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## **Islington Air Quality Strategy 2014-17**

**Part IV of the Environment Act 1995:  
Local Air Quality Management**

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## 1. Introduction

Air pollution is caused when chemicals and particles that are considered to be harmful to human health or harmful to ecosystems are released into the atmosphere. The main sources of pollution in the UK are the burning of fossil fuels for energy generation, transport and industrial emissions, with some sources of pollution occurring naturally.

Poor air quality is known to have a range of harmful effects on human health, including increasing the risk of developing cardiovascular and lung disease, and exacerbating those with pre-existing respiratory conditions, such as asthma. In 2010 the Environmental Audit Committee estimated that in the UK, the contribution of small particulate matter (PM<sub>2.5</sub>) to poor air quality is shortening life expectancy by 7-8 months<sup>1</sup> and in 2008, 30,000 died from air pollution across the UK. The Greater London Authority published a report estimating that in 2008 fine particles had an impact on mortality equivalent to 4,267 deaths in London<sup>2</sup>. The most recent Environmental Audit Committee report states that the burden of particulate air pollution (specifically fine particles smaller than 2.5 micrometres in diameter [PM<sub>2.5</sub>]) results in a loss of life expectancy from birth of 6 months<sup>3</sup>. Poor air quality in London is generally attributable to the density of development and the geographical location of the city.

Investing in measures to improve air quality is widely accepted to result in a greater economic benefit to society and the environment than the initial investment, particularly in densely populated urban areas. This cost benefit is particularly evident when air quality improvements result in associated carbon reductions. DEFRA (2007) for example suggest the health and associated economic impacts of air pollution cost the UK between £8.5 and £20.2 billion a year, with a more recent and 'conservative' economic assessment by Defra suggesting one type of pollution (particulates) by reducing average life expectancy in the UK by around six months could be 'valued' at £16 billion a year.

Several studies have shown that elevated levels of pollution are concentrated amongst socially deprived neighbourhoods Air Quality Management Areas (AQMA) tend to be characterised by higher levels of deprivation underlining this association. Added to this, people living in deprived areas are more likely to smoke, or live in households where someone smokes. The Institute of occupational medicine estimated that the elimination of passive smoking would increase average life expectancy by 2-3 months. Indoor air quality is also affected by allergens from dust mites and moulds in poor quality housing. This demonstrates the need to tackle both outdoor and indoor air pollution in order not only to reduce morbidity and mortality, but also health inequalities.

All local authorities in the UK have a statutory duty to assess air quality and identify areas that are unlikely to meet objectives set by the Government. Air quality in Islington does not meet the objective for annual mean nitrogen dioxide (NO<sub>2</sub>), and historically has not met the objectives for particulates smaller than 10 micrometres in diameter (PM<sub>10</sub>), so the whole borough has been declared an AQMA for these two pollutants.

This Air quality strategy (AQS) replaces the 2003 AQAP and outlines measures that will be taken to improve air quality in the borough. Some action is already underway, such as reducing emissions from the corporate fleet and buildings, and also through construction and new developments.

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<sup>1</sup> Environmental Audit Committee 2010. Air Quality. Fifth Report of Session 2009-10.

<sup>2</sup> Dr Brian G Miller 2010. Institute of Occupational Medicine. Report on estimation of mortality impacts of particulate air pollution. Consulting report P951-001. June 2010.

<sup>3</sup> Environmental Audit Committee 2011. Air Quality: A follow up. Ninth Report of Session 2010-12.

The key aims of this Air Quality Strategy are to:

- Reduce the impact of poor air quality on the health of residents, workers and visitors, particularly those who are vulnerable
- Fulfil statutory obligations for local air quality management and assist the UK Government and Mayor of London in meeting air quality limit values
- Encourage and implement cost effective measures to reduce emissions and exposure to poor air quality
- Raise public awareness and increase understanding of air quality issues
- Encourage good practice by businesses and residents of the borough

An Air Quality Action Plan (AQAP) was published in 2003, and most of the actions for this are considered to be achieved. However, a number of the old actions include measures that should be built upon and continued. For example, measures to tackle transport included reducing traffic and congestion, increasing the uptake of public transport, and reducing transport emissions. These actions are not considered to be finite and work needs to continue across London, not just in Islington, to address these problems. A previous action regarding targeting engine idling is considered to be on-going, and will be addressed in this new strategy. In addition, actions that considered energy-efficiency will be continued as both new and many existing properties still need to be targeted.

## **2. Legal Framework and Policies**

### **2.1 European and National Legislation**

The European Union has set legally binding limit values<sup>4</sup> for pollutants that are detrimental to human health and the environment, and this was made law in England through the Air Quality Standards Regulations 2010<sup>5</sup>. These limit values are health-based standards consistent with World Health Organisation (WHO) guidance. The Government has prepared an Air Quality Strategy for England, Scotland, Wales and Northern Ireland<sup>6</sup>, as required by the Environment Act 1995<sup>7</sup>, detailing what measures should be introduced in order to meet these limits. The most recent review was published in 2007, and this requires Councils to assess and manage air quality, and details the standards and objectives for specific pollutants (see table 2.1).

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<sup>4</sup> EU Directive 2008/52/EC.

<sup>5</sup> The Air Quality Standards Regulations 2010, SI 2010/1001.

<sup>6</sup> The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. July 2007.

<sup>7</sup> The Environment Act 1995 (c.25).

Table 2.1. EU limit values and National Air Quality Objectives.

<b>EU limit values for the protection of human health (Directive 2008/50/EC)</b>				<b>National Air Quality Objectives</b>	
<b>Pollutant</b>	<b>Concentration</b>	<b>EU obligations</b>	<b>Date to be achieved</b>	<b>Objective</b>	<b>Date to be achieved</b>
Sulphur dioxide	1 hour	350 µg/m <sup>3</sup> not to be exceeded more than 24 times a calendar year	1 January 2005	350 µg/m <sup>3</sup> not to be exceeded more than 24 times a calendar year	31 December 2004
	1 day	125 µg/m <sup>3</sup> not to be exceeded more than 3 times a calendar year	1 January 2005	125 µg/m <sup>3</sup> not to be exceeded more than 3 times a calendar year	31 December 2004
Nitrogen dioxide	1 hour	200 µg/m <sup>3</sup> not to be exceeded more than 18 times a calendar year	1 January 2010	200 µg/m <sup>3</sup> not to be exceeded more than 18 times a calendar year	31 December 2005
	Calendar year	40 µg/m <sup>3</sup>	1 January 2010	40 µg/m <sup>3</sup>	31 December 2005
Benzene	Calendar year	5 µg/m <sup>3</sup>	1 January 2010	5 µg/m <sup>3</sup>	31 December 2010
Lead	Calendar year	0.5 µg/m <sup>3</sup>	1 January 2005	0.25 µg/m <sup>3</sup>	31 December 2008
PM <sub>10</sub>	1 day	50 µg/m <sup>3</sup> not to be exceeded more than 35 times a calendar year	1 January 2005	50 µg/m <sup>3</sup> (gravimetric) not to be exceeded more than 35 times a calendar year	31 December 2004
	Calendar year	40 µg/m <sup>3</sup>	1 January 2005	40 µg/m <sup>3</sup> (gravimetric)	31 December 2004
Carbon monoxide	Maximum daily 8 hour mean	10 mg/m <sup>3</sup>	1 January 2005	10 mg/m <sup>3</sup>	31 December 2003
Ozone*	Maximum daily 8 hour mean	120 µg/m <sup>3</sup> not to be exceeded on more than 25 days per calendar year averaged over three years	31 December 2010	100 µg/m <sup>3</sup> not to be exceeded more than 10 times a year	31 December 2005
PM <sub>2.5</sub> *	Calendar year	Target value 25 µg/m <sup>3</sup>	1 January 2015	25 µg/m <sup>3</sup>	2020

\*Not prescribed for Local Air Quality Management.

European legislation has had a significant impact on improving air quality in the UK, shown by reductions in sulphur dioxide and benzene over the last twenty years. The European Union has introduced Euro Standards for road vehicles, which defines the limits for exhaust emissions for new vehicles sold in Member States. This was first introduced in 1992 and has become increasingly stringent since. The London Low Emission Zone (LEZ) uses these Euro Standards to restrict the most heavily polluting vehicles from entering London, which was introduced in 2008. This is to encourage those driving the most polluting diesel vehicles to become cleaner and the London LEZ is also becoming more stringent to reflect the updated Euro Standards.

## **2.2 Local Air Quality Management**

The Environment Act 1995 introduced the system of local air quality management (LAQM) which requires local authorities to periodically review and assess the current and likely future air quality in their area. In August 2000, Islington completed its third stage review and found that objectives for NO<sub>2</sub>, and PM<sub>10</sub> were not going to be achieved so an AQMA was declared in 2001 covering a large part of the borough. An AQMA for the entire borough was declared in 2003 and has been retained since.

The Updated Screening Assessment (USA) in 2012 showed continuing compliance with the objectives for carbon monoxide, benzene, 1,3-butadiene, lead and sulphur dioxide. The 24 hour and annual mean objectives for PM<sub>10</sub> had been met, however it was decided to retain the AQMA for this pollutant as evidence showed that a repeat in the meteorological conditions of 2003 could result in an exceedance of this objective. The AQMA was retained for NO<sub>2</sub> as the 2012 USA showed the annual mean objective at the background was borderline and at the roadside had not been met; it was predicted that there would be continued exceedances at the roadside location.

The 2012 monitoring data shows a provisional result for PM<sub>10</sub> it is not expected that the ratified data will show an exceedance. Automatic data presented for 2012 shows a slight increase of the NO<sub>2</sub> hourly mean limit the background and whilst a lower concentration in annual mean was observed the objective limit still continues to be exceeded at this location. The passive monitoring showed a decrease in all concentrations from the previous year except in one location. All roadside locations exceeded the annual mean objective whilst the only background location to exceed this objective was the monitoring point located at the Holloway bus garage (see table 2.2 for all of the air quality management reviews historically undertaken). Section 3.4 details Islington's air quality in comparison with the air quality objectives as described by the latest Progress Report in May 2013.

Table 2.2. Previous Air Quality Management Reviews.

Year	Report	Action
2000	3 <sup>rd</sup> Stage Review	AQMA declared (part of borough)
2003	Further Assessment NO <sub>2</sub>	AQMA extended (whole of borough)
2003	Action Plan	
2003	USA	No detailed assessment required, AQMA retained
2004	Progress Report	
2005	Progress Report	
2006	USA	No detailed assessment required, AQMA retained
2007	Progress Report	
2008	Progress Report	
2009	USA	No detailed assessment required, AQMA retained
2010	Progress Report	
2011	Progress Report	
2012	USA	No detailed assessment required, AQMA retained

Many large cities in England and Wales are not meeting the limit value for NO<sub>2</sub>, and in central London many road-side locations are not meeting the hourly limit for NO<sub>2</sub>. Also, some parts of London are not meeting the daily limit value for PM<sub>10</sub>. The European Union granted time extensions for compliance with the PM<sub>10</sub> limit value to 2011, and for the NO<sub>2</sub> limit value an extension has been granted to 2015.

### 2.3 London Policies

The Mayor of London's Air Quality Strategy<sup>8</sup> seeks to provide measures to improve air quality in London and ensure the Air Quality Standards Regulations 2010 are met, especially for particulates and NO<sub>2</sub>. The main areas where emissions should be reduced include the transport sector by encouraging sustainable travel and cleaner vehicles, targeting air quality priority locations and encouraging behaviour change, reducing emissions from homes, businesses and industry (including new developments) and increasing awareness of air quality issues.

The Mayor of London's Transport Strategy<sup>9</sup> is a statutory document to support and shape development across London. The aims of the strategy include making the transport system safer and more efficient, encourage modal shift to walking, cycling and public transport, improve quality of life and the environment and improve opportunities for all Londoners.

<sup>8</sup> Greater London Authority 2010. Clearing the Air. The Mayor's Air Quality Strategy.

<sup>9</sup> Greater London Authority 2010. Mayor's Transport Strategy.

Transport's contribution to climate change must be reduced and air quality improved by promoting use of low emission vehicles.

## 2.4 Islington Policies

Islington's Core Strategy<sup>10</sup>, which is part of Islington's Local Development Framework (LDF), outlines policies to improve the borough across a range of issues. This supersedes the majority of the Unitary Development Plan (UDP)<sup>11</sup>. Policy CS10 on Sustainable Design "seeks to minimise Islington's contribution to climate change and ensure that the borough develops in a way which respects environmental limits and improves quality of life". Parts of the UDP that have been retained that tackle air quality issues are:

- Env 16: development proposals are to avoid detriment air and water quality, and where possible seek improvements.
- Env 17: when considering planning applications the Council will seek to protect or enhance the amenities of the area, in particular regarding detrimental environmental effects, by consideration of appropriate planning conditions.
- Env 18: The Council is committed to implementing the National Air Quality Strategy, including encouraging developments that promote sustainable transport use.

Islington's Sustainable Transport Strategy (STS) sets out the Council's policies to improve the transport environment, and fulfils Islington's requirement to develop and adopt a Local Implementation Plan (LIP). These include:

- G4 Cleaner air: work to improve air quality by reducing transport-related air pollution.
- G5 Energy efficiency and climate protection: reduce transport-related energy consumption and GHG emissions in Islington, and reduce Islington's contribution to global climate change.

The proposals put forward to meet these objectives are Walking (W1-W3), Cycling (C1-C6), Motorcycles and Scooters (MS2), Parking (P1) and Environment (EN1-EN5). Proposal EN1 is to contribute towards the Council's AQS by reducing road traffic volumes and speeds, and promoting greener forms of transport and cleaner-fuel cars, vans and scooters. As part of this, the Islington Connect2 Route is a new walking a cycling route connecting Finsbury Park and Highbury Corner, which is part of the Sustrans Connect2 project. The aim of this is to increase walking and cycling in the area. The STS was updated and the current version was adopted in March 2012. The STS recognises poor air quality as being a major factor particularly within the most deprived areas of the borough and commits to making Islington streets fair, efficient, safe, secure, vibrant and healthy.

The LIP delivery plan is funded by Transport for London and sets out how the Council will deliver local transport improvements in the borough as set out in the Sustainable Transport Strategy. This programme contributes towards the Council's fairness agenda, ensuring that transport investment is targeted to areas experiencing:

- high levels of deprivation;
- high levels of road traffic casualties;
- high levels of localised air pollution;
- low car ownership; and
- a need for transport investment to support local businesses and shops.

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<sup>10</sup> [www.islington.gov.uk/services/planning/planningpol/local\\_dev\\_frame/pol\\_corestrat](http://www.islington.gov.uk/services/planning/planningpol/local_dev_frame/pol_corestrat)

<sup>11</sup> [www.islington.gov.uk/services/planning/planningpol/unit\\_dev\\_plan](http://www.islington.gov.uk/services/planning/planningpol/unit_dev_plan)

All projects included within the programme aim to tackle key transport issues, including congestion, road safety, traffic management, walking and cycling improvements, and improvements to public realm and spaces, all of which contribute towards improving local air quality in the borough.

In 2013 Transport for London created a new programme to encourage the take up of cycling. The council has developed a programme of cycling improvements as part of its Borough Cycling Programme bid that helps to deliver the objectives of the Mayor's Vision for Cycling in London (2013). This programme provides funding for safety schemes for cyclists, Cycle to School Partnerships, cycle training and parking.

Transport for London is creating the Central London cycling grid that will provide a set of safe, connected routes for cyclists across central London. In addition, TfL and Sustrans are creating the Quietways cycle grid. It will connect greater London cycle routes to the London grid and will be located mainly on quieter streets with less traffic.

Transport for London Central London cycle grid website:

<http://beta.tfl.gov.uk/corporate/about-tfl/how-we-work/planning-for-the-future/vision-for-cycling/central-london-cycling-grid>

The Council have produced a design manual for Islington's streets, entitled Islington Streetbook<sup>12</sup>, with the aim of improving the quality of the street environment and to deliver a high-quality, safe and accessible environment. This sets standards for those who may be involved in any street works throughout the borough, including the principles of sustainable streets, green procurement, recycling, materials, street furniture, trees and road and footway design. Islington strives to improve the local streets whilst minimising the overall environmental impact of the Council's activities.

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<sup>12</sup> [www.islington.gov.uk/services/planning/planninginis/plan\\_conserve/documents\\_and\\_guidance/Pages/streetbook.aspx](http://www.islington.gov.uk/services/planning/planninginis/plan_conserve/documents_and_guidance/Pages/streetbook.aspx)

### **3. Air Pollution in Islington**

#### **3.1 Description of Local Authority Area**

The London Borough of Islington is an inner-city borough sharing borders with the City of London, Hackney, Haringey and Camden. Densely populated with a culturally diverse community, Islington is recognised as having the least amount of green space per person of all the London boroughs. The majority of parks and open spaces are located in the north of the borough, whereas the south is predominantly mixed use residential/commercial. The southeast corner of the borough is part of the London Congestion Charge Zone. The main source of pollution is from road traffic as the A1 runs through the heart of the borough and is commonly used as a thoroughfare to travel through the city.

Islington is considered to be a desirable location for developers and is frequented by construction traffic. Emissions from construction practice are managed proactively by a Construction Impacts Monitoring Officer (CIMO). Developers are required to comply with the council's code of construction practice and the GLA control of dust and emissions from construction and demolition best practice guidance.

The borough is serviced by 10 London Underground Stations and a number of Overground stations servicing the North London line, Gospel Oak to Barking route, Hertford North to Kings Cross and the East London Line extension which runs from Hackney to Croydon passing through Islington.

#### **3.2 Pollutants of concern**

##### **3.2.1 *Particulate Matter***

Particles of varying sizes and sources exist in the air, but it is generally considered that fine particles (PM<sub>2.5</sub>) are the most harmful to human health as they can enter deep into the lungs and do the most damage. Concentrations of PM<sub>10</sub> (which consist of coarse and fine particles less than 10 micrometres in diameter) are comprised of primary particles emitted directly into the atmosphere from sources such as fuel combustion and secondary particles from chemical reactions in the air. Natural particle sources include sea salt, and all small particles can travel long distances in the air. In the UK, the biggest man-made sources of PM<sub>10</sub> are stationary fuel combustion and road transport, which includes direct engine emissions and particles from tyre and brake wear. Environmental tobacco smoke is a key contributor to indoor air pollution, contributing up to ten times more particulate matter compared to an idling engine.<sup>13</sup>

##### *Health Effects*

Fine particulate matter is widely acknowledged as having the greatest impact on human health, with fine particles (PM<sub>2.5</sub>) having a significant impact. Fine particles have a disproportionate effect on vulnerable people, such as children, the elderly, and those with pre-existing heart and lung conditions. Short- and long-term health effects include respiratory and cardiovascular illness, and even death.

When considering the types of particles in the air, metals and organic compounds are likely to have the greatest impact on health. Current research suggests that there is no safe level for exposure to PM<sub>2.5</sub>, and long-term exposure is likely to cause the most serious health

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<sup>13</sup> Invernizzi G, Ruprect A, Mazza R. et al. Particulate matter from tobacco versus diesel car exhaust: an educational perspective. *Tobacco Control* 2004;13:219-221

effects. The Government has estimated that the economic cost of the health impacts of poor air quality in the UK is around £15 billion, within a range of £8-17 billion<sup>14</sup>. The Environmental Audit Committee led an investigation into the effects and costs of air quality and the evidence presented stated that the contribution of fine particulate matter (PM<sub>2.5</sub>) to poor air quality reduces life expectancy of all people in the UK by 7-8 months, and for those who are particularly sensitive, the reduction in life expectancy could be as much as 9 years<sup>15</sup>.

### **3.2.2 Nitrogen Dioxide**

Nitrogen dioxide (NO<sub>2</sub>) is a gas formed through chemical reactions between nitric oxide (NO), which is released during fuel combustion, and oxygen. NO is not considered to be harmful to health at ambient concentrations, but NO<sub>2</sub> can be. NO<sub>2</sub> and NO are referred to together as oxides of nitrogen (NO<sub>x</sub>). Primary sources of NO<sub>x</sub> include vehicles and energy consumption, including gas boilers.

#### *Health Effects*

Nitrogen dioxide has different effects on health to fine particles, and there is no evidence to suggest a link with mortality. However, it is associated with respiratory conditions, such as inflammation of the airways. Long-term exposure is thought to decrease lung function, increase the risk of developing respiratory diseases and increase the response to allergens. NO<sub>x</sub> also reacts with other pollutants in the presence of sunlight to form NO and O, the latter combining with molecular oxygen (O<sub>2</sub>) to form ozone (O<sub>3</sub>), which can damage airways and reduce lung function.

#### *Impact on Ecosystems*

High levels of NO<sub>x</sub> can affect vegetation, including leaf damage and reduced growth. It can contribute to acidification and eutrophication of land and water systems, leading to damaged habitats and loss of a variety of life forms. The formation of ozone through NO<sub>x</sub> chemical reactions can damage vegetation leading to a loss in yield, in addition to the fact ozone is a greenhouse gas.

## **3.3 Pollution Monitoring**

Monitoring pollution is essential for managing air quality within the borough as it tells us what the current levels of pollutants are, and also how effective policies are in reducing concentrations over time. The London Borough of Islington has been monitoring air quality for more than 20 years and the whole of the borough has been declared an AQMA for NO<sub>2</sub> and PM<sub>10</sub>. The monitoring focusses mainly on these two pollutants.

### **3.3.1 Automatic Monitoring**

There are currently two automatic monitoring stations in the borough; The Holloway Road roadside monitoring station is located, opposite the Nag's Head shopping centre, and the Arsenal urban background station is at Islington's Ecology Centre (see figure 3.1 and table 3.1 for details). This is a Council-run nature reserve, park and educational facility in an area of Islington known as 'Drayton Park'. Results obtained from Arsenal are representative of pollution levels to which most Islington residents are exposed to most of the time. The Holloway Road site is indicative of the highest pollution levels found in the borough. Both

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<sup>14</sup> Defra 2010. Air Pollution: Action in a Changing Climate.

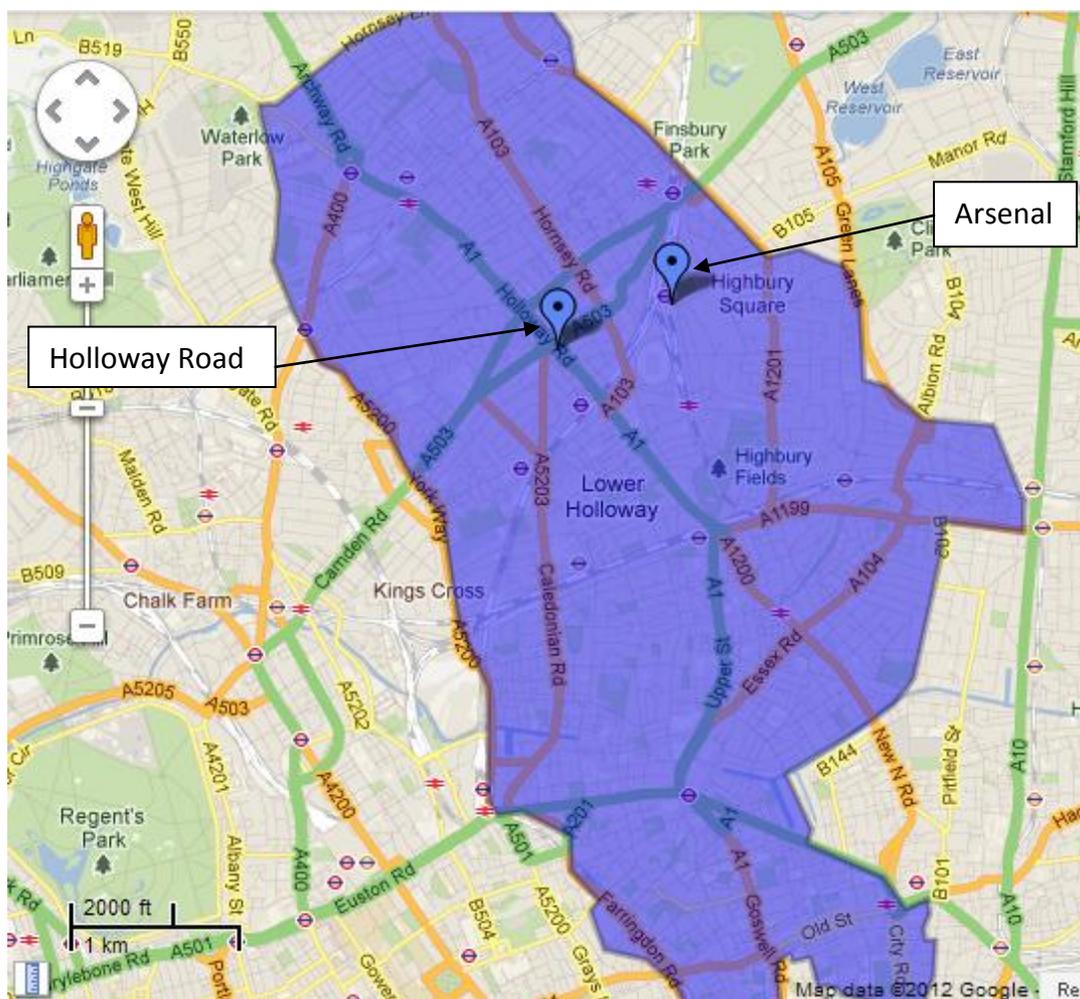
<sup>15</sup> Environmental Audit Committee 2010. Air Quality. Fifth Report of Session 2009-10.

PM<sub>10</sub> and NO<sub>2</sub> are measured at these sites, as well as carbon monoxide monitored at Holloway Road. Both of these sites use the tapered element oscillating microbalance method (TEOM) with the volatile correction method (VCM).

The data from both of the automatic air quality monitoring sites is collected on behalf of the Council by the Environmental Research Group (ERG) at King's College London. The ERG calibrate each analyser and validate and ratify the collected data to ensure its validity for comparison with the National Air Quality objectives. The data collected by the ERG across London is collated and presented on their London Air website<sup>16</sup>.

Data has also been collected from Foxham Gardens and Duncan Terrace automatic stations. These stations housed gravimetric PM<sub>10</sub> samplers but were closed in 2009. For historical data see section 3.5.

Figure 3.1. Map of automatic monitoring sites.



<sup>16</sup> [www.londonair.org.uk](http://www.londonair.org.uk)

Table 3.1. Details of automatic monitoring sites.

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location?
Arsenal	Urban Background	X 531338 Y 186031	NO <sub>2</sub> PM <sub>10</sub>	Y (1m)	N/A	N
Holloway Road	Roadside	X 530697 Y 185742	CO NO <sub>2</sub> PM <sub>10</sub>	Y (1m)	3m	Y

The Arsenal automatic monitoring site was introduced in 2007, prior to this urban background monitoring for PM<sub>10</sub> and NO<sub>2</sub> was undertaken at an automatic site at 159 Upper Street.

### 3.3.2 Non-Automatic Monitoring

NO<sub>2</sub> is monitored using diffusion tubes at 21 locations across the borough, and these are analysed by Lambeth Scientific Services. There are 9 roadside locations and 10 background locations (see figure 3.2 and table 3.2 for details). Monitoring is also conducted adjacent to the Metroline bus garage in the north of the borough using two diffusion tubes. One is near the entrance of the garage and the other is further away near a children's playground. A colocation study between three diffusion tubes and the automatic monitoring site at Holloway Road has been in operation since 2004. This is to check the reliability of the diffusion tube data in comparison with the automatic monitor and apply a bias adjustment factor to the diffusion tube results.

Figure 3.2. Map of non-automatic monitoring sites

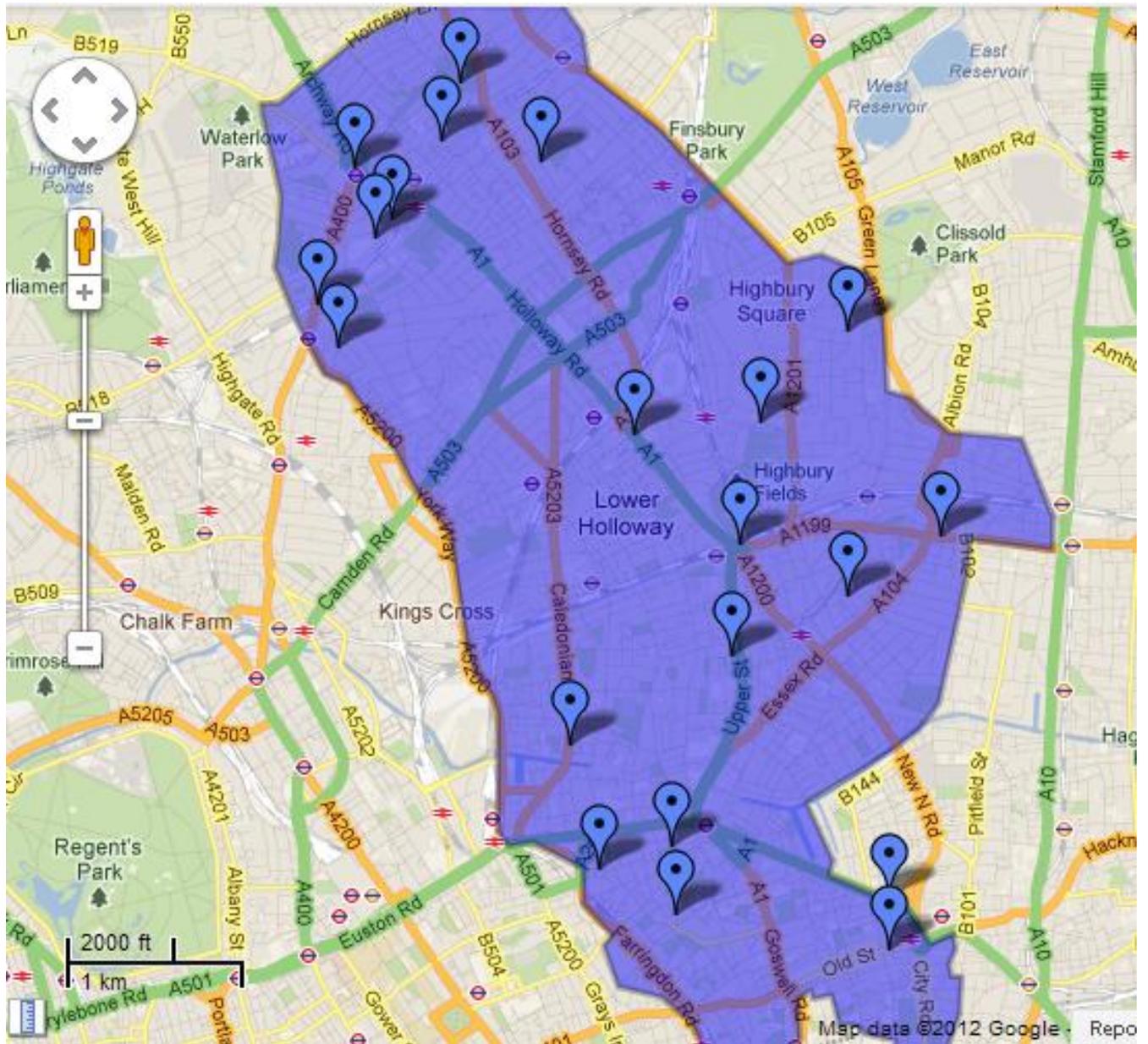


Table 3.2. Details of the non-automatic monitoring sites.

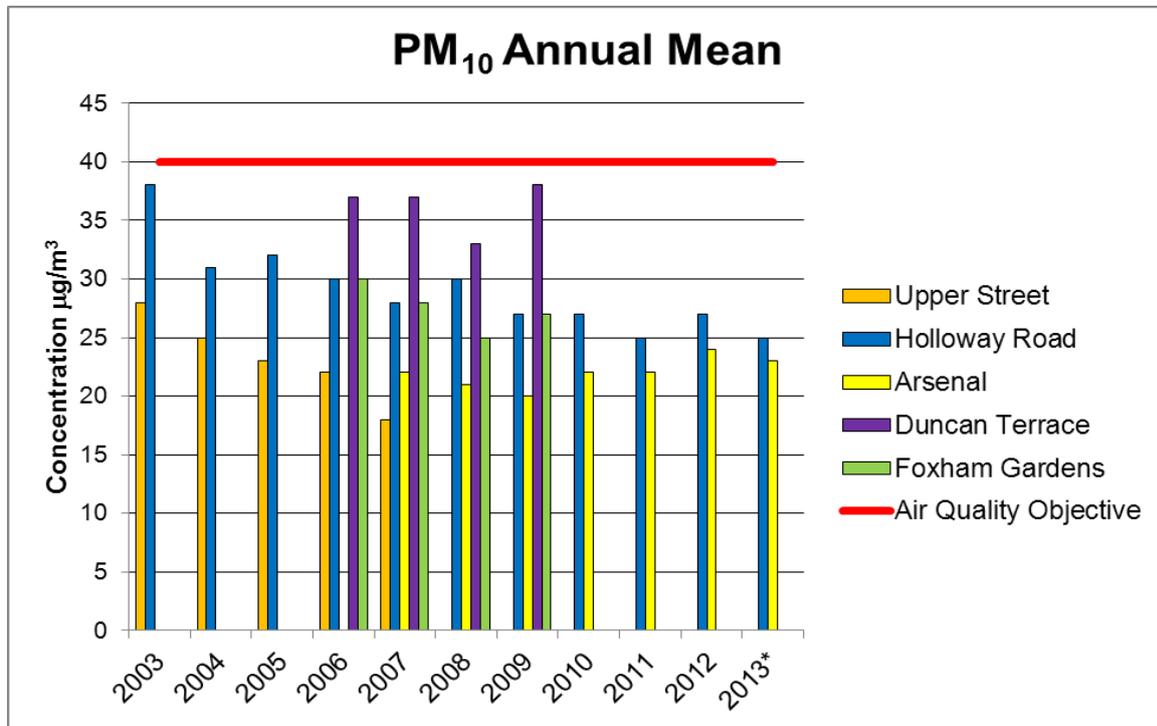
Site Name	Site Type	OS Grid Ref	Pollutants Monitored	Relevant Exposure ? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location ?
Caledonian Road	Roadside	X 530721 Y 183584	NO <sub>2</sub>	Y (0.5m)	0.5m	N
Roseberry Avenue	Roadside	X 531336 Y 182599	NO <sub>2</sub>	Y (0.5m)	0.5m	N
City Road	Roadside	X 532566 Y 182736	NO <sub>2</sub>	Y (0.5m)	0.5m	N
Old Street	Roadside	X 532577 Y 182429	NO <sub>2</sub>	Y (0.5m)	0.5m	N
Highbury Corner	Roadside	X 531669 Y 184743	NO <sub>2</sub>	Y (0.5m)	0.5m	N
Balls Pond Road	Roadside	X 532820 Y 184822	NO <sub>2</sub>	Y (0.5m)	0.5m	N
Holloway Road	Roadside	X 531034 Y 185349	NO <sub>2</sub>	Y (0.5m)	0.5m	N
Junction Road	Roadside	X 529204 Y 186093	NO <sub>2</sub>	Y (0.5m)	0.5m	N
Archway Close	Roadside	X 529396 Y 186848	NO <sub>2</sub>	Y (0.5m)	0.5m	Y
Percy Circus	Urban Background	X 530901 Y 182855	NO <sub>2</sub>	Y (1m)	N/A	N
Myddleton Square	Urban Background	X 531317 Y 182998	NO <sub>2</sub>	Y (1m)	N/A	N
Arran Walk	Urban Background	X 532303 Y 184460	NO <sub>2</sub>	Y (1m)	N/A	N
Sotheby Road	Urban Background	X 532252 Y 185983	NO <sub>2</sub>	Y (1m)	N/A	N
Highbury Fields	Urban Background	X 531755 Y 185454	NO <sub>2</sub>	Y (1m)	N/A	N
Lady Margaret Road	Urban Background	X 529325 Y 185813	NO <sub>2</sub>	Y (1m)	N/A	N
Zoffany Park	Urban Background	X 529881 Y 187022	NO <sub>2</sub>	Y (1m)	N/A	N
Elthorne Park	Urban Background	X 529987 Y 187342	NO <sub>2</sub>	Y (1m)	N/A	N
Turle Road	Urban Background	X 530469 Y 186891	NO <sub>2</sub>	Y (1m)	N/A	N
Waterloo Terrace	Urban Background	X 531625 Y 184100	NO <sub>2</sub>	Y (1m)	N/A	N
Bus 1	Urban Background	X 529521 Y 186443	NO <sub>2</sub>	Y (1m)	N/A	N
Bus 2	Urban Background	X 529618 Y 186558	NO <sub>2</sub>	Y (1m)	N/A	N

### 3.4 Comparison of Monitoring Results with Air Quality Objectives

#### 3.4.1 Particulate Matter (PM<sub>10</sub>)

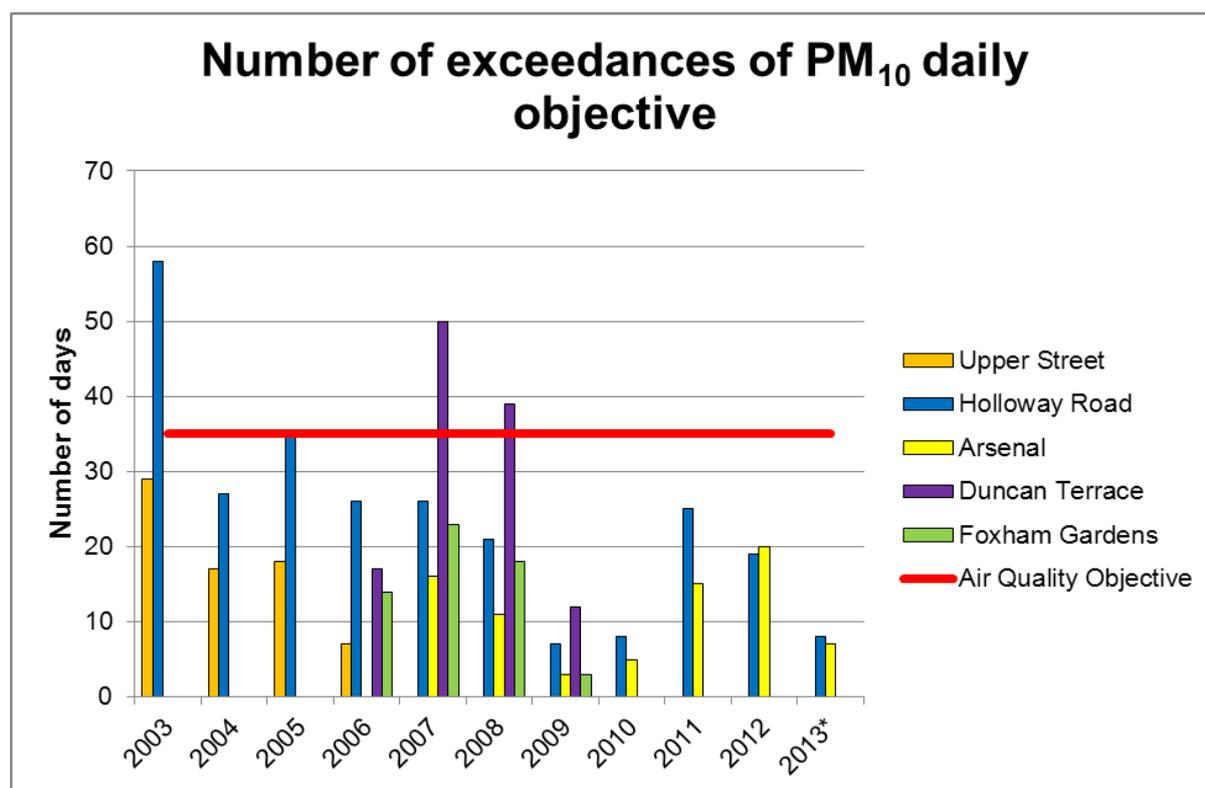
PM<sub>10</sub> is monitored at both roadside and background automatic monitoring stations. Figure 3.3 shows the annual mean objective for PM<sub>10</sub> to not have been exceeded at any point.

Figure 3.3 Annual PM<sub>10</sub> concentrations at the automatic monitoring sites.



Exceedances of the daily objective were observed in 2003, 2007 and again in 2008. This objective has been met consistently since 2008.

Figure 3.4 Daily PM<sub>10</sub> limit value breaches.



### 3.4.2 Nitrogen Dioxide (NO<sub>2</sub>)

The data at the roadside Holloway Road monitoring station shows a general decrease in NO<sub>2</sub> concentrations since 2005 until 2009 (see figure 3.3). In 2012 the lowest NO<sub>2</sub> concentrations were observed since monitoring began, 2013 shows a further decrease at the roadside location although the 2013 data has not yet been fully ratified. The concentrations at the background Arsenal monitoring station have shown a steady decrease since 2009. In 2013 we observed the 1<sup>st</sup> breach of the air quality objective limit since 2007. This may be due to an increase in the number of vehicles close to the station that were required to carry out the works to Gillespie Park. The hourly limit value has not been breached since 2007 (see figure 3.4) but again a significant increase was observed at Arsenal when compared with previous years.

Figure 3.5 Annual NO<sub>2</sub> concentrations at the automatic monitoring sites.

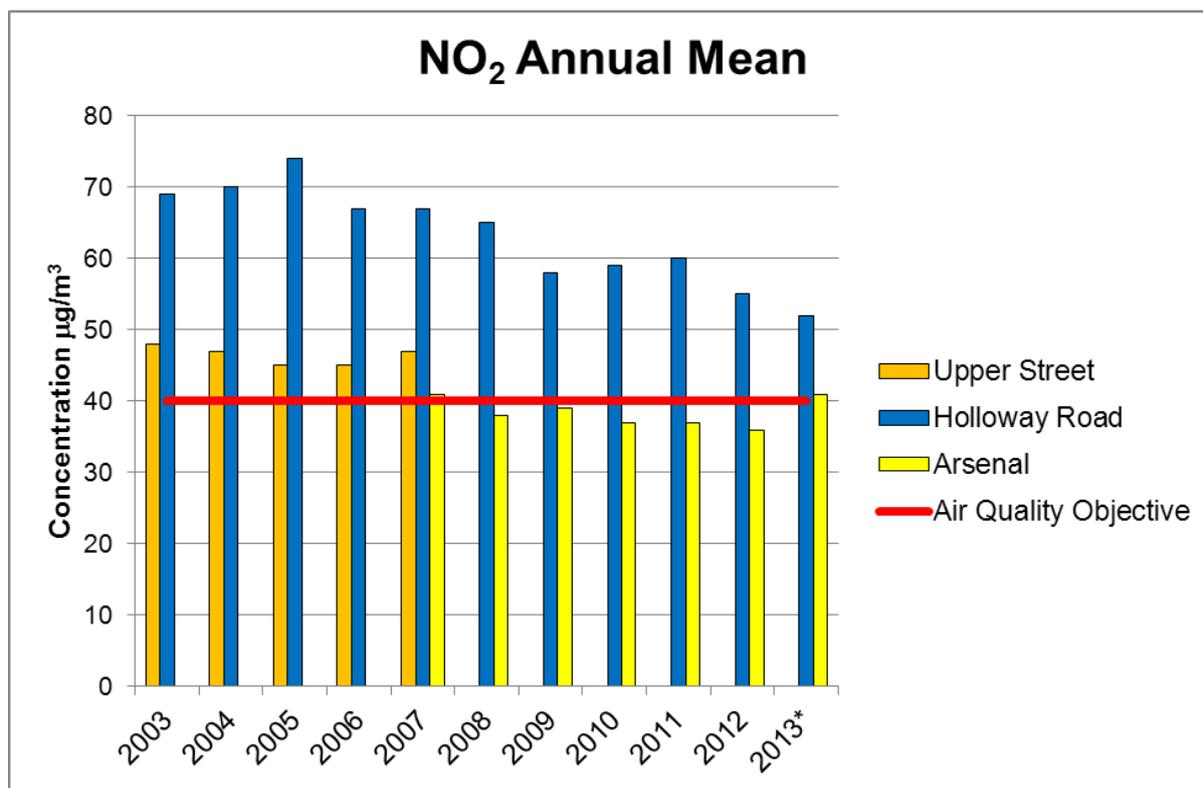
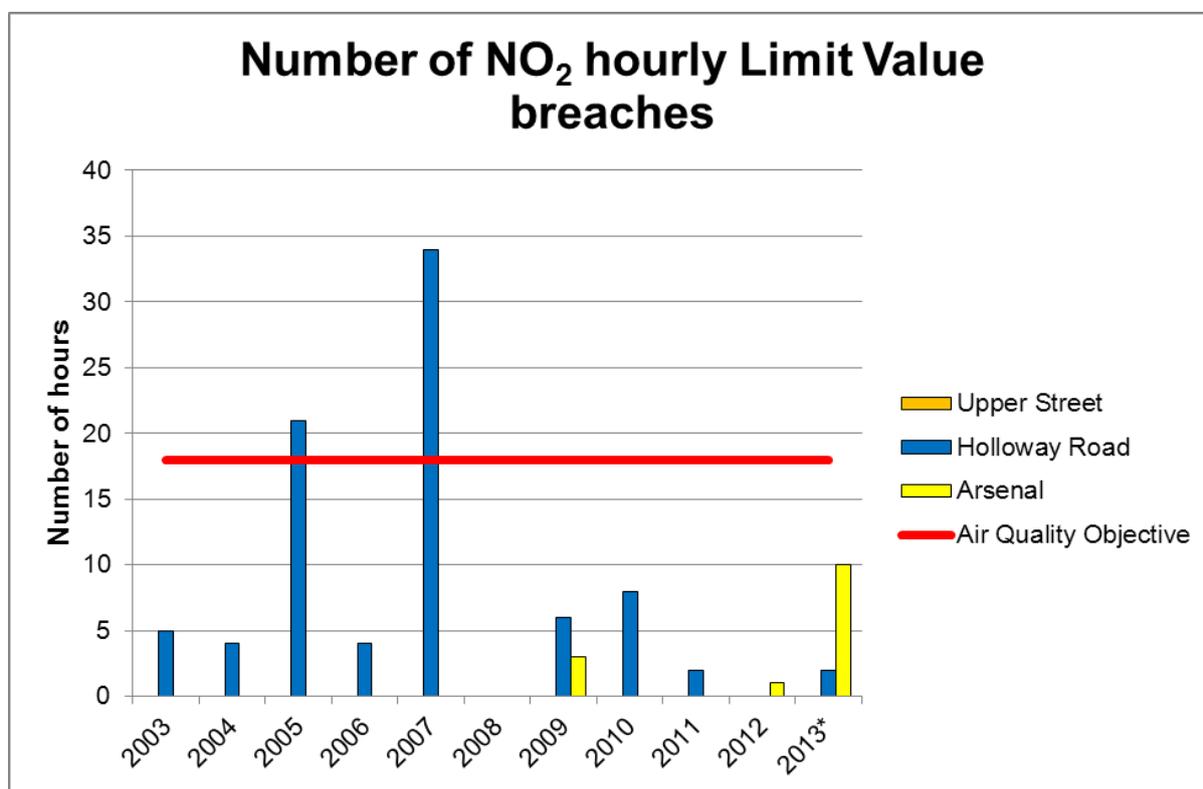
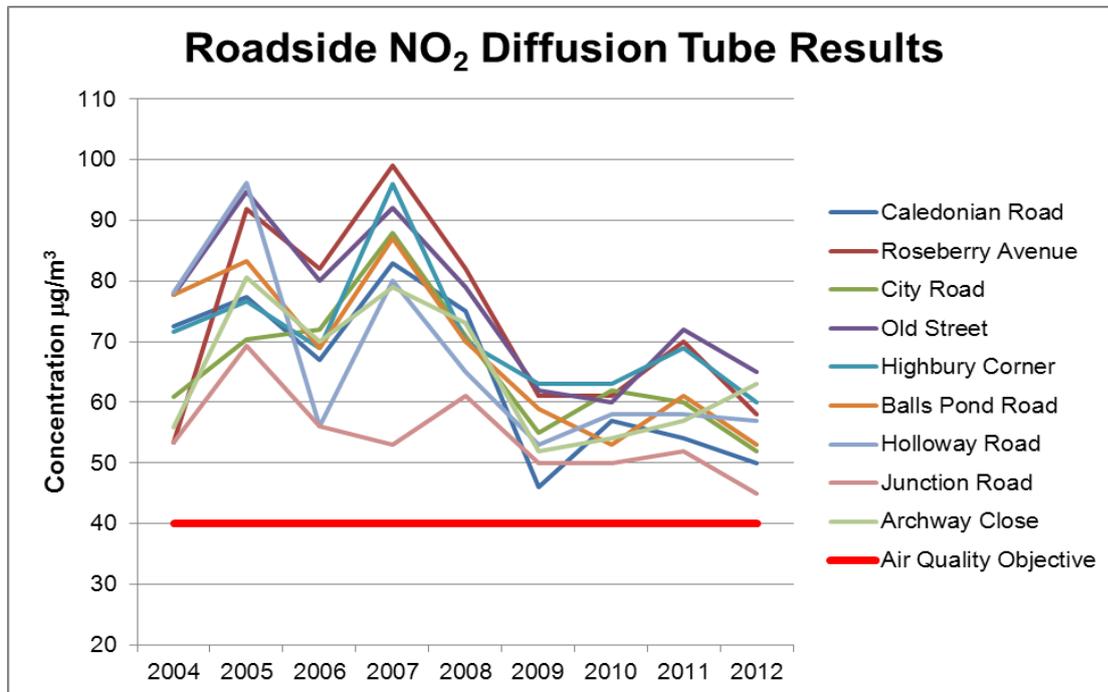


Figure 3.6 Hourly NO<sub>2</sub> limit value breaches.



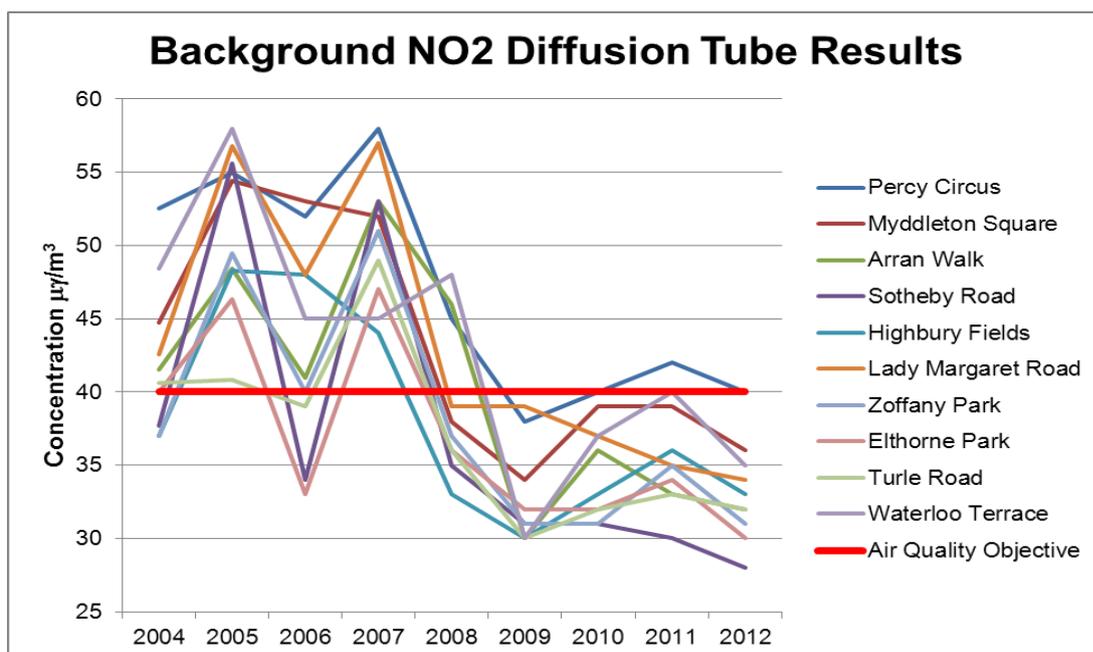
Results from the roadside diffusion tube locations shows that all sites are not meeting the air quality objective, but there has been an overall decrease in NO<sub>2</sub> results since 2007. The data shows an increase in concentrations in 2011, but there was a decrease in all but one location in 2012; this may be due to intensive construction works in this area since 2010 (see figure 3.5).

Figure 3.7 Roadside NO<sub>2</sub> diffusion tube results



The results for the background diffusion tube locations show an overall increase in concentrations since 2008; however, there has been decrease since 2010 with all of the locations meeting the air quality objective in 2012 (see figure 3.6).

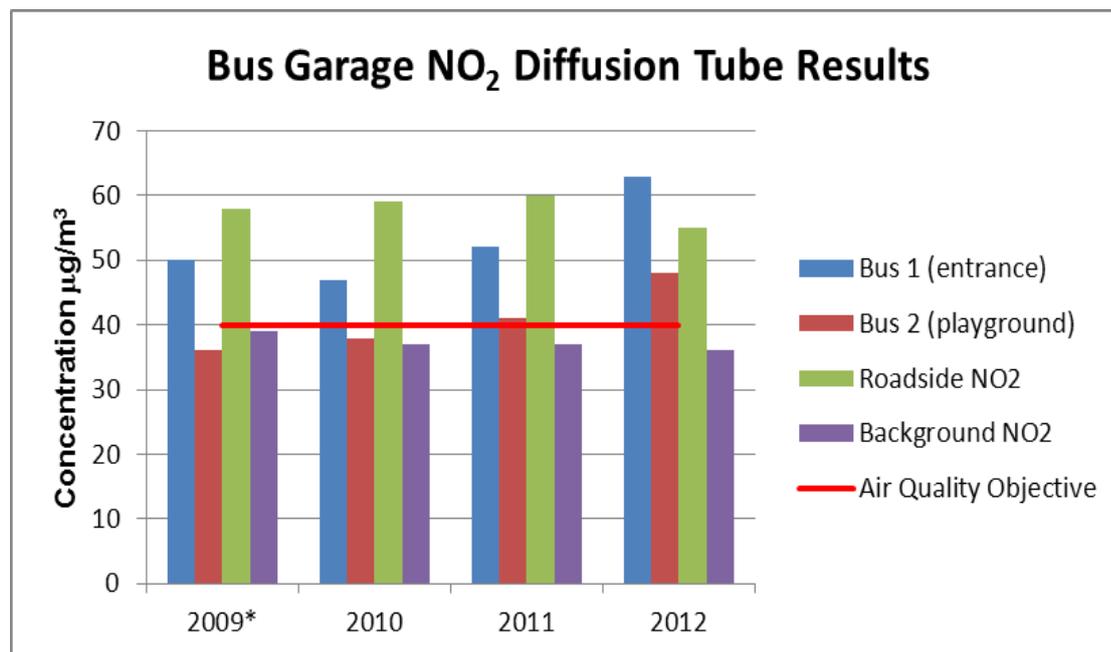
Figure 3.8 Background NO<sub>2</sub> diffusion tube results.



The diffusion tubes by the Metroline Bus Garage in the north of the borough were set up in 2009, with tube 1 by the entrance to the garage and tube 2 by a children’s playground further down Pemberton Gardens. The garage is located in a dense residential area, and it houses approximately 200 Metroline buses that serve a number of routes through Islington. Whilst the garage has upgraded a small number of its fleet to hybrids and New Bus For London (NB4L), the NO<sub>2</sub> emissions attributable to the garage remain high. Figure 3.7 shows approximately 10 - 15µg/m<sup>3</sup> increase between the garage entrance and the playground and almost 30µg/m<sup>3</sup> between the garage entrance and the background monitoring station. The Council has historically received a number of complaints about buses queuing on Pemberton Gardens on their approach to the garage, particularly late at night. It was decided to set up two diffusion tubes here to attempt to quantify the air quality impact the buses have on this locality.

The data set for 2009 is incomplete, as monitoring started in May of that year, but the results show that there has been an increase in NO<sub>x</sub> emissions by both the entrance to the garage and also by the playground (see figure 3.7). This is in line with the roadside data which has also shown an increase but they do not correlate with that of the background levels. This is expected as there are high residential buildings either side of the garage entrance creating a canyon effect and not allowing for adequate dispersion of the diesel emissions. Continuous dialogue between the Council and Metroline has achieved some improvements in reducing the numbers of idling buses and encouraging smoother flows of traffic, but more needs to be done to reduce the levels that would be representative of a normal background location.

Figure 3.9 Metroline Bus Garage NO<sub>2</sub> results (\*incomplete data set).



#### **4. Air Quality and Climate Change**

Over the last century there has been an increase in emissions from greenhouse gases (GHGs), which has been associated with a rise in global temperatures. If temperatures continue to rise this could lead to more extreme weather events in the UK, including hotter and drier summers, flooding and rising sea levels, with potentially catastrophic consequences to our economy and environment. Air quality is intrinsically linked with climate change as emissions of other pollutants, such as oxides of nitrogen (NO<sub>x</sub>) and particulates, are usually associated with emissions of GHGs, such as CO<sub>2</sub> as both sets of emissions usually arise from the same combustion processes.

Warmer temperatures and more frequent hot sunny days lead to an increase in ground level ozone (O<sub>3</sub>) concentrations, which is formed by reactions of sunlight with NO<sub>x</sub>. O<sub>3</sub> is an irritant and can exacerbate pre-existing respiratory and cardiovascular conditions. Air quality is affected by many weather-related factors, such as temperature, wind dispersion and humidity, which are all affected by a changing climate. Conversely, air pollution has both a direct and indirect impact on the climate, for example soot particles (black carbon) absorb the sun's energy and contribute to global warming.

The National Air Quality Strategy recognises that where practicable and sensible, policies tackling climate change should be synergistic with air quality policies, but this is not always the case. For example energy strategies that include biodiesel or biomass usually offer a reduction in CO<sub>2</sub> but with a gain in particle and NO<sub>x</sub> emissions, and there can be practical difficulties in using biomass efficiently as a fuel. Diesel vehicles are more fuel efficient and produced less CO<sub>2</sub> than petrol; however, they emit 22 times more particles and 4 times more NO<sub>2</sub> which has a detrimental effect on air quality and health.

## 5. Actions

### 5.1. Lobbying the Mayor of London

<b>Action</b>	<b>Date to be completed</b>
<p>The council is constrained in the improvements that it can further make to air quality as pollution is not restrained by borough boundaries. The council is lobbying the Mayor of London for action on these specific points which we believe need to be actioned to deliver improvements in air quality in Islington.</p> <p>These are:</p> <ul style="list-style-type: none"><li>• Support for the introduction of low emission and alternatively fuelled taxis, together with enforcement of emission standards</li><li>• A commitment to undertake independent real-world testing of Euro vehicles in 2014/15 to assess whether this is a suitable benchmark for diesel vehicles in the ULEZ</li><li>• Consideration of an earlier implementation date for the ULEZ</li><li>• Undertake a ULEZ options appraisal to outline the costs and benefits of different approaches to ULEZ implementation including it being wider than the current Congestion Charge Zone</li><li>• Ensure all buses operating from the Holloway garage are hybrids or New Bus for London standard (NB4L).</li><li>• Modernising junctions at Old Street, Highbury Corner and Archway with priority given to improvements that will create an environment which is conducive to active travel and protects our residents from exposure to poor air quality.</li><li>• To apply the next phase of the low emission zone (LEZ) to all buses and coaches.</li><li>• Give a long term commitment to funding to boroughs for air quality initiatives, projects and improvements.</li></ul>	On-going

## 5.2. Transport

### a. Encouraging changes in driver behaviour

Action	Date to be completed
Minimise speed – Islington became the first borough in the country to introduce a 20 mph limit on all roads.	Ongoing
Renew Islington’s Bronze FORS (Freight Operators Recognition Scheme).	April 2014
Achieve Silver FORS accreditation	April 2016
Continue to renew the council’s fleet over the next 3 years to replace Euro 3 & 4 vehicles with Euro 5 & 6.	April 2017
School travel plans will be updated to include air quality awareness raising measures and actions to reduce emissions and exposure.	2017
Undertake a targeted campaign to encourage active travel working together with local schools.	2017
Participate in the “Breathe Better Together” (BBT) campaign to be launched across London. It is an awareness raising and behaviour change campaign that will inform Londoners of when pollutant concentrations are expected to be high. Islington will work with the GLA and other boroughs to change behaviour on poor air “Action Days”.	Event launch in June 2014

### b. Reducing emissions from idling vehicles

Action	Date to be completed
Undertake an anti-idling campaign that will include the following; <ul style="list-style-type: none"> <li>- Webpage update</li> <li>- Signage</li> <li>- Targeted hotspot enforcement</li> <li>- Dashboard notices</li> <li>- Campaign day</li> <li>- Targeted campaign outside schools.</li> </ul>	March to October 2014 and repeated annually.

**c. Low emission zone feasibility study**

<b>Action</b>	<b>Date to be completed</b>
<p>Commission a source apportionment study to inform the Strategy and check that the actions are correct.</p> <p>Conduct a study into the validity and feasibility of having an Islington low emission zone. This will include a review into the most suitable location, legal implications, enforcement strategy and effect on residents.</p> <p>Conduct a cost-benefit analysis of extending the boundary of the proposed Ultra Low Emission Zone, while protecting residents and jobs, if evidence from the source apportionment study supports this.</p>	<p>Source study to complete for September 2014</p> <p>Evaluation for Dec 2014</p>

**d. Reducing personal car use**

<b>Action</b>	<b>Date to be completed</b>
<p>Review car clubs agreements to prioritise low emission vehicles.</p>	<p>March 2016</p>

**e. Reducing emissions from taxis**

<b>Action</b>	<b>Date to be completed</b>
<p>Review taxi services operating in the borough to create a green ranking scheme.</p> <p>Publish best practice guidance for mini-cab drivers and operators, working with mini-cab offices to encourage greening of their fleet as well as providing guidance on efficient driving in order to reduce fuel consumption and emissions.</p>	<p>March 2016</p> <p>March 2016</p>

**f. Emission-based parking surcharges**

<b>Action</b>	<b>Date to be completed</b>
<p>Continue tiered parking permit charge based on emissions. Work with Transport for London (TfL) and partners in developing and responding to TfL's Ultra Low Emission Zone (ULEZ).</p>	<p>March 2015 ULEZ - on-going</p>

### 5.3. Planning & Development

#### a. Determining the impacts of new developments on air quality

Action	Date to be completed
<p>Require all new developments to require air quality impact assessments with developers required to meet an “air quality neutral” standard.</p> <p>Islington already has strong planning policies to ensure developments don’t overly contribute to poor air quality. We will ensure compliance with these.</p>	June 2014
Require management plans for new developments including specific travel plans.	June 2014

#### b. Reducing emissions at construction sites

Action	Date to be completed
Update Islington’s Code of Construction Practice to include further requirements for reducing local air pollution, monitoring criteria and best practice transport strategy,	March 2015
Develop a contractors guide for reducing local air pollution,	March 2015
Require all developers to meet the highest feasible level of BREEAM (Building Research Establishment Environmental Assessment Methodology),	Ongoing
Require all major developments to meet the code for sustainable homes level 4/5.	Level 4 – up to 2016 Level 5 - from 2016

#### 5.4. Energy Usage

##### a. Improving energy efficiency

Action	Date to be completed
Produce guidance for housing providers and private landlords to give advice on measures that can be taken to reduce emissions by improving energy efficiency.	March 2016

##### b. Cleaner energy

Action	Date to be completed
Provide advice on use of non-combustion renewable energy technologies to developers to ensure compliance with carbon reduction targets whilst reducing pollutant emissions.	April 2014
Continue grant scheme, while funding allows, enabling F & G rated boilers to be replaced with energy efficient A-rated boilers.	Replace approximately 300 boilers per year

##### c. Providing advice on energy saving and fuel use

Action	Date to be completed
Continue services provided by the Energy Advice Team to residents	On-going

## 5.5. Businesses

### a. Environmental impact Assessment for procurement

Action	Date to be completed
Incorporate Air Quality considerations in to the EIA for procurement to ensure that improving local air quality is considered by our suppliers.	April 2015

### b. Business Engagement Programme

Action	Date to be completed
Work with businesses on the "City Air" initiative, targeting the boroughs NO <sub>2</sub> focus areas. Assist businesses to reduce emissions and identify practical measures to improve local air quality from their operations such as low emission deliveries, building management and energy use, whilst generating an improvement in the local area. The programme starts in Finsbury Park and will be rolled out as funding becomes available.	March 2017
Work with neighbouring boroughs to extend existing programmes such as the Zero Emission Network (ZEN) to improve air quality at the borough boundaries.	April 2016

## 5.6. Air quality awareness raising initiatives

### a. Raise awareness regarding personal exposure

Action	Date to be completed
Undertake a source apportionment study to identify the most polluting sources in the borough.	September 2014
Undertake joint working with Camden Council and the joint public health team to advise residents on local air quality, health impacts and actions individuals can take to reduce exposure.	April 2016
Hold an annual car free event	Annually
Develop Air Quality Champions for Islington to work with officers to implement measures to improve local areas and reduce emissions.	April 2015

### b. Provision of air quality information

Action	Date to be completed
Continue to lead the London wide AirText service and promote to residents.	Ongoing
Breathe Better Together information to be provided on action days.	From June 2014

## 5.7. Public Realm

Action	Date to be completed
<p>Cycle parking will be increased around the borough particularly around shopping centres and housing estates together with improvements to junctions and routes around Regents Canal.</p> <p>Safer walking and cycling routes will be mapped and advertised.</p> <p>Promote walking through the Islington Joint Strategic Needs Assessment to tackle physical inactivity and obesity.</p>	<p><b>Ongoing to March 2017</b></p> <p>July 2014</p>
<p><b>Trees</b></p> <p>500 trees to be planted across the borough in 2013/14</p> <p>Research conducted to identify species that reduce PM<sub>10</sub> concentrations and planting programme initiated to available budget.</p>	<p>March 2014</p> <p>March 2015</p>
<p><b>Highways</b></p> <p>Ensure that contractors conducting works to the Highways adhere to best practice measures to reduce local air pollution such as no idling and dust suppression techniques.</p> <p>Continue working with TfL to ensure that all new road improvements are considerate of walking and cycling to create safer, cleaner spaces for active travel.</p>	<p>Ongoing</p>
<p><b>Canals</b></p> <p>Work with the Canal and River Trust to reduce pollutant concentrations around Regents Canal by changes to mooring rules and best practice guidance.</p> <p>Initiate enforcement action where available for non-compliance.</p>	<p>February 2015</p>

## 5.8. Cleaner Air Borough

Action	Date to be completed
<p>The council have received funding from the Mayors Air Quality Fund (MAQF) and is committed to participating in GLA's Cleaner Air Borough initiative. We will strive to achieve a kite mark award in the 1st round of awards. All projects under this scheme are scheduled for completion by April 2016.</p>	<p>December 2014</p>

## References

1. Environmental Audit Committee 2010. Air Quality. Fifth Report of Session 2009-10.
2. Dr Brian G Miller 2010. Institute of Occupational Medicine. Report on estimation of mortality impacts of particulate air pollution. Consulting report P951-001. June 2010.
3. Environmental Audit Committee 2011. Air Quality: A follow up. Ninth Report of Session 2010-12.
4. EU Directive 2008/52/EC.
5. The Air Quality Standards Regulations 2010, SI 2010/1001.
6. The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. July 2007.
7. The Environment Act 1995 (c.25).
8. Greater London Authority 2010. Clearing the Air. The Mayors Air Quality Strategy.
9. Greater London Authority 2010. Mayors Transport Strategy.
10. [http://www.islington.gov.uk/services/planning/planningpol/local\\_dev\\_frame/pol\\_co\\_restrat/Pages/default.aspx](http://www.islington.gov.uk/services/planning/planningpol/local_dev_frame/pol_co_restrat/Pages/default.aspx)
11. [http://www.islington.gov.uk/services/planning/planningpol/local\\_dev\\_frame/unit\\_dev\\_plan/Pages/default.aspx](http://www.islington.gov.uk/services/planning/planningpol/local_dev_frame/unit_dev_plan/Pages/default.aspx)
12. LB Islington 2012. Islington's Transport Strategy. Local Implementation Plan 2011 to 2031.
13. LB Islington 2012. Streetbook Supplementary Planning Document.
14. Invernizzi G, Ruprecht A, Mazza R et al. Particulate matter from tobacco versus diesel car exhaust: an educational perspective. Tobacco control 2004; 13:219-221.
15. Miller, BG (2010) report on estimation of mortality impacts of particulate air pollution in London. Edinburgh: Institute of Medicine.
16. Defra 2010. Air Pollution: Action in a Changing Climate.
17. [www.londonair.org.uk](http://www.londonair.org.uk)