

city of london

City of London Air Quality Strategy 2011-2015



March 2011



Foreword

The City of London has experienced great improvements in air quality over the last 60 years since the infamous urban smogs. The main contributor to poor air quality in the 1950's was coal burning, whereas today it is road traffic. This continues to pose a hazard to health in the Square Mile because air quality targets to reduce traffic pollution, and improve air quality, are not being met.

This air quality strategy outlines the direction for air quality policy at the City of London through to 2015. It details how we will fulfil our obligations for air quality management and how we will continue to monitor the effectiveness of policies and measures that are introduced to reduce pollution. It also outlines the main sources of pollution in the Square Mile and how poor air quality can affect health.

The City has a proud history of taking action to improve air quality. In 1954 we were the first local authority to introduce a smokeless zone and in 1971 the first to obtain powers to stop the burning of sulphurous fuel. The City continues to lead by example today and we have been reducing emissions from our buildings, our fleet and our contractors' fleet. We are now encouraging City businesses to do the same.

Air quality in the City is heavily affected by pollution generated beyond our boundary so reaching air quality targets in the Square Mile requires coordinated action from the Government, Mayor of London and the City of London Corporation.

The City of London has limited powers to improve air quality, so much of this strategy is about developing and encouraging best practice, lobbying the Mayor and the Government to take the necessary action to improve air quality and rewarding the efforts of others through initiatives such as the Sustainable City Award. Actions and policies in this strategy complement other corporate policies such as transportation, planning and climate change.

Air quality is a local priority for the City of London. Our aim is to reduce the impact of poor air quality on the health of our residents, workers and visitors. I hope that we can work together to achieve this aim.

Robert Duffield CC, BA (Hons), M.Litt (Oxon)
Chairman of the Port Health and Environmental Services Committee

Contents

1. Introduction	1
1.1 List of Actions	3
1.2 Strategic Context	7
2. Background	11
2.1 What is air pollution?	11
2.2 Why is pollution a concern in the City?	11
2.3 Who is responsible for improving air quality in the City?	11
3. Pollutants of Concern in the City of London	16
3.1 Particulate matter (PM ₁₀)	16
3.2 Nitrogen dioxide	20
4. Pollution levels in the City of London	24
4.1 Particulate matter (PM ₁₀)	25
4.2 Nitrogen dioxide	30
4.3 Making data available to the public	36
5. The Links Between Air Quality and Climate Change	37
6. Reducing Emissions from Transport in the City	39
6.1 Reducing emissions from City roads	39
6.2 Using parking policy to reduce emissions	43
6.3 Reducing Emissions from City of London Fleet	43
6.4 Idling engines	47
6.5 Priority Locations	49
7. Reducing Emissions from Buildings in the City	51
7.1 Reducing Emissions from City of London Buildings	51
7.2 City Businesses	52
7.3 New Developments	53
7.4 Construction, Demolition and Street Works	58
7.5 Green roofs, green walls and trees	59
8. Increasing Public Awareness of Air Quality	61
8.1 Low pollution route map	61
8.2 Pollution alerts	62
9. Recognising and Rewarding Good Practice	63
9.1 Sustainable City Award for Air Quality	63
9.2 Considerate Contractor Scheme Environment Award	64
10. Partnership work	65
11. Lobbying	66
Appendix 1	67
Appendix 2	69
References	70

1 INTRODUCTION



Poor air quality harms human health and can increase the incidence of cardiovascular and lung disease. The Greater London Authority published a report in 2010, which detailed that an estimated 4,267 premature deaths in London in 2008 could be attributed to long term exposure to fine particles (PM_{2.5})⁽¹⁾. The City of London has some of the worst air quality in the country. This is primarily due to the density of development and its geographical location.

All local authorities in the United Kingdom are required to assess air quality and identify areas where it is unlikely to meet objectives set by the Government. The objectives have been set at levels at which minimal effects on human health are likely to occur. Air quality in the City does not meet the objectives for both annual average and hourly average nitrogen dioxide, and daily average particulate matter (PM₁₀). As a consequence, the City has been declared an Air Quality Management Area for these two pollutants.

This document sets the strategic direction for air quality policy at the City of London from 2011 until 2015. It outlines steps that the City of London will take, and is already taking, to improve air quality in the City. Some action is already underway such as reducing emissions from the corporate fleet and buildings, and controlling emissions from construction sites and new developments. Other policies and programmes will be developed and implemented over the next few years.

The key aims of the strategy are:

- **To reduce the impact of poor air quality on the health of City residents, workers and visitors, particularly those most vulnerable**
- **To fulfil statutory obligations for local air quality management and assist the UK Government and Mayor of London in meeting air quality Limit Values**
- **To encourage and implement cost effective measures to reduce emissions of air pollutants in the Square Mile**
- **To build public awareness and understanding of air quality through the provision of information**
- **To recognise, reward and disseminate good practice**
- **To work in partnership with other organisations, to take a lead and help shape national and regional air quality policy**



Dealing with poor air quality in the City requires action from a wide range of organisations. Policy development will, where appropriate, reflect action being taken by the Mayor of London as part of his Air Quality Strategy, 'Clearing The Air' ⁽²⁾, and national action, as detailed in the Government's National Air Quality Strategy ³⁾.

This strategy focuses on action to reduce nitrogen dioxide and coarse and fine particles (PM₁₀ and PM_{2.5}). The measures outlined, along with those in the Mayor's Air Quality Strategy, will improve air quality in the City. However, the proposed action will not be sufficient to meet the Limit Value for nitrogen dioxide. This requires coordinated national action.

Following publication of this strategy, an annual report will be produced detailing progress with actions, together with the latest monitoring data and any other information that is considered to be relevant in developing air quality policy at the City. For ease of reference, the air quality actions have been listed on the following pages.

1.1 LIST OF ACTIONS

Action 1



The measures that the City of London intend to progress are detailed below. Further information for each action, together with specific outcomes, is included in the body of the document.

The City of London will continue to monitor air pollutants to ensure that air quality objectives and Limit Values are being met, and to assess the effectiveness of national, regional and local policies to reduce levels of pollution.

Action 2



The City of London will ensure that, if possible, policies introduced to improve air quality will also have a positive benefit on reducing greenhouse gas emissions, and policies introduced to reduce greenhouse gas emissions will have a positive benefit on air quality.

Action 3



Options for managing traffic in the City to improve air quality locally will be considered during 2011. Air quality impact assessments will be undertaken for transport schemes that involve significant changes to traffic type and movement on City roads.

Action 4



The City of London will model the air quality impact of further controls over taxi emissions, the use of low emission buses on routes through the City and a central and inner London Low Emission Zone.

Action 5



The City of London will investigate further options for using parking policy to promote the use of low emission vehicles in the Square Mile.

Action 6



The City of London will continue to manage its vehicle fleet to reduce emissions of NO_x, PM₁₀ and CO₂ year on year.

Action 7



The City of London will continue to trial alternatively fuelled vehicles and increase the number of low emission vehicles in the fleet, where appropriate.

Action 8



The City will continue to encourage its contractors to use low emission vehicles.

Action 9



The City of London will work with public and private bodies to develop low emission procurement guidance.

Action 10 >	The City of London will engage with the City Police to reduce emissions from their fleet.
Action 11 >	The City of London will continue with its efforts to establish effective ways to prevent drivers from leaving vehicle engines idling unnecessarily in the City.
Action 12 >	The City of London will work with the Mayor of London to designate the whole of London a no-idling zone.
Action 13 >	The City of London will work with Transport for London to trial a method of dust suppression along the route from Victoria Embankment through to Tower Hill.
Action 14 >	If dust suppression is shown to be effective at reducing PM ₁₀ concentrations, the City will consider rolling it out to other areas of concern in the Square Mile and encourage Transport for London to apply it on other roads in the City that they are responsible for, particularly Mansell Street and Farringdon Street.
Action 15 >	The City of London will continue to explore and implement energy efficiency measures to reduce emissions of carbon, NOx and PM ₁₀ from its buildings.
Action 16 >	The City of London will engage with City businesses to gain their support for improving air quality in the Square Mile.
Action 17 >	Air quality will be a consideration in all development and the City of London will require developers to undertake detailed air quality impact assessments of major developments adjacent to sensitive premises, such as residential properties, schools and St Bartholomew's Hospital. This will form part of the Environmental Impact Assessment (EIA).
Action 18 >	Major developments will be encouraged to obtain maximum points for the pollution section of the BREEAM assessment relating to NOx emissions i.e. to meet a dry NOx emission rating of <40 mg/kWh for boilers (this is equivalent to a NOx rating >5).
Action 19 >	The City of London will develop local best practice guidance for controlling emissions from gas Combined Heat and Power plant.

Action 20

Developers will be encouraged to install non-combustion renewable energy technology to work towards energy security and carbon reduction targets.

Action 21

A detailed air quality impact assessment will be required for any development where biofuel or biomass is proposed for on-site energy generation.

Action 22

The City of London will consider cost effective ways of minimising emissions from back up generators by the end of 2011.

Action 23

Where appropriate, the City of London will secure air quality improvements through the S106 process.

Action 24

The City of London will continue to establish best practice for minimising emissions from construction, demolition and street works and update the City of London Code of Practice for Demolition and Construction Sites to reflect this.

Action 25

The City of London will pay particular attention to controlling emissions of PM₁₀ from construction, demolition and street works in and around the route from Victoria Embankment through to Tower Hill. This is to assist the Government to achieve the PM₁₀ Limit Value.

Action 26

The City of London will assist the Mayor of London to update the Greater London Authority and London Councils' Best Practice Guide for Controlling Dust and Emissions from Construction and Demolition.

Action 27

The City of London will encourage the use of green walls and green roofs in new and existing buildings, particularly in close proximity to the priority location Victoria Embankment, Upper and Lower Thames Street through to Tower Hill.

Action 28

The City of London will continue to increase public understanding of poor air quality through initiatives such as pollution alert systems and its work with City businesses.

Action 29

The City of London will continue to promote, reward and disseminate best practice for tackling poor air quality through the Sustainable City Awards and the Considerate Contractor Scheme Environment Award.

Action 30

The City will continue to work in partnership with key organisations to develop local, regional and national air quality policy.

Action 31

The City of London will continue to lobby the Mayor of London and the Government to ensure that the Limit Values for PM₁₀ and nitrogen dioxide are met in the Square Mile.

Action 32

Following publication of this strategy, the City of London will produce an annual report detailing progress with the actions.

1.2 STRATEGIC CONTEXT

“The City has a proud history of looking to the welfare of future generations and has long been aware that a clean environment and economic prosperity go hand in hand with a good quality of life.” The City Together Strategy

“Over the next four years, we will work towards achieving Strategic Aim 2 – To provide modern, efficient and high quality services by... developing an air quality strategy to minimise emissions of pollutants in the City”.
City of London
Corporate Plan

1.2.1 The City of London Corporation

The City of London Corporation (the City), through the Court of Common Council provides local Government services for an area in central London known as the ‘Square Mile’.

The City supports and promotes the City of London as a world leader in international finance and business. It has an unusual population structure. Land use is dominated by commercial and financial buildings, with around 310,000 people commuting into the City each working day. The residential population stands at approximately 9,300 ⁽⁴⁾. The City also hosts a large number of tourists. A new Tourist Information Centre, adjacent to St Paul’s Cathedral, received almost 800,000 visitors in the first two years.

The City of London Corporation has a long standing commitment to improve air quality. In 1954 it was the first local authority to designate its area a smokeless zone and in 1971, the first to acquire parliamentary powers to prohibit the burning of sulphurous fuel. The City of London is strongly committed to air quality improvements today, as supported by:

- The Corporate Plan 2010 - 2014⁽⁴⁾
- The City Together Strategy: The Heart of a World Class City 2008 - 2014⁽⁵⁾
- The Local Area Agreement 2008 - 2011⁽⁶⁾
- The Local Development Framework
- The Local Development Framework
- The Local Implementation Plan

1.2.2 The City of London Corporate Plan 2010 - 2014

The Corporate Plan 2010 - 2014 is the City's main strategic planning document. It provides a framework for the delivery of services and presents a clear statement of the City’s vision and strategic aims. It also describes how policy priorities will be delivered in 2010/2011.

The Corporate Plan contains three strategic aims.

1. To support and promote ‘The City’ as the world leader in international finance and business services.

“Air quality is a high City and national political priority and actions taken to improve it will also contribute to tackling climate change. Air quality is a national enforcement priority because it impacts on whole populations, particularly the elderly and those more susceptible to air pollution.” The City Together Strategy

2. To provide modern, efficient and high quality local services and policing within the Square Mile for workers, residents and visitors, whilst achieving sustainable outcomes.
3. To provide valued services to London and the nation.

The Corporate Plan places a commitment on the City of London to develop an air quality strategy.

1.2.3 The City Together Strategy

The Corporate Plan was developed with regard to the aims contained within the Sustainable Community Strategy for the City of London, *The City Together Strategy: The Heart of a World Class City 2008 -2014*. The document was developed by The City Together, which is the City's local strategic partnership.

The City Together Strategy contains 26 key goals, one of which is:

To continue to minimise noise, land and water pollution and improve air quality where this is possible.

A medium term priority in the City Together Strategy is

To identify local air pollution hot spots and seek to reduce air pollution levels and mitigate its impact where possible.

1.2.3 The Local Area Agreement 2008 - 2011

The City of London's Local Area Agreement 2008 - 2011 (LAA) was developed by The City Together. It was negotiated with national Government and aims to address the City's local priorities as effectively and efficiently as possible. It commits the City and its partners to working together to achieve improvements in areas of most concern to stakeholders.

“Nitrogen dioxide and particulate (PM₁₀) levels in the City are high. Areas of greater vulnerability to poor air quality include residential areas, the City's schools and St Bartholomew's Hospital”
The City of London Core Strategy

The current LAA (2008—2011) contains six priority targets. One of these targets is to reduce emissions of air pollutants from the City of London Corporation estate and operations. This reflects the high priority that the City of London places on improving air quality, as detailed in the Corporate Plan and City Together Strategy. The City of London Corporation was the only local authority in the country to incorporate an air quality target into its Local Area Agreement.

1.2.4 The Local Development Framework

The City of London Corporation is preparing a Local Development Framework (LDF) to guide the future development of the City. The most important part of the LDF is the Core Strategy which will set out the vision and key policies for planning in the City.

The Core Strategy has been drawn up in consultation with the City's communities. In December 2010, the Core Strategy was submitted to the Secretary of State for Communities & Local Government. He has appointed an independent planning inspector to carry out a public examination from March 2011. It is expected that the Core Strategy will be adopted late 2011.

The Core strategy recognises the impact that development can have on local air quality and how the planning process can be tailored to help build a more sustainable City. The Core Strategy requires developers to

positively address local air quality, particularly nitrogen dioxide and particulates PM₁₀ (the City's Air Quality Management Area pollutants)

The Core Strategy also requires developments to minimise carbon emissions through energy efficiency and other measures. If managed correctly, this will have a positive impact on local air quality.

“Motor transport is a significant contributor to environmental pollution in the City. Poor air quality is the major transport-related pollution problem in the City.” Draft City of London Local Implementation Plan

1.2.5 The Local Implementation Plan

The City of London is developing its second Local Implementation Plan (LIP). The LIP sets out the City of London Corporation’s proposals for the implementation of the Mayor’s Transport Strategy.

One of the key objectives of the draft LIP is:

To reduce the pollution of air, water and soils and excessive noise and vibration caused by transport in the City.

This objective will be on going and is relevant to the whole of the second local implementation plan period through to 2032. The focus of the objective is on the first part of the plan period, so that the greatest reduction in air pollutants occurs early.

2 BACKGROUND

2.1 WHAT IS AIR POLLUTION?

Air pollution is caused when chemicals and particles that are considered to be harmful to health, or to ecosystems, are released into the atmosphere. The combustion of fossil fuels for energy generation and transport, along with emissions from industry, are the main sources in the United Kingdom. Some sources of pollution can occur naturally.

Being exposed to high levels of air pollution can have a detrimental effect on health. PM₁₀, and in particular PM_{2.5}, have the most significant impact (see section 3.1.3).

2.2 WHY IS POLLUTION A CONCERN IN THE CITY?

The City has some of the highest levels of pollution in the country due to its location, at the heart of London, and the density of development. Levels of some pollutants in the City such as sulphur dioxide, carbon monoxide and benzene have reduced over the past decade, but levels of fine particles and nitrogen dioxide remain high.

Air pollution is a concern to City residents. In the most recent City of London Place Survey, when presented with a list of 20 key concerns for the Square Mile, pollution was just second to the level of traffic congestion as the issue residents felt was in most need of improvement (7).

2.3 WHO IS RESPONSIBLE FOR IMPROVING AIR QUALITY IN THE CITY?

The United Kingdom Government, Mayor of London and City of London Corporation all have a responsibility to develop plans and programmes to improve the City's air quality.

2.3.1 The Government

The Department of the Environment Food and Rural Affairs (DEFRA) is the Government department responsible for strategic measures to improve air quality across the country. DEFRA published a national air quality strategy in 1997. The strategy has undergone a series of reviews. The latest version was published in 2007.

The European Union sets *Limit Values* for a range of pollutants that are considered to be harmful to health and the environment. The European Commission can take action against any Member State if the air quality does not meet the Limit Values throughout its territory.

The Air Quality Strategy
for England, Scotland, Wales
and Northern Ireland

Volume 1



Department for Environment, Food and Rural Affairs in partnership with the
Scottish Executive, Welsh Assembly Government and Department of
the Environment Northern Ireland



The Government's National Air Quality Strategy outlines the policy framework for meeting the Limit Values.

At present, air quality in many large cities in England and Wales does not meet the European annual average Limit Value for nitrogen dioxide. In central London, air quality adjacent to busy roads does not meet the hourly average Limit Value for nitrogen dioxide. In addition, small areas of central London, which include parts of the City, do not meet the daily Limit Value for PM₁₀. Table A1, Appendix 1, details the Limit Value compliance target levels and dates for nitrogen dioxide and PM₁₀. DEFRA has submitted a request for a time extension to the European Commission to extend the deadline for compliance with the PM₁₀ Limit Value to 2011. Twenty five of the twenty seven Member States have exceeded the PM₁₀ Limit Values in at least one part of their country. The City of London Corporation contributed towards the Government's application for a time extension. During 2011, the Government will submit an application to extend the deadline for compliance with the nitrogen dioxide Limit Value. If the application is successful, this would be extended from 2010 to 2015.

European legislation has had a large impact on air quality improvements in the UK. Power stations are much cleaner than they were twenty years ago and Member States enforce tight controls over a variety of industrial emissions. These combined policies have led to a significant reduction in pollutants such as sulphur dioxide and benzene.

The European Union has also introduced Euro Standards for road vehicles. Euro Standards define the limits for exhaust emissions of new vehicles sold in Member States. The emission criteria are defined in a series of European Union Directives which have resulted in increasingly stringent standards. Since they were first introduced in 1992, pollution from vehicle exhausts has reduced significantly. Concentrations of carbon monoxide are now very low in the City due to the use of catalytic converters in vehicles.

The revised national air quality strategy introduces an 'exposure reduction' approach for fine particles; PM_{2.5}. PM_{2.5} are tiny particles associated with respiratory and cardiovascular illness and mortality. They have no known safe limit for human health. A target will be set for a percentage reduction in annual average concentrations of PM_{2.5} in urban areas to be achieved between 2010 and 2020. For the centre of London this is likely to be 10%. The Government are also expected to set a maximum level which must not be exceeded anywhere. To date, responsibility for helping the Government to achieve the European Limit Values associated with PM_{2.5} has not been passed to local authorities. However action to reduce PM₁₀ concentrations should lead to a reduction in PM_{2.5} as the sources of both pollutants in the City are broadly the same.

2.3.2 The Mayor of London

The Greater London Act 1999 requires the Mayor of London to prepare and publish an Air Quality Strategy for improving air quality across London. The Mayor of London produced his first Air Quality Strategy '*Cleaning London's Air*' in September 2002. An updated version '*Clearing The Air*' was published in December 2010. The City of London must have regard to the Mayor of London's strategy when preparing its own strategy and action plan.

Since the original air quality strategy for London was introduced, the Mayor has taken steps to reduce emissions from London buses and taxis, and has introduced a Low Emission Zone for London. He has also used the central London Congestion Charge scheme to provide incentives for the uptake of low carbon vehicles.

The Mayor proposes several measures in the latest strategy. He plans to increase the number of electric vehicles and bicycles on London's roads and further reduce emissions from London buses and taxis. The Mayor also plans to continue to use the central London Congestion Charge Zone to encourage low carbon vehicles and extend the London Low Emission Zone to include vans and minibuses.

A number of policies in The Mayor's Air Quality Strategy require co-operation from London Boroughs and the City of London. These are reflected in this strategy.





2.3.3 The City of London

All local authorities in England and Wales have a statutory duty to assess air quality. This is detailed in the Environment Act 1995. If levels of pollution don't meet the objectives set by the Government, the area must be declared an Air Quality Management Area and an action plan implemented to bring levels of pollution down. Air quality in the City meets the objectives for: sulphur dioxide, carbon monoxide, benzene, lead and 1, 3-butadiene. These are now at levels that are not considered to be harmful to human health.

Objectives for nitrogen dioxide and PM₁₀ in the City are not being met. The City has been designated an Air Quality Management Area for these two pollutants. Table A2, Appendix 1, details the air quality objectives for nitrogen dioxide and PM₁₀. The compliance dates for the nitrogen dioxide objectives are tighter than the European Union Limit Values. The Government has a legal duty to **meet** the Limit Values, whereas the City of London Corporation's statutory obligation is to **work towards** the air quality objectives.

Ozone is a pollutant which can occasionally be high in the City during hot, sunny periods that we call *summer smogs*. High levels of ozone can cause problems to people with respiratory illness. The formation of ozone can take place over several days and may have arisen from emissions hundreds, or even thousands, of kilometres away. It is not considered to be a local pollutant that the City can influence directly. However, implementation of measures in this strategy will result in lower emissions of nitrogen oxides (NO_x), which is one of the pollutants that contribute to the formation of ozone. Consequently this strategy should help towards the reduction of summer smog days in the City.

In addition to developing policies and plans to improve air quality, the City has a statutory duty to regulate emissions from certain operations. The Environmental Permitting (England and Wales) Regulations 2007 oblige the City of London to regulate certain prescribed industrial operations such as dry cleaners in the Square Mile and cement handling, timber processing and vehicle re-spraying at the London Ports. The City of London also has a duty to ensure that chimney heights for new boilers in commercial premises are sufficient to ensure adequate dispersal of pollutants. This responsibility is detailed in the Clean Air Act 1993. The City of London uses local legislation: the City of London Various Powers Act 1954, to prohibit bonfires in the Square Mile. All of these controls have been introduced to improve air quality and protect public health.

3 POLLUTANTS OF CONCERN IN THE CITY OF LONDON

3.1 PARTICULATE MATTER (PM₁₀)

3.1.1 What are fine particles?

Particles of varying sizes and sources exist in the air. However, it is generally considered that **fine** particles are most hazardous to health due to their ability to penetrate deep into the lungs and do the most damage.

Particles are defined by their size. Both coarse and fine particles, under 10 micrometers in diameter, are represented as PM₁₀. Fine particles are 2.5 micrometers or less in diameter and they are generally created by combustion. They are represented as PM_{2.5} and are the main cause of the harmful effects of particulate matter. Coarse and fine particles are not visible to the naked eye.

3.1.2 Where do particles come from?

Concentrations of PM₁₀ consist of primary particles that are emitted directly into the atmosphere from sources such as fuel combustion, and secondary particles which are formed by chemical reactions in the air. Particulate matter can be human-made or occur naturally. Natural particles found in the City include sea salt and dust from the Sahara desert.

In the UK, the biggest man-made sources of PM₁₀ are stationary fuel combustion and transport. Road transport gives rise to primary particles from both engine emissions and tyre and brake wear. The Greater London Authority holds a database of all emissions across London. It is called the London Atmospheric Emissions Inventory (LAEI)⁽⁸⁾. The latest version of the inventory, released in August 2010, details pollution emitted in 2008 and projects emissions across London for 2011 and 2015. The LAEI indicates that in 2011, approximately 49 % of PM₁₀ generated by road vehicles in the City will be caused by the general wear of tyres and brakes. This will rise to 62% of emissions associated with vehicles by 2015. Secondary PM₁₀ is created from emissions of ammonia, sulphur dioxide and oxides of nitrogen, as well as from emissions of organic compounds from fuel combustion.



Small particles can travel long distances and on any given day it is likely that the following particles are in the air in the City.

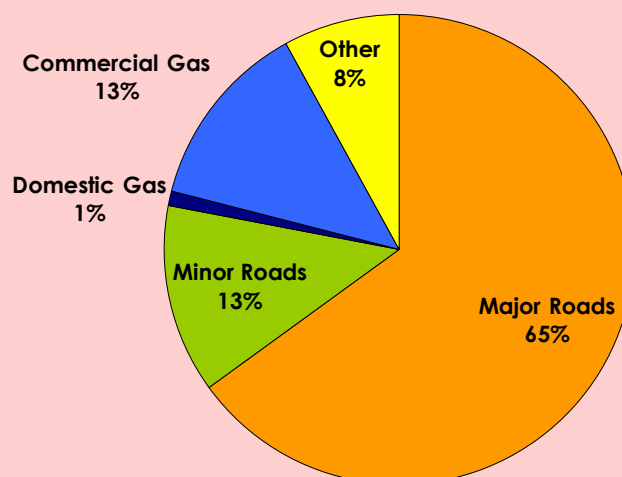
- Black carbon from fuel combustion, particularly diesel
- Trace metals e.g. vehicle brake wear
- Minerals from construction
- Sulphates from industrial fuel burning outside London
- Nitrates from fuel burning, industry and traffic
- Sea salt
- Desert dust

3.1.2.1 Primary particles emitted in the City

When considering action that the City of London may take to improve local air quality, it is important to know what is emitted from different sources within the Square Mile. In the LAEI, PM₁₀ emissions within the City are broken down into major roads (as detailed in figure 4.4), minor roads, gas used in the commercial sector and gas used in domestic premises.

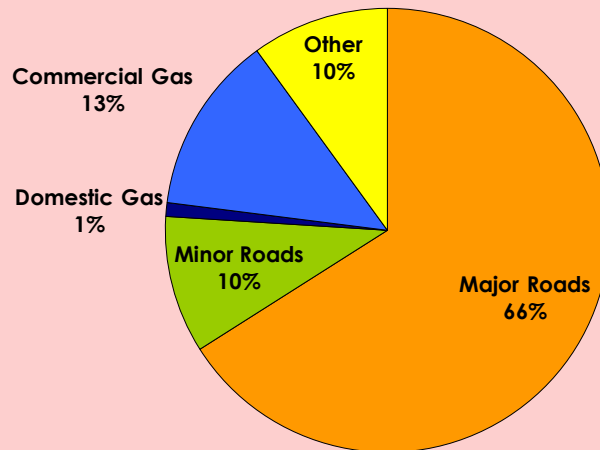
Figure 3.1 shows the anticipated relative proportion of emissions from each source in 2011. The LAEI indicates that the main source of PM₁₀ in the City is road transport. This is expected to equate to 78% of all emissions in 2011 and a similar proportion, 76%, in 2015. Previous versions of the LAEI have attributed a greater proportion of PM₁₀ to be from gas used for heating buildings.

Figure 3.1
Source of PM₁₀ emissions
in the City, 2011



The LAEI does not include emissions from construction sites in the City as, despite their size, they are classed as temporary and difficult to capture in a database which represents total annual emissions.

Figure 3.2
Source of PM₁₀ emissions
in the City, 2015



The PM₁₀ from major and minor roads is further broken down into vehicle type in figure 3.3. Figure 3.4, overleaf, shows how the relative proportions are anticipated to change by 2015. When comparing vehicle types, taxis are the biggest emitters of PM₁₀ in the City. They will be responsible for 38% of PM₁₀ emitted by vehicles in 2011, increasing to 50% in 2015.

Figure 3.3
Source of PM₁₀ emissions
from vehicle types in the City, 2011

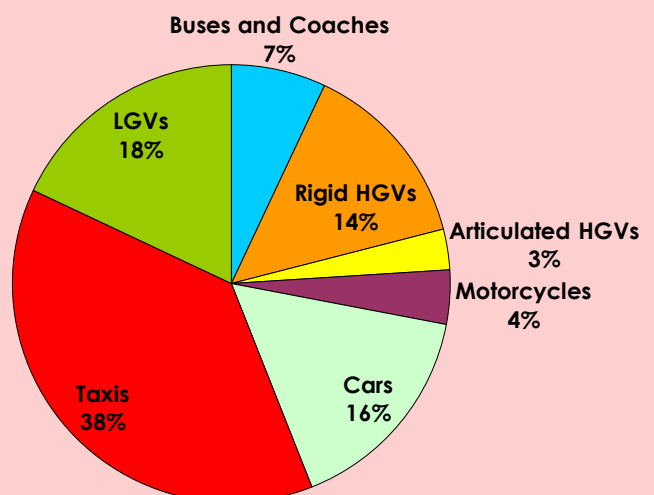
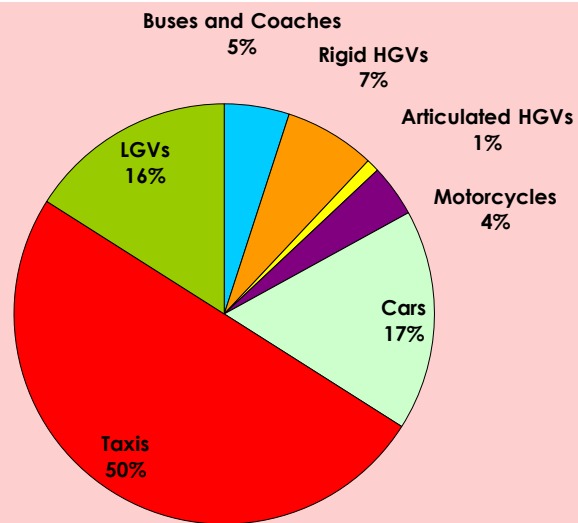


Figure 3.4
Source of PM₁₀ emissions
from vehicle types in the City, 2015



3.1.3 What are the health effects of fine particles?

Fine particles have the most significant health effects on the elderly, children and people with pre-existing heart and lung conditions. Short and long term exposure to particulate matter can cause respiratory, cardiovascular illness and even death⁽⁹⁾. It is likely that the most serious effects are caused by exposure to particles over a long time. If we consider the individual types of particles, metals and organic carbon have the most impact on health. Current evidence suggests that there is no safe limit for exposure to fine particles (PM_{2.5})⁽⁹⁾. The Government have 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⁽¹⁰⁾.

The House of Commons Environmental Audit Committee heard evidence during its investigation into air quality in 2010⁽¹¹⁾ that at least 3,500 people in London die prematurely each year due to poor air quality, and this figure could be as high as 8,000. The Committee also heard evidence that particularly vulnerable individuals could have their lives cut short by up to 9 years. This impact on mortality is generally attributed to long term exposure to fine particles.

An independent investigation, commissioned by the Greater London Authority, into the mortality impacts of particulate air pollution, suggests that in 2008, when the air quality was relatively good, the figure was likely to be 4,267, and could have been as high as 8,000⁽¹⁾.

3.2 NITROGEN DIOXIDE

A study involving school children in East London has revealed that the lung capacity of 8 and 9 year olds is 5% lower than the national average, with 7% of the children having a lung function at a level internationally regarded as hazardous⁽¹²⁾.

At present there are two health based objectives that have been set for PM₁₀. The first objective is to make sure daily concentrations do not go above 50µg/m³, for more than 35 days in any year, and the second is to ensure that the average over the year is no greater than 40µg/m³.

3.2.1 What is nitrogen dioxide?

Nitrogen dioxide is an irritant gas, which at high concentrations causes inflammation of the airways.

3.2.2 Where does nitrogen dioxide come from?

When nitrogen is released during fuel combustion it combines with oxygen atoms to create nitric oxide (NO). This further combines with oxygen to create nitrogen dioxide (NO₂). Nitric oxide is not considered to be hazardous to health at typical ambient concentrations, but nitrogen dioxide can be. Nitrogen dioxide and nitric oxide are referred to together as oxides of nitrogen (NO_x).

3.2.2.1 NO_x emitted in the City

The anticipated relative proportion of emissions of NO_x, from vehicles and gas boilers in the City during 2011, is shown in figure 3.5. Emissions from roads are expected to make up 68% of the total and gas boilers 31%. This same is predicted for 2015 (figure 3.6) As with PM₁₀, previous LAEI's have attributed a much greater proportion of NO_x to be from gas boilers (up to 75%).

Figure 3.5
Source of NO_x emissions in the City, 2011

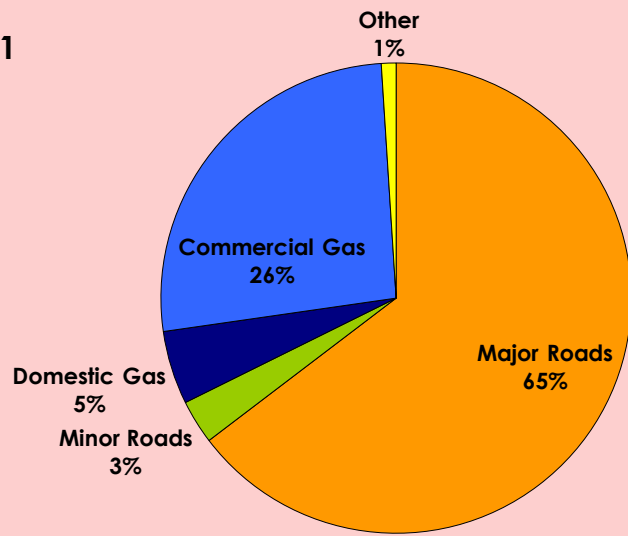


Figure 3.6
Source of NO_x emissions in the City, 2015

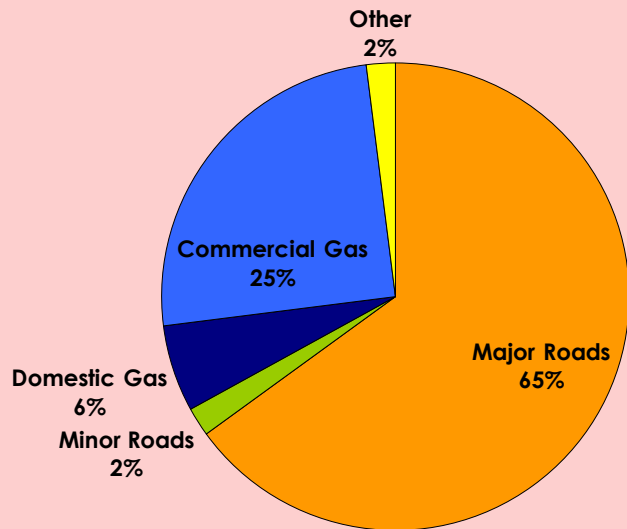


Figure 3.7 gives the anticipated relative proportion of NO_x from different vehicle types in the City in 2011. Buses, coaches and heavy goods vehicles are likely to emit a total of 46%. This is anticipated to reduce to 40% by 2015. Like with PM₁₀, the relative contribution of NO_x from taxis is expected to increase as we move towards 2015.

Figure 3.7
Source of NO_x emissions
from vehicle types in the City , 2011

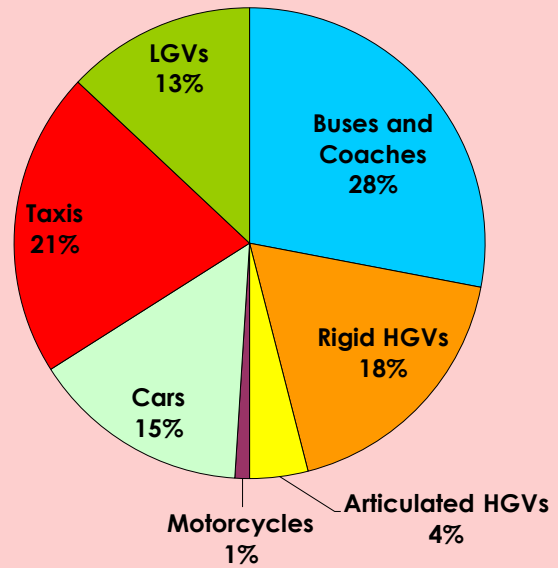
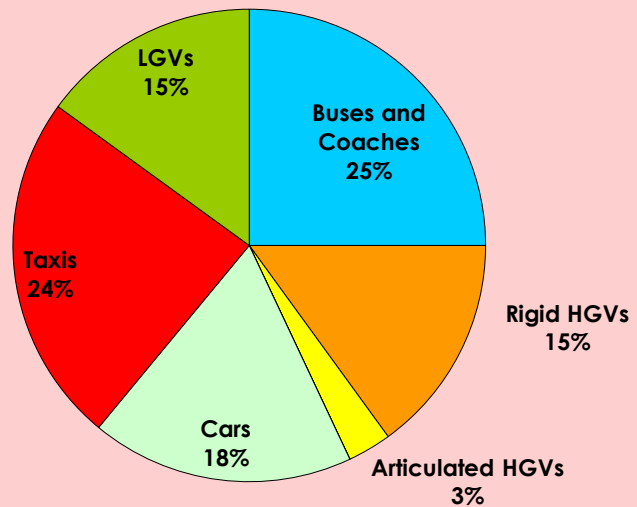


Figure 3.8
Source of NO_x emissions
from vehicle types in the City, 2015



3.2.3 What are the health effects of nitrogen dioxide?

Nitrogen dioxide has a different impact on health to fine particles. There is no proven association with mortality. It mainly impacts on respiratory conditions causing inflammation of the airways at high levels. Long term exposure can decrease lung function, increase the risk of respiratory conditions and increases the response to allergens. NO_x also contributes to the formation of fine particles and ground level ozone, both of which are associated with adverse health effects.

Critical Level is the threshold level for the atmospheric concentration of a pollutant above which harmful direct effects can be shown on a habitat or species.

Critical Load is the threshold level for the deposition of a pollutant above which harmful indirect effects can be shown on a habitat or species.

At present there are two health based objectives that have been set for nitrogen dioxide. The first is to make sure hourly concentrations do not go above $200\mu\text{g}/\text{m}^3$, for more than 18 hours in any year. The second objective is to ensure that the annual average is no greater than $40\mu\text{g}/\text{m}^3$.

3.2.4 The impact of nitrogen dioxide on ecosystems

High levels of NO_x can have an adverse effect on vegetation, including leaf damage and reduced growth. It can make vegetation more susceptible to disease and frost damage. A study of the effect of nitrogen dioxide and ammonia (NH_3) on the habitat of Epping Forest has revealed that pollution is likely to be significantly influencing ecosystem health in the forest ⁽¹³⁾. The study demonstrated that local traffic emissions contribute substantially to the exceedence of **critical levels** and **critical loads** in the area. The critical level for the protection of vegetation is $30\mu\text{g}/\text{m}^3$ measured as an annual average.

NO_x also reacts with other pollutants in the presence of sunlight to form ozone which can damage vegetation at high concentrations.

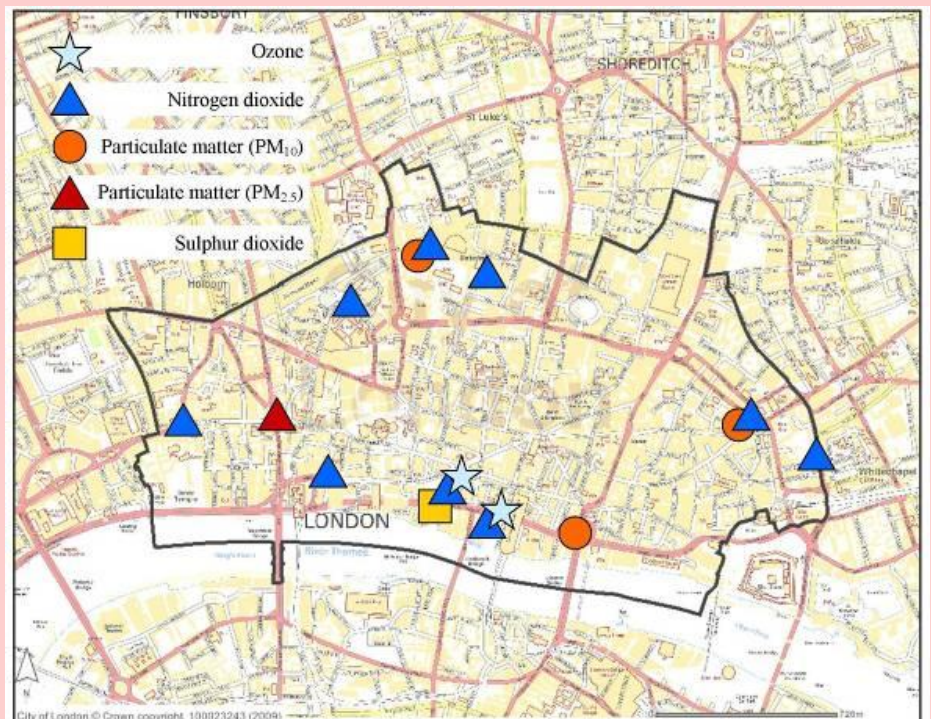
4 POLLUTION LEVELS IN THE CITY OF LONDON

Monitoring pollution is very important for managing air quality in the City. Not only does it allow for the assessment of current levels of pollutants, it also enables the City to assess the effectiveness of policies in reducing concentrations over time.

The City of London has been monitoring air quality since the late 1960's. Monitoring initially focussed on sulphur dioxide and black smoke. This was carried out to assess the effectiveness of the Clean Air Acts, which were introduced to control emissions from coal burning. Since then, the focus of air quality monitoring in the City has changed as the main sources of pollution are now road vehicles and gas heating. These have given rise to high levels of nitrogen dioxide and PM₁₀.

As the City is an Air Quality Management Area for nitrogen dioxide and PM₁₀, air quality monitoring focuses on these pollutants. Other pollutants are also monitored, to ensure continuing compliance with their associated objectives. The monitoring programme is regularly reviewed.

Figure 4.1
Air quality monitoring sites
in the City



4.1 PARTICULATE MATTER (PM₁₀)

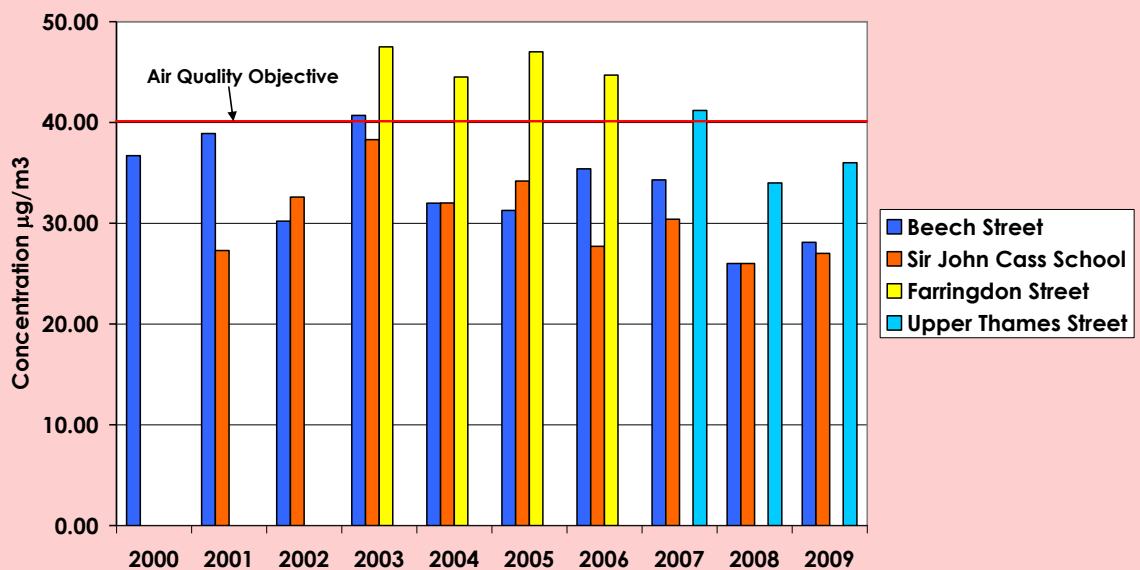
Particles are measured by concentration rather than type. They are recorded as the mass of particles contained in a cubic meter of air and are presented as microgrammes per cubic metre ($\mu\text{g}/\text{m}^3$).

Two types of analyser are used to monitor PM₁₀ levels in the City. The Tapered Element Oscillating Microbalance (TEOM) is used at Upper Thames Street and Beech Street and the Beta Attenuation Monitor (BAM) is used at Sir John Cass School. There is also a BAM in Farringdon Street recording concentrations of PM_{2.5}.

Figure 4.2 contains annual average PM₁₀ concentrations in the City since 2000. The Farringdon Street PM₁₀ analyser was moved to Upper Thames street in 2007.

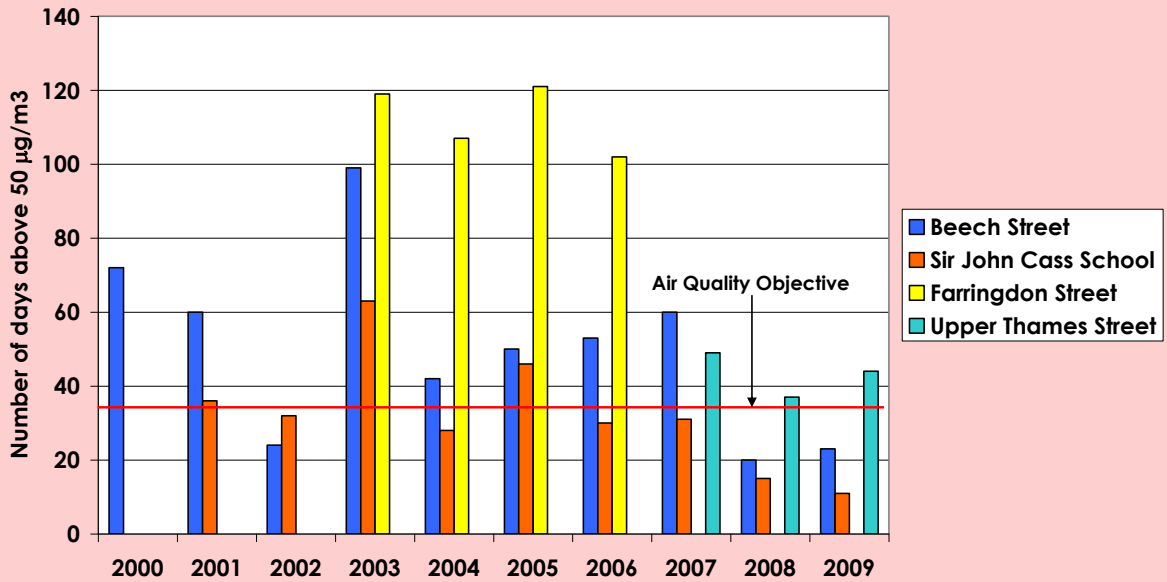
Concentrations appear to have been falling from 2007. This is partly due to unsettled weather during 2007 - 2009, which led to better air quality. However, it is also due to a new method, introduced in 2007 by DEFRA, for scaling TEOM data. It is known as the Volatile Correction Model (VCM)⁽¹⁴⁾. The annual average limit of $40\mu\text{g}/\text{m}^3$ has not been breached since 2007.

Figure 4.2
Annual average PM₁₀, 2000-2009



The effect of the unsettled weather and new scaling method is more marked in figure 4.3, which presents the number of days that the daily limit for PM₁₀ was breached at each site. The limit, 50µg/m³, should not be breached for more than 35 days in any year. The only site that the GLA considers is likely to breach the limit is Upper Thames Street, which is part of a 'priority location' as designated by the Mayor of London in his air quality strategy (see section 6.5).

Figure 4.3
Number of times the daily Limit Value for PM₁₀ was breached, 2000-2009



4.1.1 Computer modelling

As air quality monitoring only provides concentrations for specific locations, the data are supplemented by computer modelling. This takes information from the LAEI and calculates air quality concentrations across the whole of the City. All concentration maps in this document were modelled using data contained within the LAEI. The roads highlighted in figure 4.4, are considered by the LAEI to be major roads, and were modelled in detail with all other roads forming part of the background mix of air pollutants.

Figure 4.5 shows the modelled annual average PM_{10} for 2011 and figure 4.6 the number of days that the daily PM_{10} limit is anticipated to be breached during 2011. Sections of Upper Thames Street and Victoria Embankment are expected to exceed the PM_{10} Limit Value in 2011. By 2015, as shown in figure 4.7, this is limited to a very small section of Victoria Embankment.

Figure 4.8 shows how the PM_{10} levels in the City compared to surrounding Boroughs during 2008.

Figure 4.4
'Major' roads modelled in the City



Figure 4.5
Predicted annual average PM₁₀, 2011



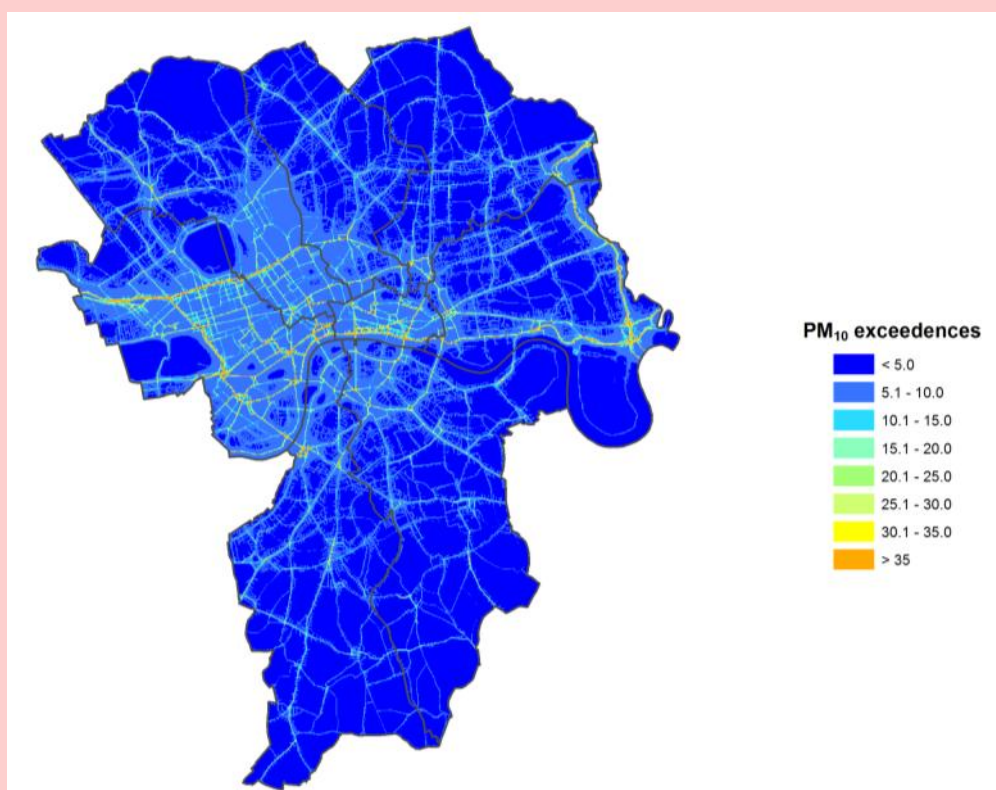
Figure 4.6
Number of days predicted to breach the 24-hour average PM₁₀ limit in the City, 2011



Figure 4.7
Number of days predicted to breach the 24-hour average PM₁₀ limit in the City, 2015



Figure 4.8
Number of days that breached the 24-hour average PM₁₀ limit across central London, 2008



4.2 NITROGEN DIOXIDE



Nitrogen dioxide is monitored in the City using passive samplers and continuous analysers, the details of which are given below.

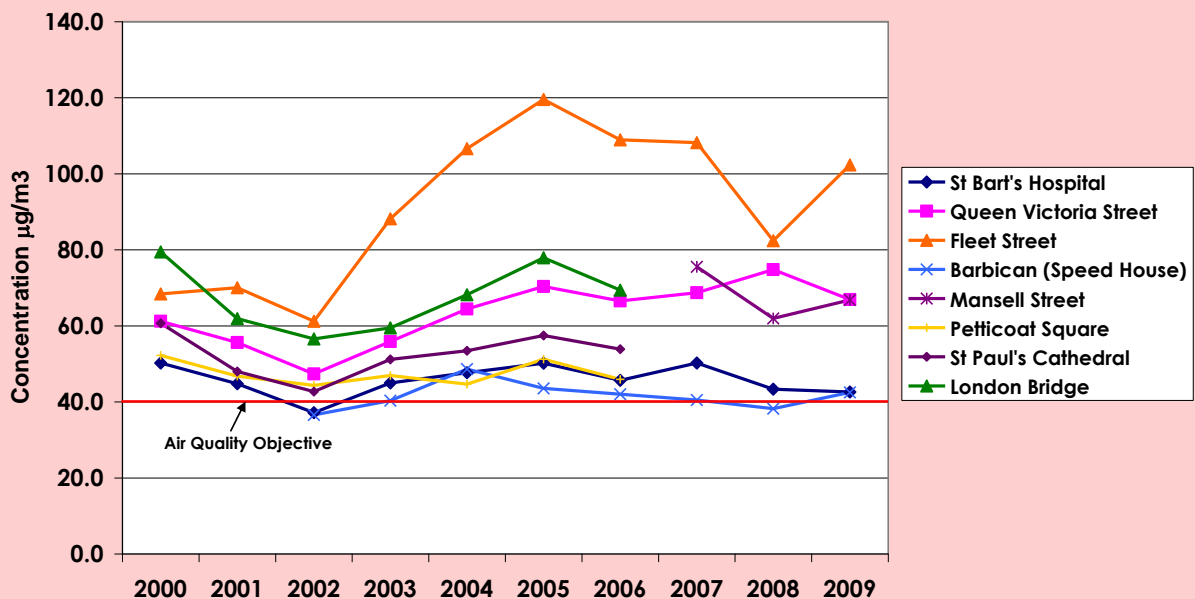
4.2.1 Passive sampling

Passive sampling involves the use of diffusion tubes to provide a simple cost-effective method of measuring long term average pollution concentrations. Air diffuses through a tube, which is placed on lamp post or building for a month. The tubes are collected and sent to a laboratory for analysis. The tubes are not a very accurate way of measuring nitrogen dioxide, but they are very useful for providing long term trends.

Diffusion tubes, as pictured, are currently located at Fleet Street, Queen Victoria Street, Mansell Street, St Bartholomew's Hospital and the Barbican.

Data from diffusion tubes, as seen in figure 4.9 reveal that concentrations of nitrogen dioxide in the City were declining until 2002. However, from 2003 there was a significant increase, particularly at roadside.

Figure 4.9
Annual average nitrogen dioxide measured by diffusion tube, 2000-2009



This increase in roadside concentrations is thought to be due to a combination of factors:

- an increase in diesel vehicles, following the introduction of the congestion charge in February 2003
- newly registered vehicles emitting higher emissions of nitrogen dioxide than expected
- technology used in some vehicles to reduce emissions of particles, which has resulted in higher concentrations of nitrogen dioxide adjacent to roads.

4.2.2 Continuous analysers

Nitrogen dioxide is also monitored using continuous analysers, which are more accurate than diffusion tubes. A reading is taken every second and averaged over 15 minutes. The data are sent via a telephone line to a central data management system. Data are regularly checked and audited to ensure they are as accurate as possible. Continuous analysers are located:

- On the roof of Senator House, Queen Victoria Street
- In the playground of Sir John Cass School
- In Beech Street tunnel
- Walbrook Wharf, Upper Thames Street
- Walbrook Wharf rooftop, Upper Thames Street



Figure 4.10 shows the annual average nitrogen dioxide monitored using continuous analysers. The limit, which should not be exceeded, is $40\mu\text{g}/\text{m}^3$. The roadside sites Walbrook Wharf, Beech Street exceed the limit by a significant margin. An analyser on the roof of Walbrook Wharf, a five storey building on Upper Thames Street, also records very high annual average concentrations. Senator House and Sir John Cass School are background sites with annual average concentrations close to $50\mu\text{g}/\text{m}^3$.

The number of hours, that the hourly limit of $200\mu\text{g}/\text{m}^3$ was breached, is displayed in figure 4.11. The limit should not be breached by more than 18 hours in any year. Background sites comply with this limit, but air quality at the roadside exceeds it by a significant margin. Walbrook Wharf recorded a total of 955 hours above $200\mu\text{g}/\text{m}^3$ in 2009.

Figure 4.10
Annual average nitrogen dioxide using continuous analysers, 2000-2009

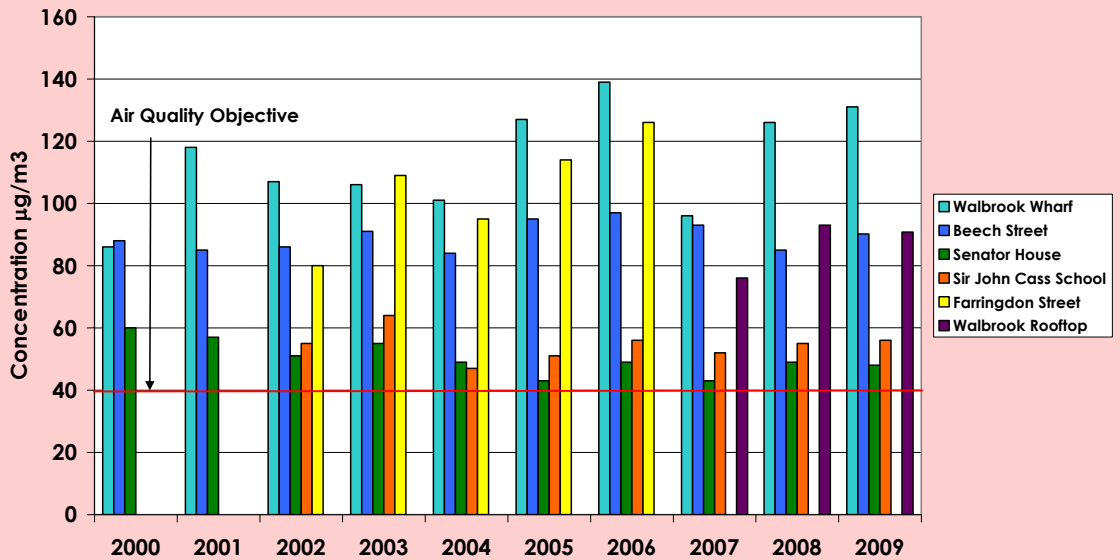
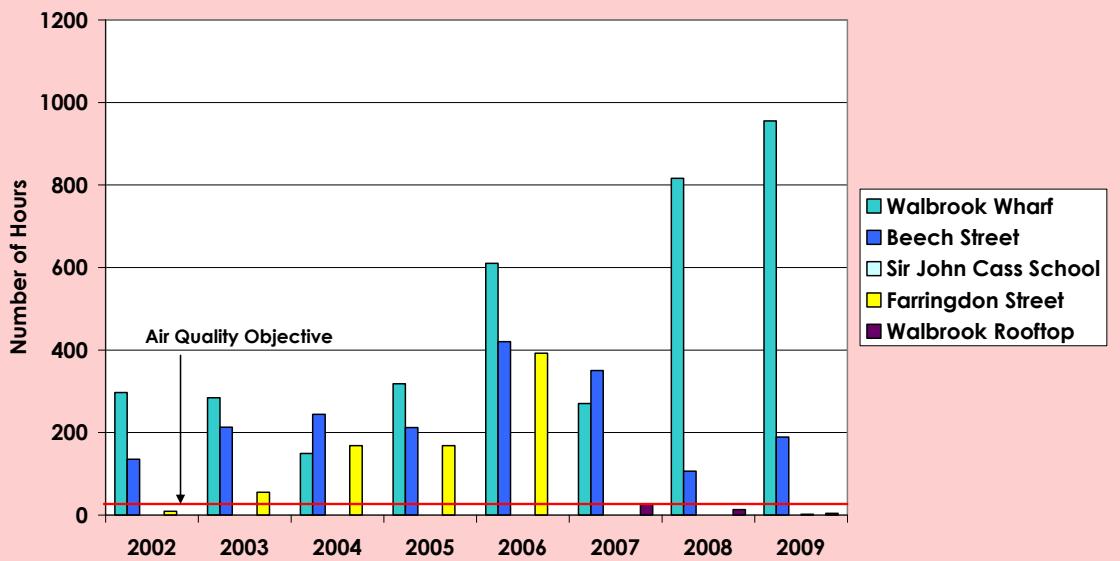


Figure 4.11
Number of times the hourly limit for nitrogen dioxide was breached, 2000-2009



4.2.3 Computer Modelling

Figure 4.12 details predicted concentrations of annual average nitrogen dioxide across the City during 2011, and figure 4.13, details anticipated concentrations in 2015. The model maps reveal that all areas of the City will exceed the $40 \mu\text{g}/\text{m}^3$ Limit Value in 2015 without intervention. Concentrations adjacent to busy roads are particularly high.

Figures 4.14 and 4.15 display the predicted hourly average nitrogen dioxide limits for 2011 and 2015. The level that should not be breached on these maps is $200 \mu\text{g}/\text{m}^3$ which is anything shaded yellow, orange and red.

Figure 4.16 reveals how concentrations of annual average nitrogen dioxide varied across central London in 2008.

Figure 4.12
Predicted annual average nitrogen dioxide across the City, 2011

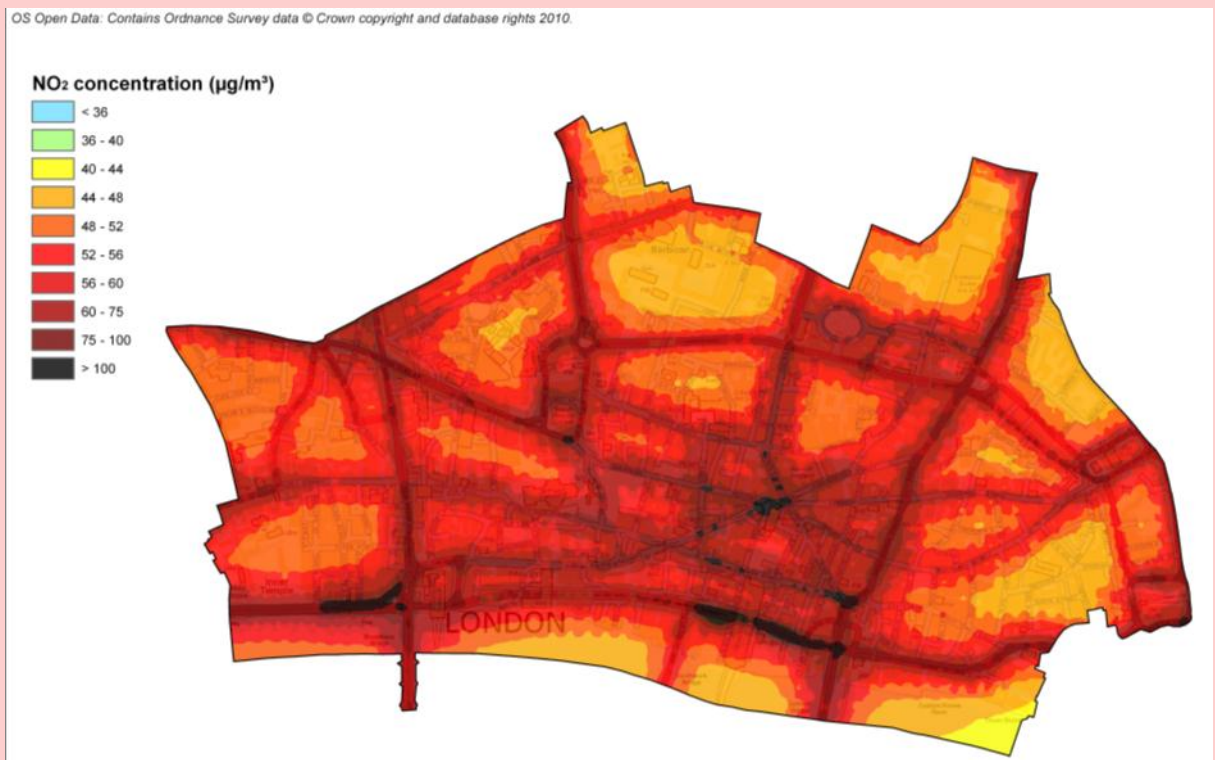


Figure 4.13
Predicted annual average nitrogen dioxide across the City, 2015

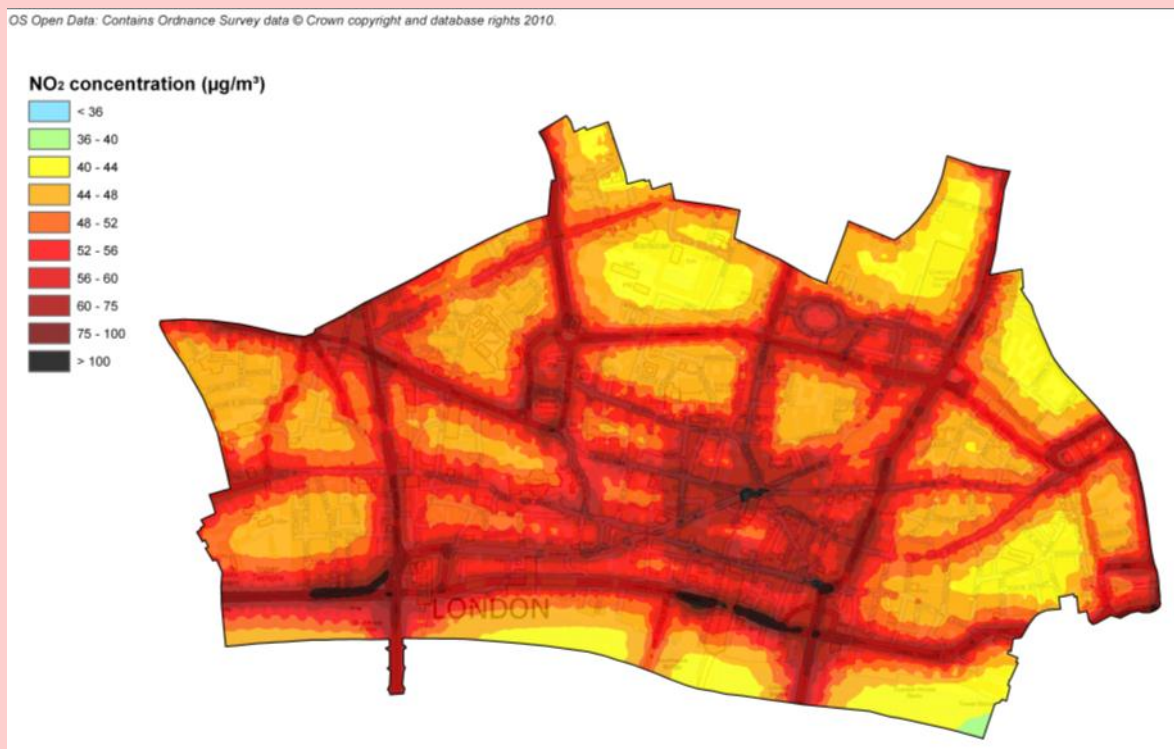


Figure 4.14
Predicted hourly average nitrogen dioxide across the City, 2011

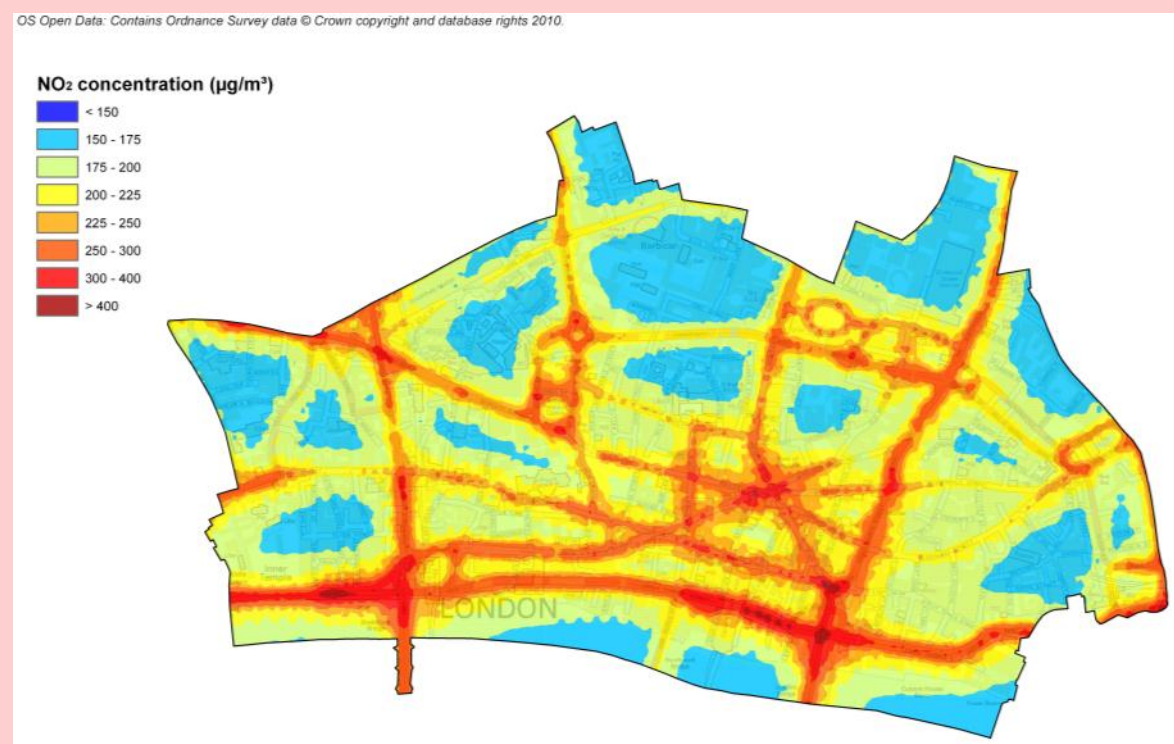
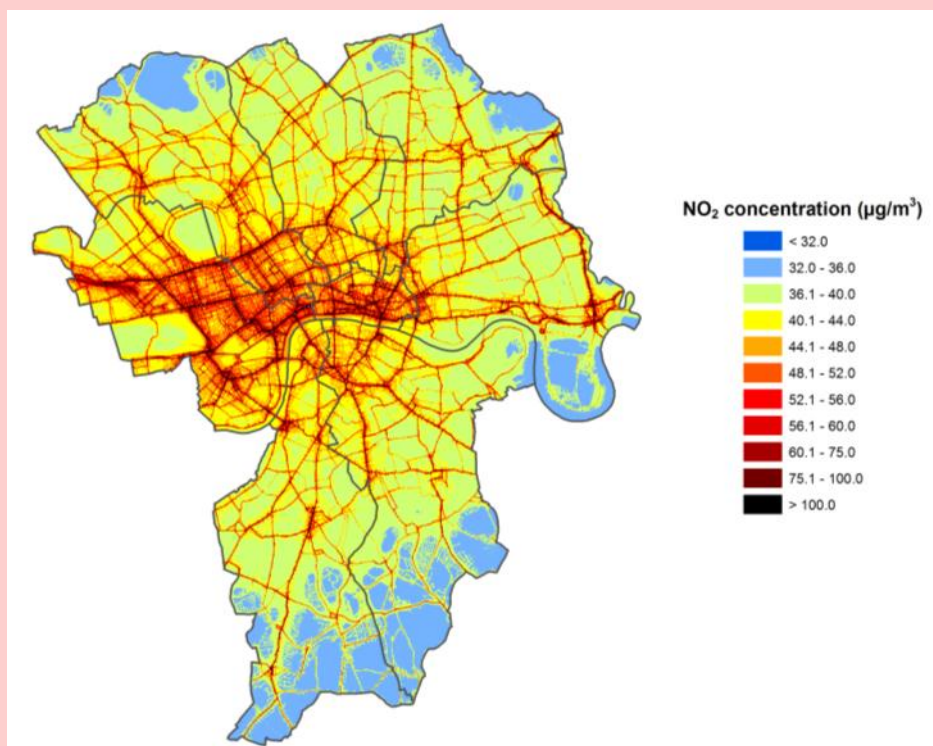


Figure 4.15
Predicted hourly average nitrogen dioxide across the City, 2015



Figure 4.16
Annual average nitrogen dioxide across central London, 2008



4.3 MAKING DATA AVAILABLE TO THE PUBLIC

Data for Senator House, Walbrook Wharf and Sir John Cass School are displayed on the London Air Quality Network, which is a web site devoted to air quality monitoring across London. The network is run by the Environmental Research Group at King's College London (ERG).

Data are also made available to the public via annual air quality monitoring reports, which are available on the City of London web site.

Action 1: The City of London will continue to monitor air pollutants to ensure that air quality objectives and Limit Values are being met, and to assess the effectiveness of national, regional and local policies to reduce levels of pollution.

Outcomes: An annual air quality data report will be published and placed on the City of London web site. A review of the air quality monitoring requirements of the City will be undertaken annually.

5 THE LINKS BETWEEN AIR QUALITY AND CLIMATE CHANGE

“Taking action to reduce the effects of climate change provides an excellent opportunity to deliver further benefits to both air pollution and greenhouse gas emissions. Both arise from broadly the same sources and will therefore benefit from many of the same measures; so the combined benefits are substantially greater, when we compare them with the costs, rather than if we look at each group of benefits in isolation” (10)



© C Totman

Air quality and climate change are interlinked. Man-made greenhouse gases, such as carbon dioxide, and air pollutants, are both largely the result of fuel combustion. Climate change itself is likely to have a direct impact on air quality. An increase in temperature will affect the formation of ozone, increasing the frequency and severity of summer smogs.

The UK Climate Change Act 2008 introduced a legally binding framework to tackle climate change. It includes a target to reduce greenhouse gas emissions by at least 80% below 1990 levels by 2050. The City of London has produced a Climate Change Mitigation Strategy⁽¹⁵⁾, which sets out how the City plans to encourage action to reduce greenhouse gas emissions in the Square Mile. This air quality strategy will form part of the delivery mechanism for the Climate Change Mitigation Strategy.

DEFRA have outlined the importance of dealing with air quality and climate change policies together in their document: Air Pollution Action in a Changing Climate⁽¹⁰⁾

Developing policies that will deal with reducing pollution and emissions of carbon will be very cost effective. Air quality and climate change co-benefits can be realised through actions such as promoting ultra-low carbon vehicles, encouraging walking and cycling, energy efficiency and using renewable sources of energy which do not involve combustion. Carbon dioxide is just one substance that impacts on climate change. Many local air pollutants like black carbon (particulates) have a warming effect, so reducing particulates should help in dealing with climate change.

Programmes to reduce emissions of carbon can sometimes have an adverse effect on air quality. An example is the use of diesel, which is considered to be more efficient and better for climate change than petrol. However, emissions of particles and nitrogen oxides from diesel are much greater than for petrol vehicles, so diesel can have a negative impact on air quality in urban areas.

“Black carbon is a fraction of particulate matter, comprising of particles resulting from inefficient burning. Sources include diesel engines, biomass burning and coal power stations... Emerging evidence suggests that black carbon may contribute 20-50% of the warming effect of CO₂ to near-term climate change” ⁽¹⁰⁾

Similarly, wood based biomass is considered to be very low carbon and is being promoted in the UK as a renewable fuel. However, PM₁₀ and NO_x emissions from biomass can be significantly higher than gas, with PM₁₀ (black carbon) being 10 to 100 times higher⁽¹⁰⁾. Biomass can also release nitrous oxide (N₂O), which has a very significant global warming potential, 310 times greater than carbon dioxide. When considering how to implement climate change policies in areas of high pollution like the City, care must be taken to ensure air quality will not deteriorate as a result.

The City of London obtained funding to commission a best practice guidance document Air Quality and Climate Change: Integrating Policy in Local Authorities ⁽¹⁶⁾. It outlines how local authorities can integrate air quality and climate change policy and the importance of integrating both policy areas into other plans and strategies that guide local authority functions. The document will inform policy development at the City.

Action 2: The City of London will ensure that, if possible, policies introduced to improve air quality will also have a positive benefit on reducing greenhouse gas emissions and policies introduced to reduce greenhouse gas emissions will have a positive benefit on air quality.

Outcome: Best practice guidance for informing local policy on the integration of climate change and air quality will lead to better integration of the two policy areas at the City.

6 REDUCING EMISSIONS FROM TRANSPORT IN THE CITY

6.1 REDUCING EMISSIONS FROM CITY ROADS

The main source of emissions in the City, of both NO_x and PM₁₀, is road transport. The road network is used intensively and there are many competing demands that influence traffic management.

City of London roads are managed as a hierarchy. Strategic roads, which provide for long distance journeys across London, and London distributor roads, which provide for journeys between and across London Boroughs, are part of the Greater London Authority network. They are managed and controlled by Transport for London (TfL). TfL is one of the GLA group of organisations, accountable to the Mayor of London, with responsibility for delivering an integrated and sustainable transport strategy for London

In the City, TfL is responsible for:

- Mansell Street / Goodmans Yard / Minories
- Victoria Embankment / Blackfriars Underpass / Upper Thames Street / Lower Thames Street / Byward Street / Tower Hill
- Farringdon Street / Ludgate Circus / New Bridge Street/ Blackfriars Bridge

The City of London is responsible for all other roads which are classed as Borough distributor roads, local distributor roads or local access roads.

6.1.1 Transport for London

The Mayor of London, via TfL, is implementing several measures to minimise emissions from their road network in the City. These include better maintenance to reduce road surface wear, and smoothing traffic flow. TfL has recently commenced a trial of a dust suppressant on the London distributor route from Victoria Embankment through to Tower Hill (see section 6.5).

More strategically, Transport for London proposes to continue the operation of the London wide Low Emission Zone, which currently requires lorries, buses and coaches to meet Euro III standard for particulate matter.



From 2012, lorries, buses and coaches will be required to meet Euro IV standard for particulate matter and light goods vehicles and minibuses will be required to meet Euro 3 standard for particulate matter.

In 2015, the Mayor proposes to introduce an emissions standard for NO_x (Euro IV for NO_x across London) into the Low Emission Zone for HGVs, buses and coaches. This would be subject to a suitable certification and testing regime, and also subject to Government funding. The Mayor has also stated that he will work with London boroughs and the City of London to assess the feasibility and cost effectiveness of a central London LEZ in the Congestion Charging zone. The City of London is assessing the impact on air quality of such a scheme.

The mix of vehicles in the City is very different from most London boroughs. Taxis and goods vehicles dominate, as they serve the needs of the City businesses. The Mayor of London licences London taxis. He intends to use the licence system to deal with emissions from taxis using an age based approach. From 2012, no new licence will be issued to a taxi over 15 years old. In its response to the Mayor's draft Air Quality Strategy, the City of London requested that the Mayor exercises tighter controls over taxi emissions, as they emit over a third of the PM₁₀ associated with transport in the City. The City is currently carrying out an assessment of the likely impact on local air quality if there were tighter controls over taxi emissions.

Transport for London also operates London buses and plans to introduce hybrid buses to the fleet. Hybrid buses emit less pollution than conventional buses. The Mayor proposes to use these lower emission buses along priority routes. The City of London is assessing the potential impact on local air quality if all buses operating in the City have lower emissions. If the impact is deemed beneficial, the City will lobby the Mayor to use low emission buses on all routes that pass through the Square Mile.



The Mayor of London is introducing schemes to encourage people to use more sustainable forms of transport such as the cycle hire scheme in central London, Cycle Superhighways and the installation of 66,000 new cycle parking spaces. He also plans to install 25,000 electric vehicle charging points across London by 2015.



6.1.2 City of London

Like the Mayor of London, the City of London is committed to sustainable transport. Approximately 10,000 people cycle to and from the City every day. The City provides public cycle parking for 1,768 bikes, which meet 18% of the existing City commuter needs, the remainder being met by private and informal parking. In 2009 and 2010 the City participated in European Mobility Week. This is a European-wide initiative to promote sustainable transport that attracts the participation of over 2,000 cities and towns. The City ran seven European Mobility Week events in 2009 and was shortlisted for the European Union's award. In 2010 the City ran two larger events, one focussed on the promotion of cycling, and the other focussed on the promotion of walking.

Many of the Mayor of London's proposals for reducing emissions from transport are included in both the Mayor's Air Quality Strategy and Mayor's Transport Strategy. Following publication of the Mayor's Transport Strategy in May 2010, the City of London is consulting on its second Local Implementation Plan (LIP) which will contain the City's proposals for the implementation of the Mayor's Transport Strategy.

The Mayor's Transport Strategy recognises the importance of traffic management in dealing with transport related pollution. Consequently, the Mayor of London has encouraged London Boroughs, and the City of London, to include proposals to improve air quality in their Local Implementation Plans.

Reducing air pollution will be a key objective of the second City of London Local Implementation Plan. This will lead to greater coordination between air quality and transport policy at the City. Options for managing traffic in the City to improve air quality locally via the LIP will be considered during 2011.



In areas of poor air quality like the City, it is important to assess the local impact of traffic management measures. Even though air quality in the City is heavily influenced by emissions across the whole of London, and Transport for London controls the main routes through the City, it is possible for the City of London to influence air quality very locally



through careful traffic management. However, The City of London is not able to take action in isolation that would result in the Limit Values for nitrogen dioxide or PM₁₀ being met. This will require coordinated action by the Government, Mayor of London and the City of London.

Action 3: Options for managing traffic in the City to improve air quality locally will be considered during 2011. Air quality impact assessments will be undertaken for transport schemes that involve significant changes to traffic type and movement on City roads.

Outcome: The City will develop proposals for reducing levels of local pollution by traffic management by June 2012.

The Mayor of London is able to control emissions from many vehicles in the City such as taxis and buses and he also controls and sets the criteria for the London Low Emission Zone. The Mayor of London has outlined his proposals for dealing with emissions from these vehicles in his 2010 Air Quality Strategy. Air quality in the City is heavily influenced by taxis and buses, as demonstrated in Section 3 of this Strategy. The City of London therefore intends to assess the potential impact on air quality if the Mayor of London introduced tighter controls. If significant air quality benefits could be realised, the City of London will lobby the Mayor of London for further action.

Action 4: The City of London will model the air quality impact of further controls over taxi emissions, the use of low emission buses on routes through the City and a central and inner London Low Emission Zone.

Outcome: A report will be produced by July 2011 on the potential impact on local air quality of these measures. If the potential impact is significant, the City of London will lobby the Mayor of London to implement tighter controls over taxis, route low emission buses through the City and implement a central or inner London Low Emission Zone.

6.2 USING PARKING POLICY TO REDUCE EMISSIONS

The City of London operates nine car parks in the Square Mile. A further four car parks are privately owned. The City also has on-street parking, but due to the many competing demands on the road network, the City's long term aim is to reduce the use of on-street space in favour of short-stay parking in public car parks.

City car parks provide some incentives for drivers to bring low emission vehicles into the City. Electric vehicles can use charging points in City of London car parks at no extra cost. The Barbican car park operates a 'green flexi card' system where vehicles that have a CO₂ emission of 120g/km or less can park for a reduced rate. The City of London did offer free parking for electric vehicles, however this was withdrawn as it was considered that electric vehicles were adding to congestion on City roads.

Parking charges can be a powerful way of influencing the choice of vehicle to bring into the City. Consequently, options for using parking charges at other City car parks to encourage low emission vehicles will be assessed by 2012.

Action 5: The City of London will investigate further options for using parking policy to encourage the use of low emission vehicles in the Square Mile.

Outcome: The City of London will aim to consult on proposals for using parking policy to incentivise low emission vehicles in the Square Mile by June 2012.

6.3 REDUCING EMISSIONS FROM CITY OF LONDON FLEET

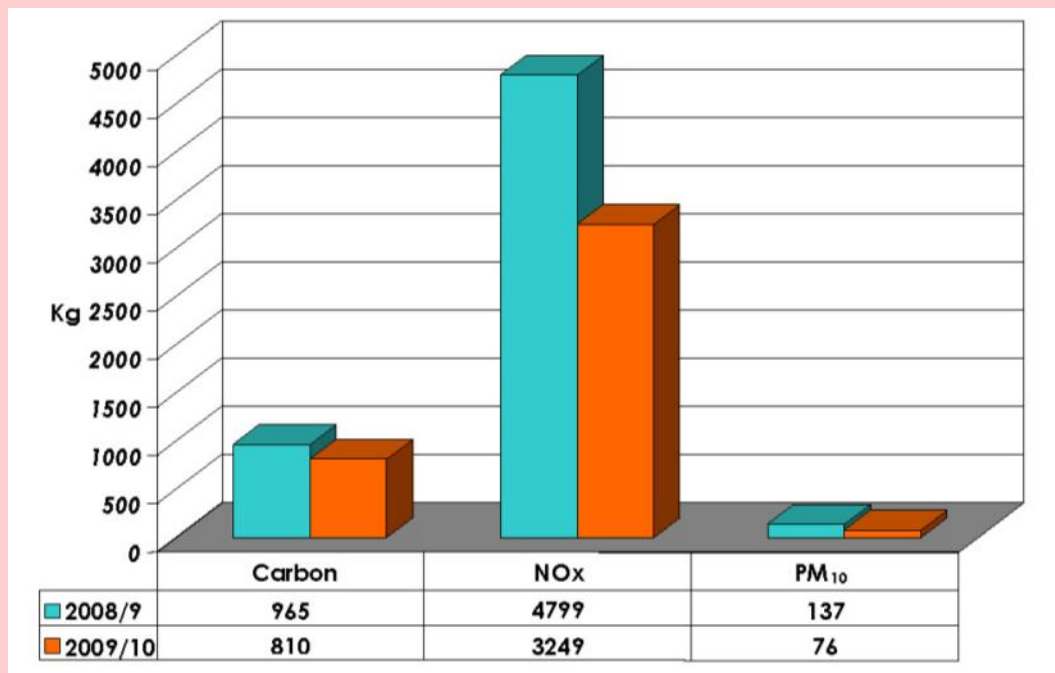
The City of London Corporation has 205 vehicles, just 91 of which are used within the Square Mile. The remaining vehicles are mainly used at open spaces sites owned by the City, both in and around London, such as Epping Forest, Burnham Beeches and Hampstead Heath. City of London contractors use an additional 50 vehicles in the Square Mile. The City Police operate a further 120 vehicles. Due to the size of the City, the amount of mileage in any given year is relatively small.

The City has a Transport Coordination Group that oversees corporate transport policy and the purchase of new vehicles. Whenever opportunities arise, low emission vehicles are purchased and the fleet is reduced in size.

A range of policies have recently been introduced to reduce emissions from the corporate fleet.

- Improved management of the fleet and contractor's fleet has delivered significant emissions reductions in carbon, NOx and PM₁₀. Between the financial years 2008/9 and 2009/10, there was a 16% reduction in emissions of CO₂, a 32% reduction in emissions of NOx, and a 45% reduction in emissions of PM₁₀. This equates to 155 kg CO₂, 1150 kg NOx and 61kg PM₁₀. The City of London was commended, via the Green Fleet Awards 2010, for improving the environmental performance of the fleet.

Figure 6.1
Kilogram reduction in emissions from City of London vehicles in the Square Mile



Action 6: The City of London will continue to manage its vehicle fleet to reduce emissions of NOx, PM₁₀ and CO₂ year on year.

Outcome: The City of London will deliver a year on year reduction in emissions of NOx, PM₁₀ and CO₂ through to 2015.



- The City has been using electric vehicles since 1988 and currently uses ten electric vehicles in the Square Mile. The City of London is part of the Department for Transport Low Carbon Vehicle Procurement Programme, which is designed to accelerate the introduction of low carbon vehicles into the UK fleet. This has led to the purchase of an additional electric vehicle for the libraries department in 2010. It is envisaged that further low carbon vehicles will be purchased through this scheme.

Action 7: The City of London will continue to trial alternatively fuelled vehicles and increase the number of low emission vehicles in the fleet, where appropriate.

Outcome: This will lead to a reduction in emissions from the corporate fleet.

- The City has a small pool of vehicles for staff. The internal recharge system is based on the CO₂, NO_x and PM₁₀ emissions. The higher the emissions, the more a vehicle costs to hire. This encourages the use of the smaller, newer vehicles.
- The City of London uses fleet management software that provides a detailed breakdown of costs to operate a vehicle, together with an overall cost per mile. This is being used to encourage departments to either reduce the number of vehicles they have or replace vehicles for more economic ones.
- The City of London has been awarded silver accreditation in the Transport for London Freight Operator Recognition Scheme. The scheme works towards best practice for freight vehicles which includes advice on fuel reduction. The City will be working towards gold accreditation next year.
- The City's contractors have trialled electric vehicles, such as the one pictured, to use in street works operations.



Action 8: The City of London will continue to encourage its contractors to use low emission vehicles.

Outcome: This will lead to a reduction in emissions of NO_x, PM₁₀ and CO₂ from the contractors' fleet.

- The City of London recognises the impact that a sustainable procurement strategy could have on reducing emissions from road transport. Consequently, the City is involved in the development of national low emission procurement guidance with a number of public and private bodies.

Action 9: The City of London will work with public and private bodies to develop low emission procurement guidance.

Outcome: Best Practice Guidance will be produced by December 2011 which will inform future procurement policy at the City.



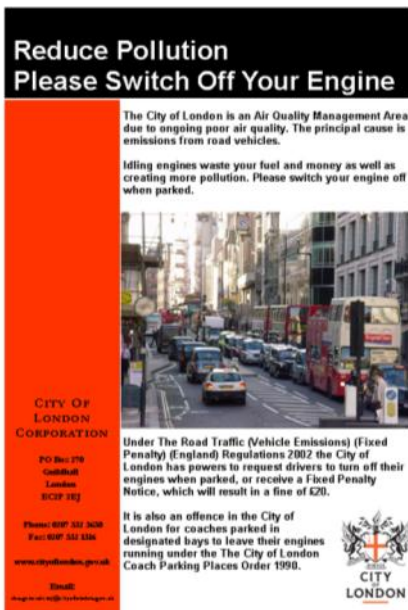
© C Totman

- A relatively simple way to reduce fuel consumption and associated emissions is for drivers to drive more efficiently. The Energy Savings Trust operate a Smarter Driving programme⁽¹⁷⁾ where people can be trained to achieve a reduction in fuel use using simple techniques. In 2010, external funding was obtained which enabled one hundred and forty staff at the City of London to undertake the training, with an average reduction in fuel consumption of 14%. If this fuel reduction is maintained it would lead to a further reduction of 113kg CO₂ and approximately 455kg NO_x and 11kg PM₁₀.
- As detailed, the City Police operate 120 vehicles. Representatives from the City Police have recently joined the Transport Coordination Group with a view to improving the coordination of fleet management.

Action 10: The City of London will engage with the City Police to reduce emissions from their fleet.

Outcome: This will lead to a reduction in emissions from the City of London Police fleet.

6.4 IDLING ENGINES



Vehicles that are left idling unnecessarily waste fuel, money and contribute to poor air quality. In the City, the main problems tend to be associated with:

- Vehicles waiting to enter or service construction sites
- Delivery vehicles
- Coaches
- Private taxis waiting for a fare

Idling engines are being dealt with in a number of ways in the City:

- The City of London has the option to adopt powers to issue a Fixed Penalty Notice to drivers of vehicles that leave their engine running whilst stationary in the City. This falls under the Road Traffic (Vehicle Emission) (Fixed Penalty) (England) Regulations 2002. To date, Police and Community Support Officers have been dealing with idling engines informally, as they already have a strong presence on the streets. Police and Community Support Officers issue a copy of the leaflet, pictured, to any offenders. The Department of Environmental Services is working with the City Police to coordinate enforcement activities and a review of how idling engines are dealt with will form part of this.
- City of London Civil Enforcement Officers have powers to issue Penalty Charge Notices to coaches parked in a coach bay with their engines running. This falls under the City of London (Coach Parking Places) (No1) Order 1990. Notices to this effect are displayed in coach parking bays.
- Officers from the City of London liaise directly with construction and demolition companies to ensure that their drivers do not leave engines running whilst waiting to enter a site.
- City businesses are being approached to generate their support for reducing idling from private hire firms and delivery vehicles (see section 7.2).



- Transport for London has been approached to establish if they are able to use the taxi licensing system to discourage taxis from leaving engines running when parked.

The Mayor of London, in his air quality strategy, proposes to make the whole of London a no-idling zone with particular focus on buses, coaches, taxis and delivery vehicles. He intends to do this by working with London boroughs and the City of London. The City supports this policy, as a piecemeal approach to dealing with this problem is not the most efficient and effective.

Action 11: The City of London will continue with its efforts to establish effective ways to prevent drivers from leaving vehicle engines idling unnecessarily in the City.

Outcome: An idling engine enforcement policy will be in place by June 2012.

Action 12: The City of London will work with the Mayor of London to designate the whole of London a no-idling zone.

Outcome: A report on the progress of this action will be prepared by the end of 2011.

6.5 PRIORITY LOCATIONS

In the Mayor of London's Air Quality Strategy 2010, seven locations in central London have been identified as being at most risk of exceeding the EU daily Limit Value for PM₁₀. These are:

- Marylebone Road
- Euston Road
- Marble Arch
- Hyde Park Corner
- Victoria Embankment
- Upper Thames Street
- Tower Hill

These areas have been earmarked as *priority locations* for specific targeted action to reduce levels of PM₁₀. Victoria Embankment through to Upper Thames Street and on to Tower Hill is a London distributor road and the main through route for traffic passing in an easterly and westerly direction through the City. It is controlled and managed by TfL. TfL intends to introduce a number of measures to reduce levels of pollution along this route including deploying low emission buses, power washing the road surface, applying a gel to suppress dust and better enforcement of no-idling and no-stopping rules.

Power washing the road surfaces followed by the application of dust suppressants can be applied as required to reduce surface particulate matter on days when pollution levels are predicted to be high. The Mayor's draft Air Quality Strategy suggests that applying these measures regularly can reduce PM₁₀ concentrations by 20% or more.

A trial of power washing and the application of dust suppression on these priority locations commenced in November 2010. The trial is being undertaken with the full cooperation of the City of London.



Action 13: The City of London will work with Transport for London to trial a method of dust suppression along the route from Victoria Embankment through to Tower Hill.

Outcome: Dust suppression will be assessed as a means of improving air quality.

Action 14: If dust suppression is shown to be effective at reducing PM₁₀ concentrations, the City of London will consider rolling it out to other areas of concern in the Square Mile and encourage Transport for London to apply it on other roads in the City that they are responsible for, particularly Mansell Street and Farringdon Street.

Outcome: PM₁₀ concentrations will be reduced across the City.

7 REDUCING EMISSIONS FROM BUILDINGS IN THE CITY

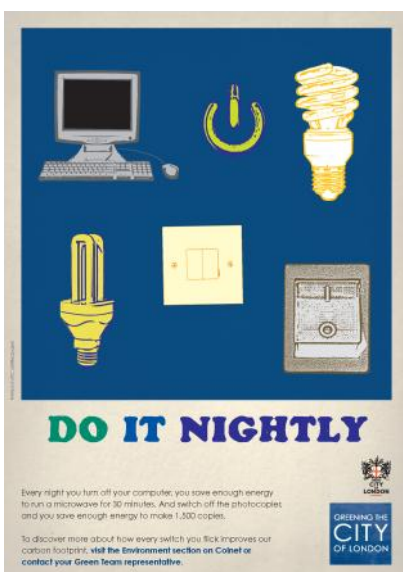
7.1 REDUCING EMISSIONS FROM CITY OF LONDON BUILDINGS

The City of London Corporation has set a target to reduce its energy consumption by 15%, by 2015, from 2008/9 levels. Between the financial years 2008/9 and 2009/10, energy efficiency measures, in buildings that the City uses to carry out its functions as a local authority, resulted in a 6.4 % reduction in emissions of CO₂, a 7% reduction in emissions of NO_x, and an 8.7% reduction in emissions of PM₁₀. This equates to 2,531 tonnes of carbon, over 6 tonnes of NO_x and 316 kg of PM₁₀. The Guildhall, Barbican complex and London Central Markets are the largest energy consumers. Together they emitted 76% of the total PM₁₀ and 69% of NO_x and 67% of carbon. External funding was obtained to undertake detailed energy efficiency assessments for these buildings. Following the assessments, a programme of energy efficiency measures will be rolled out at each building over the next 12 months to yield further savings.

In 2008/9 renewable energy accounted for 36% of total energy use. The City of London also makes use of energy from Combined Heat and Power (CHP), which is more efficient than conventional power generation. CHP energy accounted for 16.4% of the corporate energy mix in 2008/9. CHP systems capture and utilise heat that would normally be wasted in power generation plants. This high energy-efficiency reduces the amount of pollutants that ultimately are released to air. The City of London CHP system provides hot and chilled water to a number of Corporation and non-Corporation properties in the City for heating and air-conditioning.

The City of London will be a full participant in the Carbon Reduction Commitment (CRC) energy efficiency scheme, which began in April 2010. In 2009, the City of London was the first local authority in the UK to be awarded the Carbon Trust Standard for its work in carbon management.

In addition to energy efficiency assessments, the City of London launched a staff awareness raising scheme in May 2010 to promote water, waste and energy efficiencies across the organisation. The campaign, called "Greening the City of London" encouraged staff to reduce waste, energy and water use. Various communication materials such as posters and screensavers were complemented with local actions by Energy Wardens and departmental 'Green Teams'.



7.2 CITY BUSINESSES



Action 15: The City of London will continue to explore and implement energy efficiency measures to reduce emissions of carbon, NO_x and PM₁₀ from its buildings.

Outcome: The City will manage its buildings to ensure that there is a year on year reduction in NO_x, PM₁₀ and CO₂ through to 2015.

There are over 15,000 business premises in the Square Mile. The 2008 LAEI details that buildings are responsible for 31% of total NO_x emissions and 14% of PM₁₀ emissions in the City. Taxis and light goods vehicles dominate the road network as they serve the needs of the business community.

Most businesses are already reducing their carbon footprint alongside energy efficiency initiatives which have been introduced to reduce costs. Many businesses see sustainability as providing a competitive advantage in terms of Corporate Responsibility and reputation management.

It is important for City businesses to acknowledge air quality as an issue and that, in addition to considering it alongside carbon reduction from their buildings, they also consider their supply chains and own transportation requirements.

The City of London has obtained funding to approach City businesses to raise awareness about air quality and its impact on health, identify challenges that they face and establish any existing best practice. Building owners, including the City of London, as well as occupiers will be contacted. The best practice will be disseminated across the business community with a view to gaining support for improve air quality in the City.

Action 16: The City of London will engage with City businesses to gain their support for improving air quality in the Square Mile.

Outcome: A best practice report will be produced and disseminated across the City business community by September 2011.

7.3 NEW DEVELOPMENTS

The City of London prepares plans and policies that outline a strategy for shaping the Square Mile. The plans guide the City in deciding planning applications and drawing up proposals for improving the area.

The Unitary Development Plan (UDP) is the current plan for the City. It was adopted in 2002 and sets out the City's policies for planning and transportation.

The City is preparing a new plan called the Local Development Framework (LDF). The LDF will eventually supersede the existing UDP. It will contain a series of documents that together set out the City's planning strategy. The most significant of these is the Core Strategy, which has just undergone its final stage of public consultation. The Core Strategy sets out strategic policies to guide development in the City.

Spatial planning is a key means to improving air quality, particularly in the long term. Improving air quality falls within Policy CS 15 of the Core Strategy 'sustainable development and climate change'. The Core Strategy requires developers to

“positively address local air quality, particularly nitrogen dioxide and particulates PM₁₀ (the City's Air Quality Management Area pollutants)”

The City of London is in a central location with good public transport. There is very little car parking associated with new developments so the main focus for addressing local air quality with new developments is on reducing emissions from the building itself.

The data on emissions in the City in section 2, highlights that 31% of all NO_x emitted in the City comes from buildings. It is important therefore that new developments contribute towards reducing pollution levels in the City.

The majority of developments in the City are for large commercial buildings. Local emissions associated with buildings tend to be from heating systems (boilers) and uninterrupted power supplies (diesel generators). On the whole, electricity is generated outside of London, although some developments receive their energy from Citigen



Combined Heat and Power (CHP) plant just outside the City. There is also a move towards the installation of small individual CHP plant in new developments in the City. Individual developments tend to have a low impact on local concentrations of air quality due to the high background levels. However, it is prudent to look strategically at emissions across the City and take steps to reduce them wherever possible if we are to meet the air quality objectives and Limit Values.

Given the high levels of nitrogen dioxide and fine particles in the City, impact on local air quality needs to be a consideration for all developments. The potential impact of a development must be considered very closely if it is adjacent to areas where people live such as the Barbican, Middlesex Street and Mansell Street, near schools, due to the vulnerability of children to poor air quality, or near St Bartholomew's Hospital, due to the potential vulnerability of patients.

Action 17: All new developments in the City will be required to consider the impact on air quality. Developers will be required to undertake detailed air quality impact assessments of major developments adjacent to sensitive premises, such as residential properties, schools and St Bartholomew's Hospital, as part of the Environmental Impact Assessment (EIA).

Outcome: A reduction in emissions of PM₁₀ and NO_x from new developments.

The City of London draft Core Strategy states that all major developments should aim to achieve a BREEAM rating of 'excellent' or 'outstanding'.

7.3.1 Gas Boilers

Gas boilers contribute a large proportion to the City's high levels of nitrogen dioxide. The Building Research Establishment Environmental Assessment Method (BREEAM) measures the sustainability of developments in the UK. Several criteria are considered, one of which is the amount that a building is likely to contribute to local levels of pollution. The BREEAM assessment gives high credits for boilers that emit low levels of NO_x.

Action 18: Major developments will be encouraged to obtain maximum points for the pollution section of the BREEAM assessment relating to NO_x emissions i.e. to meet a dry NO_x emission rating of <40 mg/kWh for boilers (this is equivalent to a NO_x rating >5).

Outcome: The City of London will implement policies to ensure that there is minimal emissions of NO_x from new gas boilers.

7.3.2 Combined Heat and Power Plant

Small Combined Heat and Power (CHP) plant are becoming more common in new City developments. They are relatively efficient in terms of energy generation, provide advantages for energy security and offer carbon savings in comparison to conventional forms of energy generation. However, they introduce additional sources of pollution as electricity is being generated within the City. It is important, therefore, that the right controls are in place to minimise emissions.

CHP comes in a range of different technologies. The City of London is working on a best practice document to specify the most appropriate technology and emission limits for the Square Mile.

Action 19: The City of London will develop local best practice guidance for controlling emissions from gas Combined Heat and Power plant.

Outcome: Best practice guidance will be produced and implemented by December 2011, which will lead to a reduction in emissions of NO_x and PM₁₀ from CHP plant.



7.3.3 On-Site Renewable Energy

The City of London Core Strategy requires developments to adopt localised renewable energy technologies. Given the high levels of pollution, which are primarily caused by combustion in the City, developers are encouraged to install non-combustion renewable energy technology, for example photo-voltaics, solar thermal and ground source heating and cooling.

Section 5 of this strategy highlights the potential conflicts with air quality when using biomass as a low carbon fuel. In addition to emissions from the fuel itself, fuel deliveries would add to local pollution and traffic congestion. Current abatement equipment has the potential to reduce the amount of particulates from a biomass boiler to a certain extent, but not oxides of nitrogen. Consequently, whilst levels of pollution in the City fail to meet legal targets, it is not considered a suitable fuel, unless it can be demonstrated that emissions will be no greater than an equivalent gas boiler.

Liquid biofuel is also being proposed for on-site renewable energy production. There are a wide range of types of biofuel including waste oil from the food supply industry, palm oil and rape seed oil. The City has concerns over the use of biofuel as little is known about the emissions associated with the fuel when it is used in boilers. The City has no way of controlling the type of fuel that would be burned in these appliances so, until further information becomes available, the use of liquid biofuel will be discouraged. This approach will be reviewed annually to consider current best practice.

Action 20: Developers will be encouraged to install non-combustion renewable energy technology to work towards energy security and carbon reduction targets.

Outcome: A reduction in emissions of PM₁₀ and NO_x from new developments.

Action 21: A detailed air quality impact assessment will be required for any development where biofuel or biomass is proposed for on-site energy generation.

Outcome: The City will be protected from a deterioration in air quality.

7.3.4 Uninterrupted Power Supplies

A further source of pollution in the City is uninterrupted power supplies, or backup generators. These are installed to allow business continuity in the event of a power failure. They are fuelled by diesel and are generally tested once per month. In the event of a power failure, these appliances run continuously to supply electricity to buildings. As these generators run intermittently, it may not be cost effective to abate emissions, so further work is required to establish best practice.

Action 22: The City of London will consider cost effective ways of minimising emissions from back up generators by the end of 2011.

Outcome: If appropriate, best practice guidance will be developed for reducing emissions from generators.

7.3.5 Section 106 Agreements

Section 106 of the Town and Country Planning Act 1990 allows a local planning authority to enter into a legally-binding agreement or planning obligation with a developer, in association with granting planning permission. The obligation is termed a Section 106 Agreement.

These agreements are a way of addressing matters that are required to make a development acceptable in planning terms and can result in the landowner paying the local authority money for local improvement work. The City of London has used Section 106 agreements to help to reduce the impact on local air quality of major developments, and to contribute towards air quality management measures in the Square Mile.

Action 23: Where appropriate, the City of London will secure air quality improvements through the S106 process.

Outcome: This will lead to a reduction in the impact of new developments on air quality.

7.4 CONSTRUCTION, DEMOLITION AND STREET WORKS



At any given time there are many active demolition, construction and refurbishment sites and street works taking place within the City of London. The work is essential in order to enable the City to maintain its status as a world class centre of business and finance. To ensure that activities are undertaken with minimal disturbance to residents, workers and visitors, the City of London has prepared a Code of Practice detailing the environmental standards to which it expects sites to be maintained and operated. The Code of Practice is updated to reflect best practice. It is now in its 6th edition⁽¹⁸⁾.

Companies are required to submit an Environmental Management Plan (EMP) as part of the planning process. This has to be agreed by the City of London before activity can commence. Environmental Management Plans detail how the requirements of the City of London Code of Practice will be met. The plans include proposals for minimising air pollution. During the demolition and construction phase, sites are monitored to ensure they are complying with their Environmental Management Plan.

The requirements for minimising emissions are in line with the Greater London Authority and London Councils Best Practice Guide for Controlling Dust and Emissions from Construction and Demolition, November 2006⁽¹⁹⁾. The Mayor of London intends to update this guidance as part of the Mayor's Air Quality Strategy

Particular attention will be paid to construction, demolition and street works in and around the GLA designated priority location (Victoria Street through to Tower Hill). This is to ensure emissions of PM₁₀ in this area are as low as possible to assist with the achievement of the PM₁₀ Limit Value along this route.

Action 24: The City of London will continue to establish best practice for minimising emissions from construction, demolition and street works and update the City of London Code of Practice for Demolition and Construction Sites to reflect this.

Outcome: The Code of Practice for Construction and Deconstruction sites will be updated annually to reflect best practice.

Action 25: The City of London will pay particular attention to controlling emissions of PM₁₀ from construction, demolition and street works in and around the route from Victoria Embankment East to Tower Hill. This is to assist the Government to achieve the PM₁₀ Limit Value.

Outcome: A reduction in PM₁₀ emissions along this route.

Action 26: The City of London will assist the Mayor of London to update the Greater London Authority and London Councils' Best Practice Guide for Controlling Dust and Emissions from Construction and Demolition.

Outcome: A reduction in emissions from construction and demolition sites.

7.5 GREEN ROOFS, GREEN WALLS AND TREES



A green roof or green wall is a surface of a building that is partially or completely covered with vegetation. Covering roofs and walls with plants provides lots of benefits including

- storm water management
- reduction in noise transmission
- increased thermal performance so less energy used to heat and cool the building
- a habitat for native flora and fauna
- remove pollutants out of the air

There are a number of green roofs in the City, like the one pictured. A green roof has been installed on the roof of the Guildhall and work is underway to assess the feasibility of adding a green roof to Walbrook Wharf.

The City of London has produced an advisory note for green roofs with the British Council for Offices. Green roofs and walls will be encouraged through the planning process for new buildings and via engagement with City landlords for existing buildings (see section 7.2).

Action 27: The City of London will encourage the use of green walls and green roofs in new and existing buildings, particularly in close proximity to the priority location Victoria Embankment, Upper and Lower Thames Street through to Tower Hill

Outcome: Green walls and roofs will contribute towards improving air quality in the City.



In addition to green roofs and walls, trees can have an effect on air quality. They can absorb gaseous pollutants like nitrogen dioxide through the leaves, and particulate matter can stick to leaves to be washed away when it rains. However, some species emit volatile organic compounds which combine with oxides of nitrogen to create other pollutants, particularly ozone.

In 2010, a substantial hedge was planted around the perimeter of a new children's play area opposite the Tower of London. It was designed to offer some degree of protection from the noise and pollution from the traffic on Tower Hill.

The Centre for Hydrology and Ecology and Lancaster University⁽²⁰⁾ undertook research looking at how different tree species impact on air quality. They discovered that some species are better for air quality than others, see Appendix 2.

There is limited space for new trees in the City and many different pressures determine the most suitable tree species to be planted. However, when an opportunity arises to plant new trees, its impact on air quality will be one of the criteria taken into account.

8 INCREASING PUBLIC AWARENESS OF AIR QUALITY

8.1 LOW POLLUTION ROUTE MAP

The City of London has an important role to play in providing information to the public so they can make informed choices about their exposure to air pollution. The City would like to continue to take a lead in building public understanding of poor air quality, and provide advice on how to reduce the impact on poor air quality on health, by avoiding areas of high pollution. The City has already been active in this area through the development of 'low pollution route maps' and enabling an alert system to advise people when pollution levels are anticipated to be high in the City.

The City of London initiated and facilitated the addition of pollution information onto a route mapping web site www.walkit.com. This has been rolled out across London. Users are able to request a walking route that takes them away from the most polluted roads to avoid their exposure to pollution. This option has proved very popular with users of the site.

The map below is an example of a low pollution route from Smithfield Market to Fleet Street taking the user away from Fetter Lane and Fleet Street, which are more heavily polluted due to the amount of traffic.

Distance	Time	Calories	CO ₂ Saved
0.7 miles	11 mins (fast)	76 Cal (fast)	0.07 kg tube
1.1 km	15 mins (med)	68 Cal (med)	0.23 kg car
1600 steps	22 mins (slow)	66 Cal (slow)	0.12 kg bus

You can now make walkit.com stats much more personal. [Find out more...](#)



8.2 POLLUTION ALERTS

FREE service from your council



Heart or breathing problems?

Air pollution can harm your health. airTEXT alerts can help reduce the effects of pollution on you or someone you look after.

These FREE alerts come straight to your home phone, mobile or by email on days of elevated air pollution

SIGN UP NOW FOR FREE!

See inside for details or go to www.airtext.info



FREE service from your council

The City of London, along with other London Boroughs, offers a free air pollution forecast service called airTEXT. Individuals, who are sensitive to poor air quality and live or work in the City, are able to register for a free message service, that advises them when the air quality is due to be poor the following day. The alert enables the people to take remedial action on the day in question, such as avoiding busy polluted streets, remembering to take medication or increasing their medication dose. Over 6,500 people subscribe to the service across London.

The Environment Research Group at King's College London has also developed a pollution alert application for London, for use with the iPhone. Launched in March 2010, the application has 8,000 subscribers.

Action 28: The City of London will continue to increase public understanding of poor air quality through initiatives such as pollution alert systems and its work with City businesses.

Outcome: This action will be measured by the number of users signed up to the service and will lead to better public

9 RECOGNISING AND REWARDING GOOD PRACTICE

9.1 SUSTAINABLE CITY AWARD FOR AIR QUALITY



"I am thrilled to accept this prestigious new award on behalf of the Campaign for Clean Air in London. It is tremendous the City of London Corporation is taking a lead, as it has done for over 50 years, in encouraging those who want urgent radical action to reduce air pollution in London."

Simon Birkett, Founder and Director of Clean Air in London.

The City of London has been running the Sustainable City Awards for ten years. The award scheme recognises and rewards UK organisations that have demonstrated outstanding achievements and innovation across all aspects of sustainability.

In 2011, in association with Environmental Protection UK and the Environment Research Group at King's College London, the City rewarded UK organisation that have been working on innovative measures to reduce emissions and help improve local air quality. Applications were received from:

- businesses that have incorporated air quality policy into Corporate Responsibility
- local authorities implementing innovative measures to improve air quality
- establishments working to raise the awareness of air quality through public engagement

The 2011 award was won by Campaign for Clean Air in London, now known as Clean Air in London (CAL). Clean Air in London is a campaign group working to make sure that health based air quality standards, set by the World Health Organisation, are met everywhere across London. CAL shares information and research, conducts media campaigns and lobbies for action on air quality issues.

There were two runners up in the air quality category: Gnewt Cargo, who specialise in urban 'last-mile' delivery of goods using an all electric fleet of vehicles and Sheffield City Council, for their work with communities and use of biomethane in vehicles.

Highly commended were entries from The Open Air Laboratories Project (OPAL) for their community based science work to raise awareness of how air pollution and climate change shape our environment, and Volvo Car UK for their Emissions Equality Project

The City of London intends to build on this success and run the air quality award annually.

9.2 CONSIDERATE CONTRACTOR SCHEME ENVIRONMENT AWARD



The Considerate Contractor Scheme, pioneered by the City of London in 1987, aims to encourage building and civil engineering contractors working in the City to carry out their operations in a safe and considerate manner. Following the City of London's initiative, a number of individual local authorities have set up specific schemes of their own.

Building sites and street works are judged annually on the basis of their overall performance during that year, and on a site visit by a specially appointed judging panel. Awards are presented by the Lord Mayor at an annual awards ceremony. There is an Environment Award given to the company that displays innovative methods in reducing their impact on the local environment. This includes methods to control emissions of pollutants.

The 2010 award was won by Skanska for their work at St Bartholomew's hospital.

Action 29: The City of London will continue to promote, reward and disseminate best practice for tackling poor air quality through the Sustainable City Awards and the Considerate Contractor Scheme Environment Award.

Outcome: This award will result in a raised awareness of the importance of air quality and promote best practice, across a wide range of organisations.

10 PARTNERSHIP WORK



The City of London cannot deal with poor air quality in isolation. A significant proportion of pollution in the City is generated outside the Square Mile. Consequently partnership work is very important for dealing with pollution. The City has been an active member of several partnerships over the past decade and is currently a member of the following:

- Environmental Protection UK Air Quality Committee – Environmental Protection UK is a national member based charity that seeks changes in policy and practice to minimise air pollution. The committee includes representatives from industry, consultancies, the Environment Agency and GLA.
- Central London Air Quality Cluster Group – This has representatives for eight central London local authorities
- London Air Quality Steering Group – This has representatives from five London local authorities, London Councils, the GLA
- Health Protection Agency Olympics Air Quality Coordination Group – This group was established to provide advice about air quality during the Olympics.

Action 30: The City will continue to work in partnership with key organisations to develop local, regional and national air quality policy.

Outcome: This will result in shared best practice and coordinated action to improve air quality.

11 LOBBYING

Meeting the Limit Values for nitrogen dioxide will be a real challenge in the Square Mile. The PM₁₀ Limit Value along Victoria Embankment through to Tower Hill will not be met without action from the Mayor of London.

The City of London does not have the power or means of controlling emissions from many sources and so is reliant on the Government and Mayor of London to fulfil their responsibilities in relation to air quality management.

The City of London has been very active in engaging with the Mayor's Office and DEFRA. For example, the Chairman and Deputy Chairman of Port Health and Environmental Services Committee have met the Mayor of London's Environment Advisor to discuss air quality policy. Officers from The City of London have also met DEFRA officials to register the City's concern about the challenge in meeting the nitrogen dioxide Limit Value. The City also responds to consultation documents that have an impact on air quality management in the City.

Action 31: The City of London will continue to lobby the Mayor of London and the Government to ensure that the Limit Values for PM₁₀ and nitrogen dioxide are met in the Square Mile.

Outcome: The Mayor of London and Government will continue to be made aware of the City of London's commitment to improving air quality.

APPENDIX 1

Table A1 European Air Quality Limit Values for Nitrogen Dioxide and PM₁₀

Pollutant	Averaging period	Limit Value	Date by which Limit Value should be met	Potential extension, subject to satisfactory action plan
Nitrogen dioxide	1 hour	200 µg/m ³ , not to be exceeded more than 18 times a calendar year	1st January 2010	1st January 2015
	Calendar year	40 µg/m ³	1st January 2010	1st January 2015
Fine particles PM ₁₀	24 hours	50 µg/m ³ , not to be exceeded more than 35 times a calendar year	1st January 2005	1st June 2011
	Calendar year	40 µg/m ³	1st January 2005	1st June 2011

Table A2 Air Quality Objectives for Nitrogen Dioxide and PM₁₀

Pollutant	AQ Objective	Measured as	Date to achieve	Maximum level measured in the City in 2009
Nitrogen dioxide	200 µg/m ³ not to be exceeded more than 18 times a year	Hourly average	31.12.2005	200 µg/m ³ was exceeded 955 times
	40 µg/m ³	Annual average	31.12.2005	Annual average 131 µg/m ³
Particulates (PM ₁₀)	40 µg/m ³ (gravimetric)	Annual average	31.12.2004	Annual average 36 µg/m ³
	50 µg/m ³ (gravimetric) not to be exceeded more than 35 times per year	24-hour average	31.12.2004	50 µg/m ³ was exceeded 44 times

APPENDIX 2

The impact of different tree species on air quality

Greatest benefit for air quality	Smaller capacity to improve air quality	Could make air quality worse
Ash	Apple	Crack Willow
Common Alder	Cherry Laurel	English Oak
Field Maple	Common Elm	Goat Willow
Larch	Common Lime	Poplar
Norway Maple	Elder	Red Oak
Scots Pine	Grey Alder	Sessile Oak
Silver Birch	Hawthorn	White Willow
	Hazel	

REFERENCES

- 1. Dr Brian G Miller Institute of Occupational Medicine.** Report on estimation of mortality impacts of particulate air pollution. Consulting report P951-001. June 2010
www.london.gov.uk/publication/mayors-draft-air-quality-strategy
- 2. Clearing The Air. The Mayor's Air Quality Strategy December 2010.** Greater London Authority.
www.london.gov.uk/publication/mayors-air-quality-strategy
- 3. Air Quality Strategy for England, Wales and Northern Ireland, 2007** Department of the Environment Food and Rural Affairs
<http://www.defra.gov.uk/environment/quality/air/air-quality/air-quality-publications/>
- 4. City of London Corporate Plan 2010 – 2014**
www.cityoflondon.gov.uk/Corporation/LGNL_Services/Council_and_democracy/Performance/Corporate+Plans.htm
- 5. The City Together Strategy: The Heart of a World Class City 2008 – 2014**
www.cityoflondon.gov.uk/Corporation/LGNL_Services/Community_and_living/Community_advice/Community_strategy/community.htm
- 6. City of London Local Area Agreement**
www.cityoflondon.gov.uk/Corporation/LGNL_Services/Community_and_living/Community_advice/Community_strategy/laa.htm
- 7. City of London Place Survey**
- 8. London Atmospheric Emissions Inventory 2008**
<http://data.london.gov.uk/laei-2008>
- 9. Air Quality Expert Group Particulate matter in the United Kingdom**
www.airquality.co.uk/reports/reports.php?action=category§ion_id=11
- 10. DEFRA Air pollution: Action in a Changing Climate March 2010**
www.defra.gov.uk/environment/quality/air/airquality/
- 11. House of Commons Environmental Audit Committee, Air Quality Fifth Report of Session 2009 – 10. Volume 1**
www.publications.parliament.uk/pa/cm/cmenvaud.htm
- 12. news.bbc.co.uk/1/hi/world/africa/8092182.stm**
- 13. Quantifying local traffic contributions to NO₂ and NH₃ concentrations in natural habitats.** Sally R Gadsdon, Sally A. Power. Environmental Pollution 157 (2009) 2845–2852.

14. Volatile Correction Model

www.volatile-correction-model.info/

15. City of London Climate Change Mitigation Strategy 2010

www.cityoflondon.gov.uk/Corporation/LGNL_Services/Environment_and_planning/Sustainability/Climate_change/

16. Air Quality and Climate Change: Integrating Policy in Local Authorities 2011

www.environmental-protection.org.uk/aqclimate

17. EST smarter driver training programme

www.energysavingtrust.org.uk/business/Business/Transport-advice/Smarter-Driving

18. City of London Code of practice for Deconstruction and Construction 6th edition February 2011

http://www.cityoflondon.gov.uk/Corporation/LGNL_Services/Environment_and_planning/Pollution/noise.htm

19. London Best Practice Guidance: The control of dust and emissions from construction and demolition. 2006

http://static.london.gov.uk/mayor/environment/air_quality/construction-dust.jsp

20. Trees and Sustainable Urban Air Quality. Centre for Ecology and Hydrology. University of Lancaster.

www.es.lancs.ac.uk/people/cnh/docs/UrbanTrees.htm

**City of London
PO Box 270
Guildhall
London
EC2P 2EJ**

www.cityoflondon.gov.uk

Telephone: 020 7332 1162
