

Air Quality Improvement Strategy 2012 – 2017 and Action Plan 2012 – 2017

May 2012

www.southwark.gov.uk



Approved by Councillor Barrie Hargrove Cabinet Member for Transport, Environment & Recycling through the Individual Decision Making process on 29th May 2012.

Environmental Protection Team
Environmental Health and Trading Standards
Environment and Leisure Department
London Borough of Southwark
Hub 2, Floor 3,
160 Tooley Street,
London, SE1 2QH
Telephone 020 7525 4261
Fax 020 7525 5705
environmental.protection@southwark.gov.uk

Contents

SECTION ONE – EXECUTIVE SUMMARY	5
SECTION TWO – SOUTHWARK TODAY	8
SECTION THREE – STRATEGY CONTEXT	9
European legislation	9
National legislation	9
Regional	12
Local – A Fairer Future for All	12
Local air quality monitoring and assessment	14
SECTION FOUR – SOURCES OF POLLUTION	15
Nitrogen dioxide	15
Source Apportionment of Oxides of Nitrogen.....	16
Particulate matter	18
SECTION FIVE - AIR QUALITY, HEALTH AND THE ENVIRONMENT	21
Health impacts of poor air quality.....	21
Nitrogen dioxide	21
Particulate matter	21
Air quality and the natural environment.....	22
Air quality and the built environment.....	22
Air quality and climate change	22
SECTION SIX - AIR QUALITY, ACTION PLAN – OBJECTIVES AND MEASURES	25
SECTION SEVEN - AIR QUALITY, ACTION PLAN – MEASURES – REDUCE EMISSIONS FROM VEHICULAR TRANSPORT	26
Car clubs in Southwark.....	26
Walking and cycling in Southwark	27
Travel Plans	27
Idling engines	28
Road safety schemes and initiatives.....	29
Southwark’s transport emissions	29
Low emission zone	30
SECTION EIGHT – REDUCING EMISSIONS FROM FIXED SOURCES	31
Energy efficiency	31
Increased use of renewable energy	31
Controlling emissions from industrial sources	32
SECTION NINE – REDUCE EMISSIONS FROM NEW DEVELOPMENT	33
Construction emissions	33
Reducing transport emissions from new development.....	33
SECTION TEN – IMPROVE PUBLIC HEALTH AND MONITOR AIR QUALITY	34
Exposure reduction.....	34
Use new development to improve air quality.....	35
Campaigns and public awareness	35
Air quality web pages	35
Air quality monitoring	36
Street trees.....	36
APPENDIX 1 - Ward Data in connection with PM_{2.5}	38
APPENDIX 2- Measures in the Air Quality Improvement Plan	39
APPENDIX 3- Measures in the Air Quality Improvement Plan mapped to London Mayor’s Air Quality Strategy	44
Appendix 4 Consultation	51
Appendix 5 - References	52

Index of Figures

Figure 1 Predicted annual average NO₂ concentrations $\mu\text{g.m}^{-3}$, 2011 15

Figure 2 Predicted annual average NO₂ concentrations $\mu\text{g.m}^{-3}$, 2015²¹ 15

Figure 3 Map of the Borough showing the required reduction in annual average NO₂ concentrations to meet the National Air Quality Objective for NO₂ in 2011²¹ 16

Figure 4 Relationship between NO₂ concentration and NO_x concentrations 18

Figure 5 Predicted annual (2011) average PM₁₀ concentrations $\mu\text{g.m}^{-3}$, 2015²¹ 19

Figure 6 Predicted annual (2015) average PM₁₀ concentrations $\mu\text{g.m}^{-3}$, 2015²¹ 19

Figure 7 Southwark’s Road Network 20

Index of Tables

Table 1 The National Air Quality Objectives 6

Table 2 Trends in Nitrogen Dioxide 2001 – 2008 within the L. B. of Southwark 17

SECTION ONE – EXECUTIVE SUMMARY

- 1.1 Within London and other of our major cities, air pollution remains one of the most pressing environmental concerns.
- 1.2 Air pollution has negative impacts on both human health and the natural environment. The Department for Food and Rural Affairs has noted that ‘estimates indicate that air pollution reduces life expectancy in the UK by an average of six months’ and that ‘the economic cost from the impacts of air pollution in the UK is estimated at £9-19 billion’.⁴
- 1.3 The annual London survey conducted by the Mayor and the Greater London Authority to deliver evidence on the attitudes and opinions of Londoners on a wide range of issues, has identified pollution from traffic as the second greatest environmental concern for the past two years.
- 1.4 In the UK the main pollutants of concern are particulate matter (PM), oxides of nitrogen and ground level ammonia. Within Southwark, particulate matter and nitrogen dioxide are of particular concern.
- 1.5 Within this document we update our Air Quality Improvement Strategy (AQIP) and Action Plan for 2012 – 2017. Our strategy 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.
- 1.6 However, we share our local responsibility for meeting national air quality objectives with the Mayor of London. Accordingly, the Southwark AQIP provides broad support for the delivery of Mayor’s strategy. We intend also to work closely 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 locally. In doing so, we must recognise the impact of our own operations and lead by example.
- 1.7 This strategy therefore considers:
 - How we will work regionally to improve air quality across London; and
 - How we will work locally to improve air quality within Southwark.
- 1.8 Sections 7 to 10 of this document provide our action plan. It sets out a series of measures that we intend to take to ensure sustainable improvements in air quality are achieved. We will report upon the progress achieved in delivery of these measures on annual basis.
- 1.9 At the heart of this document, is an intention to ensure that air quality is given similar prominence within corporate decision-making processes, as that afforded to other environmental issues such as carbon emissions. This will involve working towards exemplary practice in all area of emissions including ‘green procurement’ and energy efficiency. We also intend 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, our desire is that policy and practice is co-ordinated in such a way as to minimise the negative impact and 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 corporate decision-making processes.
- 1.10 Together, we believe that the steps outlined in this document will work collectively towards meeting future air quality objectives in Southwark.

Table 1 The National Air Quality Objectives

Pollutant	Air Quality Objectives		Date to be achieved by and maintained thereafter
	Concentration	Measured as	
Particles (PM₁₀)	<i>50 µgm⁻³ not to be exceeded more than 35 times a year</i>	<i>24 hour mean</i>	<i>31 December 2004</i>
	<i>40µgm⁻³</i>	<i>Annual mean</i>	<i>31 December 2004</i>
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	<i>200µgm⁻³ not to be exceeded more than 18 times a year</i>	<i>1 Hour Mean</i>	<i>31 December 2005</i>
	<i>40µgm⁻³</i>	<i>Annual mean</i>	<i>31 December 2005</i>
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
	0.25µgm ⁻³	Annual running mean	31 December 2008

Air Quality Improvement Strategy 2012 – 2017

SECTION TWO – SOUTHWARK TODAY

- 2.1 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 anticipated to have risen to around 38% by 2011, Southwark is arguably one of the most diverse areas in the capital.
- 2.2 Southwark is made up of a number of distinctive neighbourhoods that extend along the river Thames and down into southeast London. The borough encompasses some of London's top attractions (e.g. Tate Modern, the Globe Theatre and the London Dungeons); creative hotspots (e.g. South Bank University, Camberwell College of Arts and the Design Museum); and acclaimed green spaces (e.g. Southwark Park, Dulwich Park and Peckham Rye).
- 2.3 Southwark also offers a wide-range of leisure and cultural opportunities, including a vibrant late night-economy; which makes a significant economic and employment contribution to the local community. The north of the borough, with considerable development currently taking place (e.g. the London Bridge and Blackfriars Station redevelopments; the Shard; and More London) 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) 2010¹ shows Southwark as the 41st most deprived local authority. Consequently, the borough faces many challenges associated with meeting the complex health and social needs of an inner-city population. Unemployment in Southwark² (10.2%) is higher than the London average (8.9%) and the percentage of the working population claiming benefits in Southwark is 15.9% compared to 14.9% across London. Gross weekly earning for both men and women in Southwark is lower than the London average.
- 2.5 Within Southwark, cardiovascular disease and cancer account for more than half of deaths. Of particular relevance to this policy and the need to improve air quality, however, is the fact that while deaths from respiratory illness such as chronic obstructive pulmonary disease (COPD) are relatively small, Southwark residents are one and a half times more likely to die from COPD than the national population. Drugs for respiratory illness formed the third largest expenditure within in the local primary care trust.
- 2.6 As part of the development of the evidence base for the Mayors London Air Quality Strategy, a study was commissioned from the Institute of Medicine³. This study estimated that fine particles (PM_{2.5}) have an impact on mortality equivalent to 4,267 deaths in London 2008, and states that a permanent reduction in PM_{2.5} concentrations of 1µg.m⁻³ would gain 400,000 years of life for the population in London as at 2008 levels. The study gives an indication of estimates for the number of deaths at ward level within Southwark (See Appendix 1 – ward data in connection with PM_{2.5}) This modelling assumes that there is a 6% change in deaths from all causes for every 10µg.m⁻³ change in average PM_{2.5} concentration. To inform sensitivity analysis, as recommended by "The Committee on the Medical Effects of Air Pollutants" (COMEAP), the calculations were repeated replacing the 6% figure with wide limits of 1% and 12%.

SECTION THREE – STRATEGY CONTEXT

- 3.1 Poor outdoor air quality can be a contributing factor to health problems as well as damaging ecosystems, biodiversity and valued habitats. The adverse health effects from short and long-term exposure to air pollution range from premature deaths caused by heart and lung disease to worsening of asthmatic conditions, which often leads to a reduced quality of life and increased costs of hospital admissions. Despite improvements over recent decades, air pollution is still expected to reduce life expectancy of every person in the UK by an average of six months with an estimated annual cost to society of up to £19 billion.⁴
- 3.2 Road transport is the main pollution source. Other important sources of air pollutants include large combustion plants, non-road transport, agriculture and domestic heating (including biomass). There are also clear links between air pollutants and the sources of greenhouse gases that cause climate change.
- 3.3 Action to manage and improve air quality is largely driven by EU legislation. However, the full context for this strategy is provided by a combination of European and national legislation and a host of national, regional and local policy and strategy.

European legislation

- 3.4 Air quality legislation in the UK has recently been developed in response to European legislation, primarily Framework Directive 96/62/EC⁵, commonly known as the Air Quality Directive. This 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 more Directives were introduced from 1999-2004 detailing limit values for the pollutants included in the Air Quality Directive:
- [Council Directive 1999/30/EC](#)⁶ relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air;
 - [Directive 2000/69/EC](#)⁷ relating to limit values for benzene and carbon monoxide in ambient air;
 - [Directive 2002/3/EC](#)⁸ relating to ozone in ambient air; and
 - [Directive 2004/107/EC](#)⁹ relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air.
- 3.5 The ambient air quality directive, Directive 2008/50/EC¹⁰, came into force in June 2008. It merged most of the previous legislation into a single directive. New objectives for PM_{2.5} (fine particles) were introduced, together with the potential 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 legislation

- 3.6 Part IV of the Environment Act 1995 provides the national framework for improvements to air quality.
- 3.7 The Act required the Secretary of State to produce a National Air Quality Strategy that contained standards, objectives and measures to improve air quality and to keep these under review. The national strategy was first produced in 1997 and has now been twice revised in response to the development of European legislation. The most recent version being published in 2007.

Management of air quality

- 3.8. The Act established the process for air quality improvement, known as local air quality management (LAQM). Through this process, councils are compelled to carry out regular reviews and assessments of air quality within their district against the objective standards in Table 1 (page 6). Where levels of any pollutant in any area are found to exceed these objectives, an air quality management area must be declared and an action plan adopted to tackle these exceedences.
- 3.9. For the purposes of assessing compliance with EU air quality limits the UK is divided into 43 zones and agglomerations. The UK meets the limits for most air pollutants in many parts of the country but within London and other major urban centres not all objectives are met in full.
- 3.10. Where compliance is not being achieved, the UK is required to produce air quality action plans detailing the measures that will achieve compliance and submit these to the European Commission on an annual basis.
- 3.11. The Air Quality Directive contains provisions for additional time to meet limit values for both PM₁₀ and NO₂. The UK and other member states are or will be seeking to use these.

Particulate matter (PM₁₀)

- 3.12. Nationally PM₁₀ limits are met but this is not the case in London. In May 2010 the UK sent a Notification to the European Commission (EC) outlining the further actions being taken to meet PM₁₀ limits within London by the extended compliance date of June 2011. In March 2011 the EC accepted the UK Notification and granted extended time until June 2011. However, in light of the narrow margin for projected compliance, this acceptance was made conditional upon inclusion within the London air quality plan of short term measures intended to reduce the risk of the limit value being exceeded.
- 3.13. The update was completed; incorporating local measures contained within the Mayor's Air Quality Strategy (published in December 2010) and accepted by the EC in July 2011.

Nitrogen dioxide (NO₂)

- 3.14. Meeting EU air quality limits for NO₂ close to roadsides in London and other major cities is very challenging given the largest source of this pollutant is road transport.
- 3.15. In September 2011, the UK sent a separate Notification to the EC, under Article 22 of the air quality directive 2008/50/EC, seeking to postpone until 2015 the compliance date for NO₂ limit values for affected parts of the country. The Notification forwarded 30 air quality plans covering relevant areas of England (including London) and 10 further plans covering Scotland, Northern Ireland and Wales.
- 3.16. The Commission has nine months to assess the plans and raise any objections on particular points. The Commission will then publish Decisions outlining the outcome of their assessment for each zone. Where the Commission is satisfied that plan for any particular zone demonstrates compliance by 2015, the Air Quality Standards Regulations 2010 will be amended to reflect the postponed compliance date.
- 3.17. The efforts underway at a national level include consideration of a national Low Emission Zone (LEZ) framework as a potential means of encouraging uptake of cleaner vehicles. An initial impact assessment has been prepared as part of this work, which is continuing.

EU Sanction

- 3.18. It is thereby understood that the UK is in breach of its obligations under Article 13 of the Directive. The means of enforcing article 13 of the Directive lies with the Commission under Article 258 of the treaty and, if referred, with the Court of Justice of the European Union. This potentially leaves the UK open to financial sanction from the EU.
- 3.19. Furthermore, Section 48 of the Localism Act 2011 makes provision for ministers to require public authorities designated under Section 52 of the Act to make payments in respect of EU sanctions relevant to the designation. Potentially, therefore, infraction sanctions levied by the EU for failure to meet air quality objectives within London could be passed, in part, down to this and other London local authorities.

Government's red tape challenge

- 3.20. The government's 'red tape challenge' is intended to reduce the burden of legislation upon business mainly through a process of simplification and consolidation but with some outdated legislation removed from statute. The challenge has been extended to cover an environment theme.
- 3.21. The red tape challenge environment theme proposals published by Defra in March 2012 state "We agree that our air quality legislation needs an overhaul. Over the next year we will review the impact of existing legislation, including the Clean Air Act, and then consult on our findings. We will look to reduce burdens on business and local authorities by:
- Focusing local air quality requirements on those that are essential to ensure compliance with EU targets;
 - Reviewing the role and responsibilities of local authorities to help ensure that action is taken by those with relevant powers to address the key issues (e.g. transport emissions);
 - Reviewing the role of transport measures in meeting air quality targets, including the consistency in approach across local areas. In taking this forward Defra will work closely with other relevant departments, especially the Department for Transport and Department of Health;
 - Reviewing the Clean Air Act and associated regulations to identify which measures are redundant and which can be modernised to help local authorities meet EU air quality targets and help reduce costs for businesses. The first merger of smoke control regulations will come into force in April; and
 - Consolidating Air Quality Standards Regulations to simplify the regulatory landscape. "
- 3.22. The document goes on to state "Working in partnership with other Member States, we will also use the European Commission review of air quality legislation, expected in 2013, to seek:
- Amendments to the Air Quality Directive which reduce the infraction risk faced by most Member States, especially in relation to nitrogen dioxide provisions;
 - Simplifications to the legal framework (e.g. through reducing requirements for Member States) to reduce costs and administrative burdens to local authorities and businesses whilst maintaining or improving health and ecosystem protection; and
 - Requirements that is strictly proportional to evidence on costs and benefits.

Particulate matter (PM_{2.5})

- 3.23. The National Air Quality Strategy now contains a new objective 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 concern, the national strategy adopts a general exposure reduction approach to fine particles, whereas the strategy deals specifically with 'hotspot' identification and remedial action for other pollutants. By using a general exposure reduction approach to fine particles it is intended to provide wider public health benefits.
- 3.24. 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 by the group. Most of these recommendations are national in their context and relate to policies and areas for which further research is required. However, consideration is given to the local impacts that plans to reduce greenhouse gas emissions might have, for instance biomass being used as a source of renewable energy generation which, 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

- 3.25. The Greater London Authority Act 1999¹¹ 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. The Mayor's Air Quality Strategy entitled 'Cleaning London's Air' was published in December 2010. The strategy sets out measures for reducing emissions from transport, homes, business and industry. It targets priority locations of poor air quality 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 Plan¹⁹ and Transport Strategy¹².

Local – A Fairer Future for All

- 3.26. At a local level, Southwark 2016, the then Southwark Alliance's Sustainable Community Strategy¹³ published in 2006, set out the framework for responding to local needs and concerns, increasing life chances and reducing the inequality gap. As part of the 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.
- 3.27. The Southwark Air Quality Improvement Strategy and Action Plan also now supports the six underlying principles of the fairer future promises in the council plan as detailed:
- **Being more transparent** – The intent behind our strategy is to promote awareness in the subject by providing our local community with clear, reliable and up to date information on local air quality and also be clear about the steps the authority intends to take to address the situation both in terms of its own operation and in partnership with other agencies;
 - **Creating a fairer borough** - A healthy natural environment is essential for our economy, for jobs and economic prosperity. The recorded data will contribute to shaping future policies which aim to address the disparity in air quality across the borough and drive smarter greener growth;
 - **Making Southwark a place to be proud of** - By recognising that improved air quality supports us in ways which may not always be visible but which have a very

real value. Our natural environment is a source of personal relaxation and enjoyment, community pride, public health and economic security;

- **Realising potential** – Our air quality monitoring stations will collect data that may assist in improving the air quality of the area. Poor air quality can affect people's health and well-being and can add to the burden of social and economic deprivation. This potential negative impact on health and wellbeing can also lead to limitations in the opportunities available for people to improve their lives and can undermine attempts to renew local neighbourhoods;
- **Spending money as we would our own** – The monitoring data collected will assist the council in making informed choices regarding the allocation of resources, and assist in identifying mechanisms for managing the natural environment in a cost effective way.
- **Transforming public services** - The air quality data collected will assist us to work more effectively with our internal and external partners to improve local outcomes on the natural environment, and pursue a more integrated approach linking a healthy natural environment to economic prosperity, sustainable development and a better quality of life, health and well being.

3.27. At the time of publication, it is our ambition to work together on the progression of this strategy with the future Health and Wellbeing Board (currently in existence as a 'shadow board'). Discussions on this will continue through to the establishment of the full board in 2013. If it does not prove possible to monitor the progress of this strategy under the future board other formal governance arrangements will be identified and put into place.

Planning

3.28. The planning system plays a vital role in the LAQM process. New development can present both an opportunity and a risk to local air quality improvement. As such, it is essential that the potential adverse impacts from developments upon air quality are taken into full account at all stages of the planning process. This ranges from development of general planning policy and land use allocation through to the detail of specific applications. Consideration may range across traffic emissions, the impact of biomass boilers, or the assessment and control of dust impacts during construction.

3.29. Guidance on planning and air quality can be found in the National Planning Policy Framework (NPPF) which was published in March 2012. The NPPF replaces and updates previous planning guidance set out in planning policy statements and planning policy guidance notes including:

- PPS1¹⁴ - Delivering sustainable development
- PPS4¹⁵ - Planning for sustainable economic growth
- PPG13¹⁶ - Transport
- PPS22¹⁷ - Renewable Energy
- PPS23¹⁸ - Planning and Pollution Control

3.30. Regional planning policy is provided by the "London Plan 2011¹⁹". Policy 7.14 – - Improving air quality - commits the Mayor, and guides boroughs, toward reducing pollutant emissions and public exposure to air pollution.

3.31. Regional planning policy is reflected within saved policy 3.6 of "The Southwark Plan²⁰" and strategic policy 13 of the Southwark's Core Strategy. Policy 3.6 states that development causing a reduction in air quality will be refused.

- 3.32. Southwark's Sustainable Design and Construction SPD²¹ 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, and in particular residential development, is designed to reduce exposure to pollution.
- 3.33. The Sustainable Design and Construction SPD also requires an air quality assessment to be submitted for all applications for major development.

Transport Plan

- 3.34. The Southwark Transport Plan responds to the revised [Mayor's Transport Strategy](#) (MTS), the emerging Sub-Regional Transport Plans (SRTPs), Southwark's Sustainable Community Strategy and other relevant policies. The Transport Plan sets out how the council will improve travel to, within and from the borough. It also sets out our long term goals and transport objectives for the borough (up to 20 years), together with a three year programme of investment and the targets and outcomes we are seeking to achieve. One of the stated objectives of this plan is to reduce the impact of transport on Southwark's air quality.

Local air quality monitoring and assessment

- 3.35. In 2002, a detailed assessment of local air quality in Southwark was undertaken. Local exceedances were noted and as a result an AQMA was declared in Southwark covering 90% of the borough (the entire area north of the South circular A205). Following this the council's initial Air Quality Improvement Strategy (AQIP) & Action Plan was established. In 2011, we decided to revisit our strategy in the light of developments in both national and regional policy; local demographic change; and considerable local development. This revision brings us up to date.
- 3.36. Today, only two of the air quality improvement objectives set by the national air quality strategy are envisaged to be exceeded in Southwark – those for particulate matter less than 10 microns in diameter (PM₁₀) and nitrogen dioxide (NO₂). Our strategy takes these issues as our focus.
- 3.37. By mid 2012 there will be two automatic air quality monitoring stations within Southwark. These will comprise a roadside location on the Old Kent Road (established in 2011) and a background site near to the Elephant and Castle southern roundabout (which is near completion as this strategy is published). Our ability to monitor and assess air quality will be further supported by the re-instatement of our diffusion tube survey (cited in this strategy), which will monitor NO₂. This will enhance our ability to target pollution hotspots and regeneration areas where new exposure to air pollution is likely.

Progression and review of this strategy

- 3.38. This strategy is written as a 5-year strategy for 2012 – 2017. It will be subject of a full review at the end of the 5-year term or earlier if developments demand this. Progress against our action plan will be reviewed annually, however, with an update and screening assessment made and provided to Defra.

Further information

- 3.39. The preparation of this document was supported by air quality and source apportionment modelling carried out by CERC on behalf of the council using ADMS-Urban (version 3.0.0.0) modelling software. Both studies were carried out using projected emissions of NO₂, PM₁₀ and PM_{2.5} for the years 2011 and 2015 from the London Atmospheric Emissions Inventory (LAEI) 2008. Copies of the full reports are available on the council's website at http://www.southwark.gov.uk/info/200075/pollution/1360/air_pollution

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. Emissions are primarily nitric oxide (NO) but this is converted into nitrogen dioxide NO_2 in the atmosphere through chemical reactions with ozone (O_3). Modelled NO_2 concentrations in Southwark for 2011 & 2015 are shown in Figure 1 and Figure 2 below.
- 4.2 The areas within which the objective for nitrogen dioxide is predicted to be met are shown in figures 1 and 2 by the green and blue range of colours. Between the two years there is a reduction in the predicted levels of nitrogen dioxide in the Borough, with the greatest reduction in the south, below the Old Kent Road. However there are areas, which are still exceeding the objective in 2015. The degree of non – compliance is shown in Figure 3 (Page 16).

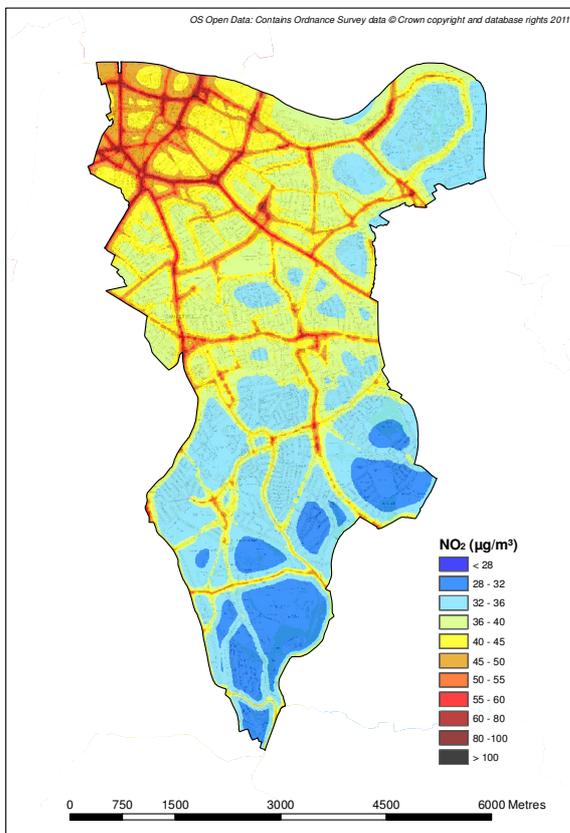


Figure 1 Predicted annual average NO_2 concentrations $\mu\text{g.m}^{-3}$, 2011²²

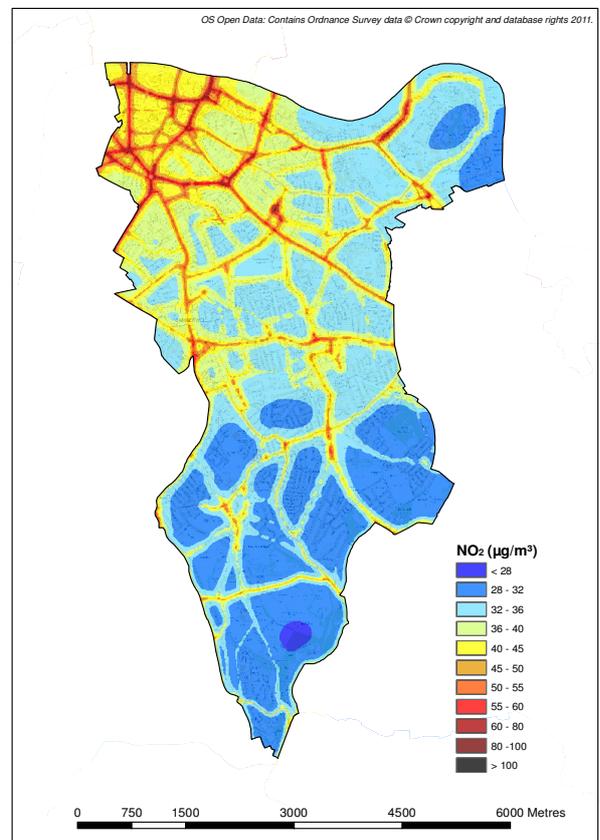


Figure 2 Predicted annual average NO_2 concentrations $\mu\text{g.m}^{-3}$, 2015²²

- 4.3 Figure 3 is a map of the borough showing the reduction of NO_2 concentrations required to meet the national air quality objective for nitrogen dioxide. It is clearly illustrated that the area within the congestion zone is the predominate area. However, there are large areas of the borough where the objective is just being met, and the authority will manage the air quality to avoid the increase in excess of the national air quality objective for nitrogen dioxide.

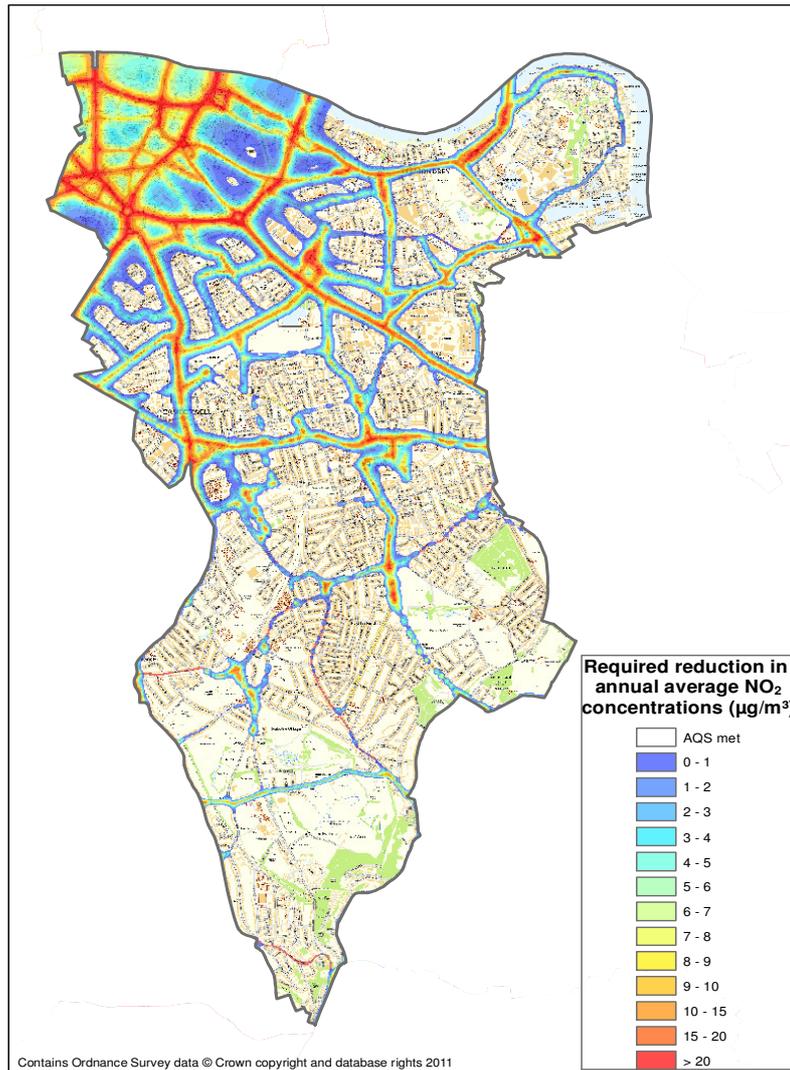


Figure 3 Map of the Borough showing the required reduction in annual average NO₂ concentrations to meet the National Air Quality Objective for NO₂ in 2011²²

Source Apportionment of Oxides of Nitrogen

4.4 Chart 1 (page 17) shows the relative contribution to NO_x emissions in Southwark from different sources, taken from the London Atmospheric Emissions Inventory 2008^{23 24} (LAEI). It includes predictions for 2011 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 have therefore grown proportionately. This predicted reduction in NO_x is primarily due to the technological advances made 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 NO₂ concentrations actually increasing in some areas of London.

4.5 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 has recently published a report in connection with the

trend in NO_x and NO₂ emissions and ambient measurements in the UK²⁵. There are several national projects starting this year exploring the NO_x and NO₂ emissions levels.

1. Select a London Borough: Southwark

Absolute Contribution (tonnes/yr) of Emissions Sources to Total NO_x Emissions in 2006, 2008, 2011 and 2015

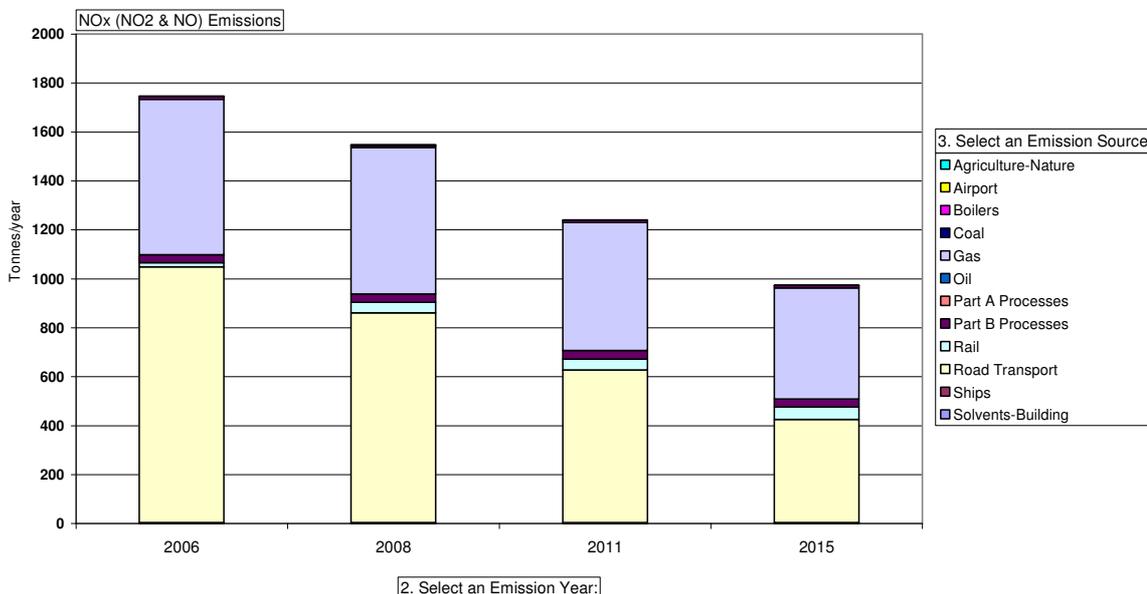


Chart 1 NO_x contributions in Southwark from various sources

		2001	2002	2003	2004	2005	2006	2007	2008
Southwark1 Elephant & Castle	µg.m ⁻³	54	46	48	51	49	42	39	46
	% Capture	97	84	73	88	99	86	74	
Southwark Roadside Old Kent Road	µg.m ⁻³	65	58	67	62	60	61	Station closed	
	% Capture	92	78	91	75	99	14		

Table 2 Trends in Nitrogen Dioxide 2001 – 2008 within the L. B. of Southwark

- 4.6 In August 2011, the Council commissioned CERC to undertake a source apportionment study in an attempt to understand the various source contributions to the air quality in the Borough. The contribution of different sources to the total NO₂ concentration cannot be determined due to the non – linearity of the chemical reactions which take place in the atmosphere.
- 4.7 In summary, the study found that emissions from sources within Southwark represent 2% of the total emissions from the LAEI area, for all three pollutants (NO_x, PM₁₀ and PM_{2.5}), for both the years 2011 and 2015. However the contributions of sources within Southwark to predicted NO_x concentrations at receptor locations ranges from 38% to 74%. Major roads account for the majority of the emissions from within Southwark for all three pollutants in both years.
- 4.8 The breakdown of predicted concentrations of NO_x at monitoring locations is similar to the emissions breakdown. Where there is a variation in the breakdown of concentrations at different monitoring locations this reflects the differences in traffic breakdown on the

nearest roads nearest to those locations. For example, at the monitoring point in the London Bridge area, taxis contribute a larger proportion to NO_x concentrations compared with other receptor locations.

- 4.9 The percentage of NO_x emitted as NO₂, known as primary NO₂, is high for cars, taxis and LGVs, compared to other vehicle types for both years. The percentage contribution of these vehicles to NO₂ contributions is therefore expected to be greater than the percentage contributions to NO_x contributions.

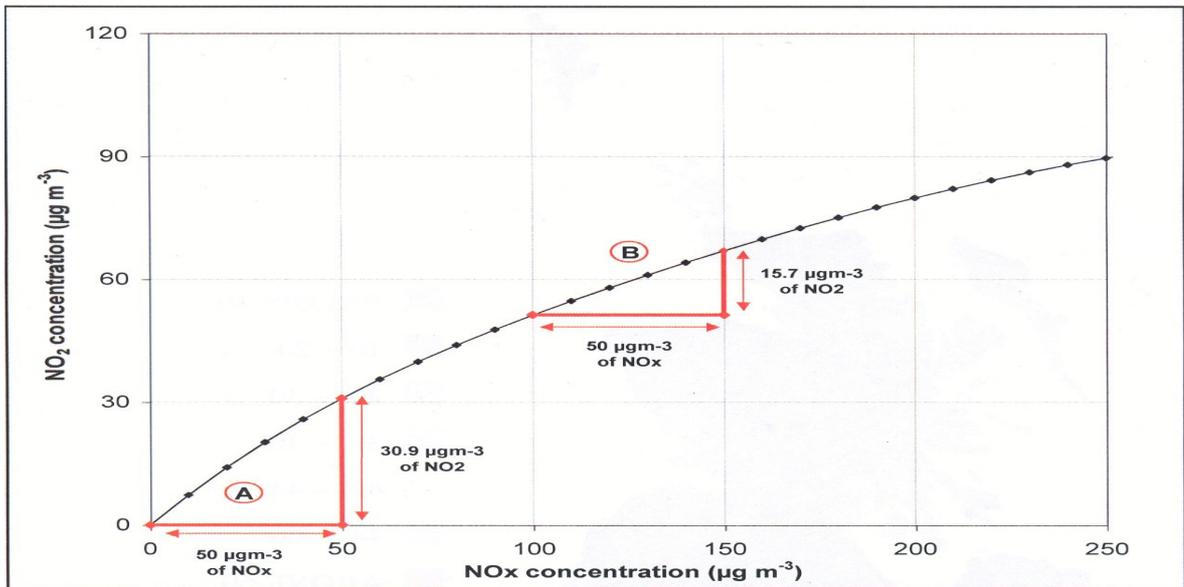


Figure 4 Relationship between NO₂ concentration and NO_x concentrations

- 4.10 It is not possible to accurately calculate the source apportionment of NO₂ concentrations because the ambient NO₂ concentrations include contributions from both directly emitted primary NO₂ and secondary NO₂ formed in the atmosphere by the oxidation of NO. As can be seen in Figure 4 above, there is not a linear relationship between NO₂ concentrations and NO_x concentrations. These curves are different for different locations depending on the sources and atmospheric chemistry. A recent Defra report²⁶ found overall, the source apportionment for NO₂ was very similar to the source apportionment for NO_x. The exceptions were for sources such as buses in London and light good vehicles, for which high primary NO₂ emission fractions are expected due to the widespread use of oxidation catalysts.

Particulate matter

- 4.11 Particulate matter under 10 microns in diameter (1 micron is one thousandth of a metre) is 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 include emissions from diesel engines (motor vehicles; fixed plant and to a lesser extent diesel trains); bonfires and biomass boilers and these are generally below 2.5µm (PM_{2.5}). Industrial processes such as concrete batching and from demolition and construction activities generate larger particles. Particles that have settled can be re-suspended and further decrease air quality. Finally, recent research has identified brake and tyre wear as a significant source of PM₁₀. Conversely, the proportion from brake and tyre wear will increase as exhaust emissions are reduced by engine management systems and technology changes.

- 4.12 Figure 5 and 6 on page 19 show PM₁₀ concentrations in Southwark for 2011 & 2015. The objective is met for the annual average in both years and there is almost no difference between the maps. Modelling was carried out for the 24-hour objective and it was predicted that the objective will also be met in 2011 and 2015.
- 4.13 Chart 2 (page 20) 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.
- 4.14 The contribution to air pollution concentrations from the road traffic networks can be seen by comparing the Figure 1 (page 15) to Figure 6 below (page19). 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, where there are areas of congestion and the slowest moving traffic.
- 4.15 Concentrations are not simply a function of the level of traffic but are determined to a significant degree by congestion and the average traffic speed. Figure 7 (page 20) shows that the greatest traffic flows are on the A2 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

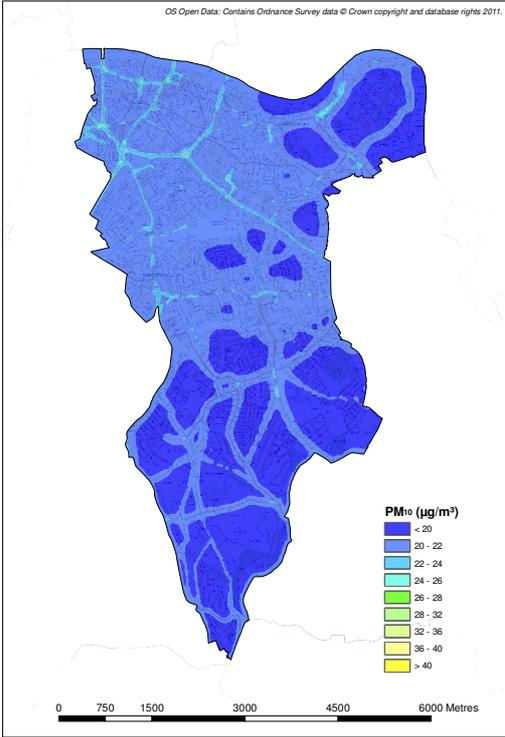


Figure 5 Predicted annual (2011) average PM₁₀ concentrations $\mu\text{g}\cdot\text{m}^{-3}$, 2015²²

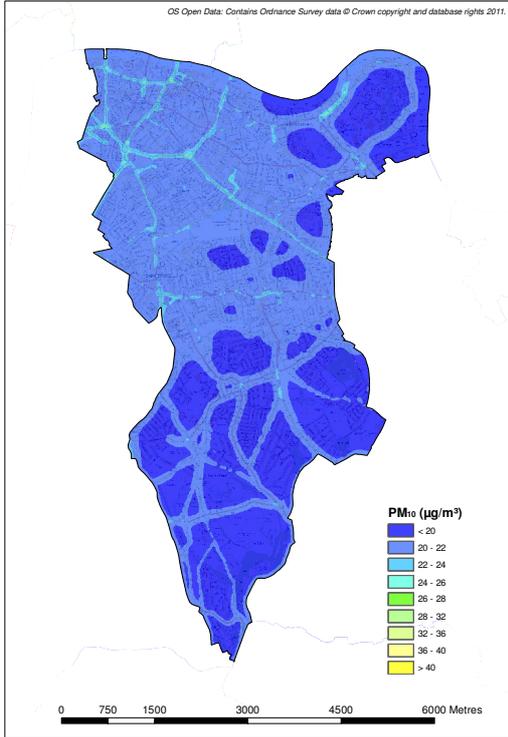


Figure 6 Predicted annual (2015) average PM₁₀ concentrations $\mu\text{g}\cdot\text{m}^{-3}$, 2015²²

1. Select a London Borough: Southwark

Absolute Contribution (t/yr) of Emissions Sources to Total PM10 Emissions in 2006, 2008, 2011 and 2015

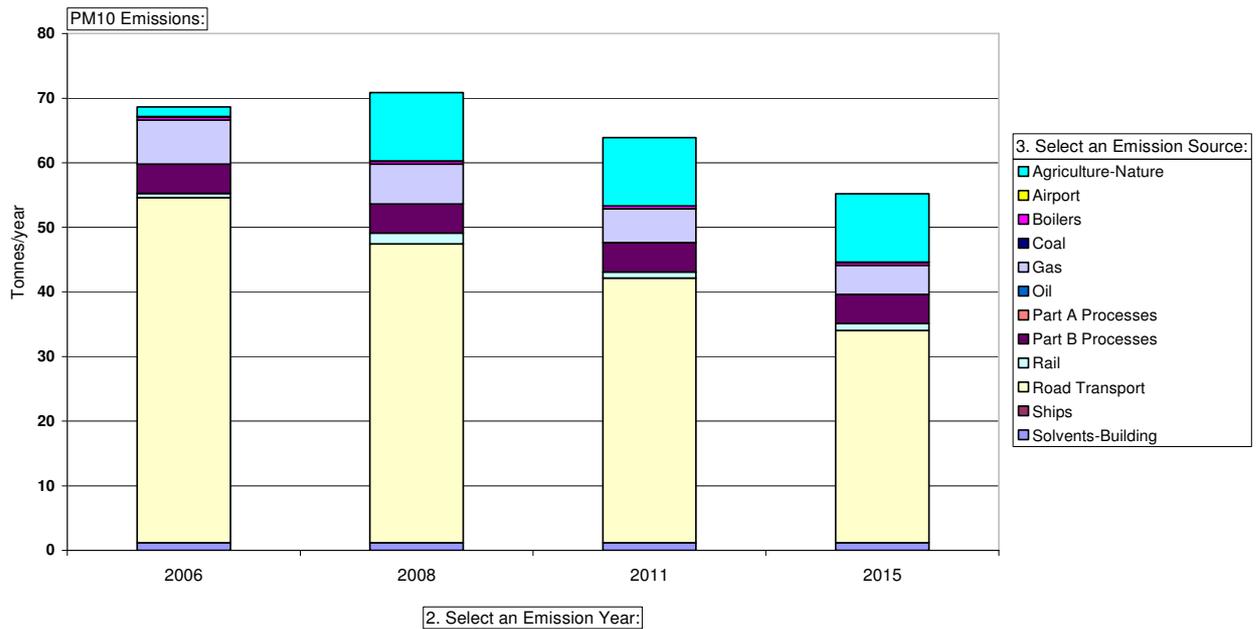


Chart 2 PM₁₀ contributions in Southwark from various sources.²³

4.16 The London congestion charge zone includes part of the borough to the northwest with the eastern boundary delineated by Tower Bridge Road and the 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 3 (page 16) 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, as traffic avoids entering the congestion zone.

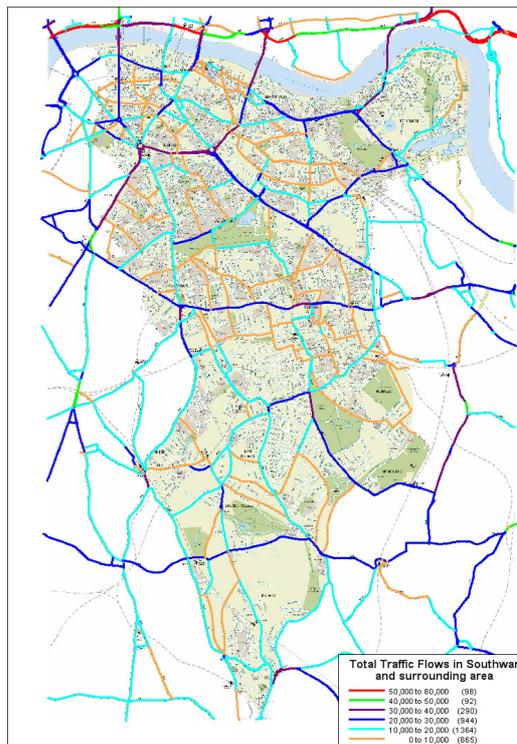


Figure 7 Southwark's Road Network

SECTION FIVE - AIR QUALITY, HEALTH AND THE ENVIRONMENT

Health impacts of poor air quality

5.1 The House of Commons Environmental Audit Committee report on Air Quality for 2010 - 11⁴ relates the following statistics:

- That the main cost of air pollution arises from adverse health effects on people;
- That the health impact of man-made particulate air pollution experienced in the UK in 2005 cost between £8.5 billion and £20.2 billion a year (Air Quality Strategy 2007);
- That the health impacts of air pollution in the UK are almost twice those of physical inactivity, estimated to be £10.7 billion per annum (Air Quality Management Resource Centre); and
- The costs of poor air quality are comparable to the cost of alcohol misuse to society, estimated to be £12-18 billion per annum (Air Quality Management Resource Centre)

5.2 Good air quality has the potential to make a key contribution to preventative health care.

Nitrogen dioxide

5.3 Nitrogen dioxide has not been included in past analysis of costs. The Committee on the Medical Effects of Air Pollutants (COMEAP) has acknowledged that further work is necessary to fully understand the health impacts of exposure to NO₂. However, 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.

5.4 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.

5.5 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

5.6 Long-term effects of exposure to particulate matter and in particular fine particles (PM_{2.5}) are strongly correlated to mortality. 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, (e.g. if the particular matter absorbs a hydrocarbon like benzene), can increase the chance of cancer. Long-term exposure to particulate matter can reduce life expectancy (approximately 6 – 9 months) due to heart disease, lung cancer and cardio-pulmonary illness in addition to reducing lung function. The evidence of short-term effects from particulates is stronger than that for NO₂.

5.7 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 COPD, but long-term exposure to high levels of particulate matter can exacerbate by having a synergistic effect and will contribute to

chronic health effects. The number of deaths in Southwark attributable to particulate matter in 2008 was estimated to be 136 by a recent study (Miller 2010)³.

- 5.8 People most affected by PM will be those susceptible because of pre-existing disease with impaired immunological response; patients with pre-existing coronary artery disease; and those with diabetes. 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

- 5.9 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. The eutrophication process occurs when the lake acquires a high concentration of nutrients, especially nitrates. These typically promote growth of blue – green algae, as seen in recent years within Burgess Park. As the algae die and decompose, high levels of organic matter and decomposing organisms deplete the water of available oxygen, causing the death of other organisms, such as fish. 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.
- 5.10 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 airflow, 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'. In such circumstances, trees planted to improve air quality may actually have a detrimental effect. Conversely, some species have been shown to have higher levels of NO₂ absorption, which may improve local air quality. Trees planted in higher densities in parkland and open spaces also benefit air quality by trapping PM.

Air quality and the built environment

- 5.11 Particulate matter soils many buildings close to heavily trafficked roads. This not only discolours them but may also accelerate weathering and chemical attack, known as acidification, 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

- 5.12 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 went on record as the hottest in Europe for the past 500 years and resulted in a large number of deaths. This could become an average summer by 2050. 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 as dispersal of pollutants is inhibited due to lack of wind. Higher temperatures are also likely to make people sensitive to air pollution more susceptible to respiratory and cardiovascular disease.

- 5.13 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 Sulphur Dioxide (SO₂) and other aerosols emitted have acted to slow warming by reflecting solar radiation. Consequently as levels of SO₂ reduce, warming will accelerate.
- 5.14 Many policies and measures to reduce greenhouse gas emissions will also improve air quality. For example, the greater uses of public transport will not only reduce carbon emissions but will also reduce 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.
- 5.15 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.

Air Quality Action Plan 2012 – 2017

SECTION SIX - AIR QUALITY, ACTION PLAN – OBJECTIVES AND MEASURES

- 6.1 The AQSIP seeks to introduce measures that will lead to reductions in NO_x and PM₁₀ emissions within Southwark and improve the health of people living and working in Southwark by reducing exposure to air pollution and raising air quality awareness. On this basis, our air quality action plan has been developed to meet the following strategic air quality 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.
- 6.2 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 the borough are at sufficient height that their emissions do not affect local air quality.
- 6.3 Most industrial processes within Southwark are controlled through the Integrated Pollution Prevention Control (IPPC) process. These fall into two categories. Part A processes are regulated by the Environment Agency and incorporate power stations and large industries. Part B processes are regulated by the local authority and incorporate small industrial processes that have the potential to cause air pollution. These include dry-cleaning; vehicle re-sprayers; furniture manufacturing; cement batching plants; and petrol stations / uploading of petrol.
- 6.4 The only Part A process currently operating within the borough is the Integrated Waste Management Facility on the Old Kent Road. Fortunately, this does 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. However, the SELCHP (South London Combined Heat and Power), a power plant that burns waste located on the Southwark boundary but within Lewisham, also falls within the category of a Part A process and this emits 375 tonnes of NO_x and 4 tonnes of PM₁₀ per year. Some of these emissions contribute to background pollution levels within Southwark, and this has been taken into account in our recent modelling exercise.
- 6.5 Sections 7 to 10 of this document deal with the strategic air quality objectives in more detail and set out the specific measures that we intend to take to reduce air pollution and improve air quality in the Borough.

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

- 7.1 The vast majority of PM₁₀ and NO_x emissions in the borough are from vehicles.
- 7.2 The council's Transport Plan, developed in parallel to this strategy and action plan, will assist in the aim of reducing emissions from vehicular transport.
- 7.3 The objectives of the Transport Plan set out to:
- Ensure that 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. This is achieved by encouraging people to walk, cycle and use public transport, thereby encouraging a reduction in the use of private vehicles. The combination of reducing emissions from vehicular transport and achieving this modal shift will not only improve air quality but 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, will reduce health problems and benefit wider society.
- 7.5 Transport planning policies are also in place within the Southwark Plan (Saved Policies) that support reduction in use of cars through parking restraint, promotion of public transport and green travel measures such as provision of car clubs. This approach will be carried through Strategic Policy 2 of the Southwark Core Strategy 2011 and continue to be strengthened in the forthcoming local planning documents.

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 car club members found that 85% of members do not own a car and that there are approximately 25 fewer cars on the road for each car club.
- 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. In the last year, Zipcar (formerly Streetcar) members who live in Southwark have driven 1,401,305 miles in Zipcar

vehicles. This has been calculated by the organisation to produce 217.2 tonnes of CO₂ (by using a fleet average emission of 155gCO₂.miles⁻¹). As a comparative measure, similar mileage in the average private car would have produced 389.56 tonnes of CO₂. 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 (Saved Policies) that encourages the use of car clubs for new development. These policies will be strengthened in the forthcoming local planning policies.

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, as follows:

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 physical 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, evaluate and publicise progress of measures to encourage sustainable travel choices within the borough.

Travel Plans

- 7.12 A travel plan is a package of measures produced by employers to encourage staff to use alternatives to single-occupancy vehicles. Until recently Southwark worked through SELTrans (South-East London Transport Strategy) to develop travel plans for businesses operating within the borough. However, it became clear that there is great demand for travel planning and the Authority now employs a travel plan co-coordinator on a permanent basis. The co-ordinator is able to provide advice and assistance on travel planning for Southwark businesses. Our understanding is that this will be supported by Transport for London plans to provide a web-based travel plan service for businesses in due course.

- 7.13 Travel plans are also used for schools, as a means of improving safety and encouraging sustainable travel options among students, parents, guardians and staff. Travel plans are also used to encourage educational programmes relating to child travel and linked how this links to the environment, safety and health.

- 7.14 Incorporated within the Council Plan is a target to reduce the number of children being driven to school from a baseline of 15.7% in 2010-11 to 13% by 2013-14. In the past 5 years a 5% decrease in numbers has been achieved. Travel plans have a role in contributing toward this reduction. In total, 109 schools are targeted to have a travel plan. Hospital schools are omitted as they are not appropriate in these circumstances. Of the

109 schools, 103 (94%) have completed travel plans in place. At the time of writing a further 3 schools are engaged in compiling a travel plan. Around 35% of current travel plans are currently due for review and it is acknowledged that some schools are having difficulty finding the resource to prepare or review their travel plan. However, we have now made this process easier by developing a web-based travel plan service.

- 7.15 Some of the benefits of a well-written travel plan are fairly comprehensible, for example, promoting a rise in activity and sociability. However, the impact on vehicular traffic patterns and the 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. It is exacerbated near school entrances, at the point where pupil exposure is most likely, with cars breaking, stopping; idling and then moving off again. All of these actions generate higher pollution emissions than moving at a constant speed. We intend to investigate funding opportunities to pilot a scheme to review school travel plans in Southwark with a view to identifying improvements in air quality. Should this prove successful, we will roll the scheme out further.

Measure 3: Southwark will investigate funding opportunities to pilot a scheme to identify and implement local air quality improvements near to schools and publicise the results.

Idling engines

- 7.16 Vehicle drivers, who leave their engine running, when unnecessary, contribute to air pollution. It is an offence under Regulation 98 of the Road Vehicles (Construction and Use) Regulations 1986²⁷ for vehicles to be left idling unnecessarily. The Road Traffic (Vehicle Emissions) (Fixed Penalty)(England) Regulations 2002²⁸ enable local authority authorised persons to request vehicle users to switch off engines when parked and to issue fixed penalty notices of £20 to those who refuse to co-operate.
- 7.17 There are several locations within Southwark where drivers tend to leave their engines running. These are primarily at bus and coach stands but this also occurs outside schools. As part of the Mayor's policy¹ to make London a 'no idling zone', Transport for London launched in 2011, a pan London awareness-raising and marketing campaign, aimed at all drivers in the capital, to deter unnecessary engine idling. The initiative is being delivered in partnership with Asthma UK and the Automobile Association. Drivers are being asked to switch off their engines whilst parked, loading or waiting at the roadside to help improve the health of Londoners.
- 7.18 We will continue to support this initiative through local publicity and investigate the potential to follow this with targeted enforcement activity, with the intention of helping reduce the incidence of unnecessary engine idling.

Measure 4: Southwark will mount a publicity campaign and investigate potential to undertake enforcement on idling engines at hotspots within the borough.

¹ Mayor of London Air Quality Strategy Policy

Road safety schemes and initiatives

- 7.19 Southwark's Transport Plan includes many measures that will work to improve road safety and reducing road accidents. However, while established with undoubted good intentions, road safety schemes and initiatives can sometimes inadvertently have a detrimental impact on air quality. For instance, traffic calming schemes can sometimes lead to higher emissions. The transport research laboratory for emissions of various pollutants carried out research into vehicles travelling through traffic calming schemes, such as road humps. The research found that emissions of NO_x increased 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%.
- 7.20 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. 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 highway traffic management schemes and initiatives and road safety schemes and initiatives >£1m in value.

Southwark's transport emissions

- 7.21 There are three areas in which the council has direct responsibility for emissions from vehicles. These comprise use of:

- Light commercial vehicles;
- Lease cars; and
- Essential car user vehicles

Southwark's own fleet is 323 vehicles strong with a further 349 vehicles comprising the 'grey fleet' - vehicles leased cars to employees).

- 7.22 In addition, Southwark has an indirect responsibility over emissions from contractors' vehicles. Contractors vehicle emissions can be controlled through the procurement process, by having suitable tender / contract conditions to ensure that the vehicles used in conjunction with the contract are 'clean and green'.
- 7.23 Southwark has made great advances in reducing emissions from its 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. While the closure of the council's Manor Place Depot and relocation of vehicle refuelling facility to the Integrated Waste Management Facility (IWMF) has affected the speed with which this process can be progressed, this course of action will be pursued.
- 7.24 In due course, emissions from the LGV fleet will become progressively lower as will emissions from the lease car fleet. Lease cars provided for essential users benefit air quality, because the vehicles provided to users are the most up to date fuel-efficient vehicles. Further control is levelled over the vehicles that are used by staff by limiting the CO₂ emissions.
- 7.25 The council is also participating in the Energy Savings Trust feasibility study which is intended to help organisations choose the right vehicles for their fleets, drive them more

efficiently, and drive them less. The benefits are clear: lower fuel bills, less environmental impact, and improved efficiency.

- 7.26 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 provide eco-driving training to its employee driving test examiners. Employees taking the Southwark driving test will receive cascade smarter driving training as part of the driving test. We will examine the potential to have this programme rolled out to all employees that drive for work purposes.
- 7.27 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. The Authority will take into account of TfL's Electric Vehicle public sector procurement framework when drawing up the procurement strategy.

Measure 6: Southwark will deliver 'in house' smarter driver training to all employees that take the council's internal driving test and investigate how to extend this out to all staff who 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

- 7.28 The Low Emission Zone (LEZ) was introduced in 2008 to encourage the most polluting heavy diesel vehicles driving in the Capital to become cleaner. The LEZ covers most of Greater London. To drive within the zone without incurring a daily charge, vehicles must meet certain emissions standards that limit the amount of particulate matter emitted. The LEZ emissions standards have become more stringent since their introduction with the range of vehicles affected increased and the standards made tighter.
- 7.29 The LEZ has thereby contributed to improving air quality within Greater London by reducing the area for which concentrations of PM₁₀ and NO₂ are above objective levels.
- 7.30 Air quality remains a particular problem, however, in central London where the highest levels of pollution are frequently recorded. The Mayor's 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. This could be in the form of an inner London LEZ that has more stringent emission standards than the London wide scheme or a LEZ that includes vehicles (such as cars) that are not covered by the London-wide scheme.

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 The prime fixed sources of emissions are from heating and power supplies, such as gas boilers. These presently account for almost 50% of emissions within the borough but, as technological advances reduce emissions from vehicles, the proportion of emissions attributable to fixed sources will increase. The increasing significance of fixed sources will require initiatives and measures that understand the potential co-benefits to be obtained, 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
- By reducing their use through energy efficiency measures such as insulation. The authority has a Carbon Reduction Report.

8.3 Southwark has 90 central boiler houses which provide 22,000 council homes their heating. We are improving the efficiency of these properties by bringing 10,000 of these homes up to current standards. By August 2011, 4,741 properties in the Borough had received cavity wall insulation. A further 10,000 properties are proposed to have loft and / or cavity wall insulation installed as the opportunity presents itself.

Measure 9: Southwark will continue its implementation of energy efficiency measures in council owned buildings.

Increased use of renewable energy

8.4 The council considers that decentralised energy productions, district heating schemes and combined heat and power (CHP) are effective means of delivering energy efficiency gains.

8.5 The council is currently developing proposals for a district heating scheme which will capture heat, which is normally released into the environment, from the South East London Combined Heat and Power Plant (SELCHP) in Deptford and direct this to boiler houses in estates across the borough. This project will save an estimated 8,000 tonnes per annum (70%) of CO₂ emissions and 2 tonnes per annum (90%) of NO_x emissions. This will result in lower cost heat being delivered to almost 3,000 homes.

8.6 While decentralised power generation reduces carbon emissions, this type of generation may, in some instances (e.g. biomass), have a negative impact on local air quality by increasing particulates and nitrogen dioxide emissions. 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, and encourage non-polluting renewable energy generation.

Controlling emissions from industrial sources

- 8.7 As has been noted earlier in this document, the local authority pollution control regime (LAPPC) is the process by which Southwark regulates small industrial processes. Specifically, the council has responsibility for regulating those processes (Part B processes) which have the potential to cause air pollution.
- 8.8 Operators carrying on any Part B process must obtain the relevant environmental permit from the council and is inspected and monitored for compliance
- 8.9 All Part B operators within the Borough are fully compliant.

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 redevelopment and regeneration in progress, Southwark is a borough that is undergoing significant change. The principles of sustainable development are vital to building and maintaining a sustainable future. New development can affect local air quality both through the construction process and by the emissions from its operation. Our intention is to work with developers and contractors to reduce the potential impacts. 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 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 provides advice on minimising the impact of demolition and construction with a range of measures covering site planning, demolition and traffic controls. In January 2012 the GLA commenced a revision of the 2006 Guidance. Until that guidance is published the Institute of Air Quality Management (IAQM) have produced interim guidance on the assessment of the impacts of construction on air quality and the determination of their significance and recommended mitigation measures for low, medium and high risk sites.

9.4 Following on from the 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 retrofitted to construction plant.

9.5 Southwark have for some year's 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 in accordance with current best practice guides..

Measure 12: Southwark will require developers to adopt the measures included in the current Best Practice Guidance on construction and demolition, within their environmental construction management plans.

Reducing transport emissions from new development

9.6 Applicants for major developments are also 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 As this strategy notes, some 90% of the area of Southwark is incorporated within an Air Quality Management Area. Currently, while latest modelling from TfL suggests that the PM₁₀ targets may be met across the whole of the Southwark area, concentrations of NO₂ are likely to exceed national objectives for many parts of this borough.
- 10.2 Sections 7 to 9 of this strategy have considered approaches to achieving emissions reductions from a range of sources. However, emissions reductions are not the only method of achieving the principle objective of this strategy, of protecting public health. There are other complementary approaches to be taken.
- 10.3 Of particular importance is the issue of exposure reduction. While it is necessary to consider bringing down the concentration of pollutants to below the objective limits and beyond, regard should also be had to limiting individual levels of exposure to those pollutants at their current levels. For instance, the air quality objective for the annual mean of NO₂ (40µg.m⁻³) will not apply in a bus garage, as there is no relevant exposure. However the 1hr mean objective (200µg.m⁻³) may apply. Reducing or removing exposure to the pollutant can therefore be an effective tool to protect public health.

Exposure reduction

- 10.4 Southwark has one of the highest housing targets of any London borough and is responding to the challenge of providing sustainable development well.
- 10.5 Sustainable development is best located close to services and amenities. By locating housing near to travel nodes and areas with 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. This step can also, however, expose more people to pollution in the short to medium term, particularly for development near to busy roads.
- 10.6 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 such areas, we will develop specific policy and development guidance to ensure that exposure to pollution is minimised.
- 10.7 Southwark presently requires all submissions for major applications within the AQMA to include an air quality assessment. Should the assessment identify that the proposed 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.
- 10.8 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 calculations 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, which have been shown to be less than robust. Many air quality assessments rely on this data and are therefore often viewed as 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.

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.

Use new development to improve air quality

- 10.9 Policy 7 of the Mayor's 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.
- 10.10 Policy 3.2 of the Southwark Plan (Saved Policies) states that planning permission will not be granted for development that would lead to a reduction in air quality. It is envisaged that this approach will be continued in forthcoming local planning documents. 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 in order to seek emission reductions.

Measure 16: Southwark will develop policies within its emerging local development documents that will require new development to reduce PM₁₀ and NO_x emissions when compared to previous site use.

Campaigns and public awareness

- 10.11 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. AirText also provides information on UV, pollen and temperature.
- 10.12 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. As of April 2012 some 6970 people had signed up to receive alerts and this figure continues to grow.
- 10.13 As the popularity of AirText increases, AirText is promoting subscriber uptake of alternative free social media such as twitter and are developing an android smart phone App.
- 10.14 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

- 10.15 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 and will respond to and engage with residents to support community efforts to raise awareness and change behaviour.

Air quality monitoring

- 10.16 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 2012 at the Elephant & Castle. Not only will this assist in monitoring progress on air quality improvement measures that will be implemented by Southwark and the Mayor, but they will also have the capacity to provide vital data for air quality assessments that might be undertaken by developers or the council.
- 10.17 Automatic monitoring stations provide accurate data, but may incur operational costs of up to £25,000 per year and require secure storage space for equipment, which can be difficult to find. Diffusion tubes offer a complementary cost effective method of monitoring air quality. Unlike automatic monitoring stations, they require no power supply or planning permission and locations can be readily sourced, for instance, they can be attached to street furniture, such as lampposts. It is intended, therefore, to use diffusion tubes to supplement our 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 objectives and achieve a measurable improvement in local air quality.

Measure 19: Southwark will establish and maintain the operation of two automatic monitoring stations at the Elephant and Castle and Old Kent Road and supplement this with a diffusion tube survey to provide a more comprehensive survey of air quality in the borough.

Street trees

- 10.18 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 NO_x to form ground level ozone. Additionally, street trees can inhibit airflow and prevent the dispersion of pollutants, exacerbating the build up of concentrations, particularly in street canyons. Conversely, species such as Ash, Common alder and Silver birch could assist in improving air quality.
- 10.19 The Mayor in his Air Quality Strategy reaffirms his commitment to plant 10,000 trees in 40 priority locations throughout London. Air quality is intended to be 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 all trees are placed in the correct context so as to make a contribution. Natural England has produced a resource to select appropriate tree species in urban contexts – Right Trees for a Changing Climate²⁹.
- 10.20 There are approximately 90,000 trees in Southwark. Southwark Council is responsible for the direct management, maintenance and care of over half (57,500) of the borough's tree population. There is currently no funding for new trees but Southwark's Tree Management Strategy 2010 aims to ensure through its tree maintenance programme

that 95% of trees are maintained healthy and safe by 2012 and a programme replacing current empty tree pits is in hand.

- 10.21 Opportunities for extending the borough's tree population under the Mayor's strategy will be explored.

Measure 20: Southwark will pursue its Tree Management Strategy and investigate opportunities to work together with the Mayor on the commitment to plant new trees in priority locations in accordance with the 'right tree right place' methodology, taking into suitable account the benefits and costs of street trees on air quality within the Borough and Camberwell.

APPENDIX 1 - Ward Data in connection with PM_{2.5}

Ward	Total population 2008	PM _{2.5} Concentrations $\mu\text{g.m}^{-3}$	Attributable deaths at coefficient (change for $10\mu\text{g.m}^{-3}$ PM _{2.5})		
			6%	1%	12%
Brunswick Park	12,281	15.82	6	1	11
Camberwell Green	13,928	15.97	7	1	13
Cathedrals	15,723	16.61	8	1	14
Chaucer	15,934	16.52	8	1	15
College	11,303	15.27	6	1	10
East Dulwich	11,947	15.41	6	1	11
East Walworth	13,100	16.14	6	1	12
Faraday	13,570	15.79	7	1	12
Grange	14,559	16.06	7	1	13
Livesey	13,699	15.71	7	1	13
Newington	14,277	15.93	7	1	13
Nunhead	12,030	15.45	6	1	11
Peckham	11,842	15.66	6	1	11
Peckham Rye	12,912	15.29	6	1	12
Riverside	13,354	16	7	1	12
Rotherhithe	13,022	15.72	6	1	12
South Bermondsey	12,809	15.99	6	1	12
South Camberwell	12,313	15.5	6	1	11
Surrey	12,719	15.35	6	1	12
The Lane	14,420	15.67	7	1	13
Village	11,096	15.44	5	1	10

APPENDIX 2- Measures in the Air Quality Improvement Plan

No	Measure	Focus	Delivery Department	Planning Phase	Implementation Phase	Indicator
1	Southwark will continue to encourage the use of the car club schemes, monitor and report on uptake and allocate additional spaces should demand warrant.	Reducing the use of private cars in the borough and an incentive to avoid non-essential car journeys	Public Realm	Jan – May 2012	To March 2013 with review Feb 13	No of car –club members in the Borough No of car spaces in the Borough
2	Southwark will continue to implement, evaluate and publicise progress of measures to encourage sustainable travel choices, within the borough.	Reducing the use of private cars in the borough and an incentive to avoid non-essential car journeys	Planning Policy Public Realm Transport Planning	Jan – May 2012	To March 2013 with review Feb 13	No of projects to improve the walking and cycling environment in the Borough
3	Southwark will investigate funding opportunities to pilot a scheme to identify and implement local air quality improvements near to schools and publicise the results.	Reducing short – term pollution of NO _x and PM ₁₀	Education Development Control and Strategic Projects EHTS	June 2012	July 12 To March 2013 with review Feb 13	Funding source identified The number of schemes introduced. Reduction in number of children being driven to school
4	Southwark will mount a publicity campaign and investigate potential to undertake enforcement on idling engines at hotspots within the borough.	Reducing short – term pollution of NO _x and PM ₁₀	Community Safety	June 2012	To Mar 2013 with review Feb 13	The number of idling vehicles owner requests to turn off engines and percentage of FPN issued.
5	Southwark will undertake air quality assessments on all major highway traffic management schemes and initiatives and road safety schemes and initiatives > £1m in value	To ensure that the scheme will improve the local air quality.	Transportation Planning, Development Control and Strategic Projects EHTS	March 2012	To Mar 2013 with review Feb 13	The number of air quality assessments undertaken

No	Measure	Focus	Delivery Department	Planning Phase	Operation Phase	Indicator
6	Southwark will deliver 'in house' smarter driver training to all employees that take the council's internal driving test and investigate how to extend this out to all staff who are required to drive for work purposes.	To provide 'eco-driving' training to all staff	Sustainable Transport	2012-13	2013 - 14	The number of training employees in the year
7	We will develop an emissions strategy for all new council and council contractors' vehicles and plant.	To promote and encourage the use cleaner greener vehicles and plant.	EHTS Energy Team Sustainable Transport Procurement	June 2012	March 2013 2013 – 2014 with review Feb 14	Production of strategy The number of contracts renewed using the emissions strategy and percentage reduction in NO _x and PM ₁₀
8	Southwark will work with partner boroughs in the Central London Air Quality Cluster Group to establish a Central London Low Emission Zone.	To assess the feasibility and cost – effectiveness of central LEZ with other Boroughs and GLA.	EHTS Central London Air Quality Cluster Group GLA Southwark PCT	2012	March 2013	Progress of the proposal on annual basis
9	Southwark will continue its implementation of energy efficiency measures in council owned buildings.	The reduction of emissions of NO _x and PM ₁₀ from properties.	Energy Team Housing	Jan – May 2012	To Mar 2013 with review Feb 13	The number of properties that have received cavity wall insulation The number of properties that have received loft insulation
10	Southwark will ensure that local energy generation plant will be fitted with suitable abatement and dispersal technologies, and encourage non-polluting renewable generation	To ensure that the plant does cause a deterioration to the local air quality.	Development Control Planning Policy Energy Team EHTS	Jan – May 2012	To Mar 2013 with review Feb 13	The percentage of the number of annual maintenance reports submitted to the Authority.

No	Measure	Focus	Delivery Department	Planning Phase	Operational Phase	Indicator
11	Southwark will continue to regulate Part B Processes to ensure that high standards of air pollution control are maintained.	To ensure that Part B processes do not pose no health risk to residents and visitors in the local area to the process.	EHTS	Jan – May 2012	To Mar 2013 with review Feb 13	Number of new processes Percentage of programmed inspection completed in the year
12	Southwark will require developers to adopt measures included in the Best Practice Guidance on construction and demolition within their Environmental Construction Management Plans (ECMP).	The reduction of emissions of NO _x and PM ₁₀ by responsible management of the site.	Development Management EHTS GLA	Jan – May 2012	To Mar 2013 with review Feb 13	The number of ECMP's submitted and the percentage of the number of annual reports.
13	Southwark will monitor all travel plans received as part of the planning process for compliance and take enforcement action where appropriate.	To encourage the use other means of transport other than private vehicles.	Development Management and Strategic Projects	March 2012	To Mar 2013 with review Feb 13	Number of development travel plans secured Number of development travel plans monitored at years 1, 3 and 5. Modal shift from development travel plans – Single Occupancy vehicle use percentage reduction ²

² Data will come in the future when the Borough have the baseline data to measure against.

No	Measure	Focus	Delivery Department	Planning Phase	Operational Phase	Indicator
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.	To ensure that new developments contribute to the local authority working towards the national air quality objectives	Development Management EHTS Planning Policy	Jan – May 2012	To Mar 2013 with review Feb 13	The number of air quality assessments
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.	To gather data in order the local authority can inform policy and ensure that decision can be made with all available data.	EHTS	Jan – May 2012	To Mar 2013 with review Feb 13	Evidence base provided Annual update Number of hits on the website
16	Southwark will develop policies within its emerging Local Development documents that will require new development to reduce PM ₁₀ and NO _x emissions when compared to previous site use.	To use spatial planning process to promote 'air quality neutral' developments in the Borough.	Planning Policy Development Management EHTS	June – Aug 2012	Sept 2012 – Mar 2013	Number of planning policies developed in connection with air quality
17	Southwark will continue to promote the AirTEXT service at events and schools and will support other events relevant to air quality	Reducing the health impacts of air quality on the vulnerable persons in the Borough.	EHTS	Jan – May 2012	To Mar 2013 with review Feb 13	The number of participates of the AirText and the number of alerts in a year.

No	Measure	Focus	Delivery Department	Planning Phase	Operational Phase	Indicator
18	Southwark will provide up to date information on air quality via its website and will respond to and engage with residents to support community efforts to raise awareness and change behaviour	Raising public awareness of air quality	EHTS Corporate IT	Jan – May 2012	To Mar 2013 with review Feb 13	The number of hits on the website
19	Southwark will establish and maintain the operation of two automatic monitoring stations at the Elephant and Castle and Old Kent Road and supplement this with a diffusion tube survey to provide a more comprehensive survey of air quality in the borough.	To provide data to monitor the effectiveness of this strategy and inform policy decisions.	EHTS	Jan – May 20122012	To Mar 2013 with review Feb 13	Data capture of the monitoring stations and the number of diffusion tubes
20	Southwark will pursue its Tree Management Strategy and investigate opportunities to work together with the Mayor on the commitment to plant new trees in priority locations in accordance with the 'right tree right place' methodology, taking into suitable account the benefits and costs of street trees on air quality within the Borough and Camberwell	To improve the environment of the local public realm.	Public Realm EHTS	Jan – May 20122012	To Mar 2013 with review Feb 13	The number of trees planted.

APPENDIX 3- Measures in the Air Quality Improvement Plan mapped to London Mayor’s Air Quality Strategy

No	Measure	Focus	GLA Air Quality Policy	Proposal
1	Southwark will continue to encourage the use of the car club schemes, monitor and report on uptake and allocate additional spaces should demand warrant.	Reducing the use of private cars in the borough and an incentive to avoid non-essential car journeys	1. - Encouraging smarter choices and sustainable travel	<i>Car clubs and car sharing</i> The Mayor, working with boroughs, will provide on-street infrastructure (e.g. parking spaces and charge points) to support car clubs, especially those using electric or hybrid vehicles. The Mayor, working with boroughs and employers, will promote car-sharing by making better use of journey planning technology
2	Southwark will continue to implement, evaluate and publicise progress of measures to encourage sustainable travel choices within the borough.	Reducing the use of private cars in the borough and an incentive to avoid non-essential car journeys	1. - Encouraging smarter choices and sustainable travel	<i>Promoting smarter travel</i> Working with boroughs, the Mayor will develop further smarter travel schemes and initiatives, including workplace and school travel plans. Working with boroughs, the Mayor will encourage increased levels of cycling through a number of schemes including the central London Barclays Cycle Hire scheme; cycle training; and delivering Barclays Cycle Superhighways from inner to central London. Working with boroughs, the Mayor will encourage individuals to walk more by improving the quality of the walking environment, and the provision of information, e.g. through the further roll out of the Legible London way-finding system
3	Southwark will investigate funding opportunities to pilot a scheme to identify and implement local air quality improvements near to schools and publicise the results.	Reducing short – term pollution of NO _x and PM ₁₀	N/A	No direct London Mayor Air Quality Strategy proposal

No	Measure	Focus	GLA Air Quality Policy	Proposal
4	Southwark will mount a publicity campaign and investigate potential to undertake enforcement on idling engines at hotspots within the borough.	Reducing short – term pollution of NO _x and PM ₁₀	1. - Encouraging smarter choices and sustainable travel	<i>No unnecessary idling</i> The Mayor will make London a ‘no idling zone’ for parked vehicles with a particular focus on buses, coaches, taxis, private hire vehicles, and delivery vehicles. He will work with boroughs and other stakeholders to target locations where idling is a particular problem, gathering information on persistent idling vehicles, providing a mechanism for reporting problem idling and improving enforcement. The Mayor will work with the Government to ensure that the fixed penalty for idling represents a genuine deterrent
5	Southwark will undertake air quality assessments on all major highway traffic management schemes and initiatives and road safety schemes and initiatives > £1m in value	To ensure that the scheme will improve the local air quality.	3. - Identifying priority locations and improving air quality through a package of local measures	<i>Further identification of priority areas</i> Through TfL and the GLA, the Mayor will work with boroughs to identify other locations that have poor air quality (PM ₁₀ and NO ₂), which would benefit from targeted action for emissions reduction. TfL will work with boroughs and other stakeholders to establish a range of measures available to be applied at these locations, which boroughs will be required to include in their Local Implementation Plans and other relevant programmes
6	Southwark will deliver ‘in house’ smarter driver training to all employees that take the council’s internal driving test and investigate how to extend this out to all staff who are required to drive for work purposes..	To provide ‘eco-driving’ training to all staff	1. - Encouraging smarter choices and sustainable travel	The Mayor will reduce emissions from vehicles over which he has influence by implementing eco-driving training for bus drivers and GLA group drivers.

No	Measure	Focus	GLA Air Quality Policy	Proposal
7	We will develop an emissions strategy for all new council and council contractors' vehicles and plant.	To promote and encourage the use cleaner greener vehicles and plant.	4. - Reducing emissions from public transport	<i>GLA, borough and public sector fleets</i> The Mayor, through the functional bodies, and working in partnership with the Government, boroughs and other public sector bodies, will develop a 'low emissions strategy' for all of London's public sector vehicles with the objective of achieving zero tailpipe emissions.
8	Southwark will work with partner boroughs in the Central London Air Quality Cluster Group to establish a Central London Low Emission Zone.	To assess the feasibility and cost – effectiveness of central LEZ with other Boroughs and GLA.	5 Schemes that control emissions to air The Mayor will work with boroughs to assess the feasibility and cost effectiveness of a central London LEZ in the Congestion charging zone
9	Southwark will continue its implementation of energy efficiency measures in council owned buildings.	The reduction of emissions of NO _x and PM ₁₀ from properties	9 - Energy efficient buildings	The Mayor will <ul style="list-style-type: none"> • Work through the GLA, the London Development Agency (LDA) and with London Boroughs, London Councils and the Energy Saving Trust (EST) to deliver RE: NEW, a pan-London programme to retrofit residential properties to improve energy and water efficiency. • Work with the GLA group, London boroughs and other public sector organisations in London to implement the RE: FIT programme to improve energy efficiency in public sector buildings. • Work with commercial landlords and tenants through the Better Buildings Partnership to share knowledge in the commercial sector on implementing sustainable upgrades. • Work with businesses through the Green500 scheme to reduce their energy use. • Support London boroughs to deliver RE: CONNECT - Low Carbon Zones that demonstrate the potential for energy savings which will reduce emissions of NO_x resulting from physical measures and community engagement.

No	Measure	Focus	GLA Air Quality Policy	Proposal
10	Southwark will ensure that local energy generation plant will be fitted with suitable abatement and dispersal technologies, and encourage non-polluting renewable generation.	To ensure that the plant does cause a deterioration to the local air quality.	8. - Maximising the air quality benefits of low to zero carbon energy supply	<p>The Mayor will use his planning powers to: -</p> <ul style="list-style-type: none"> • Apply emissions limits for both PM and NO_x for new biomass boilers (including use of biofuels) and NO_x emission limits for Combined Heating and Power Plant (CHP) across London. These emission limits will be regularly reviewed as new evidence becomes available and abatement technology improves. This will be applicable at a strategic and local level. • Require an emissions assessment to be included as part of the standard air quality assessment that is submitted at the planning application stage for new developments that include biomass boilers or CHP. • Require biomass and CHP operators to monitor and provide evidence on a yearly basis in the form of an annual maintenance report to show continued compliance with emission limits
11	Southwark will continue to regulate Part B Processes to ensure that high standards of air pollution control are maintained.	To ensure that Part B processes do not pose no health risk to residents and visitors in the local area to the process.	N/A	No direct London Mayor Air Quality Strategy proposal
12	Southwark will require developers to adopt the measures included in the current Best Practice Guidance on construction and demolition within their environmental construction management plans.	The reduction of emissions of NO _x and PM ₁₀ by responsible management of the site.	6 - Reducing emissions from construction and demolition sites	<p>The Mayor will work with London Councils to review and update the Best Practice Guidance (BPG) for construction and demolition sites and then create Supplementary Planning Guidance to assist implementation.</p> <p>The Mayor will ensure that strategic planning applications include BPG implementation.</p> <p>The Mayor will require the GLA Group to include full implementation of the BPG in its procurement policy (including through the supply chain).</p>

No	Measure	Focus	GLA Air Quality Policy	Proposal
13	Southwark will monitor all travel plans received as part of the planning process for compliance and take enforcement action where appropriate.	To encourage the use of other means of transport other than private vehicles.	1. Encouraging smarter choices and sustainable travel	<i>Providing the right information to the public</i> The Mayor will provide clear information about emissions from the public transport fleet to enable people and businesses to make more informed transport choices.
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.	To ensure that new developments contribute to the local authority working towards the national air quality objectives	7. Using the planning process to improve air quality	The Mayor will use his planning powers to: <ul style="list-style-type: none"> • Develop a checklist to guide boroughs and developers in the assessment of the potential emissions from new developments. • Minimise increased exposure to existing poor air quality, particularly within AQMAs or where a development is likely to be used by large numbers of people who are particularly vulnerable to poor air quality. • Ensure air quality benefits are realised through developer contributions and mitigation measures as secured through planning conditions, section 106 agreements or the Community Infrastructure Levy, where appropriate. • Provide guidance for boroughs in producing their Supplementary Planning Documents on air quality to assist them in determining planning applications.
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.	To gather data in order the local authority can inform policy and ensure that decision can be made with all available data.	12. - Raising public awareness of air quality issues	The Mayor, through the GLA and the functional bodies, will work with London boroughs, the Government and the private sector to: Develop a central air quality website for London on the GLA website, which will include data, technical information and advice on how to improve air quality.

No	Measure	Focus	GLA Air Quality Policy	Proposal
16	Southwark will develop policies within its emerging Local Development documents that will require new development to reduce PM ₁₀ and NO _x emissions when compared to previous site use.	To use spatial planning process to promote 'air quality neutral' developments in the Borough.	7. Using the planning process to improve air quality	<p>The Mayor will use his planning powers to:</p> <ul style="list-style-type: none"> • Develop a checklist to guide boroughs and developers in the assessment of the potential emissions from new developments. • Minimise increased exposure to existing poor air quality, particularly within AQMAs or where a development is likely to be used by large numbers of people who are particularly vulnerable to poor air quality. • Ensure air quality benefits are realised through developer contributions and mitigation measures as secured through planning conditions, section 106 agreements or the Community Infrastructure Levy, where appropriate. • Provide guidance for boroughs in producing their Supplementary Planning Documents on air quality to assist them in determining planning applications.
17	Southwark will continue to promote the AirTEXT service at events and schools and will support other events relevant to air quality	Reducing the health impacts of air quality on the vulnerable persons in the Borough.	12. - Raising public awareness of air quality issues	Support the development and take-up of targeted information schemes such as airTEXT through lobbying, publicity campaigns and funding streams.
18	Southwark will provide up to date information on air quality via its website and will respond to and engage with residents to support community efforts to raise awareness and change behaviour.	Raising public awareness of air quality.	15. - Monitoring progress and reporting	The Mayor, through the GLA, will make information about air quality in London available to the public on the GLA website in a clear format. The Mayor will publish an annual Progress Report on his Air Quality Strategy and will revise the Strategy should changes be necessary to achieve national air quality policy objectives and relevant EU limit values.

No	Measure	Focus	Delivery Department	Planning Phase
19	Southwark will establish and maintain the operation of two automatic monitoring stations at the Elephant and Castle and Old Kent Road and supplement this with a diffusion tube survey to provide a more comprehensive survey of air quality in the borough.	To provide data to monitor the effectiveness of this strategy and inform policy decisions.	11. - Encouraging innovation	The Mayor will support the improvement of the air quality monitoring network in London so that it provides accurate and up to date information about air quality trends and current conditions in London.
20	Southwark will pursue its Tree Management Strategy and investigate opportunities to work together with the Mayor on the commitment to plant new trees in priority locations in accordance with the 'right tree right place' methodology, taking into suitable account the benefits and costs of street trees on air quality within the Borough and Camberwell.	To improve the environment of the local public realm.	10. - Improved air quality in the public realm	The Mayor will work with the London Boroughs and other organisations to: <ul style="list-style-type: none"> Plant trees in areas of poor air quality under the 'right place, right tree' principle through the Mayor's Street Trees programme and other schemes.

Appendix 4 Consultation

Consultation has taken place with a range of stakeholders.

Internal stakeholders have included: -

- Transport Planning;
- Planning;
- Climate Change / Sustainability Team;
- Public Realm;
- Design and Construction;
- Housing Energy team
- Parking;
- Community Engagement; and
- Legal Services.

External stakeholders consulted have included

- Defra;
- GLA air quality officers;
- Transport for London;
- London Councils;
- Environmental Protection UK;
- CIEH;
- Environment Agency;
- Natural England;
- SELCHP;
- Veolia;
- Southwark NHS and Public Health;
- Health Protection Agency;
- Freight Transport Association;
- Southwark Cyclists;
- Better Bankside;
- Team London Bridge;
- Southwark Friends of the Earth;
- Chambers of Commerce; and
- Living Streets.

The consultation was also publicised at each community council and opened generally to members of the public.

The authority would like to thank everyone for contributing to the consultation and responding with useful comments.

Appendix 5 - References

- 1 <http://www.communities.gov.uk/publications/corporate/statistics/indices2010?view=Standard>
- 2 <https://www.nomisweb.co.uk/reports/lmp/la/2038431870/report.aspx>
- 3 <http://data.london.gov.uk/datastore/package/estimation-health-impacts-particulate-pollution-london>
- 4 <http://www.parliament.uk/business/committees/committees-a-z/commons-select/environmental-audit-committee/news/air-quality-a-follow-up-report/>
- 5 <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31996L0062:EN:HTML>
- 6 <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31999L0030:EN:HTML>
- 7 <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32000L0069:EN:HTML>
- 8 <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2002:067:0014:0030:EN:PDF>
- 9 http://www.irceline.be/~celinair/documents/EU_guidelines/zwmet_pak_en.pdf
- 10 <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:152:0001:0044:EN:PDF>
- 11 <http://www.legislation.gov.uk/ukpga/1999/29/contents>
- 12 <http://www.london.gov.uk/publication/mayors-transport-strategy>
- 13 http://www.southwark.gov.uk/info/10010/southwark_partnerships/580/southwark_2016/1
- 14 <http://www.communities.gov.uk/documents/planningandbuilding/pdf/planningpolicystatement1.pdf>
- 15 <http://www.communities.gov.uk/documents/planningandbuilding/pdf/planningpolicystatement4.pdf>
- 16 <http://www.communities.gov.uk/documents/planningandbuilding/pdf/1758358.pdf>
- 17 <http://www.communities.gov.uk/documents/planningandbuilding/pdf/147444.pdf>
- 18 <http://www.communities.gov.uk/documents/planningandbuilding/pdf/planningpolicystatement23.pdf>
- 19 <http://www.london.gov.uk/thelondonplan/>
- 20 http://www.southwark.gov.uk/info/856/planning_policy/1241/the_southwark_plan/1
- 21 http://www.southwark.gov.uk/info/200151/supplementary_planning_documents_and_guidance/1254/sustainable_design_and_construction_spd/1
- 22 CERC (2011) Air quality Modelling for the London Borough of Southwark 13th May 2011
- 24 <http://data.london.gov.uk/laei-2008>
- 25 Carslaw D, Beevers S, Westmoreland E, Williams. M, Tate J, Murrells T, Stedman J, Li Y, Grice S, Kent A, and Tsagatakis I (2011) Trends in NO_x and NO₂ emissions and ambient measurements in the UK. Prepared for Defra version 3rd March 2011. King's College, University of Leeds and AEA
- 26 Defra (2011) Air Quality Plans for the achievement of EU Air Quality limit values for Nitrogen Dioxide (NO₂) in the UK, Draft Technical Report June 2011 Crown Copyright 2011
- 27 <http://www.legislation.gov.uk/uksi/1986/1078/contents/made>

28 <http://www.legislation.gov.uk/uksi/2002/1808/contents/made>

29 <http://www.right-trees.org.uk>