

Draft Air Quality Strategy and Action Plan (V4- 31/12/10)

Contents

Section One – Introduction	3
Section Two – Southwark Today	6
Section Three – Strategy Context	7
Air quality monitoring and assessment	7
Planning	7
Transport plan	8
European	8
National	8
Regional	9
Local	9
Southwark Alliance	9
Section Four – Sources of Pollution	10
Nitrogen dioxide	10
Particulate matter	11
Section Five – Air Quality Health & the Environment	14
Health Impacts of poor air quality	14
Nitrogen dioxide	14
Particulate matter	14
Air quality and the natural environment	14
Air quality and the built environment	15
Air quality and climate change	15
Section Six – Air Quality Action Plan – Objectives and Measures	16
Section Seven – Reduce Emissions from Vehicular Transport	17
Section Eight – Reducing Emissions from Fixed Sources	21
Section Nine – Reduce Emissions from New Development	22
Section Ten – Improve Public Health and Monitor Air Quality	23

INTRODUCTION

- 1.1 Pollution is one of the most pressing environmental concerns for people living in London. While great advances have been made since the smog events that occurred in the immediate post-war period, the air quality challenge remains. It has been highlighted as one of the five national priorities for local authority environmental health and trading standards services. Links between air quality and climate change have also been recognised nationally with the publication of the “Air Quality and Climate Change: A UK Perspective” report in 2007.
- 1.2 While there has been success in reducing smoke emissions, other pollutants remain increased in concentrations. For example, benzene (which until recently was used as an additive to petrol) levels in the atmosphere have increased in line with the popularity of the motor vehicle. Since the UK joined the European Union, European legislation has driven national regulations to control air pollution.
- 1.3 The Environment Act 1995 required the preparation of a National Air Quality Strategy (NAQS) setting air quality standards and objectives for particular pollutants which are based on EU Directives. The 1995 Act also required each local authority to review and assess air quality within its district and determine whether the national air quality objectives are likely to be met locally, for the relevant year. Local air quality management as this process is known has been delivered in Southwark through the establishment of an air quality management area (AQMA) and an ‘Air Quality Strategy and Improvement Plan’ (AQSIP). Southwark is required to periodically review and assess the effectiveness of the AQSIP through regular update and screening assessments (USA).
- 1.4 The initial Southwark AQSIP was first launched in 2002. At this time, our initial review and assessment had identified that not all of the national air quality objectives would be met by the relevant due date and the area of the borough north of the A205 had been declared an AQMA accordingly.
- 1.5 The last Southwark USA was undertaken in 2006 and this identified that only two of the set targets, those for particulate matter less than 10 microns in diameter (PM₁₀) and nitrogen dioxide (NO₂), would be exceeded.
- 1.6 This remains the current position. Table 1 (page 5) lists the range of pollutants covered by EU Directives and the concentrations at which limits have been set. Targets for those pollutants shown in italics have been met in Southwark. Only the annual mean objectives for NO₂ and PM₁₀ are not anticipated to be met by the due date.
- 1.7 However, we have now chosen to revisit our strategy, in full, in recognition of the developments that have taken place in both national and regional policy and in light of demographic and development changes within the borough.
- 1.8 This document sets out this council’s strategic approach to improving the air quality of the borough. It has four overall objectives:
 - To reduce emissions from vehicular transport;
 - To tackle emissions from existing fixed sources
 - To reduce emissions from new development; and
 - To protect public health and monitor air quality.
- 1.9 However, there are two considerations within the strategy.
 - How we will work regionally to improve air quality across London.
 - How local air quality will be improved.

Integral to the first is implementing and supporting regional policies and measures. Many of these are detailed in the Mayor's draft Air Quality Strategy, and this document provides broad support for the delivery of Mayor's strategy. We will work with the Greater London Authority (GLA), Transport for London (TfL) and our neighbouring authorities to deliver cleaner air for London as a whole as well as Southwark locally.

- 1.10 At the heart of this document, now called the Air Quality Strategy and Action Plan (AQSAP), is an intention to ensure the integration of local policy and practice on air quality; climate change; transport planning and spatial planning. Although there may be occasional instances where an action taken in one of these policy areas may have an adverse impact on another, we intend to ensure that policy and practice is co-ordinated in such a way as to ensure that potential secondary benefits are realised wherever possible. However, it is crucial that both potential co-benefits and adverse impacts are highlighted, understood and taken into account through all decision making processes.
- 1.11 In order to help assure that this consideration takes place we are currently examining methods by which the delivery of the AQSAP may be monitored through the Southwark Sustainable Environment Partnership. The process for this will be detailed within the final version of this policy.
- 1.12 We also intend to ensure that air quality is given similar prominence in the decision making process within the Council to that currently afforded to other environmental issues such as carbon emissions. This will involve working towards exemplary practice in all area of emissions including 'green procurement'; energy efficiency and exposure reduction.
- 1.13 Together, we believe that these strategic objectives will work towards meeting future air quality objectives in Southwark.

Table 1: National Air Quality Objectives

Pollutant	Air Quality Objectives		Date to be achieved by and maintained thereafter
	Concentration	Measured as	
Particles (PM₁₀)	50 µgm ⁻³ not to be exceeded more than 35 times a year	24 hour mean	31 December 2004
	40µgm ⁻³	Annual mean	31 December 2004
Particles (PM_{2.5})	25 µgm ⁻³	Annual Mean	2020
	15% reduction in concentrations at urban background	Annual Mean	Between 2010 and 2020
Nitrogen dioxide	200µgm ⁻³ not to be exceeded more than 18 times a year	1 Hour Mean	31 December 2005
	40µgm ⁻³	Annual mean	31 December 2005
Ozone	100µgm ⁻³ not to be exceeded more than 10 times a year	8 hour mean	31 December 2005
Carbon monoxide	10µgm ⁻³	8 hour running mean	31 December 2003
Sulphur dioxide	350µgm ⁻³ not to be exceeded more than 24 times a year	1 hour mean	31 December 2004
	125µgm ⁻³ not to be exceeded more than 3 times a year	24 hour mean	31 December 2004
	266µgm ⁻³ not to be exceeded more than 35 times a year	15 minute mean	31 December 2005
Benzene	5µgm ⁻³	Annual mean	31 December 2010
1,3-Butadiene	2.25µgm ⁻³	Annual running mean	31 December 2003
Lead	0.5µgm ⁻³	Annual running mean	31 December 2004
	025µgm ⁻³	Annual running mean	31 December 2008

SECTION TWO – SOUTHWARK TODAY

- 2.1 Alongside the City of London, Southwark is one of the oldest areas of London, with a history stretching back to Roman times. Southwark's population reached 274,000 in 2007 and is believed to be growing by as much as 4,000 people per year, with a projected population of over 310,000 by 2016. The population has a young demographic profile and demonstrates rich ethnic and cultural diversity, with around one-third (90,600) of the population from black or ethnic minority communities. With this figure set to rise to 38% by 2011, Southwark is arguably one of the most diverse areas in the capital.
- 2.2 Southwark is made up of eight very distinctive neighbourhoods that extend along the river Thames and down into south east London. The borough also encompasses some of London's top attractions, creative hotspots, scenic villages and acclaimed green spaces.
- 2.3 Southwark has a wide-range of leisure and cultural opportunities; and makes a significant economic and employment contribution to the local community. The north of the borough is recognized as one of London's fastest growing tourist quarters and a thriving business location.
- 2.4 Alongside the borough's rich vibrancy, Southwark has its fair share of challenges. The Index of Multiple Deprivation (IMD) 2007 shows Southwark as the 27th most deprived local authority nationally and 60% of the borough's wards are among the 10% most deprived in the country. Consequently, the borough faces many challenges associated with meeting the complex health and social needs of an inner-city population. Unemployment in Southwark (8.9%) is higher than the London average (6.7%) and the percentage of the working population claiming benefits in Southwark is 15.6% compared to 13.9% across London. Gross weekly earning for both men and women in Southwark is lower than the London average.
- 2.5 Cardiovascular disease and cancer account for more than half of the deaths in the borough. Deaths from respiratory illness such as chronic obstructive pulmonary disease (COPD) are relatively small, but Southwark residents are one and a half times more likely to die from COPD than the national population. COPD is a major cause of ill health, drugs for respiratory illness being the third largest expenditure in the primary care trust and higher hospital admissions for COPD in some wards.

SECTION THREE – STRATEGY CONTEXT

- 3.1 For Southwark, the responsibility of meeting national air quality objectives for the pollutants in table 1, bar ozone, lies jointly with the Mayor of London and Southwark Council. This joint responsibility reflects the fact that air quality issues are London wide and that a large proportion of emissions come from the Transport for London Road Network (TRLN) for which the Mayor has overall control. The Mayor's forthcoming Air Quality Strategy will tackle to some extent air quality in Southwark and London as a whole, however as a council, we need to recognise the impact of our operations and lead by example. How we will do this is detailed from section 7 of this document. We will report on and review these measures annually to ensure that sustainable improvements to air quality are being delivered.
- 3.2 As noted in our introduction, the framework within which improvements to air quality will be made was established in 1995 with the Environment Act, this process is known as local air quality management (LAQM). This is the process which compels councils to carry out regular reviews and assessments of air quality within their district against the objective standards in table 1. If any areas are found to exceed these objectives, an air quality management area should be declared and an action plan adopted to tackle these exceedances.
- 3.3 For Southwark, the only pollutants for which the objective levels are not presently being met are NO₂ and PM₁₀ and the AQMA that covers most of the borough was declared in 2000 on the basis of a detailed assessment.

Air quality monitoring and assessment

- 3.4 There are two automatic monitoring stations within Southwark, a roadside location on the Old Kent Road and a background site near to the Elephant and Castle southern roundabout. We are also proposing to resume our diffusion tube survey which monitors NO₂ as part of our action plan, targeting pollution hotspots and regeneration areas where new exposure to air pollution is likely.

Planning

- 3.5 The planning system plays a vital part of the LAQM process and presents both an opportunity and risk to local air quality improvement. Being a material planning consideration, it is essential that air quality is given proper consideration through the planning process, from policy development and land use allocation to ensuring that new development does not have an adverse impact on air quality.
- 3.6 Guidance on planning and air quality comes from a variety of documents that range from in their remit from national to local:
 - PPS1- Delivering sustainable development - This sets out the government's overarching planning policies on the delivery of sustainable development through the planning process. It requires regional and local planning authorities to give consideration to environmental matters such as air quality in their development plan documents;
 - PPS4- Planning for sustainable economic growth - Air quality is one of the town centre health check indicators that are introduced in within this document, recognising the economic impact that poor air quality can have;
 - PPG13- Transport - Reinforces the need to co-ordinate transport and land use planning and states that air quality is a key consideration for the integration of these two disciplines;
 - PPS22- Renewable Energy - Recognising the role that renewable energy can play in reducing greenhouse gas emissions, PPS22 importantly highlights the contribution that small scale projects, including biomass, can provide; and
 - PPS23- Planning and Pollution Control - Providing the primary guidance from central government on air quality within the planning system, this document reinforces the need to integrate policies on land use planning, transport and air quality. It also highlights the need to apply the 'precautionary approach' to assessment of environmental impacts.

- 3.7 Southwark's development plan includes regional planning policy which in London is the London Plan. Policy 4A.19 - Improving air quality commits the Mayor and guides boroughs to reduce pollutant emissions and public exposure.
- 3.8 Local planning policy is undergoing significant change presently. Development plans are being replaced by the Local Development Framework. Some policies of the present development plan for Southwark, the Southwark Plan, will be retained for the next 3 years. One of these is policy 3.6 which states development causing a reduction in air quality will be refused.
- 3.9 Southwark's Sustainable Construction and Design SPD provides advice to developers on how to minimise the impact of development on local air quality. With most of the borough subject to poor air quality, it is important that new development, in particular residential development, is designed to reduce exposure to pollution, this SPD provides guidance on how to achieve this aim.
- 3.10 The Sustainable Design and Construction SPD also requires air quality assessments to be submitted for all applications for major development.

Transport Plan

- 3.11 The Transport Plan is presently being prepared in response to the revised Mayor's Transport Strategy. It sets out how we will improve travel to, within and from the borough by setting long term objectives and a 3 year investment programme. One of the objectives of this plan is to reduce the impact of transport on Southwark's air quality.
- 3.12 There are a host of policies and regulations in place which share the aim of improving air quality. The following provide the context for this strategy.

European

- 3.13 Air quality legislation in the UK has been developed in response to European legislation, primarily Framework Directive 96/62/EC, commonly known as the Air Quality Directive introduced the pollutants for which air quality standards would be developed. It also described the basic principles of air quality assessment and management for member states. Following this four daughter Directives were introduced from 1999-2004 detailing limit values for the pollutants included in the Air Quality Directive:
- [Council Directive 1999/30/EC](#) relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air;
 - [Directive 2000/69/EC](#) relating to limit values for benzene and carbon monoxide in ambient air;
 - [Directive 2002/3/EC](#) relating to ozone in ambient air; and
 - [Directive 2004/107/EC](#) relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air.
- 3.14 A new air quality directive, Directive 2008/50/EC, came into force in June 2008 which merged most of the previous legislation into a single directive. New objectives for PM_{2.5} (fine particles) were introduced as was the possibility for member states to apply for time extensions for meeting targets for PM₁₀ (3 years) and NO₂ and benzene (5 years). The assessment process was also refined to allow natural sources of pollution (sea salt, Saharan dust etc.) to be discounted in order to assess compliance.

National

- 3.15 Part IV of the Environment Act 1995 requires the Secretary of State to produce a National Air Quality Strategy that contains standards, objectives and measures to improve air quality. These policies are to be kept under review which has meant that since the adoption of the first Air Quality Strategy in 1997, it has been revised twice; the latest being published in 2007.
- 3.16 The latest National Air Quality Strategy contains a new standard for fine particles (PM_{2.5}). These particles are of particular concern because they are inhaled deeper into the respiratory system and are considered to cause the greatest adverse health effects. In recognition of this, an exposure reduction approach has also been adopted. The exposure reduction

approach moves away from addressing 'hotspots' to gain wider health benefits of reducing concentrations over a greater geographic area.

- 3.17 The National Air Quality Strategy also emphasises the links and some potential conflicts between reducing greenhouse gas emissions and improving air quality. Reference is made to the air quality expert group report on air quality and climate change and in particular the main recommendations made. Most of these recommendations are national in their context and relate to policies and areas for which further research is required. Consideration is, however, also given to the local impacts that measures to reduce greenhouse gas emissions might have, for instance biomass being used as a source of renewable energy generation if unattenuated may lead to local reductions in air quality. Most of the connections between air quality and climate change initiatives are however beneficial to both.

Regional

- 3.18 The Greater London Authority Act 1999 requires the Mayor of London to publish an Air Quality Strategy for the capital. This regional strategy must include proposals for implementing the policies contained in the National Air Quality Strategy. A draft Air Quality Strategy was published in March 2010 for public consultation. This strategy introduces measures for reducing emissions from transport, homes, business and industry. It targets air quality priority locations and seeks to increase awareness of air quality issues. The Mayor's Air Quality Strategy is not however a 'stand alone' document and is complemented by measures to improve air quality in the London Plan and Transport Strategy.

Local

Southwark Alliance

- 3.19 Southwark 2016, the Southwark Alliance's Sustainable Community Strategy published in 2006 sets out the framework for responding to local needs and concerns, increasing life chances and reducing the inequality gap. As part of the Southwark alliance's objective to make Southwark a better place for people, a commitment was made to achieve a measurable improvement in air quality by 2016.

SECTION FOUR – SOURCES OF POLLUTION

Nitrogen dioxide

- 4.1 Nitrogen dioxide is formed by a number of processes, however, in London the main cause is from the combustion of fossil fuels. Excess air that is required for complete combustion of fuels introduces nitrogen into the reaction, this forms nitrogen dioxide and nitric oxide which are collectively referred to as oxides of nitrogen (NO_x). NO_x emissions are primarily nitric oxide (NO) but this is converted into NO_2 in the atmosphere through chemical reactions with ozone (O_3). Modelled NO_2 concentrations in Southwark for 2010 are shown in figure 1 below.

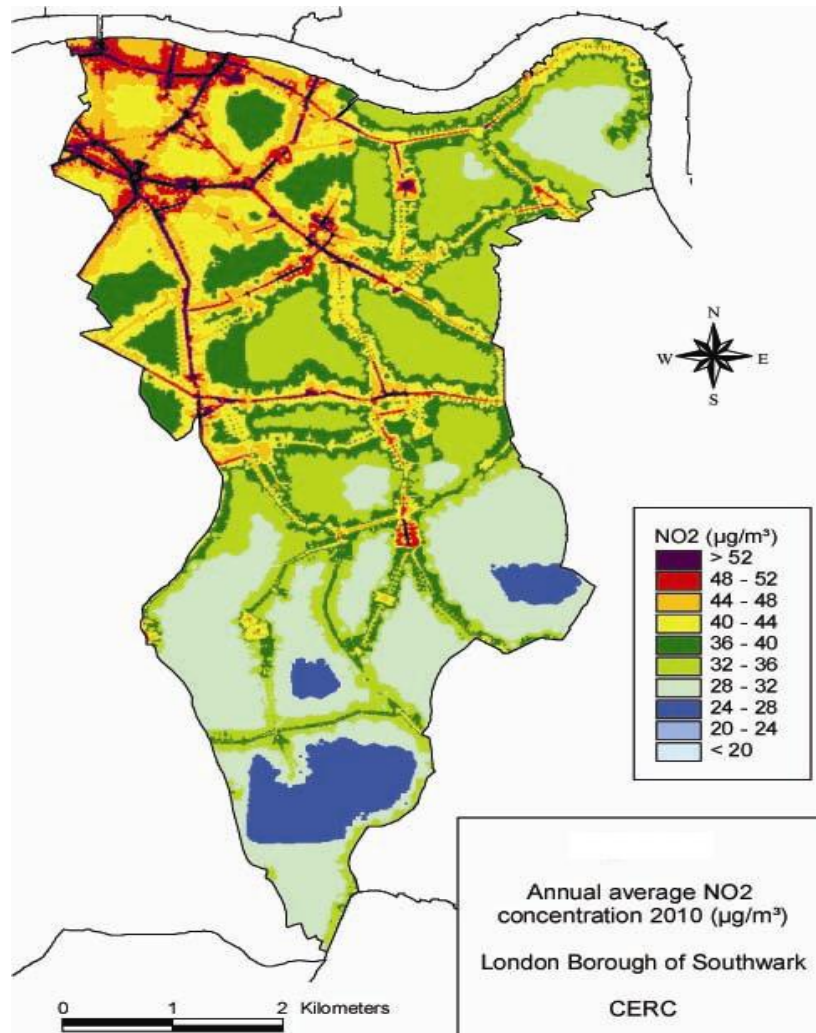


Figure 1

- 4.2 Chart 1 below shows the relative contribution to NO_x emissions in Southwark from different sources from the London Atmospheric Emissions Inventory 2006 (LAEI) and includes predictions for 2010 and 2015. As this chart shows, contributions from road transport were predicted to have decreased since 2004, whilst emissions from gas sources remained stable and therefore grown proportionately. This predicted reduction in NO_x is primarily due to the technological advances in reducing exhaust emissions. Unfortunately there has been a disparity between predicted emission reductions and measured concentrations, which have remained fairly stable since 2002. NO_x concentrations have remained stable at urban roadside and background sites with NO_2 concentrations actually increasing in some areas of London.

- 4.3 The reasons for this disparity are not yet fully understood but are thought to be related to the emissions of NO_x from diesel vehicles in real-life situations being different from that which has been calculated. Defra is currently researching this issue.

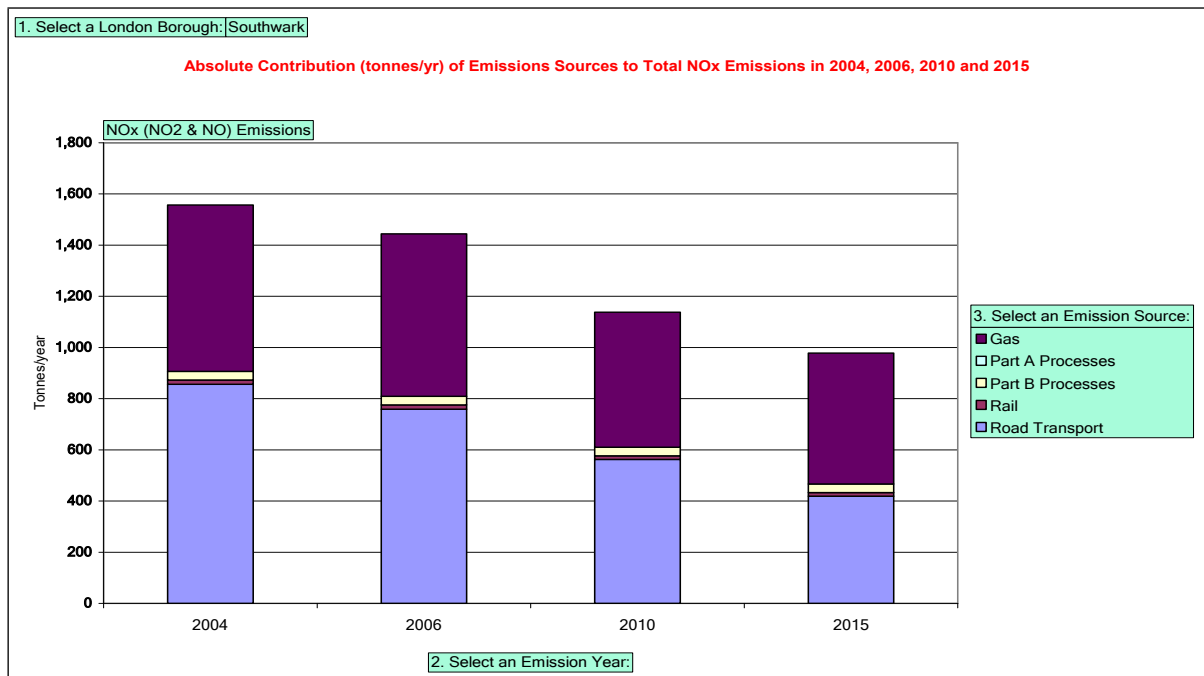


Chart 1- NO_x contributions in Southwark from various sources

Particulate matter

- 4.3 Particulate matter under 10 microns in diameter (1 micron (1 μ m) is one thousandth of a metre) are referred to as PM₁₀. There are many sources of PM₁₀ within Southwark. These generally derive from natural sources, for instance, dust blown in from the Sahara and sea salt. Man-made sources comprising emissions from diesel engines (motor vehicles; fixed plant and to a lesser extent diesel trains); bonfires and biomass boilers and are generally below 2.5 μ m (PM_{2.5}). Larger particles are generated by industrial processes such as concrete batching and from demolition and construction activities. Particles that have settled can be re-suspended and decrease air quality. Finally, recent research has identified brake and tyre wear as a significant source of PM₁₀. Crucially the proportion from brake and tyre wear will increase as exhaust emissions are reduced. Figure 2 on the following page shows PM₁₀ concentrations in Southwark for 2010.
- 4.4 Chart 2 (page 13) shows the absolute contribution from different sources of PM₁₀, again from the LAEI. The downward trend is due to reduced exhaust emissions but the proportional contribution from road transport remains high. The trend in concentrations of PM₁₀ has followed predicted reductions in emissions. Predicted emissions from biomass boilers are not included in this data and could form a significant source in the future.
- 4.5 The contribution to air pollution concentrations from the road traffic networks can be seen by comparing the figures 1 and 2 to figure 3 below. The major east-west routes of the New/Old Kent Road and A202- Peckham/Camberwell Road are distinct sources. There is a concentration in the north west of the borough with particular hotspots around the Elephant and Castle, Tower Bridge Road and the London Bridge/Bankside area.
- 4.6 Concentrations are not simply a function of the level of traffic but determined to a significant degree by congestion. Figure 3 shows that the greatest traffic flows are on the A2 towards and Walworth Road east and south of the Elephant and Castle respectively. Although concentrations are high the along these roads, concentrations along roads with fewer vehicles are comparable, due to increased congestion
- 4.7 The London congestion charge zone includes part of the borough to the north west with the eastern boundary formed by Tower Bridge Road along New Kent Road to the Elephant and Castle and then west along Kennington Lane. Although concentrations within the zone itself have been reduced, high concentrations remain on the boundary roads which figure 2 illustrates fairly well. It is important that these concentrations are tackled effectively, particularly for areas where planned regeneration includes significant housing development, such as around the Elephant and Castle.

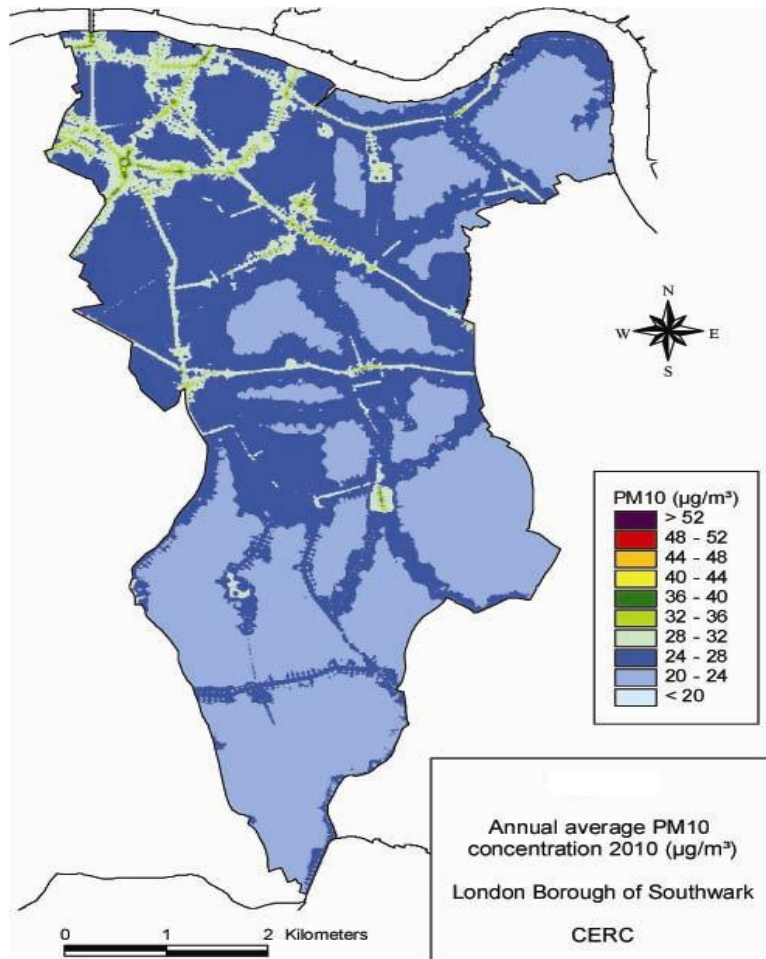


Figure 2- PM₁₀ concentrations in Southwark

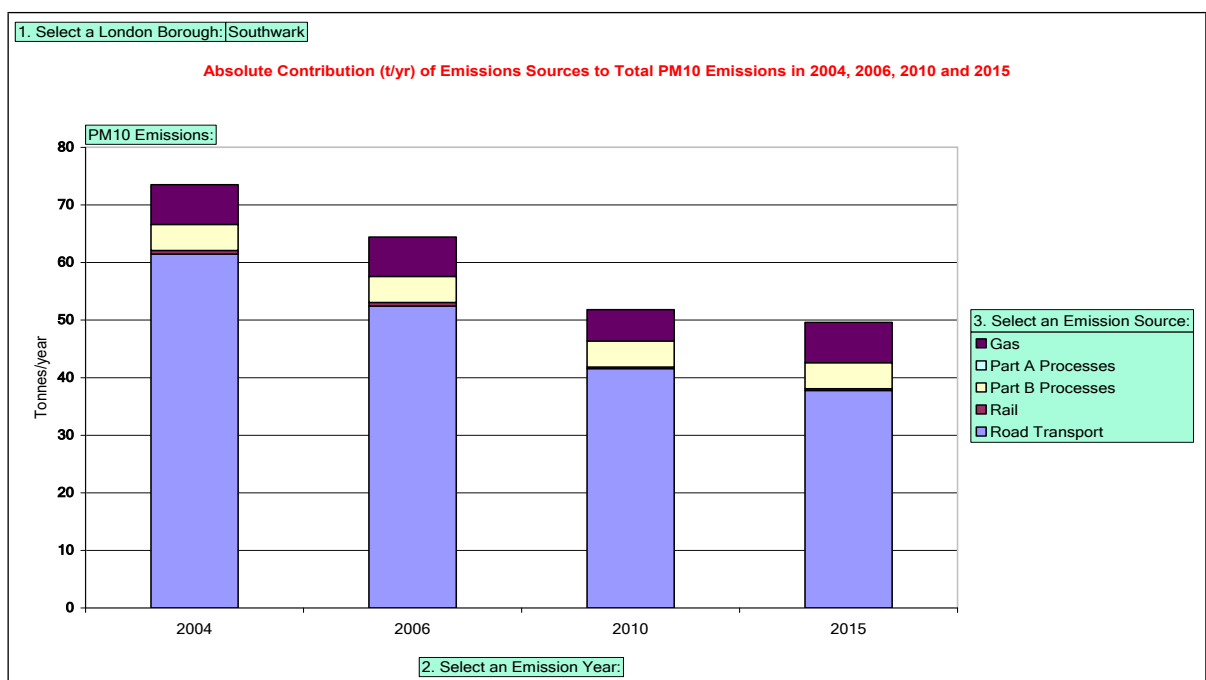


Chart 2- PM₁₀ contributions in Southwark from various sources.

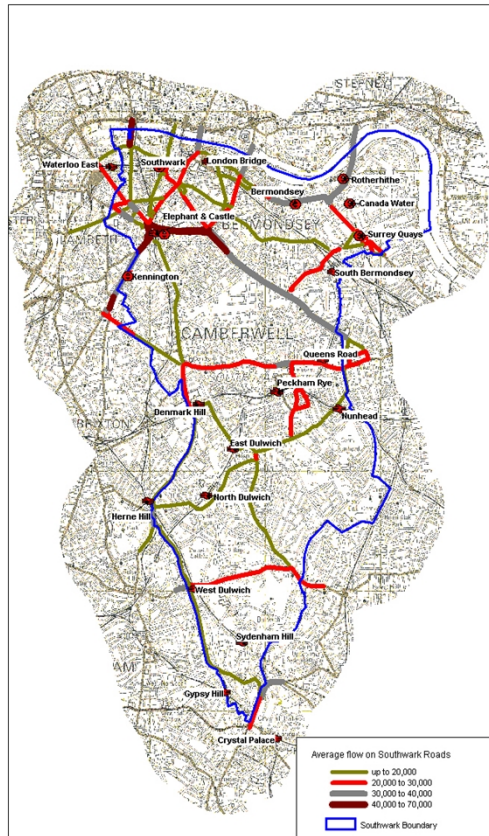


Figure 2.1- Southwark's Road Network

SECTION FIVE - AIR QUALITY, HEALTH AND THE ENVIRONMENT

Health impacts of poor air quality

Nitrogen dioxide

- 5.1 There are many studies on the effect that exposure to NO₂ has upon health. Studies on short-term exposure under controlled conditions in test chambers have found that exposure to NO₂ levels common in road tunnels can cause mild inflammation of the airways. Most short-term exposure studies have found health effects to be minimal.
- 5.2 The main concern with respect to NO₂ is the effect that long-term exposure (greater than one year) can have. For instance, hospital admissions increase in areas with increased NO₂ and epidemiological studies have found correlations between long-term exposure to NO₂ and lung function in children. Effects of NO₂ on health are complicated by the fact that this compound is associated with other pollutants such as ozone and particulate matter.
- 5.3 One study (MacKerron and Mourato, 2008) into the effect of air pollution on self reported happiness, or life satisfaction (LS) found that a 10µgm⁻³ increase in NO₂ caused a 5% drop in LS rating. Such a finding suggests that the effects of NO₂ are not exclusively health related and cleaner air can lead to greater life satisfaction.

Particulate matter

- 5.4 Long-term effects of exposure to particulate matter and in particular fine particles (PM_{2.5}) are strongly correlated to mortality. Closely related to lung function, particulate matter enters the respiratory system with the smaller fraction (PM_{2.5}) reaching the deepest part causing irritation and decreased function. Effects are also related to the chemical composition of the particles which if carcinogenic can increase the chance of cancer. Long-term exposure to particulate matter can reduce life expectancy due to lung cancer and cardio-pulmonary illness in addition to reducing lung function. The evidence of short-term effects from particulates is stronger than for NO₂.
- 5.5 The incidence of chronic obstructive pulmonary disorder (COPD, the term now used to refer to bronchitis and emphysema) in Southwark is 50% higher than the national average. Smoking is the most common cause of CPOD but long term exposure to high levels of particulate matter can exacerbate and even contribute to chronic health effects.
- 5.6 Children, the elderly and those with respiratory difficulties are affected most by poor air quality. Poor air quality also disproportionately affects the most disadvantaged members of society as they are more likely to live near to sources of pollution.

Air quality and the natural environment

- 5.7 Air pollution can have significant effects on the natural environment. Whilst acidification has been greatly reduced through controls of sulphur emissions, NO_x can cause acidification and eutrophication within lakes. Southwark's open spaces have a number of lakes that are potentially sensitive to high NO_x. NO_x is also one of the compounds used in the formation of ground ozone (O₃) which damages vegetation. Recent research (Gadsdon and Power, 2009) has shown that local traffic emissions are a large contributor to pollutants that damage roadside vegetation through leaf damage and reduced growth at a distance of up to 20m from the roadside.
- 5.8 The relationship between urban trees and air quality is not straightforward. The intuitive feeling that trees in the urban environment will improve air quality does not always prove to be the case. Although trees can remove particles from the air, they also inhibit air flow, particularly in street canyons. Street canyons are formed by high sided buildings either side of a road and often give rise to elevated levels of pollution caused by air becoming 'trapped', so planting trees in such areas to improve air quality may in fact have a detrimental effect. Conversely, some species have been shown to have higher levels of NO₂ absorption which may improve local air quality.

Air quality and the built environment

- 5.9 Many buildings close to heavily trafficked roads are soiled by particulate matter which other than discolouring them may also accelerate weathering and chemical attack, placing a cost on the owners of these buildings for cleaning. A paper by Eyre et. al. in 2000 estimated that the cost of physical damage to buildings in London was over £400m per kg of SO₂. Building cleaning due to soiling is estimated to be over £250 per tonne of black smoke, which equates to £15, 000 for Southwark in 2010.

Air quality and climate change

- 5.10 Air quality and climate change are linked not just through their shared sources but also through the effect that one has on the other. Changes that are likely to occur through climate change include Britain having hotter drier summers and wetter milder winters. For example, the summer of 2003, which was the hottest in Europe for the past 500 years and resulted in a large number of deaths. This could by 2050 become an average summer. During hot periods, the formation of ground level ozone increases which adversely affects the respiratory system. Stable air systems over Britain that accompany high pressure summer and winter are predicted to increase in frequency and will result in more air pollution episodes because dispersal of pollutants is inhibited. Higher temperatures are also likely to make people sensitive to air pollution more susceptible to respiratory and cardiovascular disease.
- 5.11 Many air pollutants have some impact upon climate change, however some add to warming whilst others cool the atmosphere. Particulate matter is one example of emissions that can do both with black particles (soot) absorbing radiation whilst other particles act to reflect radiation thereby cooling the atmosphere. Indeed, some scientists argue that the high levels of SO₂ and other aerosols emitted have acted to slow warming by reflecting solar radiation and that as levels are reduced, warming will accelerate.
- 5.12 Many policies and measures to reduce greenhouse gas emissions will also improve air quality. For example, the greater use of public transport will not only reduce carbon emissions but also air pollution. The relationship between greenhouse gas and emissions of air pollution is however complicated by the fact that some measures to reduce carbon emissions can increase air pollution. For example, biomass is considered to be carbon neutral and will reduce carbon emissions if used to replace boilers that use fossil fuels. However, emissions of NO_x and PM₁₀ from biomass boilers are often much greater than for gas boilers and can result in a decrease in air quality. Similarly, small diesel vehicles are more efficient than petrol vehicles of comparable size but emit more NO_x and PM₁₀.
- 5.13 Areas in which policies and measures to tackle poor air quality and climate change clash will therefore need careful consideration to balance the benefits and costs. Fortunately, there are many areas in which co-benefits will be realised such as behavioural change and modal shift.

SECTION SIX - AIR QUALITY ACTION PLAN- OBJECTIVES AND MEASURES.

- 6.1 The AQSAP seeks to introduce measures that will lead to reductions in NO_x and PM₁₀ emissions and to protect sensitive receptors from the ill effects of poor air quality. Transport sources other than road are not significant contributors to air pollution in Southwark. Only a small number of diesel trains pass through or terminate within Southwark and aircraft flying over Southwark are at sufficient height that their emissions do not affect the air quality of the borough.
- 6.2 Most industrial processes within Southwark are controlled through the Integrated Pollution Prevention Control (IPPC) process and regulated by the Council. There are no Part A processes currently operating within the borough; however the Integrated Waste Management Facility on the Old Kent Road will be a Part A Process. Fortunately, this will not emit any significant levels of NO_x or PM₁₀ due to the nature of the process which is a biological treatment facility rather than one based on combustion. SELCHP (South London Combined Heat and Power), a power plant that burns waste located in Lewisham and emits 375 tonnes of NO_x and 4 tonnes of PM₁₀ per year. Some of these emissions contribute to background pollution levels within Southwark which we will include in our next modelling exercise.
- 6.3 In addition to reducing emissions, this action plan will also seek to improve the health of people living and working in Southwark by reducing exposure to air pollution and raising air quality awareness. The air quality action plan has been developed to meet the strategic air quality strategy objectives:
- Reduce emissions from vehicular transport;
 - Reduce emissions from new development;
 - Tackle emissions from existing fixed sources; and
 - Protect public health and monitor air quality

SECTION SEVEN – AIR QUALITY ACTION PLAN – MEASURES – REDUCE EMISSIONS FROM VEHICULAR TRANSPORT

- 7.1 The vast majority of PM₁₀ and the majority of NO_x emissions in the borough are from vehicles. There are a host of environmental problems caused by our reliance on vehicles from climate change to air pollution. Reducing emissions from vehicular transport will also have economic and societal benefits. Reduced congestion will increase the economic efficiency of businesses whilst encouraging people to use more sustainable forms of transport such as cycling and walking which reduce health problems and benefit wider society.
- 7.2 The transport plan which is being developed in parallel to this action plan will assist in the aim of reducing emissions from vehicular transport.
- 7.3 The draft transport plan objectives include:
- Ensure the quality, efficiency and reliability of the transport network is maintained;
 - Encourage sustainable travel choices;
 - Increase sustainable transport capacity and manage demand for travel;
 - Ensure the transport network is safe and secure for all and improve perceptions of safety.
 - Improve travel opportunities and maximise independence for all;
 - Reduce the impact of transport on the environment;
 - Reduce transport's contribution to climate change;
 - Reduce the impact of transport on Southwark's air quality;
 - Improve the health and wellbeing of all by making the borough a better place; and
 - Ensure the transport system helps people to achieve their potential
- 7.4 Modal shift to more sustainable forms of transport will be crucial to delivering both the transport plan and the air quality action plan. Encouraging people to walk, cycle and use public transport will be used in conjunction with means to make private vehicle use less attractive.
- 7.5 Transport planning policies are also in place within the Southwark Plan that support reduction in use of cars through parking restraint, promotion of public transport and green travel measures such as provision of car clubs. These policies will continue to be strengthened in the Local Development Framework which will replace the Southwark Plan. This has already been progressed in documents such as the Sustainable Transport SPD (2010) and the Sustainable Design and Construction SPD (2009).

Car clubs in Southwark

- 7.6 Car clubs have the potential to deliver significant environmental benefits, particularly in urban areas where the barriers to car clubs are much reduced. A recent survey by Carplus of carclub members found that 85% of car club members do not own a car and there are approximately 25 fewer cars on the road for each car club car.
- 7.7 Car club membership also encourages greater use of more sustainable travel options such as walking and cycling. The same survey reported that 84% of car club members walk trips lasting 20 minutes or more at least once a week and 34% of members use their bikes once a week. These figures compare favourably with those reported in the National Travel Survey of 64% and 15% respectively.
- 7.8 Finally, there are significant reductions in emissions from car club cars compared to privately owned vehicles. Car club cars, which are generally newer vehicles emit lower emissions and as a whole emit a third less CO₂ than average. A similar reduction in NO_x and PM₁₀ emissions can be expected from non-diesel vehicles. As members pay for usage per mile, there is an in-built incentive to limit trip mileage. Average mileage for car club members is between 250-340 miles annually.
- 7.9 Transport planning policies are also in place within the Southwark Plan that encourages the use of car clubs for new development. These policies will be strengthened in the Local Development Framework which will replace the Southwark Plan.

Measure 1:

We will continue to encourage the use of the car club schemes, monitor and report on uptake and allocate additional spaces should demand warrant.

Walking and cycling in Southwark

7.10 Southwark's commitment to walking and cycling is demonstrated in our road hierarchy:

1. Pedestrians (including the needs of disabled people);
2. Cyclists;
3. Public transport;
4. Freight;
5. Taxis;
6. Powered two wheelers; and
7. Private cars.

7.11 Increased use of walking and cycling as modes of transport provides benefits to society and individuals from an environmental perspective in addition to the health benefits gained from increased activity. The health benefits of cycling and walking provide a co-benefit, however it must be recognised that there are many for whom cycling is not a viable option because of age, disability or long-term illness.

Measure 2:

Southwark will continue to implement measures to encourage sustainable travel choices, within the borough.

Travel Plans

7.12 Until recently Southwark worked through SELTrans (South-East London Transport Strategy) to develop travel plans for businesses operating within the borough. It has become clear that there is great demand for travel planning and we employed a travel plan co-coordinator on a contract basis who will be able to provide advice and assistance on travel planning for Southwark businesses.

7.13 Over 90% of schools in Southwark now have a travel plan with only 9 schools without one. Of these, two are schools in hospitals for whom travel plans are not always appropriate. Some schools have had difficulty in allocating the time required to write a travel plan; we are now making this process easier by developing a web-based travel plan service. Some benefits of a well written travel plan are fairly comprehensible, for example, promoting a rise in activity and sociability. The impact on vehicular traffic patterns and potential benefits to local air quality are not generally monitored or quantified. The increase in background pollution levels around the 'school run' time is quite recognisable and can be exacerbated near school entrances where pupil exposure is most likely. We will, subject to securing funding, pilot a scheme to review five school travel plans in Southwark in order to identify improvements for air quality. Should this prove successful, we will roll the scheme out further.

Measure 3:

Southwark will pilot a scheme to identify and implement local air quality improvements near to schools.

Idling engines

7.14 Vehicle driver who leave their engine running when unnecessary make a contribution to air pollution. It is an offence under Regulation 98 of the Road Vehicles (Construction and Use) Regulations 1986 for vehicles left idling unnecessarily whilst stationary. The Road Traffic (Vehicle Emissions) Regulations 1986 for vehicles left idling unnecessarily whilst stationary. The Road Traffic (Vehicle Emissions) (Fixed Penalty)(England) Regulations 2002 enable

local authority authorised persons to request vehicle users to switch off engines when parked and to issue fixed penalty notices to those who refuse to co-operate. It is a requirement of Regulation 88 of the Road vehicles (Construction and Use) Regulations 1986, as amended, that drivers switch off engines in parked vehicles. Fixed penalty fines of £20 can be issued in such instances

- 7.15 There are several locations within Southwark where drivers tend to leave their engines running, these are primarily bus and coach stands but also outside schools. We will support the Mayor's policy to make London a 'no idling zone' and undertake a publicity campaign followed by enforcement to reduce this activity in Southwark.

Measure 4:

Southwark will, following a publicity campaign, undertake enforcement on idling engines at hotspots within the borough.

Road safety schemes and initiatives

- 7.15 Southwark's forthcoming Transport Plan will include many measures that will work to improve road safety. Schemes and initiatives to improve road safety can sometimes inadvertently have a detrimental impact on air quality. For instance, traffic calming schemes can sometimes lead to higher emissions. Research was undertaken by the transport research laboratory for emissions of various pollutants when vehicles travelled through traffic calming schemes such as road hump. Emissions of NO_x were found to increase by up to 30% for diesel vehicles whilst emissions from petrol vehicles increased only slightly. Emissions of CO₂ from all vehicles increased by between 20% and 26%
- 7.16 Total emissions are however also a function of the number of vehicles using any particular 'traffic calmed' section of road. So whilst individual exhaust emissions might increase, a reduction in traffic could compensate. It is therefore important that initiatives and schemes to manage traffic consider adequately any adverse impact on the environment with respect to air quality and carbon emissions. These will need to be balanced against the more obvious benefits of reducing traffic accidents. Air quality assessments, whether through detailed modelling or screening can be used to better understand the wider impacts of traffic management schemes.

Measure 5:

Southwark will undertake air quality assessments on all major >£1m in value and having a significant impact on the highway) traffic management schemes and initiatives.

Southwark's transport emissions

- 7.17 There are three areas in which the council have direct responsibility for emissions from vehicles:
- Light commercial;
 - Lease cars; and
 - Essential car user vehicles
- 7.18 In addition, Southwark also have a level of responsibility over emissions from contractors' vehicles. Southwark's fleet is 544 strong with a further 289 comprising the 'grey fleet'-vehicles owned by employees.
- 7.19 Southwark has made great advances in reducing emissions from the LGV (light goods vehicles) fleet, primarily through regularly upgrading the fleet and from converting 63% to liquid petroleum gas (LPG). More recently, 60 replacement vehicles have been ordered with stop-start technology and are Euro 5.5 compliant. Emissions from the LGV fleet will become progressively lower as will emissions from the lease car fleet (395 vehicles).
- 7.20 We recently commissioned the energy savings trust to undertake a 'green fleet review'. The recommendations made range from measures to better manage fuel usage to reviewing

lease and essential car user provision. Any measures to reduce carbon emission from Southwark's fleet will also reduce emissions of air pollutants. Recommendations in the green fleet review are being reviewed by the council; those selected for implementation will be assessed for their benefit in terms of air quality and shall be included in the Air Quality Improvement Plan that will be published for public consultation.

7.21 Smarter driving, in a manner that reduces fuel consumption can deliver significant benefits with respect to emissions and fuel costs. Fuel consumption can be reduced by up to 15% following tuition from instructors. The energy savings trust provides this training which is subsidised by TfL and costs £15 per employee. However, the high number of drivers within the Council means that this cost could be over £12,000. In order to reduce this cost and provide more flexibility to smarter driver training, Southwark will have an officer trained to deliver the smarter driver training. This programme will be rolled out to all employees that drive for work purposes and can be included as part of the driving test induction given to new members of staff.

7.22 The council's procurement process requires consideration to be given to environmental and sustainability issues through the 'Gateway 1- Procurement Strategy Approval' scheme. There is however little guidance to officers preparing these reports on how their particular procurement scheme might impact on air quality. Types of contracts that have the potential to impact on air quality include those that involve transport and energy generation or use. By requiring contractors to comply with Southwark's own standards for emissions, we can reduce the Council's wider impact on air quality and climate change.

Measure 6:

Southwark will train an officer to deliver 'in house' smarter driver training to all employees that are required to drive for work purposes.

Measure 7

We will develop an emissions strategy for all new council and council contractors' vehicles and plant.

Low emission zone

7.23 The London low emission zone (LEZ) that came into force in 2008 has shown how ambitious air quality measures can be delivered regionally. By reducing the area for of London for which concentrations of PM₁₀ and NO₂ are above objectives, the Mayor has made an important step forward in complying with targets.

7.24 Air quality remains a particular problem in central London where the highest levels of pollution are frequently recorded. The Mayor's draft Air Quality Strategy encourages boroughs to establish local low emission zones in order to improve air quality. As part of the central London air quality cluster group, Southwark has the opportunity to push forward such an initiative.

Measure 8

Southwark will work with partner boroughs in the central London air quality cluster group to lobby for a central London low emission zone.

SECTION EIGHT – REDUCING EMISSIONS FROM FIXED SOURCES

8.1 Emissions from fixed sources are primarily from heating and power sources such as gas boilers. These presently account for just fewer than 50% of emissions within the borough but as technological advances reduce emissions from vehicles, the proportion of fixed sources will increase. The increased significance of fixed sources will require initiatives and measures that importantly have co-benefits because reducing emissions of air pollution will inevitably reduce CO₂ emissions. We will continue to reduce the council's own emissions and work with businesses and community groups to reduce their emissions.

Energy efficiency

8.2 There are two ways in which emissions from gas boilers may be reduced- by upgrading boilers to more modern appliances that emit fewer levels of pollution and reducing use through energy efficiency measures such as insulation.

8.3 Southwark has 22, 000 council homes that are served by 90 central boiler houses. We are improving the efficiency of these properties by bringing 10,000 of these homes up to current standards. This will be complemented by the cavity wall insulation in tall tower blocks for which the Council has secured £4.3m funding.

Measure 9

Southwark will continue its implementation of energy efficiency measures in council owned buildings.

Increased use of renewable energy

8.4 The council is presently investigating the feasibility of a large scale biomass plant which will benefit from the renewable heat incentive. Additionally, we are encouraging local combined heat and power plants which generate locally, increasing the efficiency of the energy generation process as transmission losses will be vastly reduced.

8.5 Although cuts in overall emissions are made through decentralised power generation, emissions that are made occur close to the point of energy use and can lead to a decrease in local air quality. It is crucial that energy generation plants are designed to minimise emissions and their contribution to local pollution concentrations. Abatement technologies should be used where available and flue stack heights should be sufficient to adequately disperse gasses.

Measure 10

Southwark will ensure that local energy generation plant will be fitted with suitable abatement and dispersal technologies.

Controlling emissions from industrial sources

8.6 The local authority pollution control regime (LAPPC) is the process by which Southwark regulates small industrial processes. Referred to as part B processes (part A processes, larger industrial installations are regulated by the Environment Agency), the council issues environmental permits to the operators and monitors compliance.

Measure 11

Southwark will continue to regulate part B processes to ensure that high standards of air pollution control are maintained.

SECTION NINE – REDUCE EMISSIONS FROM NEW DEVELOPMENT

9.1 With one of the highest new housing targets and significant regeneration either underway or planned, Southwark is a borough that is undergoing significant change in terms of development. The principles of sustainable development are vital to building and maintaining a sustainable future. New development can affect local air quality through the construction process and by the emissions from its operation. We will therefore work with developers and their contractors to reduce as far as practicable, the impact of demolition and construction. We will also use the planning process to improve air quality by ensuring that no new development has a negative impact on air quality. Area specific policies and measures will also be developed for large regeneration areas that will actively reduce air pollution.

Construction emissions

9.2 Emissions of particulate matter from construction sites not only have the potential to increase local concentrations but can give rise to nuisance complaints from local residents and businesses. Most of these emissions come from the construction process itself rather than road transport servicing sites as demolition, earthworks and stockpiling of aggregates can lead to dust generation. Emissions of NO_x arise from mobile and fixed plant in addition to servicing vehicles.

9.3 In 2006, London councils and the GLA published the Best Practice Guidance (BPG) on construction and demolition which gives advice on minimising the impact of demolition and construction with a range of measures including site planning, demolition and traffic controls.

9.4 Following on from this BPG, the energy savings trust launched the Non-Road Mobile Machinery Register (NMMR) which is part of their independent accreditation scheme for equipment that can be retro-fitted to construction plant.

9.5 Southwark have for some years required major developers to submit construction management plans that detail how environmental impacts of construction and demolition will be mitigated. We will now also require major developments to monitor PM₁₀ emissions from their site.

Measure 12

Southwark will require developers, within their environmental construction management plans, to adopt the measures included in the London Councils and GLA Best Practice Guidance on construction and demolition.

Reducing transport emissions from new development

9.6 Applicants for major developments are required to submit a transport assessment, which should include a travel plan. Travel plans are a vital tool in assessing impacts of new development and mitigating any impacts that might be identified. It is therefore vital that these continue to be received, monitored and enforced.

Measure 13

Southwark will monitor all travel plans received as part of the planning process for compliance and take enforcement action where appropriate.

SECTION TEN – IMPROVE PUBLIC HEALTH AND MONITOR AIR QUALITY

10.1 Air quality objectives were developed to protect human health which is why the first objective of the AQSAP is to protect public health. Reduction of emissions will of course benefit public health but there are also other complementary means to achieve this objective. The air quality objectives are only applied to areas where there is significant exposure to pollutants. For instance, the air quality objective for annual NO₂ (40µgm⁻³) does not apply in underpasses, where there is no relevant objective. However the 1hr objective (200µg⁻³) may apply. Reducing or removing exposure can therefore be an effective tool to protect public health

Exposure reduction

10.2 The majority of Southwark has been declared an AQMA. Concentrations of NO₂ are likely to exceed national objectives for many parts of this area. Latest modelling from TfL suggests that the PM₁₀ targets may be met across the whole of Southwark.

10.3 Southwark has one of the highest housing targets of any London borough and is responding to this challenge well. Sustainable development is best located close to services and amenities. By locating housing near to travel nodes and areas high public transport accessibility, the need to travel by unsustainable forms of transport is reduced. Locating housing near to transport therefore assists in reducing air pollution in the longer term but can, in the short to medium term expose more people to pollution, particularly for development near to busy roads.

10.4 Air quality modelling indicates that areas due for significant regeneration such as the Elephant and Castle, Old Kent Road, London Bridge and Bankside are subject to the highest concentrations of PM₁₀ and NO₂ in the borough. By prioritising areas such areas, we will develop specific policy and development guidance to ensure that exposure to pollution is minimised.

10.5 Southwark presently require all submissions for major applications within the AQMA to include an air quality assessment. Should the assessment find that the development will generate new exposure to poor air quality; the developer will need to submit measures to mitigate such effects. Mitigation can take the form of designing the development to increase the distance from the source of pollution, having no balconies and placing non-sensitive areas (corridors, stairwells etc.) closest to the source.

10.6 Recent research by Defra has shown that measured concentrations of NO_x have not reduced as predicted. Emissions data for vehicles are based on levels that are often calculated rather than being measured, it is these calculated emissions that are used to predict how emissions will change in the future. Unfortunately, the relevant technical guidance from Defra still refers to the emissions data that have been shown to be less than robust. Many air quality assessments use this data and are therefore overly optimistic in their assessment of future concentrations. We will gather an evidence base in order to provide a more robust set of data that can be used in air quality assessments.

Use new development to improve air quality

10.7 Policy 8 of the Mayor's draft Air Quality Strategy- Using the planning process to improve air quality, includes proposals to develop guidance for borough and developers in assessing emissions from new development and the development of Supplementary Planning Guidance on air quality. With technological advances reducing PM₁₀ and NO_x emissions from transportation sources, the contribution from energy and heating sources associated with new development will increase proportionately.

10.7 Policy 3.2 of the Southwark Plan states that planning permission will not be granted for development that would lead to a reduction in air quality. It is envisioned that this policy will

be continued in the replacement Local Development Framework. This policy does not however effectively improve air quality and therefore Southwark will consider introducing a more ambitious standard for new development. The success of the Mayor's policy of requiring 20% reduction of CO₂ emissions from on-site renewable energy generation, where feasible, has shown that ambitious emission reduction targets can be delivered. We will therefore work closely with colleagues in planning policy to strengthen air quality policies within the Local Development Framework in order to seek emission reductions.

Measure 14

Southwark will require developers to submit air quality assessments for all major applications within the air quality management area and any other development that may have an adverse impact on air quality.

Measure 15

Southwark will gather an evidence base to determine present and future concentrations within the borough, this information will be made available to developers and their consultants when needed to conduct air quality assessments.

Measure 16

Southwark will develop policies within its emerging local development framework that will require new development to reduce PM₁₀ and NO_x emissions when compared to previous site use.

Campaigns and public awareness

- 10.8 The AirTEXT scheme has proved one of the most successful awareness initiatives for air quality in London. People are able to sign up to this service free of charge and receive a text message, email or telephone call if air pollution levels are predicted to reach 'moderate' or higher levels the following day.
- 10.9 Southwark took part in the AirTEXT marketing campaign that ran from July 2008 to January 2009 by visiting shopping centres to ask people to sign up. The target to double subscribers (in London) to 5000 was exceeded; there are presently 6421 people receiving alerts.
- 10.10 Nationally, there are several schemes that seek to raise awareness of air quality, these include 'Don't Choke Britain'; 'Bike to Work Week'; 'Walk to School Week' and 'Car Free Day'. By supporting and promoting these events, we will help to keep the profile of air quality high and encourage behavioural change.

Measure 17

Southwark will continue to promote the AirTEXT service at events and schools and will support other events relevant to air quality.

Air quality web pages

- 10.11 Southwark's web pages on air quality contain information on the sources of air pollution and some of the health effects. To accompany this air quality action plan, we intend to review the information contained within these pages and provide additional information on AirTEXT; construction emissions and monitoring data from our new air monitoring locations.

Measure 18

Southwark will provide up to date information on air quality via its website.

Air quality monitoring

- 10.12 Southwark has two automatic air quality monitoring stations that will sample the air at strategic locations within the borough. The first, situated on the Old Kent Road, opened in November 2010. A second is scheduled to open in mid 2011 at the Elephant & Castle. Not only will these assist in monitoring progress on air quality improvement measures that will be implemented by Southwark and the Mayor, but they will provide vital data for air quality assessments that might be undertaken by developers or the council.
- 10.13 Automatic monitoring stations provide accurate data, but with operational costs can be up to £25,000 per year and equipment requires secure storage space that can be difficult to find. Diffusion tubes offer a cost effective method to monitor air quality and can be attached to street furniture such as lampposts. Unlike automatic monitoring stations, they require no power supply or planning permission and locations can be readily changed. Diffusion tubes can therefore be used to complement the automatic monitoring stations, providing Southwark with a more robust monitoring programme. Monitoring air quality in Southwark is vital to assess whether we will meet our objective to achieve a measurable improvement in air quality that is in the Sustainable Community Strategy.

Measure 19

Southwark will commence the operation of two automatic monitoring stations at the Elephant and Castle and Old Kent Road and a diffusion tube survey to provide a more comprehensive survey of air quality in the borough.

Street tress

- 10.14 Green infrastructure can have real benefits in reducing the urban heat island effect, absorbing carbon and improving general amenity. Street trees are not always beneficial with respect to air quality. Some species such as eucalyptus are high emitters of volatile organic compounds (VOCs) which react with ground level ozone to form NO₂. Additionally, street trees can inhibit air flow and prevent the dispersion of pollutants exacerbating the build up of concentrations, particularly in street canyons. Conversely, species such as poplar are good absorbers of NO₂ and could assist in improving air quality.
- 10.15 The Mayor in his draft Air Quality Strategy reaffirms his commitment to plant 10,000 trees in 40 priority locations throughout London, air quality being one of the criteria used to determine their location. Borough and Camberwell are the areas selected within Southwark under this initiative. It is vital that trees are placed in the correct context where they do not worsen local air quality

Measure 20

Southwark will work with the Mayor to ensure that the 'right tree right place' methodology proposed takes suitable account of the benefits and costs of street trees on air quality within the Borough and Camberwell.