and how to assess the significance of the impacts. This guidance is widely followed by consultants undertaking AQAs and local authorities reviewing them.

Guidance was issued in 2010 by EPUK that incorporated IAQM's 2009 position on the description of air quality impacts and the assessment of their significance. After this had been used for a few years there was concern within the air quality profession that it was not sufficiently stringent, and that very few developments were being refused on air quality grounds. In particular, there was concern regarding 'air quality creep'. That is, the effect of a series of developments, which each were predicted to result a small impact, but overall air quality was deteriorating.

The 2015 guidance contained more stringent requirements for assessing the significance of the impacts on air quality. To assess the overall significance of the effects of proposed developments the guidance requires the following factors to be taken into account:

- the existing and future air quality in the absence of the development;
- the extent of current and future population exposure to the impacts; and
- the influence and validity of any assumptions adopted when undertaking the prediction of impacts.

Other factors may be relevant in individual cases.

Minor modifications to the 2105 guidance were made in 2017.

IAQM also produce non-statutory guidance on the assessment of construction impacts, construction monitoring, odour assessment, and dust from mineral sites for use in the planning process[10].

[9] EPUK & IAQM, 2017, Land-Use planning & development control: planning for air quality, www.iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf.
[10] http://iaqm.co.uk/guidance/

3 Air quality legislation and policy

3.1 European Union Air Quality Directive

The Air Quality Directive[11] sets out a series of air quality limit values, with information on how to assess compliance and where the limits apply. The limit values for the protection of human health applies at all locations except:

a. Any locations situated within areas where members of the public do not have access and there is no fixed habitation;

b. Where health and safety at work provisions apply; and

c. In the carriageway of roads, and on the central reservation of roads except where there is normally pedestrian access to the central reservation

The EU limit values are mandatory and those for nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$)[12] are shown in table 3.1. These are the pollutants considered to be of most concern.

Table 3.1 EU Air quality limit values for NO_2 and PM

Pollutant	Time Period	Limit Value	Date to be achieved
Nitrogen Dioxide (NO_2)	1-hour Mean	200 µg/m^3 Not to be exceeded more than 18 times a year	1 January 2010
	Annual Mean	40 µg/m^3	
Fine Particles (PM_{10})	24-hour Mean	50 µg/m^3 Not to be exceeded more than 35 times a year	1 January 2005[13]
	Annual Mean	40 µg/m^3	
Fine Particles ($PM_{2.5}$)	Annual Mean	25 µg/m^3	1 January 2015
		20 µg/m^3	1 January 2020

For $PM_{2.5}$ the Directive also sets a national exposure reduction target which, for the UK, is 15% reduction of 2010 levels by 2020, measured at urban background sites.

[11] Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe.

[12] PM_{10} is generally defined as particles with a diameter of less than 10 microns (µm); $PM_{2.5}$ is defined as particles with a diameter of less than 2.5 µm.

[13] These deadlines for compliance waswere originally set under Council Directive 1999/30/EC of 22 April 1999 relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air.

The Air Quality Standards Regulations 2010 implement the Directive into UK legislation. Defra is the competent authority responsible for ensuring compliance with the requirements in England and reporting compliance for the whole of the UK to the European Commission.

The most recent compliance report[14] states that the UK:

- met the limit value for hourly mean NO_2 in all but two zones;
- Only six zones were compliant with the annual mean NO_2 limit value. The remaining 37 exceeded this limit value;
- All zones met the limit value for daily mean and annual mean concentrations of PM_{10};
- All zones met the and limit values value for annual mean concentrations of $PM_{2.5}$[15].; and
- All zones met the EU limit values for sulphur dioxide, carbon monoxide, lead and benzene.

Where a limit value is exceeded beyond the compliance date the Member State must produce a plan showing how the limit value will be achieved as soon as possible. The UK Government has produced three plans since the NO_2 limit value was due to be achieved in 2010. The 2011, 2015 and 2017 national air quality plans have all been successfully challenged in the courts by ClientEarth, an environmental group. The modelling in the 2015 plan was found to overly optimistic as it did not take into account the latest information on emissions of nitrogen oxides (NOx) from diesel vehicles.

Defra is responsible for determining compliance with the limit values. It does this through a combination of measurements and modelling. The modelling covers over 9,000 road links in the UK, and does not take into account of local factors which might influence air quality.

3.2 London Local Air Quality Management (LLAQM)

Part IV of the Environment Act 1995 requires the UK Government to publish an Air Quality Strategy and local authorities to review, assess and manage air quality within their areas. The latter has become known as Local Air Quality Management (LAQM).

The latest Strategy, published in 2007, sets a series of air quality objectives (AQOs). It defines 'standards' as a set of concentrations below which effects are unlikely even in sensitive population groups, or below which risks to public health would be exceedingly small. They are based purely upon the scientific and medical evidence of the effects of an individual pollutant.

It states 'objectives' set out the extent to which the Government expects the 'standards' to be achieved by a certain date.

The AQOs included as part of LAQM are prescribed in the Air Quality (England) Regulations 2000 and the Air Quality (Amendment) (England) Regulations 2002. The AQO values for nitrogen dioxide (NO_2) and particulate matter (PM_{10}) are the same as those in the Air Quality Directive (see Table 3.1) but they were to be achieved earlier, by 31 December 2005 and 31 December 2004 respectively. The AQO for $PM_{2.5}$ is the same as the Stage 1 limit value in the Directive, but was to have been achieved by 2020[16]. The EU limit value has to be achieved by 2015, but was not agreed until after the national

[14] Defra, Air Pollution in the UK 2016 Compliance Assessment Summary. September 2017.

[15] Target value (25μg/m^3) to be met by 1 January 2010; Stage 1 limit value (25 μg/m^3) to be met by 1 January 2015; Stage 2 limit value (20 μg/m^3) must be met by 1 January 2020.

[16] PM_{10} and $PM_{2.5}$ are defined as particulate matter which passes through a size-selective inlet with a 50% efficiency cut-off at 10 microns and 2'5 micros respectively.

strategy was published. This pollutant is not included within LLAQM, although local authorities are encouraged to consider it.

Local authorities are required to work towards achieving the AQOs, but are not statutorily required to achieve them. This recognises that measures are required at the national and international levels as well as locally to control air pollution. If a local authority's review and assessment shows that a AQO may not be achieved it must declare an Air Quality Management Area (AQMA) and produce an Air Quality Action Plan.

In 2016 it was agreed between Defra and the Mayor of London that the guidance for LAQM for London should be different from that in the rest of the country in recognition of the particular challenges Greater London faces. Policy[17] and Technical[18] Guidance for London LAQM (LLAQM) was issued by the Mayor of London in May 2016.

The AQOs apply to external air where there is exposure to the public over the relevant averaging periods. Examples of where the AQOs apply are provided in the LLAQM Technical Guidance. The AQOs do not apply in workplaces, inside buildings or where people are unlikely to be regularly exposed (i.e. centre of roadways).

The LAQM regime and compliance with the EU limit have been kept as separate processes despite the limit values and the AQOs being numerically the same, and both air quality management systems aim to protect human health.

3.3 Mayor's Environment Strategy

The Mayor of London has a very ambitious strategy to improve the environment[19], including air quality. The London Environment Strategy (LEN) was published in May 2018, and replaces the previous Mayor's Air Quality Strategy, published in 2010.

The Mayor's aim is for London to have the best air quality of any major world city by 2050.

This includes:

- reducing exposure of Londoners to harmful pollution across the capital – especially at priority locations like schools – and tackling health inequality;
- achieving legal compliance with UK and EU limits as soon as possible, including by mobilising action from the London boroughs, government and other partners; and
- establishing and achieving new, tighter air quality targets for a cleaner London, meeting World Health Organization (WHO) health-based guidelines[20] by 2030 by transitioning to a zero[21] emission[22] London.

[17] London Local Air Quality Management (LLAQM) Policy Guidance 2016 (LLAQM.PG (16)).
[18] London Local Air Quality Management (LLAQM) Technical Guidance 2016 (LLAQM.TG (16)).
[19] London Environment Strategy, Mayor of London. May 2018. https://www.london.gov.uk/what-we-do/environment/london-environment-strategy
[20] The WHO guidelines for $PM_{2.5}$ and PM10 are 10 µg/m^3 and 20 µg/m^3 respectively. WHO are currently reviewing their air quality guideline for NO_2 and other pollutants.
[21] The term zero emission refers to the exhaust emissions, there will continue to be non-exhaust emissions from road traffic.
[22] Zero emission refers to exhaust emission and does not include non-exhaust emissions from road traffic due to the wear of brakes, tyres and road surfaces.

To reduce emissions from transport the Mayor is committed to phasing out of fossil fuels, especially diesel, and encourage the take up of zero emission vehicles and a shift to more sustainable travel like walking, cycling or public transport throughout London. He has set the following targets:

- all taxis and private hire vehicles to be zero emission capable by 2033;
- all TfL buses to be zero emission by 2037;
- all newly registered road vehicles driven in London to be zero emission by 2030; and
- London's entire transport system to be zero emission by 2050.

Regarding land use planning, the LEN proposes that the emerging London Plan encourage new developments to take into account local air quality so they are suitable for their use and location. The LEN includes a policy to phase out the use of fossil fuels to heat and cool London's buildings to reduce the impact of building emissions on air quality

The current London Plan requires new developments to be air quality neutral. The emerging London Plan includes a policy requiring new large scale developments in London to be air quality positive, by, for example, the provision of low or zero emission heating and energy, green infrastructure, improvements to the public transport, walking and cycling infrastructure.

The Mayor will use the LLAQM regime to assist boroughs and require them to exercise their statutory duties to improve air quality and will exercise his statutory powers as required.

The Mayor has declared nearly 200 air quality focus areas in London. These are locations where there is both poor air quality and high exposure. There is a focus area along the Euston Road and another to the north of Somers Town.

3.4 Camden Council

Camden Council declared the whole borough an air quality management area (AQAM) due to high levels of NO_2 and PM_{10} in September 2000. Whilst the Council are currently meeting the AQOs for $PM_{10,}$ Camden (and the majority of London) continues to fail to meet the AQOs for NO_2.

The Council adopt in January 2018 the more stringent World Health Organization (WHO) guidelines for PM with a target compliance data of 2030[23].

Camden Council air quality action plan 2016-2018[24] sets out the air quality issues and opportunities in Camden, and includes over 60 actions grouped under the following themes:

- Reducing transport emissions;
- Reducing emissions associated with new development;
- Reducing emissions from gas boilers and industrial processes;
- Air quality awareness-raising initiatives; and
- Lobbying and partnership working.

Progress of the action plan is reviewed annually.

[23] London Borough of Camden, Air quality in Camden – Update to full Council, Summary of report, 26 February 2018.
[24] Camden Council, Camden's Clean Air Action Plan 2016-2018,

A new Action Plan - the Clean Air Action Plan 2019-2022 (CAAP) - has been prepared. To align with the Council's commitment to target WHO guidelines by 2030, the new plan will be the first of three four-year plans to 2030. Consultation on the draft CAAP is due to commence soon.

Headline actions from the draft CAAP for reducing emissions from significant infrastructure projects, such as HS2, are:

- enforcing Non-road mobile machinery (NRMM) at construction sites;
- ensuring construction emissions are reduced;
- ensuring all medium and high-risk sites have a demolition management plan (DMP) and a construction management plan (CMP)
- ensuring all medium and high-risk sites have real-time PM monitoring and that the information from this monitoring is easily accessible to the public; and
- enforcing HS2 assurances with respect to air pollution and green space.

To reduce building emissions the draft CAAP includes:

- Promoting and enforcing smoke control legislation;
- Promoting and delivering energy efficiency retrofitting projects in workplaces and homes;
- Enforcing Air Quality Neutral and Air Quality Positive policies for new developments;
- Ensuring adequate, appropriate and well-located green space and infrastructure is included in new and existing developments;
- master planning and major regeneration areas such as the Kentish Town Goods Area are zero combustion low emission zones; and
- Continue to control emissions from permitted process via inspections and enforcement.

To reduce transport emissions the draft CAAP includes:

- Installing Ultra Low Emission Vehicle (ULEV) infrastructure (regular and rapid EV charge points);
- Improving walking and cycling infrastructure;
- Reducing emissions from Council fleets, with a fully low emission fleet targeted by 2022;
- Discouraging unnecessary idling by taxis and other vehicles;
- Using parking policy to encourage a switch to lower emitting vehicles; and
- Opening the Council's compressed natural gas facility at York Way to the public

The Council engaged King's College London to model future pollution levels in Camden by 2030 and then test how the quantifiable measures within the draft plan would assist in helping meet WHO the guidelines. The study found that NO_2 concentrations in Camden will be within the UK national air quality objective and WHO air quality guideline at almost all locations by 2030. In contrast, PM_{10} and $PM_{2.5}$ concentrations are expected to rise from existing levels and to exceed the WHO guidelines at all locations, although they would remain in compliance with national air quality objectives.

By far the largest contributor to the modelled concentrations of both PM_{10} and $PM_{2.5}$ in 2030 is the 'background' source, which includes emission sources outside Camden and which contributes 60-75% of PM_{10}, and 65-80% of $PM_{2.5}$. Initial assessments have suggested that with the CAAP measures

the concentrations of NO_2, PM_{10} and $PM_{2.5}$ are reduced at all locations but remain above WHO guidelines for PM.

4 Air quality

4.1 Sources of air pollution

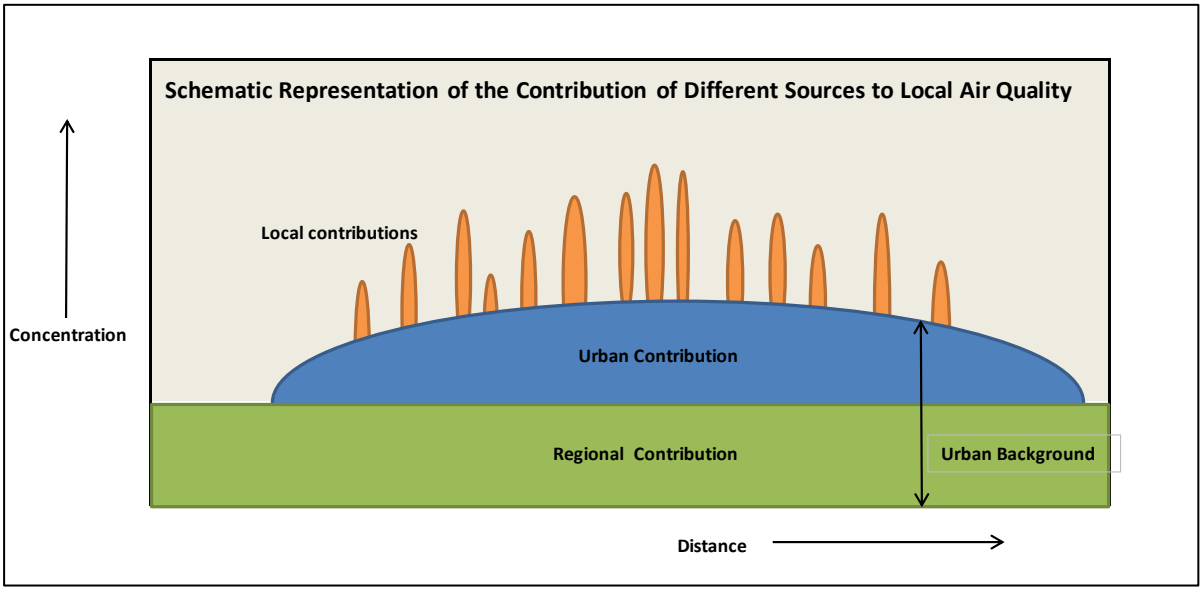
UCL has provided STNF with information on the sources of pollution in Somers Town. This data, extracted from the Mayor's London Atmospheric Emission Inventory (LAEI), shows that for nitrogen oxides (NOx)[25] road traffic is the overwhelming source (82%). For $PM_{2.5}$ the main source is also traffic (62%), while for PM_{10} traffic (53%) and the resuspension of particles from roads and surfaces (27%) are the main sources. It should be noted that the LAEI provides information for 1 km by 1 km grids across London and that these grids do not correspond directly to the STNP area. The data, however, give a good indication of the main local sources of pollution.

According to the London Environment Strategy, London's NOx emissions fell by 25 percent, PM_{10} by 20 per cent and $PM_{2.5}$ by 27 percent between 2008 and 2013, and there is evidence that air pollution is generally improving, albeit slowly and not in all locations.

Emission inventories only provide a partial picture of the contribution from different sources of pollution. Air coming into London already contains air pollution, picked up as it travels over urban and industrial areas, and for some pollutants, formed in the air. As air crosses London more air pollution is picked up but some will also be lost through chemical reactions, deposition to the ground or washed out by the rain.

Figure 4.1 is a schematic representation of the contributions from sources at the regional, city-wide and local scales. The relative contribution will depend on the pollutant and local conditions.

Figure 4.1 Schematic representation of the contribution of different sources to local air quality



[25] NOx is a mixture mainly of nitrogen monoxide (NO) and nitrogen dioxide (NO_2). When discussing emissions the term NOx is used, but when discussing air quality the term NO_2 is used as this is the component of NOx associated with adverse health effects.

Sources outside London make up nearly half (48 percent) of the contribution to the estimated death risk from long-term exposure to $PM_{2.5}$ in London as a whole. It is also responsible for the majority of health effects associated with short-term exposure. Even if all local emissions sources were removed, nearly half the health effects of London's air pollution would still occur[26].

4.2 Vehicle emissions

The main reason why the EU annual mean NO_2 limit value is widely exceeded in the UK, and elsewhere, is that NOx emissions from diesel vehicles did not, over a period of nearly two decades, fall as expected. Increasingly stringent emission standards have been introduced at the EU level since the early 1990s, but were not effective at reducing emission when vehicles were driven under real world conditions. Vehicles meeting the most recent emissions standards (Euro 6 for cars and vans and Euro VI for buses and lorries) have, however, been shown, on average, to have significantly lower NOx emissions than earlier vehicles[27].

Another issue is that modern diesel vehicles emit a higher proportion of the NOx as NO_2 than older models or petrol vehicles. This has a significant influence on roadside concentrations as the conversion of NO to NO_2 is limited by the amount of ozone available.

Defra produce a series of LAQM tools to enable local authorities to review and assess air quality in their areas. Consultants producing AQAs for new developments also use these tools. These include maps of background concentrations and the Emission Factor Toolkit (EFT) which is used to forecast future emissions from road vehicles. These have been over-optimistic, predicting larger emission reductions than have occurred, resulting in future predictions of NO_2 concentrations often being lower than reality.

There remains uncertainty as to the emissions performance of diesel cars meeting the new real world driving emission limits that first came into effect in September 2017 for new models and from 2019 for all new cars. More stringent requirements come into force from 2020 and 2021. It will be some time before a large number of these vehicles have been independently tested and their emissions understood. It will also be some time before the impacts of degradation of the emission control systems on emissions will be known.

Due to this uncertainty it is good practice to use conservative assumptions regarding future NOx emissions[28]. This may mean assuming no reductions in NOx emissions per vehicle in the future. For very large developments that are unlikely to be completed for many years it is often more appropriate to use an emission factor for half way between the base year and the completion year.

In general, the rate of improvement in vehicle NOx emissions is likely to be greater than the rate of traffic growth. This is because there is good evidence that the most recent diesel vehicles have significantly lower emissions than earlier models[29]. This means that NOx emission will decline in the future. The uncertainty relates to the rate of improvement.

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[26] Mayor of London, 2018, London Environment. https://www.london.gov.uk/what-we-do/environment/london-environment-strategy

[27] E.g. TNO, 2016, The Netherlands In-Service Emissions Testing Programme for Heavy-Duty Vehicles 2015-2016 – Annual report, Report no R1127, Delft**,** & Department for Transport, 2016 Vehicle Emission Programme, Presented to Parliament by the Secretary of State for Transport by Command of Her Majesty, Cmd 9259,

74[28] IAQM, 2018, Dealing with Uncertainty in Vehicle NOx Emissions within Air Quality Assessments July 2018, www.iaqm.co.uk/text/position_statements/uncertainty_vehicle_NOx_emissions.pdf.

[29] This applies to both heavy duty and light duty vehicles.

These uncertainties do not apply to PM emissions from diesel vehicles. Diesel particle filters are very effective at reducing PM emissions and these have been fitted to new vehicles for a number of years to meet the Euro 5 / V emissions standards. The non-exhaust PM emissions from these vehicles, due to the wear of brakes, tyres and road surfaces, exceeds the exhaust emissions.

4.3 Background concentrations

Defra produce estimates of the 'background' concentrations of NO_2 and PM up to the year 2030 for the whole of the UK. These are average concentrations over a 1 km by 1 km area, and as such under-estimate concentrations near to pollution sources such as busy roads. These background concentrations are used with the results of dispersion models to predict air quality.

These are periodically updated to reflect new data, for example, traffic forecasts and vehicle emissions. The background NO_2 concentrations have been updated several times over recent years using a different 'base year'. This refers to the year the model was calibrated, that is, the modelled concentrations were compared with monitoring data and the model results adjusted to the best fit the monitoring data.

Table 4.1 Defra's estimated 2015 and 2018 background NO_2 concentrations (µg/m^3) for the two grids covering Somers Town[30]

Model base year	Grid 529500,183500 (northern part of Somers Town)		Grid 529500,182500 (southern part of Somers Town)	
	2015	**2018**	**2015**	**2018**
2011	37.1	33.0	44.1	39.0
2013	38.5	34.5	45.3	40.3
2015	38.2	33.4	48.2	41.4

Whilst the differences are generally small in the northern part of Somers Town, when concentrations are close to the AQOs the changes in the background are larger and can make the difference between the AQOs being achieved or exceeded.

The LLAQM Technical Guidance states[31] "*To determine background pollutant concentrations, local authorities should use suitable pollution monitoring sites nearby or, if unavailable, the UK background maps*".

One of the problems is that there are not always suitable background monitoring sites, or sites are inappropriately classified. The HS2 monitoring locations in Somers Town are classified as kerbside and roadside locations[32] where local traffic emissions influence the measured concentrations. Background sites are those away from the immediate influence of local sources of pollution and are representative of a wide area. The HS2 monitoring sites are close to the local roads, but there is little traffic on many of these roads (in the absence of construction traffic).

4.4 Dispersion Modelling

The most common dispersion models used in the UK to assess the impacts of proposed developments are part of the Atmospheric Dispersion Model System (ADMS). For point sources (e.g.

[30] https://uk-air.defra.gov.uk/data/laqm-background-home

[31] Paragraph 4.40, Mayor of London, 2016, London Local Air Quality Management (LLAQM) Technical Guidance 2016 (LLAQM.TG (16)).

[32] Kerbside and roadside are defined in LAQM technical guidance as within 1 m of the kerb or 1 to 5 m of the kerb respectively.

boiler emissions) the ADMS model is used, for road traffic emissions the ADMS-Roads model is typically used, although this model can include a small number of point source. Where both ADMS and ADMS-Roads models are used the results can be combined with the background concentrations to provide the total ambient concentrations.

Dispersion models attempt to replicate very complex atmospheric process into number of mathematical equations. Inevitably there are a number of simplifications. The output of the models may undergo further processing. For example, it is common to model NOx concentrations and then convert them to NO_2 concentrations outside the model.

Dispersion models use the dimensions of roads and junctions, locations of receptors, height of street canyons, the height of the discharge from a point sources etc. The models have a number of default input parameters that can be changed to reflect the location conditions. Each modeller will make different assumptions and therefore the outputs will be slightly different.

ADMS-Roads modelled outputs are 'verified' against measured data. That is, a comparison is made with measured data and the model results are corrected to more accurately agree with the measurements. A method to do this is set out in the LLAQM technical guidance. In general ADMS under predicts concentrations especially in urban area.

The LAQM technical guidance states that the predicted results from a dispersion model may differ from measured for the following reasons:

- Estimates of background concentrations;
- Meteorological data uncertainties;
- Uncertainties in source activity data such as traffic flows, stack emissions and emissions factors;
- Model input parameters such as roughness length;
- Model limitations; and
- Uncertainties associated with monitoring data, including locations.

In reality, the differences between modelled and monitored results are likely to be a combination of all of these aspects.

Dispersion modelling is better at predicting long term average concentrations than short term concentrations. Predicting exceedances of the NO_2 1 -hour AQO is not straightforward as concentrations are highly variable year to year depending on the weather and changing traffic emissions.

The modelled results from industrial sources alone are not generally verified because appropriate monitoring around stacks is generally not available. The location at which peak concentrations are predicted will vary from year to year, due to changes in meteorological conditions.

When assessing the impact of a new development on air quality it is important that the assessor has a good understanding of the uncertainties in the model results and that these are taken into consideration when making a conclusion as to whether a predicted impact is significant or not.

5 Air quality in Somers Town

5.1 Introduction

Somers Town benefits from more air quality monitoring than most areas in London with data being collected by Camden Council, HS2 and Argent LLP (the developer of the Kings Cross regeneration project). The monitoring sites are shown in Figure 5.1.

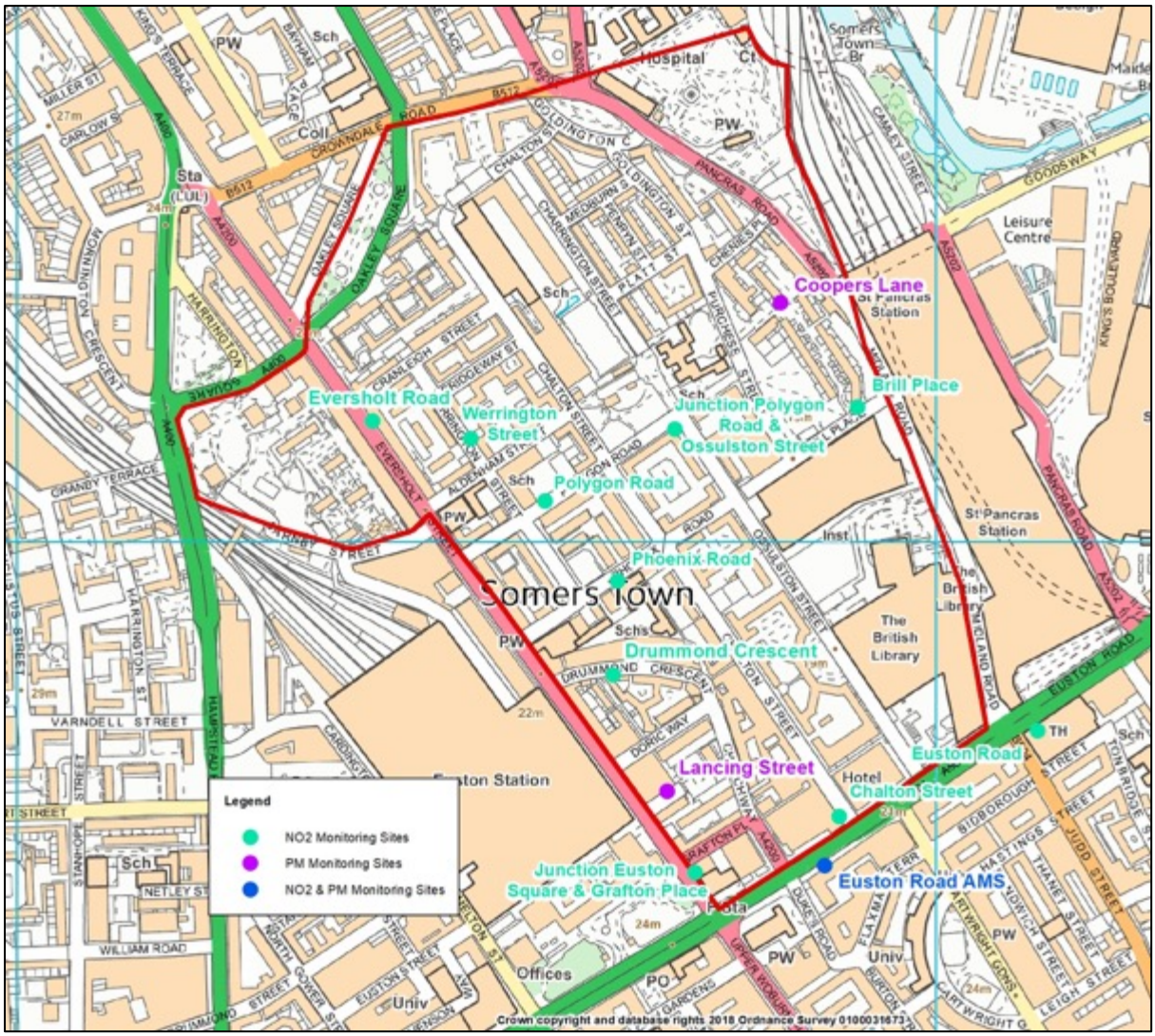


Figure 5.1 Monitoring Locations in Somers Town

Most of the sites are HS2's NO_2 measurement locations. These use diffusion tubes, an indicative measurement technique that is less accurate than the instruments used at Camden Council's Euston Road automatic monitoring site (AMS). The Council also use diffusion tubes at its Brill Place and Euston Road monitoring sites

Diffusion tubes are exposed for four week periods and sent to a laboratory for analysis. The results are 'bias adjusted' to increase their accuracy. The results are averaged to provide annual mean concentrations. The long term average data may also be adjusted if the monitoring period is significantly less than a year. The four week average concentrations

should not be compared with the AQO, as concentrations vary, with the highest concentrations generally occurring in the winter.

The Coopers Lane and Lancing Street monitoring sites measure PM from the Argent and HS2 construction sites respectively. The Argent site is upwind of the Kings Cross regeneration area during the prevailing wind and aims to provide a comparison with the downwind monitoring sites.

5.2 Camden Data

NO_2 concentrations are measured by Camden Council in Brill Place in Somers Town and along Euston Road (at the Euston Road automatic monitoring station (AMS) and at Camden Town Hall). The AMS uses a continuous NO_2 monitor which is more accurate than the diffusion tubes used at the other two sites. The continuous monitor also provides one hour mean concentrations.

Figure 5.2 shows the data for Brill Place and both Euston Road sites from 2010-2017. There is a downward trend at the AMS, but little change at Camden Town Hall and Brill Place. It is not clear why the trends at the two Euston Road monitoring sites are so different.

Annual mean NO_2 concentrations have exceeded the AQO (40 µg/m^3) each year since 2010.

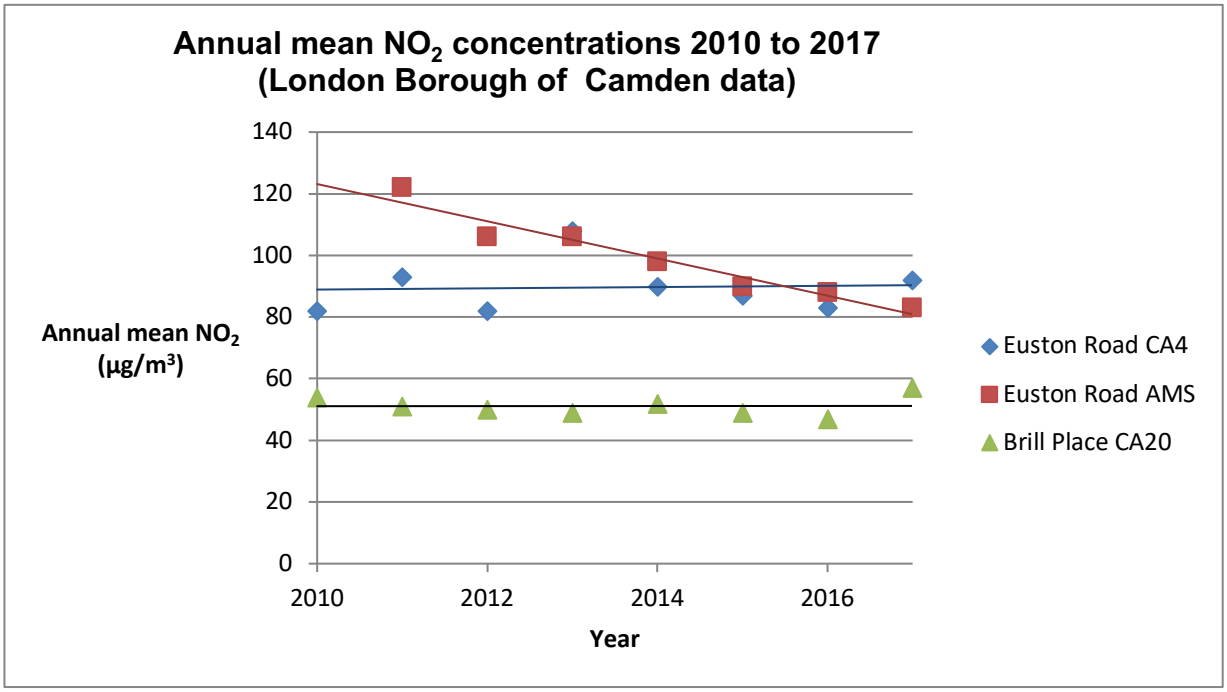


Figure 5.2 Brill Place and Euston Road annual mean NO_2 concentrations

The Figure 5.3 shows the Brill Place data with the AQO shown as a red line.

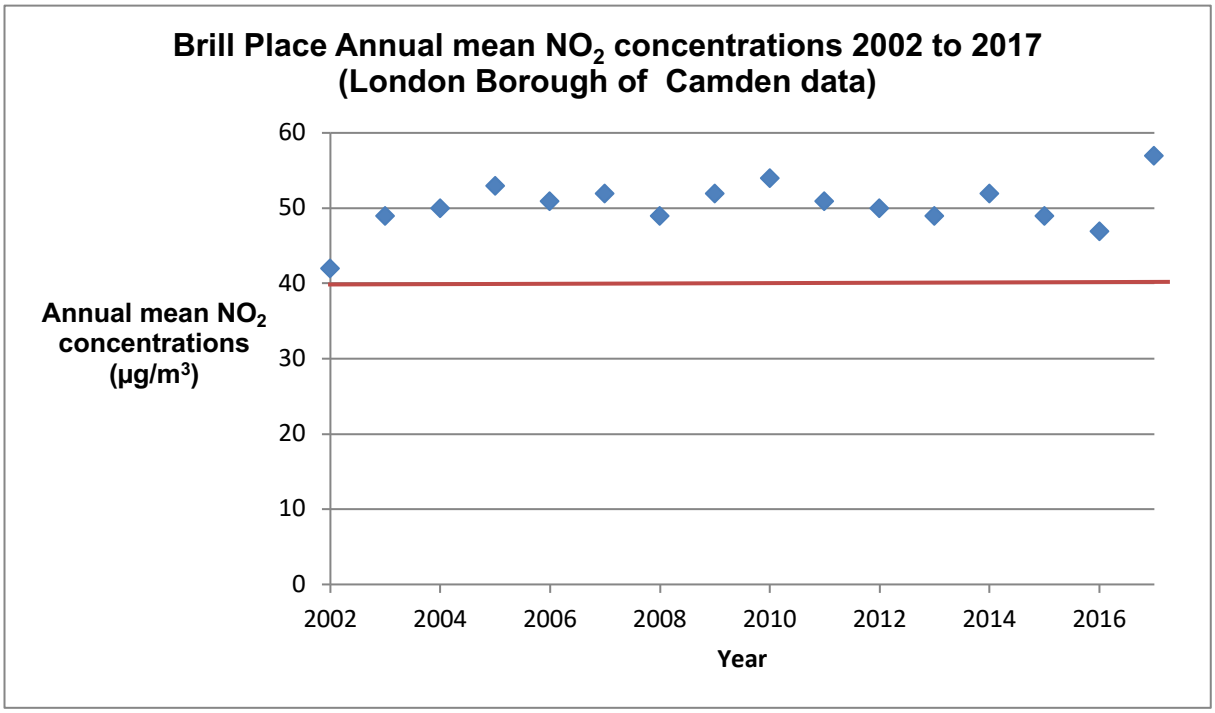


Figure 5.3 Brill Place annual mean NO_2 concentrations 2002-2017

The Euston Road AMS has reported extremely high one-hour average NO_2 concentrations; the highest in Camden (see Table 5.1). In 2011 there are over 726 hours with concentrations above 200 µg/m^3. The number of hours above this level has fallen significantly since then and in 2017 was exceed for 25 hours. The AQO allows 18 hours in a year to exceed 200 µg/m^3, and therefore, despite the huge improvement, the objective was exceeded in all years.

This improvement is likely to be due to a combination of the effectiveness of the Euro VI heavy duty emissions standard and efforts by Transport for London to reduce emissions from its bus fleet, by retrofitting emission control systems and replacing older vehicles. This improvement has also been seen elsewhere in central London.

Table 5.1 Number hours NO_2 concentrations exceeded short term NO_2 AQO at the Euston AMS

NO_2 Concentrations	2011	2012	2013	2014	2015	2016	2017
No hours >200 µg/^{3}	726	294	404	221	54	39	25

Annual mean NO_2 concentrations at the Brill Place and the Euston Road diffusion tube monitoring sites were significantly higher in 2017 than in 2016 (10 and 9 µg/m^3 respectively). A review of the annual mean concentrations measured at continuous monitoring sites in Camden and Westminster (where there was more than 90% data capture) shows that concentrations were higher at these sites in 2016 than 2017. Weather is an important determinant of the year to year variation in air quality, but cannot account for the different trend in Somers Town. It suggests an additional local source, such as increased traffic (possibly due to the taxi rank for St Pancras Station) or a large boiler or CHP engine due to new development. Further investigation is required to identify it.

PM_{10} and $PM_{2.5}$ concentrations have also been measured at the Euston Road AMS since 2014 and 2015 respectively. Table 5.2 shows that the annual mean AQOs (40 µg/m^3 for PM_{10} and 25 µg/m for $PM_{2.5}$) are achieved. The WHO guideline for $PM_{2.5}$ (10 µg/m^3) was, however, exceeded over the three years. The guideline for PM_{10} (20 µg/m^3) was also exceeded in 2014 and 2016.

The table also shows that the short term PM_{10} AQO (no more than 35 days per year with concentrations greater than 50 µg/m^3) is also achieved.

Table 5.2 PM concentrations measured at the Euston AMS

Year	2014	2015	2016	2017
PM_{10}				
Annual mean concentration (µg/m^3)	29	18	24	20
No days >50 µg/m^3	5	5	10	3
$PM_{2.5}$				
Annual mean concentration (µg/m^3)	n/d	17	17	14

5.3 HS2 Data

HS2 commenced NO_2 monitoring using diffusion tubes at eight locations in Somers Town at the end of June 2016. These are

- Chalton Street
- Junction of Euston Square and Grafton Place
- Junction of Polygon Road and Ossulston Street
- Phoenix Road
- Werrington Street
- Polygon Road
- Eversholt Street
- Drummond Crescent

The monitored NO_2 concentrations for 2016 and 2017 are shown in Table 5.3.

Table 5.3. Annual mean NO_2 concentrations measured by HS2 in Somers Town

Monitoring location	Site classification*	Site ID	NO_2 concentrations (µg/m^3)	
			2016**	2017***
Brill Place				57
Euston Road diffusion tube				83
Euston Road AMS				92
Chalton Street	Roadside	BM7	67	58
Junction of Euston Square and Grafton Place	Roadside	BM8	67	58
Junction of Polygon Road and Ossulston Street	Roadside	BMF	43	35
Phoenix Road	Roadside	BPV	41	36
Werrington Street	Kerbside	BQ0	44	32
Polygon Road	Roadside	BQ1	41	35
Eversholt Street	Kerbside	BQA	71	52
Drummond Crescent	Kerbside	BQD	61	38

* Classified using categories in table 4.8 of Local Air Quality Management Technical Guidance (2016)
** Monitoring commenced in June 2016. The 2016 data has been converted to an equivalent annual mean using the methodology in Local Air Quality Management Technical Guidance (2016)

Monitoring location	Site classification*	Site ID	NO_2 concentrations (µg/m^3)	
			2016**	2017***
***Data corrected using bias adjustment factors as follows: roadside sides 0.898; kerbside sites 0.847. The roads within Somers Town are not busy and are not the normal type of roadside or kerbside locations where NO_2 concentrations are monitored as part of local air quality management. If the HS2 urban background adjustment factor (0.909) had been used concentrations would be 1-7% higher than in the table in Somers Town. The correct adjustment factor was used for the busy streets such as Eversholt Street.				

The 2016 annual mean concentrations are estimated from the six months data and therefore is less reliable than the 2017 data. The 2016 data suggests that the annual mean AQO is exceeded at all monitoring locations, with particularly high levels near to Euston Road. This data represents the baseline prior to the commencement of construction works near or in Somers Town. Slightly Lower NO_2 concentrations were measured in 2017. If the HS2 background adjustment factor had been used the annual mean AQO would also have been exceeded at Drummond Crescent.

The diffusion tubes provide long term average concentrations. Where the annual mean is above 60 µg/m^3 there is a risk that the one-hour AQO may be exceeded. This was close to being exceeded in Chalton Street and the junction of Euston Square and Grafton Place, but not elsewhere in 2017.

From 1 March 2018 HS2 have also been monitoring PM_{10} at Lancing Street, close to the construction work at One Euston Square, 40 Melton Street, Grant Thornton House and 22 Melton Street to the south of Euston Station. There is insufficient data available to compare against the AQOs. The monthly monitoring reports compare the measured data against the original IAQM suggested action level of 250 µg/m^3 averaged over 15 minutes. This is the level used to manage dust emissions from construction sites and is linked to an alarm system to notify the construction site management that action is need to reduce emissions.

This action level was revised in October 2018 and is now 190 µg/m^3 averaged over one hour. It is based on the analysis of monitoring data from construction sites undertaken by Kings College London.

5.4 Kings Cross Data

Argent LLP, the developers of the regeneration of Kings Cross, monitor particulate matter ($PM_{10,}$ and $PM_{2.5}$) in Coopers Lane, Somers Town. They use two types of monitor, the FDMS (Filter Dynamics Measurement System) and the indicative Osiris instrument. Coopers Lane is generally upwind of the construction works at King's Cross and gives an indication of background levels across Somers Town, away from the main roads. The measured concentrations may be affected by emissions from the railway lines running into St Pancras Station.

Table 5.4 presents the data for 2013 to 2017. The PM_{10} data are from the FDMS which is equivalent to the reference method and therefore is the most accurate. The $PM_{2.5}$ data are from the indicative Osiris monitor.

Argent's monthly monitoring reports also include indicative data for total suspended particles and ultrafine particles. There are, however, no AQO or World Health Organization (WHO) guidelines to access the measured data against and therefore they have not been included in this report.

Table 5.4 PM concentrations measured by Kings College on behalf of Argent LLP at Coopers Lane, Somers Town

Year	2013	2014	2015	2016	2017
PM_{10}					
Annual mean (µg/m^3)	24.5	26.8	19.2	18.7	14.9
No days > 50 µg/m^3	18	14	8	11	1
No hours >190 µg/m^3(1)	0	0	5	0	0
Data capture	92%	70%	86%	74%	99%
$PM_{2.5}$					
Annual mean (µg/m^3)	6.2	5.3	6.3	6.8	6.8
Data capture	96%	89%	90%	86%	94%
Notes: (1) IAQM Action level in *'Guidance on Monitoring in the Vicinity of Demolition and Construction Sites*' published in 2018.					

The annual mean PM_{10} and $PM_{2.5}$ concentrations are below the relevant AQOs (40 µg/m^3 and 25 µg/m^3 respectively) and also, since 2015, below the World Health Organization (WHO) air quality guideline (20 µg/m^3) for PM_{10}. The measured $PM_{2.5}$ concentrations have also been below the WHO guideline for $PM_{2.5}$ (10 µg/m^3) since 2013. There is some uncertainty regarding the $PM_{2.5}$ data as an indicative measurement method was used, and the values seem too low.

The new IAQM action level for construction sites (one hour average of 190 µg/m^3) has been exceeded five times, all in 2015. These events occurred on three separate days.

Where the data capture is less than 90% the concentrations may under- or over- report the average concentration. The more missing data the less reliable it is.

The data in Tables 5.2 and 5.4 show that the annual mean PM_{10} concentrations are generally higher at the roadside AMS on Euston Road than at Coopers Lane, but in 2015 it was higher at Coopers Lane. This is likely to be due to construction works at King's Cross. Concentrations have declined at both sites since 2014. The $PM_{2.5}$ levels are significantly lower at Coopers Lane than Euston Road, have remained relatively constant, suggesting that this is mainly from regional sources, whereas at the roadside site road traffic is an important source of $PM_{2.5}$. Roadside PM concentrations are declining as the proportion of vehicle fitted with diesel particle traps increases. These devices are effective at reducing PM emissions form vehicle exhausts.

5.5 Greater London Authority's modelled data

The Greater London Authority (GLA) provides modelled data at a 20m spatial resolution across London for 2013, 2020 and 2025 for NO_2, NOx, PM_{10} and $PM_{2.5}$. This provides the best indication of how air pollution varies across Somers Town and an indication of how NO_2 and PM_{10} concentrations may improve in the future. The maps do not take account of the Mayor of London's plans to meet the EU limit value across London by 2025, as set out in the 2018 London Environment Strategy.

Figures 5.4 and 5.5 show where NO_2 concentration have been predicted to exceed the annual mean AQO (40 µg/m^3) and 60 µg/m^3 in 2013 and 2020 in Camden (60 µg/m^3 is used to indicate where the one-hour AQO may be exceeded).

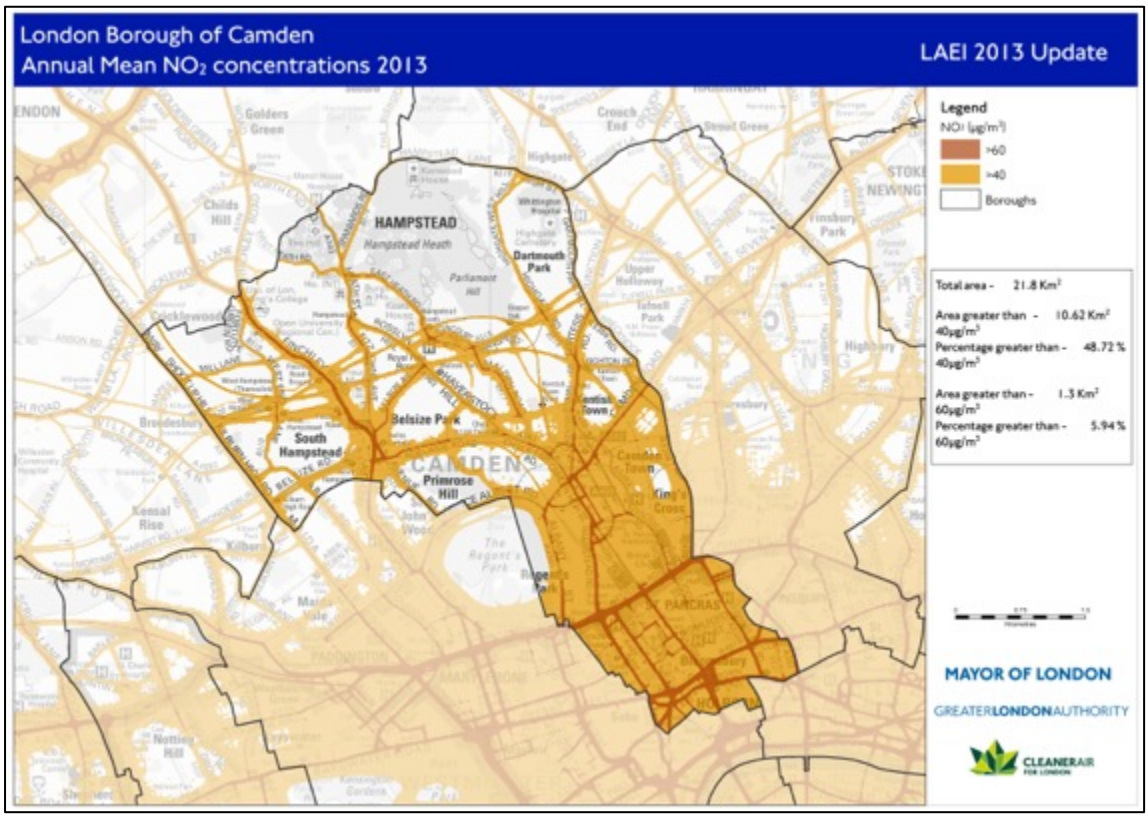


Figure 5.4 2013 modelled annual mean NO_2 concentrations in Somers Town (data from the GLA)

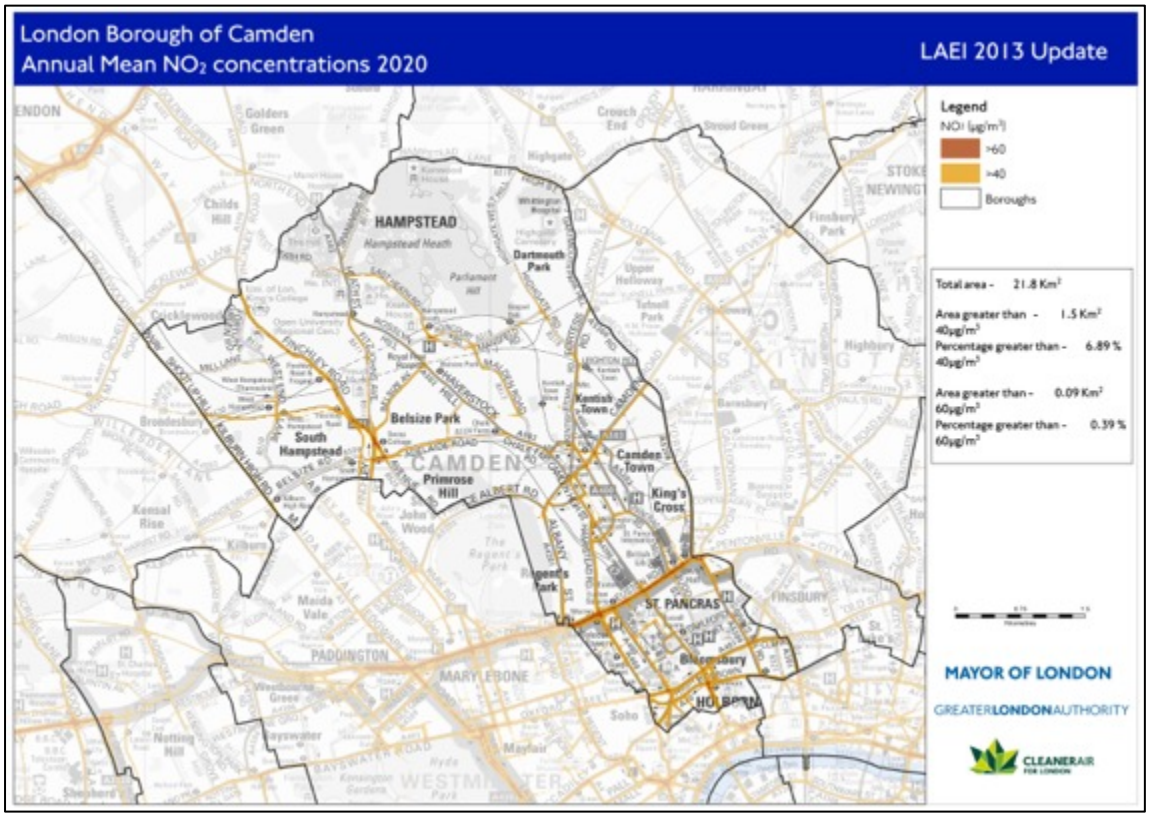


Figure 5.5 2020 modelled annual mean NO_2 concentrations in Somers Town (data from the GLA)

The GLA data (see Appendix 1) shows that close to Euston Road there were very high NO_2 concentrations, more than double the AQO. Lower concentrations occurred close to Eversholt

Street, Lidlington Place, Crowndale Road and Midland Road but were still high, and over 60 µg/m^3 in some locations. Figure 5.5 shows that by 2020 the annual mean AQO is only anticipated to be exceeded alongside busy roads.

In Appendix 1 further GLA maps for NO_2 and PM in 2013 and 2020 for Camden are presented.

5.6 Miscellaneous NO_2 data

There is also monitoring data for a number of Somers Town's schools shown. No information has been provided regarding the location of the monitoring sites, the duration or method used to measure NO_2 concentrations. Without this information little reliance can be placed on the data and therefore it has not been presented.

5.7 Summary

There have been high annual mean NO_2 concentrations in Somers Town for many years, but there is evidence that annual mean NO_2 concentrations are reducing, at least at some locations, and that by 2020 the AQO should be achieved in most areas away from the main roads.

The one-hour NO_2 AQO is currently exceeded alongside the Euston Road, but levels have fallen dramatically over recent years.

It should be noted that the EU NO_2 limit values are predicted to be achieved throughout London by 2025, although this may mean the implementation of zero emission zones in a few areas with persistent exceedences of the limit[33].

The PM_{10} and $PM_{2.5}$ AQOs are currently achieved in Somers Town but concentrations exceed the World Health Organization's $PM_{2.5}$ air quality guideline. Concentrations are higher close to Euston Road than at Coopers Lane.

There is evidence from WHO that health effects occur below the AQOs[34] and the WHO are currently reviewing their guidelines for PM, NO_2 and other air pollutants[35]. There is much clearer evidence of the health effects of $PM_{2.5}$ than NO_2, and it may be that NO_2 is an indicator of general traffic pollution.

[33] Mayor of London, London Environment Strategy, May 2018

[34] WHO Regional Office for Europe, 2013, Review of evidence on health aspects of air pollution –REVIHAAP Project, Technical Report, Copenhagen.

[35] http://www.euro.who.int/en/health-topics/environment-and-health/air-quality/activities/update-of-who-global-air-quality-guidelines, accessed 21 august 2018.

6 Recent Developments

6.1 Introduction

Somers Town is undergoing rapid regeneration with a number of significant developments in recent years and more to come.

The London Borough of Camden has a significant property portfolio in Somers Town including many housing estates, schools, a play project, and children's nurseries. The Council also provides and maintains the majority of the open space.

Camden's Community Investment Programme (CIP) is a 15 year strategic programme to make use of the Council's assets to improve and transform key places and services. The aim is to sell or redevelop properties that are out of date, expensive to maintain, or underused and difficult to access and the funds generated being reinvested into improving Council services and facilities including repairing the council housing stock and repairing and rebuilding schools. Where possible the CIP projects are self-financing which means building new homes for private sale.

This section discusses four major developments that have either recently been completed or are under construction. Two of the four are Camden Council projects.

A review of the methodologies and data used to assess their project's air quality impacts has been undertaken. In general the air quality assessments (AQAs) use acceptable methodologies, although several are poorly written, are unclear in places and do not provide all the model input data.

One generic issue that has been identified is the background data assumed in the assessments which varies from 31 µg/m^3 to 50 µg/m^3. The AQAs generally use Defra's modelled background data. This has changed over time as shown above (see Table 4.1). When predicted concentrations are close to the AQO small changes in the background can make the difference between the AQO being achieved and exceeded.

As noted above the Mayor's statutory guidance requires the use of suitable background monitoring sites nearby if available. There are no NO_2 monitoring sites classified as background sites in Somers Town (the monitoring sites are all either roadside or kerbside).

It should be noted that statutory and non-statutory guidance, and Defra's LAQM tools, have changed between when the first and last assessments were undertaken, and therefore the AQAs are not strictly comparable.

6.2 Francis Crick Institute

The Francis Crick Institute (formerly known as the UK Centre for Medical Research and Innovation) is a biomedical research centre which opened in 2016. The institute is a partnership between Cancer Research UK, UCL, Imperial College London, King's College London, the Medical Research Council, and the Wellcome Trust. The institute is the biggest single biomedical laboratory in Europe.

The AQA was dated September 2010. It is chapter 9 of the Environmental Statement; the author of the chapter is not provided. The AQA included:

- Construction impacts including modelling the impact of the emissions from the construction plant (also known as non-road mobile machinery or NRMM) and the construction traffic. This included modelling along Ossulston Street, Midland Road, Brill Place and Euston Road as street canyons. Traffic speeds were assumed to be 20 kph except within 20m of junctions where they were assumed to be 5 kph. It was assumed that all construction

vehicles use Euston Road and Midland Road. At the time of the assessment there was no standard method for assessing the impact on dust and PM_{10} during construction, and it largely relied on best practice guidance issued by the GLA and the London Councils.

- Emissions of formaldehyde, 1-methyl-1-propanethiol, and benzene from the laboratories;
- Traffic during operation of the development. The Institute is essentially car free and the modelling was largely used for predicting future concentrations at receptors close to the local roads. The impact of the development traffic was very small. This modelling allowed the air quality impact of the energy plant to be assessed with the contribution from local traffic.
- The energy plant to be installed was assumed to be one gas-fired combined heat and power engine, two gas-fired steam boilers and 3 gas-fired low temperature hot water boilers. The NOx and PM emissions during diesel firing of the boilers were also modelled.
- There are four back-up diesel generators for use during a black-out or emergency. Diesel generators can give rise to very high short term concentrations of NO_2, but their use as backup generators is likely to be infrequent unless the Institute has exacting requirements regarding voltage fluctuations, or if the generators are used to provide electricity for the national grid. Regular monthly testing of the generators was anticipated, and the impacts modelled, but their design for use was not modelled.
- The background air quality data was taken from a combination of Bloomsbury Square background monitoring site and the British Library diffusion tube data (this monitoring site no longer exists).
- The operation of the development added a small amount of NO_2 to the background concentration that was assumed to already exceed the AQO.

The conclusion of the AQA was that the impacts will not be significant.

Using the current EPUK/IAQM criteria the impact would have been moderate at one receptor and not significant at all others. The overall conclusion is unlikely to have changed.

The assessment was thorough. It would be useful to find out what energy plant was actually installed (see Phoenix Court Energy Centre), the frequency of the test firing of the diesel generations and their operational use to date.

6.3 Phoenix Court Energy Centre

The Phoenix Energy Centre is a Camden Council project to provide district heating to its housing estates in Somers Town. The energy plant is located in the basement former carpark of a housing block with the flues located within a lift shaft. The AQA was undertaken by URS and is dated December 2013. The modelling was undertaken to discharge a planning condition (condition 4 for application number 2013/0884/P[36]). The planning officer's report stated "*Due to the nature of the project with the CHP specification yet to be determined, a full Air Quality Assessment (AQA) is not currently possible or appropriate. However, given the initial findings of work that has been undertaken so far to model and manage air quality impacts (contained within the Planning Design*

[36] Condition 4 states "Prior to the installation of the CHP plant hereby approved, a full Air Quality Assessment and scheme of mitigation shall be submitted to and approved, in writing, by the local planning authority. The development shall thereafter not proceed other than in complete accordance with such scheme that has been approved."

and Access Statement), Camden Environmental Health Officers are of the view that the flue heights proposed are sufficient as a means of minimising local impacts."

The location of the Energy Centre is particularly sensitive as the building is occupied by homes, and in the block of buildings in which it is located is occupied by two children's nurseries and sheltered accommodation for older people (Monica Shaw Court).

The project is now known as Somers Town Energy and is operated by Vital Energi. Three 1.3 MW boilers have been operational for several years. According to Vital Energi's website a 1MW CHP engine has been delivered and is being installed as this report was being written[37]. The size of the CHP engine was dependent on the electricity demand of the Francis Crick Institute, suggesting that the Institute did not install its proposed CHP engine.

The original AQA assumed up to two gas fired boilers (each 1.8 MW capacity) will operate at any one time with a third as backup/standby, and a gas fired CHP engine (with a maximum 1 MWe capacity). The emissions from the boilers will discharge 3 m above the roof (21.6m above the ground) and the CHP emissions at 8m above the roof (26.6m from the ground). The Energy Centre was originally intended to replace 14 existing centralised boilers used in the Goldington Street, Coopers Lane, Monica Shaw and Oakshott Estates. These boilers have a total capacity of 4.3 MW, and are 70-75% efficient compared to 95% for the Energy Centre boilers. The impact of the decommissioning of these boilers was not taken into account in the AQA.

No construction impact assessment was undertaken, presumably because the energy centre is located within an existing building.

The impact of the NOx emissions from the energy plant was initially modelled using five years of meteorological data from Heathrow Airport. The results from the meteorological year (2010) which predicted the highest annual mean concentration was used in the assessment. Typically the worst case meteorological year for assessing the short-term (one hour) impacts is not the same as the long term (annual mean) impacts. A separate worst case year should have been modelled for assessing the short-term impacts.

The AQA used an incorrect method for assessing the amount of NOx that would be NO_2.

The background annual mean NO_2 concentration was taken from the Brill Place diffusion tube for 2012. For assessing the short term impacts it was assumed that the background would be twice the annual mean. This is a standard assumption used by the Environment Agency.

The impacts of the operation of the Energy Centre at individual receptors were predicted to be either slight or negligible using the 2010 EPUK significance criteria. Using the more recent criteria (first issued in June 2015) the impact would have been substantial at five receptors due to the high assumed background concentration.

An update was provided by URS (now AECOM) on 27 November 2017, on behalf of Vital Energi, the operator of the energy centre. In Phase 1 three 1.3 MW boilers with lower NOx emissions than assumed in the original AQA were installed. This assumed that the Energy Centre would also provide 100% heating to the Phoenix Court housing (currently seperately heated) and offices, the Mayford Estate, the proposed Edith Neville School and the proposed community hub and housing overbuild (part of the Central Somers Town CIP).

[37] www.vitalenergi.co.uk/blog/major-next-steps-for-somers-town-heat-network, accessed 24 October 2018.

The updated AQA used a slightly lower NOx emissions (in mg/Nm^3) and increased the efflux velocity from 15 m/s to 24 m/s for the CHP engine than the original AQA. In addition the stack height for the boilers, as well as the CHP engine, was 5 m higher than in the original AQA. These changes resulted in a smaller impact than in the original AQA. This may also be due to a change in the assumed proportion of NO_2 in the NOx, but no details of the methodology were given.

By using a lower background concentration (36.2 μg/m^3 instead of 50 μg/m^3) the significance of the impacts was reduced and ranged from negligible to moderate using the EPUK/IAQM 2015 criteria. Had the same background concentration been used as in the original AQA the impacts would have been substantial at seven out the 13 receptors included in the model.

The value of 36.2 μg/m^3 came from "*that used to support to Central Somers Town planning application*"[38]. This background level was determined from the Defra predicted background concentrations for 2013 with the contribution from half the A roads removed. As the emissions from the local roads (including the A roads) was not modelled by AECOM this under-estimated the NO_2 concentrations. In addition, according to the Central Somers Town AQA the background NO_2 with the contribution for the A roads within the grid removed is 37.1 μg/m^3 not 36.2 μg/m^3

The correct background concentration (with no A roads removed) should have been 45.3 μg/m^3. This figure is over 9 μg/m^3 higher that that used. If this value had been use the updated assessment would have come to the same conclusions as the use of 50 μg/m^3.

Phoenix Energy Centre is located at the junction of Brill Place and Purchese Street. The AQA for Central Somers Town used a background of 43 μg/m^3 for the Tower located on Brill Place and 36.2 μg/m^3 elsewhere. This was to reconcile the differences between the monitoring and modelled concentrations in Brill Place "*This is broadly mid-range between the monitored Brill Place concentration and the predicted Defra background concentration to take into account the additional dilution and dispersion which would be expected between the monitoring site location and the site of the proposed Brill Place Tower.*"[39]

If a background concentration of 43 μg/m^3 had been used the impacts would have been substantial at the same seven receptors as if 50 μg/m^3 had been used. The monitored NO_2 concentration at the Brill Place in 2015 was 49 μg/m^3 (and 57 μg/m^3 in 2017).

The updated AQA also states that the Energy Centre was designed to provide heating for Phoenix Court Housing, the Mayford Estate, the proposed Edith Neville School and the proposed community hub and house overbuild, as well as the four housing estates listed above.

The fact that the Energy Centre is going to make air quality deteriorate in an area where the AQO is already exceeded by a wide margin, suggests that is should not have been given planning consent. Whilst is it true that the boilers at the Energy Centre will be more efficient and have lower NOx emissions (in g/kWh) than those it will replace, more emissions will be released in one place possibly resulting in a larger impact on air quality close to the Energy Centre than near the existing boilers.

It is interesting that the Greater London Authority is now moving way from the use of fossil fuels for centralised heating systems, now preferring to use heat pumps which do not provide any emissions of air pollutants locally.

[38] Note from Vital Energy, addendum to support an update to the previously discharged condition No 4 of planning application 2013/0884/P (undated).
[39] From Section 5.4, the Central Somers Town AQA,

6.4 Central Somers Town

The proposed Central Somers Town re-development will provide a new Edith Neville Primary School, community facilities, commercial facilities such as shops and restaurants and 136 homes over 7 buildings ranging from 3 to 25 storeys in height. It also includes 11,760 m^2 of public open space and associated highway works and landscaping.

Ramboll ENVIRON undertook the AQA, dated December 2015.

The construction impacts were assessed using the IAQM qualitative methodology and mitigation measures recommended. No assessment of the impact of the construction traffic was undertaken.

The proposed development is car free and heating will be provided by the Phoenix Court Energy Centre. Therefore there will be no direct air quality impacts during the operation of the development on the local community[40]. The assessment of the operational impacts focuses on the exposure of future users of the development to poor air quality due to other sources of air pollution including from existing traffic, the Phoenix Court Energy Centre and the Francis Crick Institute.

It found unacceptable air quality at the Tower due to emissions from the Energy Centre and the Francis Crick Institute. The apartments will use local heat reclaim ventilation units installed in each apartment. The supply air will come from the façades of each apartment and filters to remove NOx and particulate matter from the incoming air will be fitted.

An air quality neutral assessment was undertaken.

The Camden Town District Management Committee (CTDMC) commissioned Air Quality Experts Global Ltd to review this AQA. The main criticisms of the AQA were:

- Traffic data – collected during the school holidays when typically traffic levels are lower than during school times. This is a valid criticism.
- No data are provided on the height of the canyon street – there is no evidence in the AQA that the roads were modelled as street canyons. It would have been preferable to include street canyons in the model. This is corrected for the base year by the model verification process, but will under-estimate at some locations and over-estimate at others.
- Increasing the background concentration at Brill Place – this was an unusual approach. The model verification factor[41] was 3.08 (before adjustment of the background; the critique misunderstood this) which is at the higher end of the typical range. However the AQA was not assessing the impact of the development traffic on existing receptors, but was assessing the exposure of users of the development. The critique's comments about under-estimating the traffic component are irrelevant in this context.
- The impact of the construction traffic emissions should have been quantified alone and with other construction sites in the area - this is a valid criticism. Air Quality Experts Global Ltd was instructed to undertake this assessment by CTDMC. The cumulative effects and the assessment methodology are discussed later. The impacts of the construction traffic for the Central Somers Town development, assuming an annual average daily traffic increase of 100 heavy duty vehicles, was predicted to increase annual mean NO_2 concentrations by up to

[40] This emissions from the energy used in the Central Somers Town development would be from the Energy Centre not directly from the development.
[41] Modelled air quality data is compared with monitoring data and the model adjusted to better fit the monitoring data. The verification factor is this adjustment factor.

1 µg/m^3 which is a substantial impact given the high existing concentrations. The report also concluded that the construction traffic would contribute to exceedences of the one-hour NO_2 AQO, which would affect commuters and children's playgrounds (although this was not quantified). The AQA used 2013 emission factors, with 2015 traffic data which is considered to be conservative assumptions. This study does however illustrate the need for major planning applications to provide an assessment of the impact of the construction traffic. This should be required for all construction sites in Somers Town that will result in 25 or more HGV movements per day expressed as an annual Average Daily Traffic.

6.5 Maria Fidelis Catholic School

The AQA for the Maria Fidelis Catholic secondary school was produced by REC and is dated June 2016. The school is currently being built.

No construction impact assessment was undertaken.

The AQA considered the impact of the emissions from road traffic and the school's gas fired boilers on the exposure of future users of the school in 2018, the assumed year of its opening. NO_2 levels were predicted across the proposed development site including at the ground, first and second floors.

Traffic data from the London Atmospheric Emission Inventory were used, and parts of Eversholt Road and Euston Road were modelled as street canyons. No details of the canyons were provided.

The contribution of the A roads in the Defra modelled background concentration was removed, which reduced the background concentration by 10 µg/m^3 in 2013 and over 7 µg/m^3 in 2018. The background NO_2 concentrations where 46.53 µg/m^3 in 2013 and 39.02 µg/m^3 in 2018, reducing to 25.39 µg/m^3 and 31.38 µg/m^3 respectively with the contributions from the A roads removed. This is a valid approach as the AQA explicitly modelled the road traffic emissions. However, it is not clear whether the A roads contribution in the grid was removed or all contributions from A roads. If the latter, this is likely to be an underestimate of the background concentration.

This was the only assessment to use data from London City Airport; the others used data from Heathrow Airport.

The model verification factor for 2013 was 2.0305, which is reasonable.

In 2018 the predicted concentrations were below the AQO and therefore air quality at the school was considered acceptable.

A sensitivity test was undertaken, assuming no change in vehicle emissions from 2013 to 2018. This predicted the AQO to be exceeded at the sports hall on the ground floor. Mitigation measures were recommended on the basis of the results from this sensitivity test.

A qualitative cumulative assessment of the operational impacts of other development in Somers Town was undertaken. It was concluded that none of the other developments would have a significant impact at the new school.

No assessment was undertaken of the impact of the boiler emissions on existing receptors, and no detailed results of the impact of the energy plant on NO_2 concentrations was provided. Only the total concentrations (background + traffic + boilers) were presented.

A single metrological year of data was used. This is considered acceptable for local authorities undertaking their air quality review and assessment but is not best practice when assessing point

sources. The Environment Agency requires the use of five years meteorological data to identify the 'worst case' year and for this worst case meteorological year to be used in the AQA.

6.6 HS2

HS2's Air Quality Strategy[42] states that it will:

- Avoid pollutant emissions to air as far as practicable;
- Avoid causing public and workforce exposure to air pollutants where emissions cannot be avoided, as far as practicable;
- Reduce pollutant emissions as far as practicable, where emissions cannot be avoided;
- Minimise public and workforce exposure to pollutant emissions as far as practicable, where exposure cannot be avoided;
- Work with the relevant authorities to maintain air quality, especially where construction or operations may have significant air quality effects in locations where those authorities have management areas or zones with plans or measures directed at compliance with national air quality standards; and
- Provide mitigation for dust soiling, where it cannot be prevented

The Environmental Statement, as amended, predicts no significant effects in relation to dust emissions during construction of the project. It is anticipated that the use of appropriate mitigation measures will minimise or eliminate the impacts.

Traffic emissions during construction of the project are predicted to give rise to significant effects from changes in annual mean NO_2 concentrations and the 24-hour daily mean PM_{10} concentrations around Euston Station and its approach. This area is known as Community Forum Area 1 (CFA 1). Increases in NO_2 and PM_{10} concentrations are predicted to occur along Euston Road, Midland Road and Eversholt Street. Whilst these are considered to be temporary impacts they may last until 2033 if there is no improvement in background air quality or reduction in vehicle emissions.

HS2 will require all vehicles to meet the Euro 6 and VI emissions standard from the start of construction and has set targets to reduction future vehicle emissions[43].

6.7 Cumulative Construction Impacts

Air Quality Experts Global Ltd undertook an AQA of the cumulative impact of the construction traffic associated with Central Somers Town, HS2, Maria Fidelis School, and Crossrail 2. It also considered the impact on Central Somers Town alone which as discussed above.

[42] High Speed Two, 2017, Air Quality Strategy.
[43] HS2, 2017, Information Paper E31: Air Quality.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/672406/E31_-_Air_Quality_v1.5.pdf.

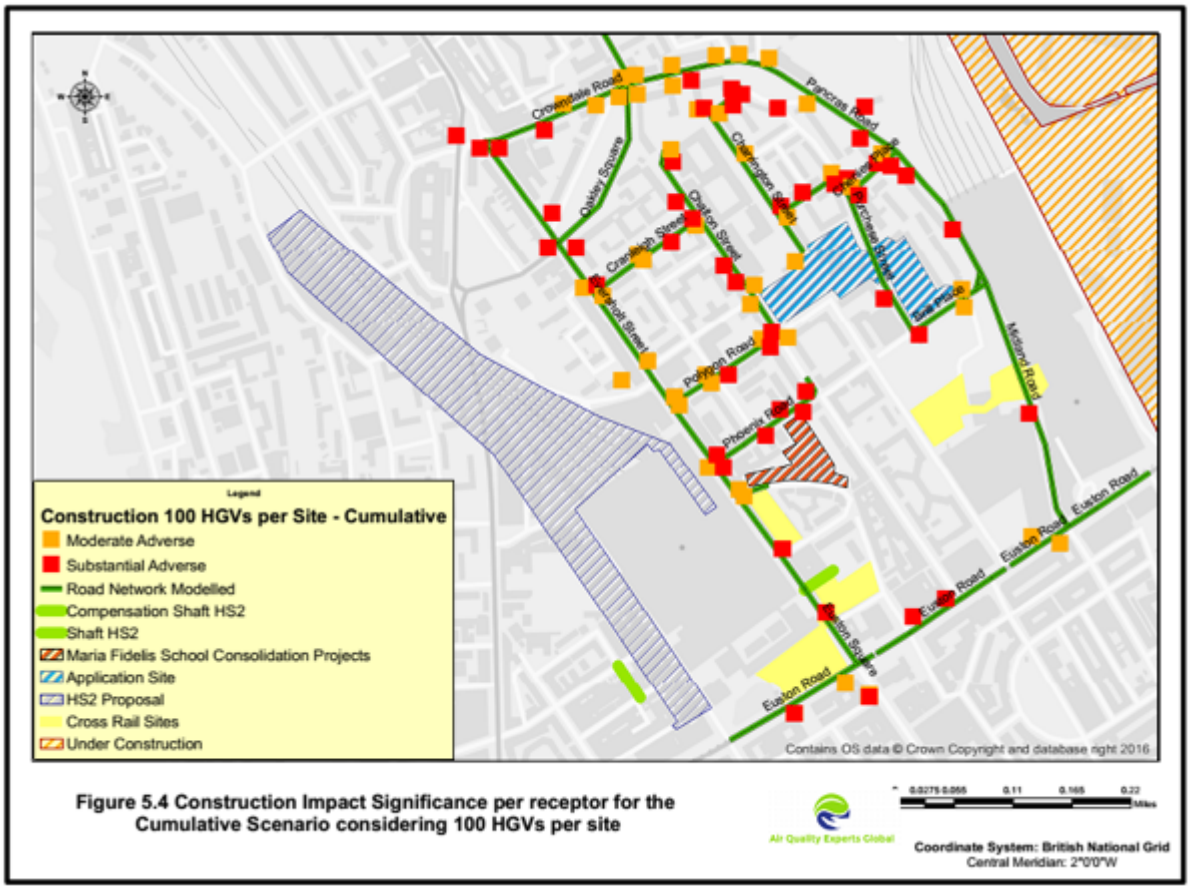


Figure 5.4 Construction Impact Significance per receptor for the Cumulative Scenario considering 100 HGVs per site

Figure 6.1 Cumulative Impact of the emissions from 100 heavy goods vehicles per construction site on NO_2 concentrations (extracted from Air Quality Experts Global Ltd.'s report)

Insufficient information was available on the likely magnitude of the construction traffic. Therefore a matrix of possible HGV movements was used to estimate a range of potential impacts across the study area. For the cumulative assessment it was assumed that the construction works would each add 50 or 100, heavy goods vehicles to the local roads. This resulted in a maximum of 400 extra vehicles per day on some roads. The results are illustrated on Figure 6.1, extracted from the Air Quality Experts Global Ltd.'s report[44]. It shows a large number of substantial impacts.

In reality the heavy goods vehicles associated with construction sites varies considerably throughout the duration of the works. It is considered unlikely that there will be as many at 400 extra vehicles movements, expressed as the annual average daily traffic.

6.8 Summary

Table 6.1 provides a brief summary of the four AQAs reviewed. It focuses on the background concentrations as this is the main factor that varies considerably across the AQAs (from 31.4 µg/m^3 to 50 µg/m^3). The EPUK/IAQM matrix for describing the impact at individual receptors is based on the magnitude of the change in annual mean concentration and the air quality with the proposed development. The latter is dependent on the background concentration which is generally a significant proportion of the total concentration.

[44] Air Quality Experts Global Ltd, 2016, Somers Town, London 2015/2704/P, Impact on Local Air Quality of Central Somers Town CIP, High Speed Two, Maria Fidelis School Consolidation Projects and Crossrail 2 Construction Traffic Emissions.

The background is also very important when considered the exposure of future users of the developments. The EPUK/IAQM matrix is not used to assess these impacts. Instead, the impacts are accessed against whether or not the AQO is likely to be exceeded and mitigation needed.

The AQAs for the Francis Crick Institute and the Phoenix Court Energy Centre were undertaken prior to GLA requirement to undertake an Air Quality Neutral assessment.

Only one of the four AQAs assessed the impact of the construction traffic. In areas of good air quality the impact of construction traffic and NRMM emissions are unlikely to be significant. This is not the case when existing concentrations are close to or above an AQO. The EPUK/IAQM guidance suggests assessment are required where there are more than 25 heavy duty vehicle movements, expressed as an annual average daily traffic flow, in an AQMA.

Table 6.1: Summary of the Reviewed AQA

Development	Date of AQA	Construction/ construction traffic included in AQA?	Air quality neutral assessment	Background NO_2 concentration ($\mu g/m^3$)	Comments
Francis Crick Institute	September 2010	YESYES	N/a	42.3 (2015)	Building opened in 2016
Phoenix Court Energy Centre	December 2013	NO/NO	N/a	50 (2012) in original AQA 36.2 (2015) in 2017 AQA	Phase 1 operational. Phase 2 CHP engine installation underway.
Central Somers Town	December 2015	YES/NO	YES	43 (2014) for the Tower 36.2 elsewhere	Phase 1 (rebuilding of the Edith Neville primary school, new facilities for 'Plot 10' play project and a new nursery for St Aloysius) are currently under construction.
Maria Fidelis Catholic School	June 2016	NO/NO	YES	31.4 (2018)	Under construction, due for completion December 2018, on site for former Police Garages
Defra background concentrations	Grid 529500, 18350[45]			38.2 (2015) 33.5 (2018)	From most recent estimated.
	Grid 52950, 182500[46]			48.2 (2015) 41.4 (2018)	

[45] In Somers Town north of a line approximately from Barnby Street to the SW corner of the Francis Crick Institute.
[46] In Somers Town south of a line approximately from Barnby Street to the SW corner of the Francis Crick Institute.

7 Neighbourhood Plan

7.1 Introduction

This section provides some suggestions regarding the neighbourhood plan; other suggestions are likely to emerge during discussion with local residents. It should be noted that the Neighbourhood Plan is a land use planning document and therefore this should be the focus of its contents. There may be additional issues that local residents feel are important, but a neighbourhood plan can be weakened by becoming unfocused.

This section of the report draws on the relevant (to planning) community contributions made at the meeting of the Full Council held on 29 January 2018 that discussed air quality in Camden.

The new London Plan (July 2018 version) includes a requirement for all major developments to be at least air quality neutral, and larger scale developments (where an Environmental Impact Assessment is required) to be air quality positive. The draft Plan also requires development proposals to ensure that where emissions need to be reduced, the preference is for emissions to be reduced on site. Where it can be demonstrated that on-site emission reduction is impractical or inappropriate, off-site measures to improve air quality may be acceptable, provided that equivalent air quality benefits can be demonstrated. This means that the benefits will occur elsewhere.

Development proposals should use design solutions to prevent or minimise increased exposure to air pollution and make provision to address local problems of air quality. Particular care should be taken with developments that are likely to be used by people particularly vulnerable to the effects of poor air quality, such as children or older people.

It might be useful for the Neighbourhood Plan to include a map highlighting the most sensitive locations e.g. school, children's nurseries, pre-school groups, doctors' surgeries, sheltered accommodation and any care homes.

This report is on air quality, but there are a number of other issues that should be considered in the Neighbourhood Plan that may have an impact on air quality such as:

- the use of green infrastructure and the importance of green (not hard) open spaces for people's mental health wellbeing;
- the benefits of walking and recognition that walking needs to be made more pleasurable by improving the environment.

7.2 Planning applications

Planning application summaries

Planning applications for major developments can be huge, covering hundreds of pages of text. For the vast majority of local residents these are impenetrable due to the time and effort required for non-specialists to read and digest the technical information.

Camden Council is a major developer in Somers Town. It is therefore particularly important for local residents to be able to scrutinise planning applications made on the Council's behalf as the Council is also the decision maker.

It is therefore recommended that lay summaries of the technical information are provided for all major planning applications that may affect Somers Town. These should not be short, bland reassurances that everything will be fine. These should be honest attempts to explain the likely impacts and the proposed mitigation measures.

It is recommended that the summaries be approximately 2 pages long and provide a well written and understandable summary of the assessment methods and their limitations and assumptions; the results; and the assessment of the significance of the impacts. Full references to the main documents should be provides (e.g. paragraph numbers and document references). Large tables of data are not appropriate.

The aim of theses summaries would be to inform and educate residents affected by proposed development, not to confuse and cover up information that residents might find unacceptable.

Air quality assessments

The results of air quality assessments are very dependent on the assumptions regarding the background concentrations used, especially in an area such as Somers Town where there is a large spatial variation. Therefore all assessments should use conservative background concentration(s) and clearly justify the choice of background concentration.

All assessments should provide information on model verification, including justification for the monitoring stations used in the verification process. The verification factor should be minimised and be no greater than two[47]. Factors to consider include using time varying emissions, modelling roads as street canyons, and ensuring that the correct model parameters are used.

If there is inadequate monitoring data available developers must undertake their own monitoring for an absolute minimum of six months and preferably for a full year to inform the assessment and for model verification. Relying on data from outside Somers Town is likely to result in errors in the assessment. This developer monitoring should include suitable roadside **and** background sites. Sensors should not be used until they have been proven to provide robust data (this is not currently the case for NO_2 sensors).

The air quality assessment for major developments should provide an assessment of the impact of the construction traffic. This should be required for all construction sites in Somers Town that will result in 25 or more HGV movements per day (averaged over a year) during any period of the construction phase.

Air quality positive

Given that Somers Town is amongst the 20% most deprived neighbourhoods in the country (and part is within the 10% most deprived) it is important that air quality is improved as soon as possible. All major developments[48] in Somers Town should be air quality positive (and not just those requiring an Environmental Impact Assessment). This could be achieved, for example, by the provision of low or zero-emission heating and energy or by designing out features such as street canyons that prevent effective dispersion of pollutants.

7.3 Design

The design of a development can affect air quality and the following factors should be considered in the design of all new development in Somers Town:

- new development should not create or exacerbate an existing street canyon;

[47] This is based on best practice advice from CERC who produce the ADMS-Roads model that is typically used in AQAs.

[48] Major developments are defined by The Town and Country Planning (Development Management Procedure) (England) Order 2015, statutory Instrument 2015 No. 595. This includes 10 or more dwellings, a housing site with an area of 0.5 hectares or more; the provision of a building or buildings where the floor space to be created by the development is 1,000 square metres or more; or development carried out on a site having an area of 1 hectare or more.

- the use of gas for heating of space and hot water contributes to air pollution. Other options such as heat pumps and electricity should be used in preference to fossil fuels (this means that no new development should be connected to Somers Town Energy);
- Green infrastructure (i.e. the use of plants and trees) can be important for reducing the exposure of the public to poor air quality, for example by keeping people further from busy roads. However trees and large bushes in street canyons can reduce the flow of air and make air pollution worst. It would be useful to include in the Neighbourhood Plan advice on where green infrastructure may be a useful mitigation measure[49];
- Major developments should be designed with 'clean oases', that is outdoor space where planting is used to reduce very local air pollution levels so people can enjoy outdoor space; and
- Special consideration should be given to the most sensitive locations such as schools, GP surgeries, children's nurseries and sheltered accommodation.

7.4 Planning conditions

The following are suggestions for planning conditions for major development to reduce the impact of construction works and traffic:

- Ensure that all major development submits an Air Quality and Dust Management Plan (AQDMP) to the local planning authority for approval prior to construction commencing. This should include the recommended mitigation measures in the Air Quality Assessment, and be prepared by the principal contractor for the development to ensure their commitment to minimising emissions;
- Require the AQDMP to include a ban on construction vehicles during school start and finish times to make walking and cycling safer for children, where appropriate;
- Require the AQDMP to adopt the Central London non road mobile machinery requirements, and for developers to show that they have seriously considered the use of electric equipment in preference to diesel operated construction equipment;
- All developments with parking provision should meet minimum standards for the provision of electric charging facilities including rapid electric charging.
- The effectiveness of travel plans should be monitored annually, and revised as appropriate, to minimise the impact of the use of traffic on local residents.
- Planning applications for new schools, or their extensions, should restrict access by private car. A travel plan should be agreed by the local planning authority and monitored annually to ensure that pupils due not arrive or leave school by car.
- Require that the details of the installed boilers, and if appropriate, CHP engines, and associated flues, are submitted to the local planning authority for approval, prior to first occupation of the development.

[49] See Ferranti, E.J.S., MacKenzie, A.R., Ashworth K., and Hewitt C.N. 2017. *First Steps in Urban Air Quality*. A Trees and Design Action Group (TDAG) Guidance Document. UK: London. Available from: http://epapers.bham.ac.uk/3069/Quality for Built Environment Practitioners

7.5 Enforcement of planning conditions

This is a duty of Camden Council, but a clear statement along the following lines may be useful: "*The Neighbourhood Forum expects Camden Council to respond positively and quickly to any concerns raised by local residents regarding suspected non-compliance with planning conditions*".

7.6 S106 agreements/ Community Infrastructure Levy (CIL)

To ensure that there is good air quality data in Somers Town for future air quality assessments monitoring must continue when Kings Cross and HS2 monitoring stops. Section 106 or CIL payments could be allocated to establishing long term background and roadside air quality monitoring sites in Somers Town.

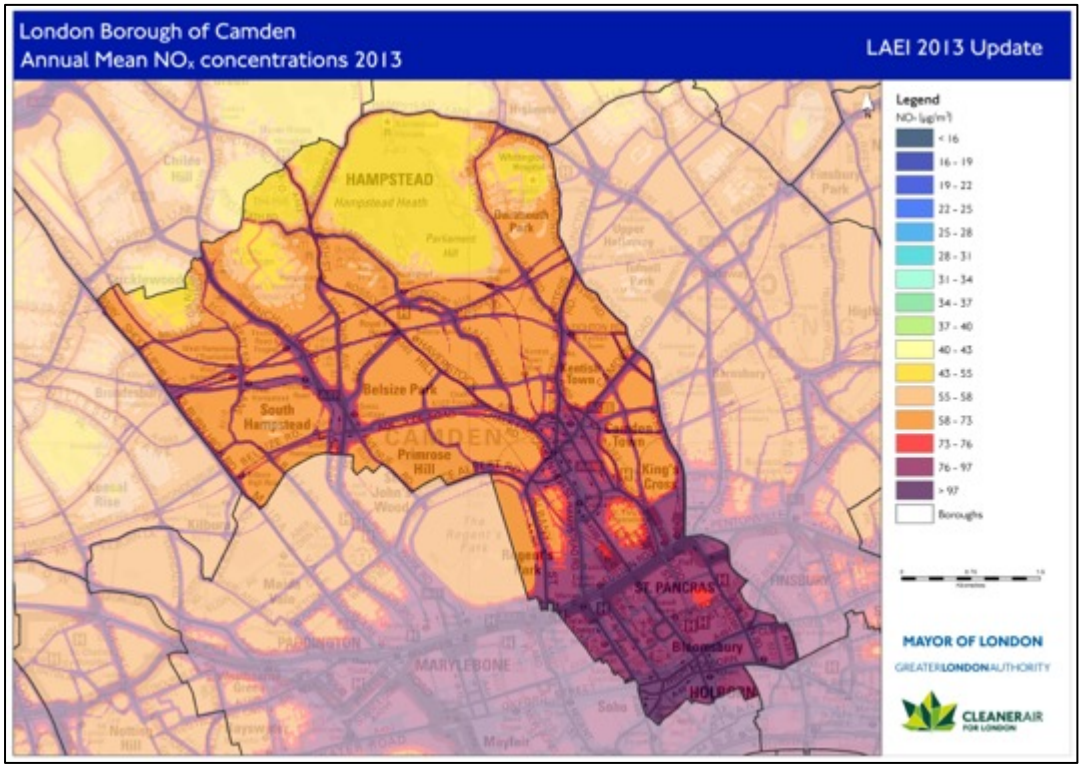
Of particular concern are the emissions from the taxi ranks for St Pancras Station and Euston Station. The high concentrations measured at Brill Place may be due to this source. Monitoring could provide greater insight into whether this is the cause of the high concentrations, or whether it is due to another local source such as the Somers Town Energy or deliveries and taxis for the Crick Institute. Ideally continuous monitoring apparatus would be installed.

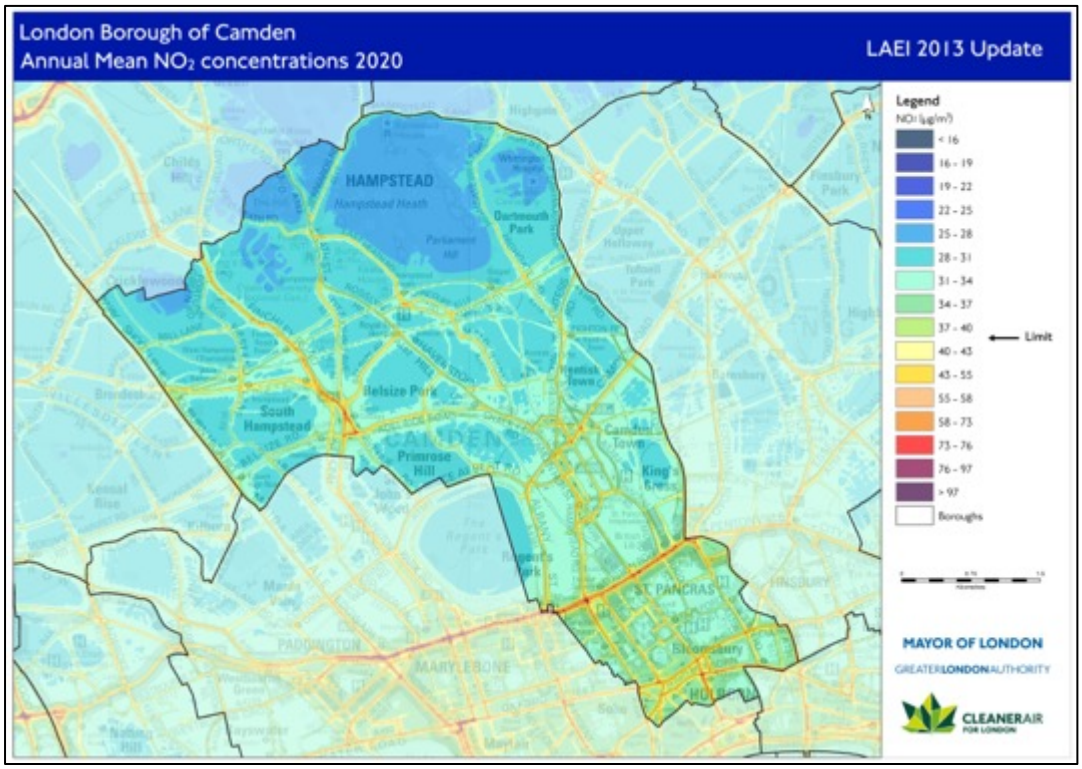
7.7 Awareness Raising

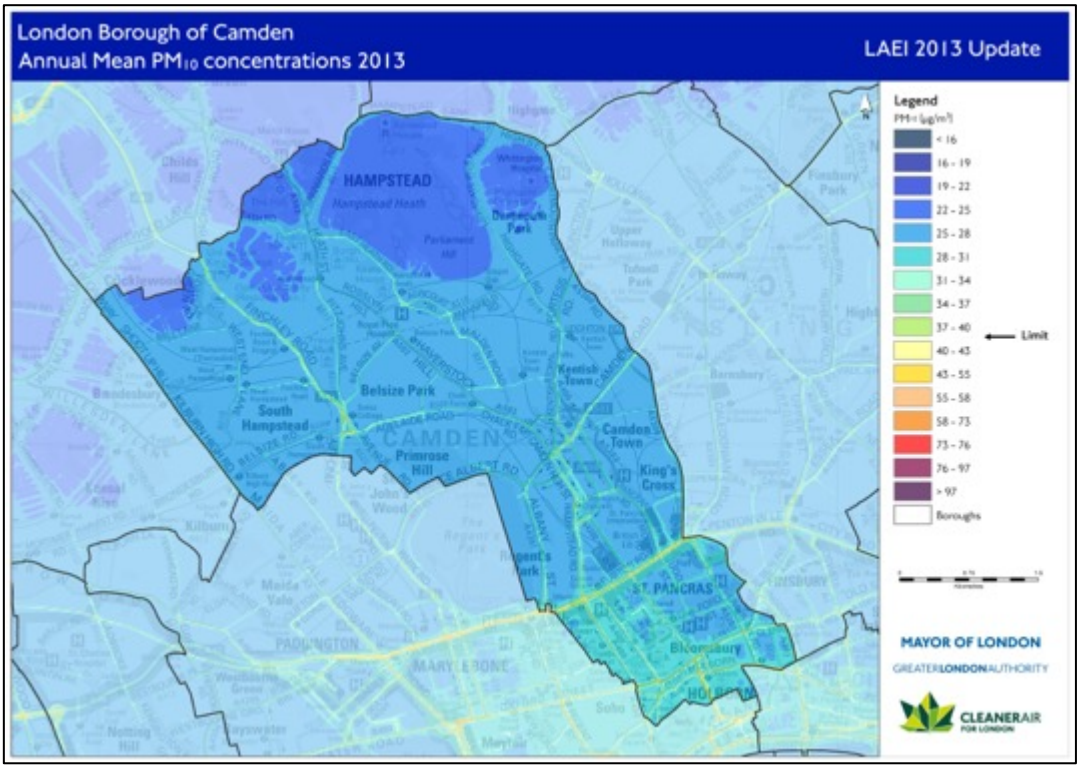
Awareness raising is not a planning issue, but it may be that money raised thorough section 106 agreements could be used to raise public awareness of air quality issues.

The Neighbourhood Plan could require developers to raise awareness of the impact of poor air quality on public health through their travel plans.

APPENDIX 1 GLA modelling of NO2, PM10 and PM2.5 concentrations in Camden in 2013 and 2020



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Annual Mean PM10 concentrations 2013
LAEI 2013 Update
Legend
PM10 (µg/m³)
< 16
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19 - 22
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73 - 76
76 - 97
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Boroughs
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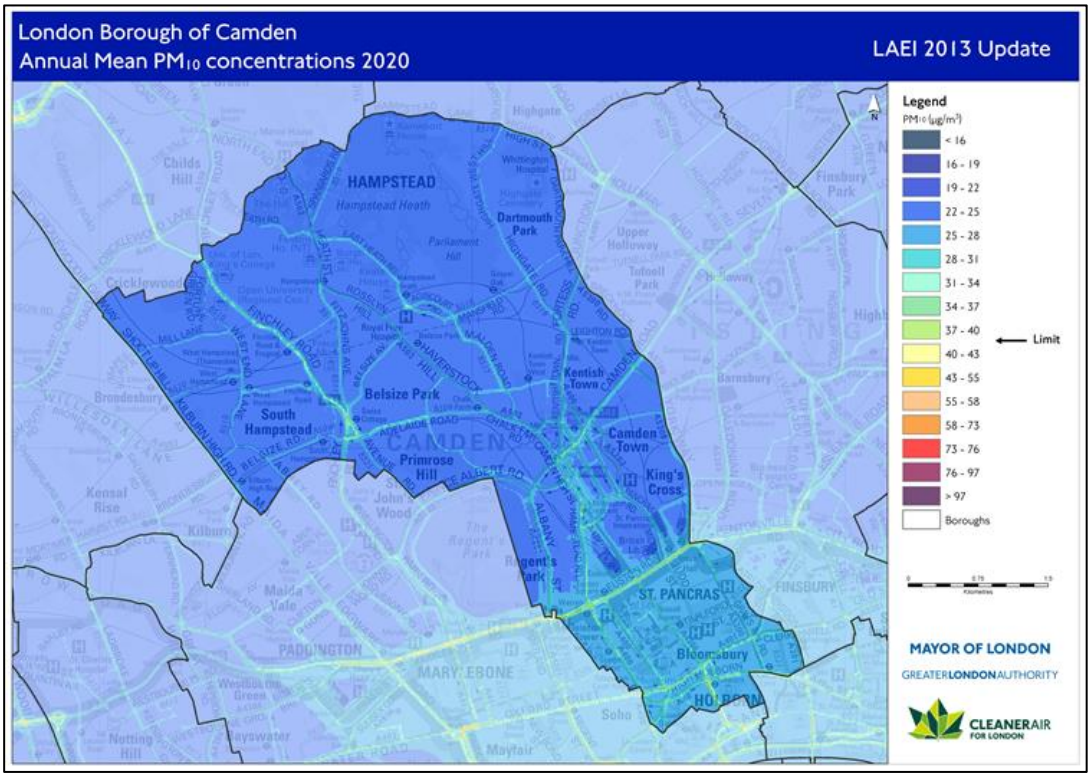
HAMPSTEAD
Hampstead Heath
Dartmouth Park
Belsize Park
South Hampstead
Kentish Town
Camden Town
Primrose Hill
King's Cross
ST. PANCRAS
Bloomsbury
MAYOR OF LONDON
GREATERLONDONAUTHORITY
CLEANERAIR FOR LONDON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LAEI 2013 Update
Legend
PM10 (µg/m³)
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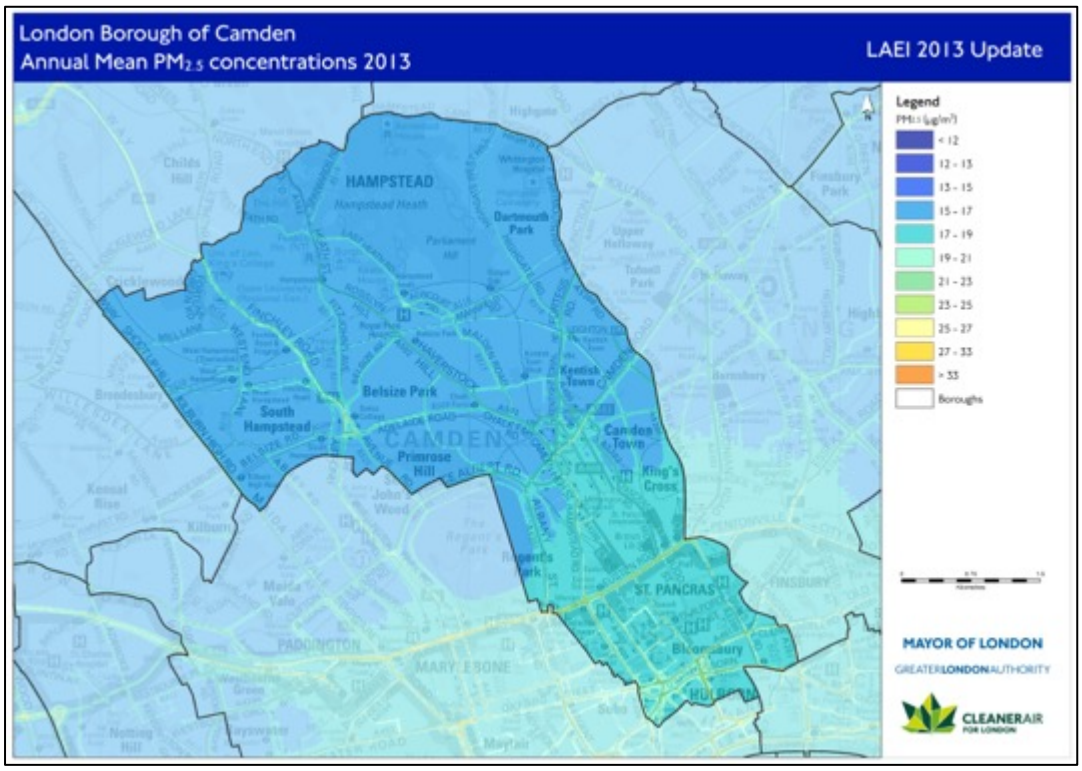
HAMPSTEAD
Hampstead Heath
Dartmouth Park
Belsize Park
South Hampstead
Kentish Town
Camden Town
Primrose Hill
King's Cross
ST. PANCRAS
Bloomsbury
MAYOR OF LONDON
GREATERLONDONAUTHORITY
CLEANERAIR FOR LONDON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Annual Mean PM2.5 concentrations 2013
LAEI 2013 Update
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13 - 15
15 - 17
17 - 19
19 - 21
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27 - 33
> 33
Boroughs
HAMPSTEAD
Belsize Park
South Hampstead
Primrose Hill
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King's Cross
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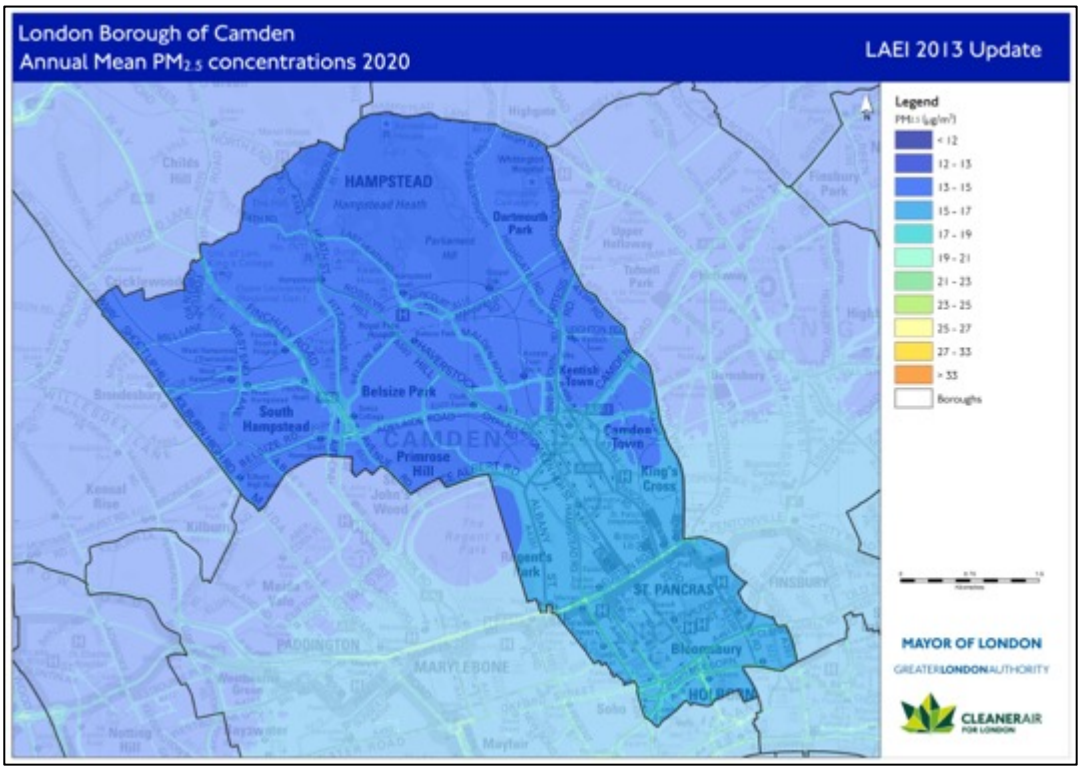
GREATERLONDONAUTHORITY
CLEANERAIR FOR LONDON


London Borough of Camden
Annual Mean PM2.5 concentrations 2020
LAEI 2013 Update
Legend
< 12
12 - 13
13 - 15
15 - 17
17 - 19
19 - 21
21 - 23
23 - 25
25 - 27
27 - 33
> 33
Boroughs
HAMPSTEAD
Belsize Park
South Hampstead
Primrose Hill
Camden Town
King's Cross
ST PANCRAS
MAYOR OF LONDON
GREATERLONDONAUTHORITY
CLEANERAIR FOR LONDON