Air Quality Action Plan

2009 - 2014

THE ROYAL BOROUGH OF
KENSINGTON
AND CHELSEA

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The artwork on the front cover is by Vincent Freely of The Cardinal Vaughan Memorial School. He was the winner in the senior category of an air quality art competition that took place in spring 2007. The artwork on the rear cover of this document is by Alex Somerville-Cotton of Hill House School, who was the winner in the junior category.

A number of schools participated in the air quality art competition and we were extremely impressed with the high standard of the entries. This inspirational work gives us hope that future generations will grow with an awareness of the effects of pollution on our environment and health and that they will make better informed choices where travel or building emissions are concerned.

Foreword

Poor air can have a significant impact on our health. It can increase our risk of heart and lung disease and can lower the resistance of our immune system; it is also associated with asthma. Whilst the Council has been working to try to improve air quality for a number of years, it has become apparent that the measures introduced, though successful in their own right, have not reduced concentrations of pollution as much as we would have liked.

I know that air quality is a real concern to you all and I too am very keen to see an improvement; I therefore welcome the production of this renewed action plan which, among other things, not only focuses on reducing emissions from vehicles, but also, for the first time, targets buildings – existing and proposed. This is a great step forward, not least because we will be looking at buildings that the Council owns and seeing what changes we can make.

I would like to thank those of you who took part in the consultation exercise of the draft action plan; your feed back was extremely useful and has really made us think.

Now we just have to act. Only by working together can we make a difference and I hope this plan guides us in doing this.

Councillor Paget-Brown
Cabinet member for Transportation, Environment and Leisure

Contents

Section 1: Introduction 1
1.1 Aims and objectives 1
1.2 Background - National and Local Air Quality Management 1
1.3 Health and air quality 3
1.4 Climate change and air quality 4
1.5 Consultation 4

Section 2: Air quality in Kensington and Chelsea 6
2.1 Monitoring of air quality 6
2.2 Trends in air pollution levels 6
2.3 Sources of NO_2 and PM_{10} emissions in the Royal Borough 10
2.4 Modelling future pollution trends 12

Section 3: Progress towards improvement..... 14
3.1 Air Quality Action Plan progress 14

Section 4: The Council's new action plan proposals 19
A. Protecting public health and the environment 19
B. Leading by example 23
C. Reducing emissions from new developments 26
D. Reducing emissions from existing buildings 28
E. Reducing emissions from road transport 32
Summary of actions 39

Section 5: Cost benefit analysis 44

Appendix I: List of acronyms and abbreviations 47
Appendix II: National air quality objectives 50

Executive Summary

Residents of the Royal Borough are understandably worried about local air pollution. The two pollutants of concern are nitrogen dioxide and particulate matter suspended in the air, referred to as particles. These pollutants come from two main sources: the exhausts of the millions of vehicles that travel through the borough's dense network of roads on a weekly basis and emissions from both residential and commercial buildings. They can cause serious health effects and current health advice suggests that exposure to the pollutants is responsible for four times as many premature deaths in London each year as fatalities from road accidents. There are also well founded fears that poor air quality is reducing the development of children's lung capacity by as much as ten per cent, and that lives are being shortened by several years, rather than months as previously thought, as a result of exposure to the pollutants.

The Council has been working hard to reduce pollution levels in the Royal Borough following the first Air Quality Action Plan (AQAP) produced in 2003. Measures have been implemented by a number of different Council departments, reflecting the diverse nature of the problems we face. However, despite this and the introduction of many regional measures (like the Congestion Charging Zone (CCZ)), monitoring data shows objectives in Kensington and Chelsea are still not being met, highlighting the need for new and more effective measures. However it has to be recognised that air quality in London is the product of activities elsewhere in the south east and even in northern Europe, as well as metropolitan traffic and building emissions. It is therefore crucial that local action is fully supported regionally and nationally by government policies; the impact of actions taken by one London borough is almost imperceptible, when it comes to detecting air quality improvements. This aspect and the Council's vision for future improvements to air quality will be the subject of a concise Local Air Quality Strategy to be published in 2010.

There is a direct relationship between this renewed Air Quality Action Plan (and its associated local strategy) and several other Council strategies, namely the Environmental Policy Statement, the Climate Change Strategy, the Affordable Warmth Strategy and the Local Development Framework (LDF) being developed by the Planning Department. These all come under the 'umbrella' of the Community Strategy.

This plan sets out the actions that the Council will implement over the next five years. To give the action plan a fresh impetus, it includes some new focus areas. Because of our concern about the effects of pollution on health, we are extending our pollution monitoring network to include fine particles ($PM_{2.5}$) and are starting to take a more concerted look at indoor air quality. We are also giving greater consideration to reducing emissions from buildings (new and existing) taking the lead by reducing emissions both from Council buildings and vehicle fleet and accounting for this using the new national indicator NI 194. With our Planning colleagues we are introducing an air quality action fund (as part of 'section 106' agreements) as a means to counteract adverse effects of new developments, although our first priority will be to steer developers towards technology that reduces emissions. However, we will not forget the contribution that vehicle emissions continue to make to air pollution and are working with others to look at the possibility of a local Low Emission Zone (LEZ), and how electric vehicles can contribute to reducing local pollution.

As well as these new areas, the plan continues to include measures to encourage residents and those who work in the borough to change their behaviour and use less polluting modes of transport – cycling, walking, alternative fuels and car clubs.

In developing this latest action plan, an extensive consultation process was undertaken. This involved statutory consultees, residents' associations, interest groups and individuals. Support was received for the majority of the actions proposed in the plan. In particular, respondents supported those relating to the Council taking the lead in reducing emissions from its building and vehicles, raising awareness of emissions from boilers, and the need for electric recharging infrastructure within the borough.

Section 1: Introduction

1.1 Aims and objectives

The main aim of this renewed action plan is to propose and deliver measures in the Royal Borough that will work towards meeting national air quality objectives. We want to encourage residents and those who work or study in the borough, to actively participate with the measures in the action plan, and to raise awareness of air quality issues in the local community. To give our action plans a fresh impetus we have given greater weight to reducing emissions from buildings. Over the next five years we hope to make measurable inroads into helping owners to improve the energy efficiency of their buildings and also improve the energy performance of the Council's buildings.

During the past five years there has been growing evidence of the health effects of air pollution and at the same time there are well known health benefits in increasing the efficiency of heating in housing and making this affordable to the vulnerable in the community. These benefits, combined with the need to minimise the impact of climate change, obviously make it advantageous to coordinate action plans to deliver in these three aspects.

The main objectives of this action plan are to:

- Protect public health and the environment by monitoring air quality, regulating industrial emissions and raising awareness of health effects of pollution and motivating behavioural changes;

- Lead by example by reducing emissions from Council and contractors' buildings and vehicles and increasing the use of renewable technology;

- Reduce emissions from new developments (during the construction phase and in subsequent use) and existing buildings by implementing energy efficiency measures and affordable warmth schemes to reduce heat loss and drive down fuel bills; and

- Reduce emissions from road transport; this includes encouraging alternatives to the car, reducing emissions from vehicles on the road and encouraging the uptake of alternative 'low emission' vehicles.

1.2 Background - National and Local Air Quality Management

Air quality affects everyone who lives or works in the borough, irrespective of their background, age or social status. Kensington and Chelsea suffers from poor air quality like other inner London boroughs and many urban areas in other parts of the country. The majority of our air quality is poor because of two pollutants in particular – nitrogen dioxide (NO_2) and particulate matter (PM_{10}), referred to in this report as particles.

Since the introduction of the first National Air Quality Strategy in 1998 (NAQS)[1] (foreshadowed in the Environment Act 1995) local authorities and the Government have been working towards meeting health-based targets. At the outset, in areas where national air quality objectives were not being met, local authorities were required to take specific steps to identify and address the problems. Consequently in December 2000, the Council declared the whole of the Royal Borough an Air Quality Management Area (AQMA) based on exceedences of two pollutants - NO_2 and PM_{10}.

This resulted in the production of the first Air Quality Action Plan in 2003, which proposed 25 actions to tackle air pollution, including measures such as enforcing the idling engine regulations, the development of green travel plans in schools and the encouragement of city car clubs.

Many of the actions identified in the original action plan have been successfully completed. At the same time significant measures to improve air quality have been taken by the Mayor of London, such as the creation of the Congestion Charging Zone and more recently the creation of the Low Emission Zone. In the former case, the CCZ has been a fairly blunt instrument for improving air quality and it has been difficult to discern any significant benefit, and its detrimental effects along the periphery may have locally offset the benefits. In the latter case it was expected at the outset that the emissions standards would need tightening and the range of vehicles for which the restrictions applied would need widening to include smaller vehicles before substantial benefits materialised. There have also been important lessons learned from the use of alternative fuels and hybrid vehicles. Though promising, the development of hydrogen cell technology for cars is still an ambition rather than a reality. There are other concerns regarding the sustainability and variable performance of biofuels.

Despite good progress with these actions, levels of the two problematic pollutants are not decreasing as steadily as predicted by the Government. In certain locations levels have hardly changed, which meant they failed to meet the objectives set for 2004 and 2005 (see Appendix II, P50), and continue to seriously damage health. The reason for this may be that the Government's earlier assumptions about the air quality benefits of new vehicle technology were too optimistic. Moreover, the latest national Air Quality Strategy published in 2007 introduced new tighter national objectives for particles, reflecting increased medical concern; this has been reinforced by research identifying particular harm being done to the development of children's lungs. These present an even greater challenge and we anticipate, in due course, local authorities will also have to work towards stricter standards.

The Government is particularly concerned that the UK is failing to meet EU air quality objectives for PM_{10} and NO_2 and there is renewed emphasis on local authority action plans and whether measures being taken are sufficient, relevant, and up to date. This and other considerations prompted us to renew our Air Quality Action Plan in order to set fresh targets and identify new measures to improve local air quality.

[1] Air Quality Strategy (AQS) for England, Wales, Scotland and Northern Ireland (Department for Environment, Food and Rural Affairs (Defra), 1998)

1.3 Health and air quality

From a public health perspective, air quality has direct implications for human health, with both short-term and long-term exposure to elevated levels of pollutants causing concern. Research has shown that exposure to particulate matter and nitrogen dioxide increases our risk of cardiovascular and pulmonary diseases and cancer, lowers the resistance of our immune system and is associated with asthma. Groups most at risk are the elderly and very young, and those with pre-existing pulmonary or cardiovascular problems.[2] A recent study suggests a relationship between long-term exposure to air pollution and inhibited lung development in children which may reduce their potential lung capacity by up to ten per cent throughout their lifespan and becomes particularly significant in later years.[3] It is also important to understand when considering the Government's statistics which refer to premature mortality measured in months, that this is derived from national average statistics. In London, the reduction in lifespan for those over 30 years of age may be as much as ten years.

Air pollution also affects building materials, leading to soiling and the degradation of buildings, as well as dirtying internal fabrics, furnishings and fittings. It also damages the natural environment and suppresses crop yields in rural areas.

Research commissioned by the NHS Executive London[4] found that more people in London are harmed every year by air pollution from road transport than by road accidents. It is estimated that approximately 1,088 respiratory hospital admissions and approximately 3000 premature deaths are caused annually by air pollution in the capital.[5] In comparison, road accidents in London led to 231 deaths in 2006. Annually, 24,000 people in the UK die prematurely as a result of air pollution.[6]

A survey conducted in 2005 (Residents' Panel May 2005) showed that reducing air pollution was one of the most important environmental issues for local residents, and feedback from residents since then has continued to emphasise local concern for the poor quality of our air. The Council recognises this and is committed to making air quality central to its policies. This commitment is reflected in the production of the latest draft of the Community Strategy (2008) and the integration of air quality into planning considerations in the Local Development Framework. The LDF is a framework of documents which will replace the existing Unitary Development Plan (UDP) - the current principal policy document which shapes decisions relating to land use within the borough. A specific Air Quality Supplementary Planning Document has recently been published that sets out for developers the Council's requirements to reduce the detrimental impact of redevelopment on air quality.

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[2] Health Aspects of Air Pollution: Results from the WHO project "Systematic Review of Health Aspects of Air Pollution in Europe", World Health Organisation, June 2004.

[3] Effect of exposure to traffic on lung development from 10 to 18 years of age: a cohort study Feb 17, 2007, The Lancet, Vol. 369 No. 9561 pp 571-577

[4] Transport and Health in London: a Report for the NHS Executive, London 2000

[5] Every Breath You Take: An investigation into air quality in London, London Assembly, May 2009

[6] - Mayor's Air Quality Strategy, Progress report to March GLA, 2005.

- Every Breath You Take': An Investigation into Air Quality In London, London Assembly May 2009

- Air Quality and Health (COMEAP) Jan 1998

-TfL fact sheet 'Casualties in Greater London during 2006, 2007'

1.4 Climate change and air quality

The observed rise in global temperatures over the last century has been associated with increases of man-made emissions of so called greenhouse gases, in particular carbon dioxide (CO_2). If the current trend continues this could result in important changes in global weather patterns leading to more frequent extreme weather events, hotter and drier summers, flooding and rising sea levels. This in turn would have detrimental social, economic and environmental effects.

Climate change will have an impact on both local air quality and human health. Warmer temperatures and more frequent sunny hot days will result in an increase in ground level ozone concentrations. Ozone is an irritant and can exacerbate the effects of existing respiratory and cardiovascular health conditions.

Air quality and climate change are intrinsically linked. Air quality is dependent on weather factors such as wind, which influences how pollutants are dispersed, and temperature and humidity. Greenhouse gases and air pollution share common sources, notably the combustion of fossil fuels, and therefore measures to tackle climate change are often likely to be beneficial to air quality and vice versa. However, this is not always the case, as in the use of diesel fuel and the firing of boilers with biomass. Diesel vehicles are more fuel efficient than petrol and produce less CO_2, however they emit more particles and NO_2. Similar considerations apply to biomass; in certain situations using biomass as a fuel for boiler furnaces may be more sustainable, but its emissions will contain more particles and polycyclic aromatic hydrocarbons. There are also practical difficulties in using biomass efficiently as a fuel.

These types of possible conflicts and issues must be carefully considered when setting policies and measures to address climate change and air quality.

As well as relating to the Council's Climate Change and Affordable Warmth Strategies, the plan is supported by the Environmental Policy Statement and the Community Strategy. Specifically, The Future of Our Community called for the 2003 Air Quality Action Plan to be refreshed. There has been a clear need to firmly link the plan to the emerging Local Development Framework of Planning policies, within the core strategy and Supplementary Planning Documents (SPDs) in particular the Air Quality SPD that provides guidance to developers.

Until now the Council has relied on the combination of the Air Quality Management Area declaration, the Air Quality Action Plan and annual air quality reviews and progress reports to reflect its policy on improving air quality. However, to express its renewed determination to reduce air pollution, the Council will be publishing a short Local Air Quality Strategy as a statement of intent and with a greater sense of vision in order to develop a clearer dialogue between local, regional and national policy making.

1.5 Consultation

The measures in this action plan are the result of an evaluation of options for action, cost-effectiveness analysis and the representations made by residents and other interested parties during a public consultation. A consultation paper was designed in autumn 2008 to aid a wide-ranging discussion of the issues surrounding local air

quality and to stimulate ideas and suggestions for the new edition of the action plan. The consultation ran from 16 December 2008 to 13 March 2009. A number of statutory consultees were contacted as below:

- The Secretary of State
- The Environment Agency
- Transport for London
- The Mayor of London
- All neighbouring local authorities
- Other public authorities as appropriate
- Bodies representing local business interests and other organisations as appropriate

The Council also contacted residents' associations, interest groups and individuals who had expressed an interest in air quality issues. Council officers attended a number of meetings with residents' associations and groups as well as partner organisations (i.e. Health Protection Agency and local NHS) to enable a lively debate and explore opportunities for future collaboration. Two public consultation workshops were held in February 2009.

A summary of the consultation responses was reported as part of the Key Decision process to adopt the plan.

This action plan is the result of a commitment by the Council to fundamentally review its original action plan published in 2003. This document outlines the individual actions the Council will take over the next five years, in order to reduce pollution levels in the borough. As required by the latest government guidance on producing action plans (Defra, 2009) we have identified clear measurable targets to be achieved by a specified date and have briefly assessed the cost effectiveness of each action. Table 2, in Section 4, outlines the main measures included in the action plan and the targets and timeframe for their implementation.

Section 2: Air quality in Kensington and Chelsea

2.1 Monitoring of air quality

The starting point of local air quality management (LAQM) is measuring the problem by continuously monitoring the varying concentrations of key pollutants which have the potential to affect human health, in order to work out how much progress is being made towards achieving acceptable levels of pollution (as determined by the national objectives). Pollutant concentrations of course vary with weather conditions, the time of day and where they are monitored.

In technical terms, the Council has an obligation to monitor and manage the levels of seven key pollutants in the borough: benzene, 1,3-butadiene, carbon monoxide, lead, nitrogen dioxide, particles, and sulphur dioxide. At the moment, as mentioned in the introduction, only two of these pollutants: nitrogen dioxide and particles continue to exceed national objectives and are cause for serious concern. Additionally, the Council monitors levels of ozone and reports on polycyclic aromatic hydrocarbons (PAHs), but these are not currently included in the LAQM regime.

The Council has five long-term continuous monitoring stations that are all part of the London Air Quality Network (LAQN) and 28 diffusion tube sites located across the borough, as shown in Figure 1. These monitoring sites are all operated to high standards of quality assurance and quality control, which are equivalent to those of the Government's network, thus ensuring good accuracy, precision and reliability.

2.2 Trends in air pollution levels

There are two types of national objectives, which the borough is required to meet for PM_{10} and NO_2, measured as averages over long or short periods and expressed as the weight of the pollutant in a cubic metre of air; the unit µg is one millionth of a gram.

- **Annual mean** objective: - this is set at 40 µg/m^3 for both pollutants and was to have been met by 2004 for PM_{10} and by 2005 for NO_2.

- **Daily mean** (24 hr) and **1hr mean** objectives: - 50µg/m^3 not to be exceeded on more than 35 days per year for PM_{10}; 200 µg/m^3 not to be exceeded on more than 18 occasions per year for NO_2.

Nitrogen dioxide (NO_2)

Figure 2 shows that levels of NO_2 at all sites have been above the annual mean objective shown as a red line (at 40 µg/m^3) since 1996, apart from North Kensington, which fell below the objective level for the first time in 2006 and has remained just below since then. North Kensington is a background site away from main roads. At most roadside locations annual NO_2 concentrations are currently at a level above 80 micrograms per cubic metre (µg/m^3), more than twice the national objective

concentration. Marylebone Road in the City of Westminster is shown for comparison purposes.

Figure 1

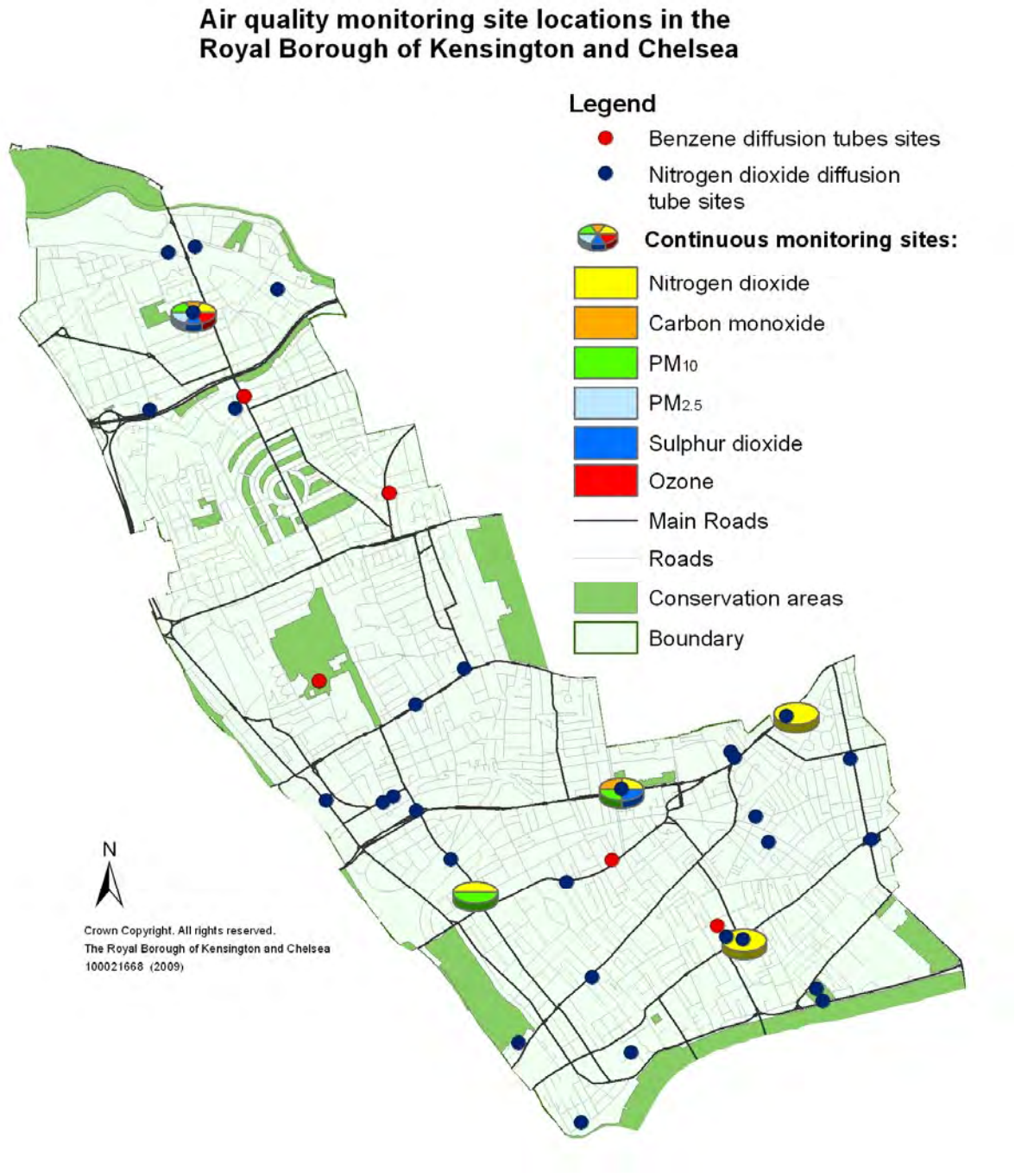
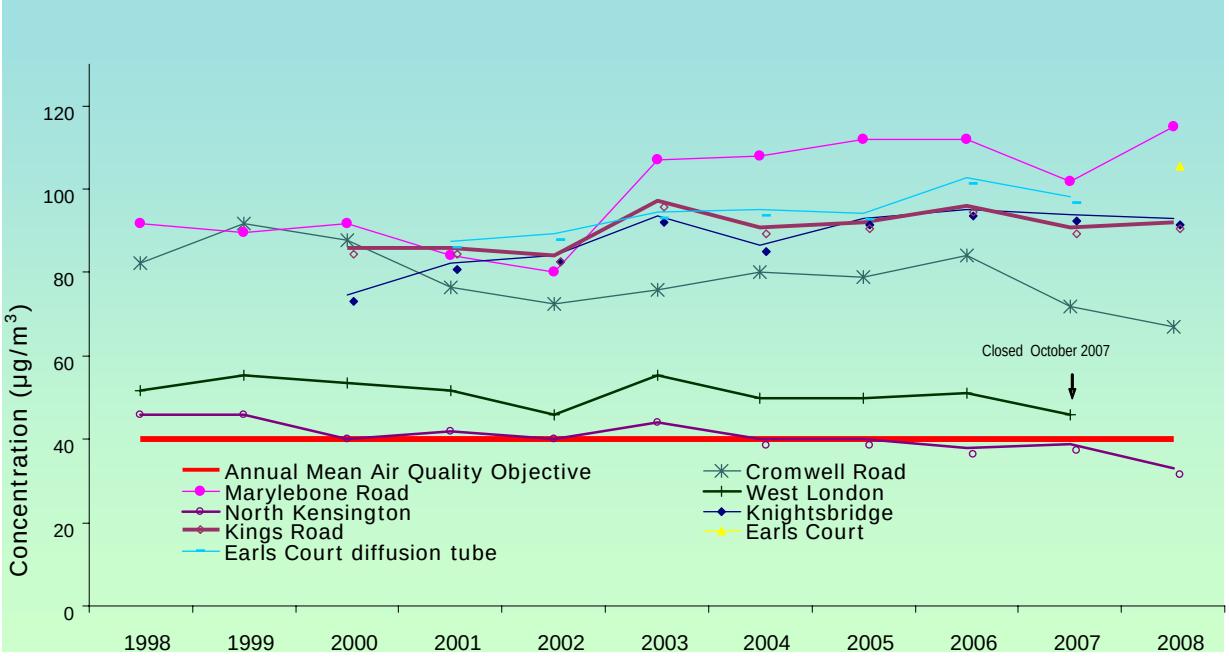


Figure 2 Exceedences of the annual mean NO_2 objective in the borough



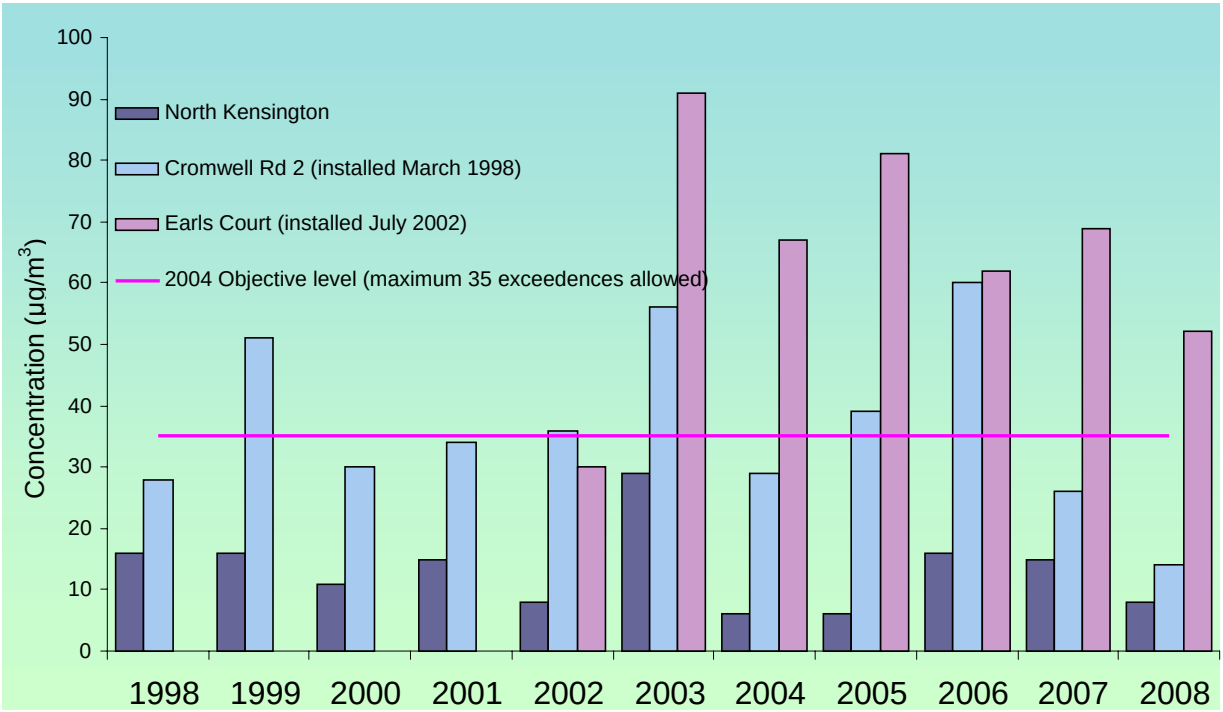
The hourly mean objective has been exceeded at three monitoring locations in 2008, namely Knightsbridge, Chelsea Town Hall and the Earl's Court site, which was installed in 2008. The number of exceedences at the Chelsea site increased compared to 2007, however it remains below the number reached at the site in 2006. The Knightsbridge site has shown a steady increase in the number of hourly exceedences since monitoring began at this site. The site, though 'a worst case' location, is nonetheless relevant in terms of exposure as it is a busy shopping area.

Particles- PM_{10}

We monitor particles (PM_{10}) invisible to the naked eye (less than a tenth of the width of a human hair). Whilst no clear trend in annual mean PM_{10} levels can be seen, all sites show slight reductions between 2007 and 2008. Only North Kensington shows a longer term overall reduction since 1995. Measurements at most sites show compliance with the annual mean objective, however the Earl's Court site only just met it in 2008 and so we are not confident that this compliance is reliable yet.

The 24 hour (or daily mean) objective has been regularly exceeded at the roadside locations (shown in Figure 3) but again there is no clear overall trend. There has been a reduction in the level at both the North Kensington and Cromwell Road sites since 2006, and both of these sites achieved the objective level in 2007 and 2008. The exceedences at the Earl's Court Road site are substantial. The extent of the exceedences is likely to be dependent on factors such as weather conditions.

Figure 3 Exceedences of the daily mean objective for particles (PM_{10})



Fine particles – $PM_{2.5}$

In addition to PM_{10}, we also monitor another size fraction of particulate matter, $PM_{2.5}$, referred to as fine particles. This is the proportion of PM_{10} making up the finest size fraction of particulate matter measured by local authorities, which due to its minute size (≤2.5 µg/m^3 in diameter) can reach deep into the lungs and even cause damage beyond the lung's lining. Although it is not separately classed as a key pollutant yet, the danger to human health that this pollutant poses has been recognised by the latest national Air Quality Strategy (2007) and a new approach termed the 'exposure reduction framework' has been introduced. It is designed to achieve a more widespread reduction of particles rather than targeting pollution hotspots. A preliminary consideration of $PM_{2.5}$ data indicates that annual mean levels locally are probably within the cap of 25µg/m^3 (to be achieved by 2020) at background locations, however roadside locations are likely to be above this exposure limit. Monitoring shows that levels are changing very little, or perhaps even showing a slight increase. We are hoping to establish a roadside monitoring site during 2009.

Overall monitoring results show some improvement in concentrations of nitrogen dioxide and particles, **however, many locations stubbornly remain above the objective levels**. In particular, short term (hourly/daily) objectives for nitrogen dioxide have apparently increased at a few roadside locations compared to 2007 levels.

The remaining five key pollutants managed by local authorities already meet objective levels and continue to show very small reductions, or have largely stabilised. Ozone, a key pollutant not managed through the LAQM process, continues to be a cause for concern. This is because of its irritant effects on the eyes and throat, and because monitoring data from the North Kensington site, which is representative of a worst case location, shows a continuous rise in concentrations and levels have exceeded the objective for the past six years.

2.3 Sources of NO_2 and PM_{10} emissions in the Royal Borough

It is important to identify the origin of the two key pollutants of concern; technically this is termed 'source apportionment', in order to target these sources and adopt effective measures to reduce emissions. The London Atmospheric Emissions Inventory (LAEI) has been used to examine the sources of pollutants in the borough. The 2006 LAEI was released in April 2009.

NO_2 comes from nitrogen oxides (NO_x) that react with other gases in the air to produce NO_2. Currently there are three main sources of nitrogen oxides: road transport, gas consumption in buildings and railways.

The burning of gas in domestic/commercial premises (i.e. boilers) amounts to the largest source of NO_x emissions in Kensington and Chelsea (see Figure 4), accounting for 47 per cent of the emissions.

This shows the important links that need to be made with energy efficiency measures to reduce gas usage. By 2010 estimates suggest that the proportion of NO_x contributed from this source will increase to 49 per cent.

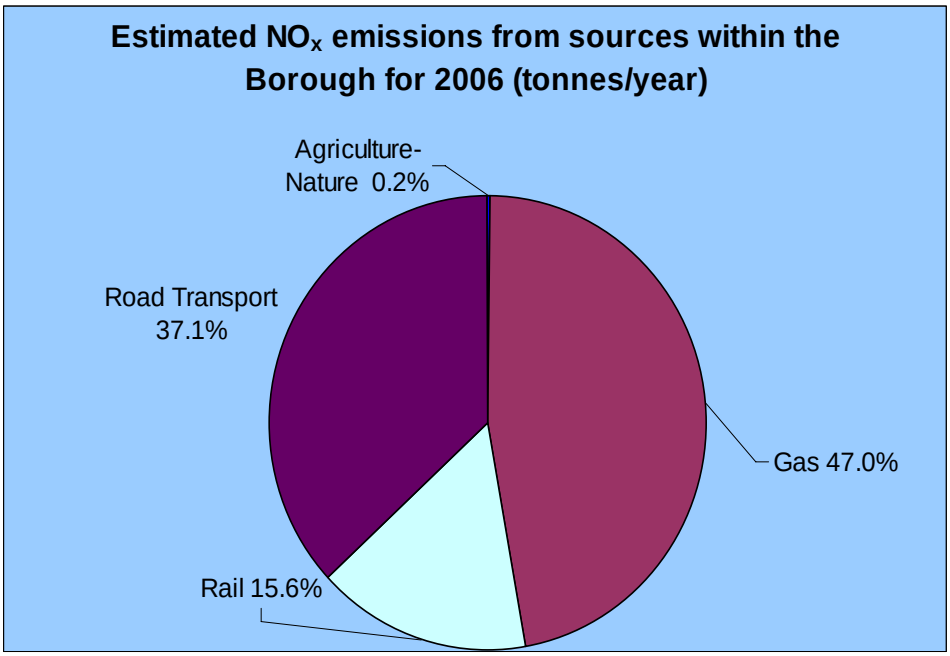
Transport is the other main source with road transport contributing to 37 per cent of emissions and diesel powered trains on the railways responsible for 16 per cent of emissions (underground trains of course are not included in this category as they are electric and their contribution to local emissions is considered to be insignificant). The relative proportions of the total emissions from both of these sources increased from 2004 to 2006.

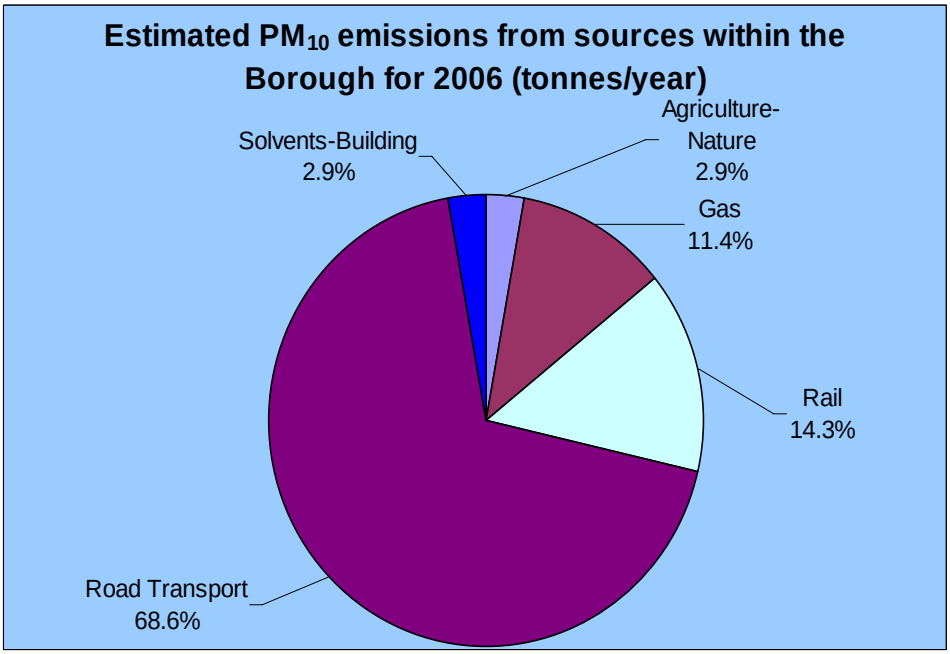
In contrast, the majority of PM_{10} pollution emanates from road transport (see Figure 4) while the contribution from railways (the borough has two major rail corridors – the Paddington Mainline and the West London Line) is similar for both pollutants. It is important to note that trans-boundary sources of PM_{10} are not accounted for in the inventory referred to above. This means that actual particulate levels may be significantly higher than estimated.

It is believed that further expansion at Heathrow airport may lead to an increased contribution to the NO_x and PM_{10} emissions in the borough due to airport related traffic. In addition, it has been suggested that the improvements in aircraft fleet may not be sufficient to offset the greater volume of emissions released from the larger numbers of aircraft that will use the airport.

The Council, as part of the 2M Group will continue to lobby the Government against a third runway and further expansion. The 2M Group is an all-party alliance of local authorities concerned at the environmental impact of Heathrow expansion on their communities. The group, which took its name from the two million residents of the original 12 authorities, now represents 21 councils with a combined population of around 4.5 million people.

Figure 4 Source apportionment of NO_x and PM_{10} borough emissions





The 2006 LAEI shows that airport emissions were not a direct contributor of NO_x and PM_{10} emissions in the borough in 2006, nor is it estimated that they will directly contribute to emissions in the borough in 2010, though this could change in the future should significant expansion take place.

2.4 Modelling future pollution trends

Air quality modelling is used as an alternative to monitoring. It is a useful tool that allows predictions to be made on how certain factors/activities may affect emission levels. Modelling is less accurate than direct monitoring as the resulting predictions depend heavily on the validity of input data, inbuilt assumptions, and the factoring in of various variables, such as weather conditions. However, the computer models used have developed considerably over the past ten years and show an improving correlation with monitoring results.

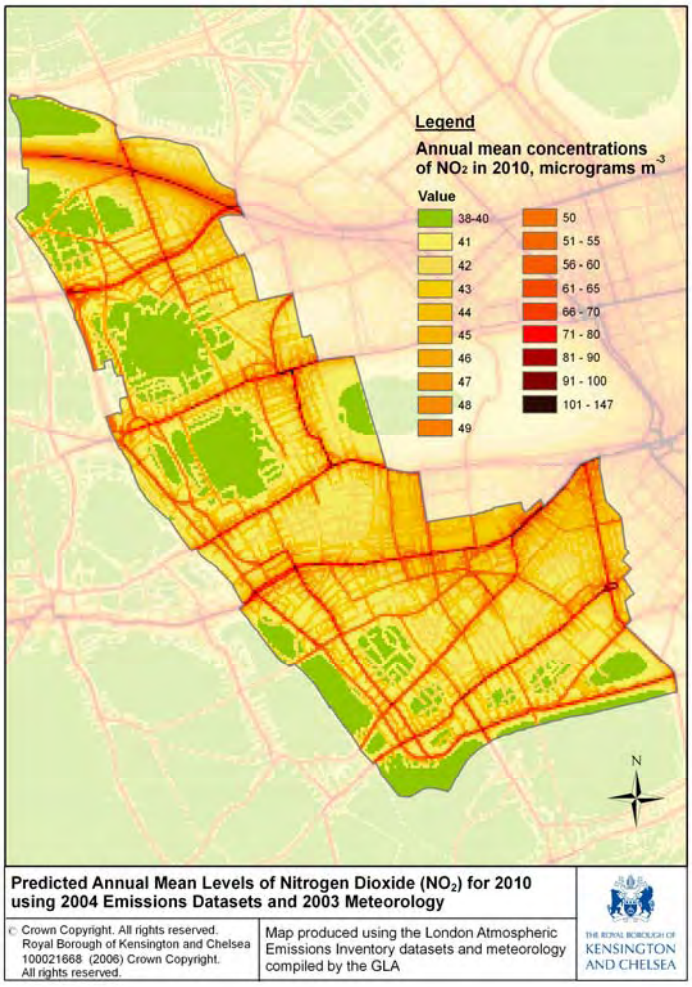
Figure 5 (next page) shows the locations of predicted exceedences of the National Air Quality Objectives for PM_{10} and NO_2 for 2010. The map shows that the objective for NO_2 will still be exceeded over a large part of the borough (all but green areas) with levels along major roads substantially in excess of the objective. Only isolated areas away from major routes and in less densely populated parts of the borough are likely to fall below the objective.

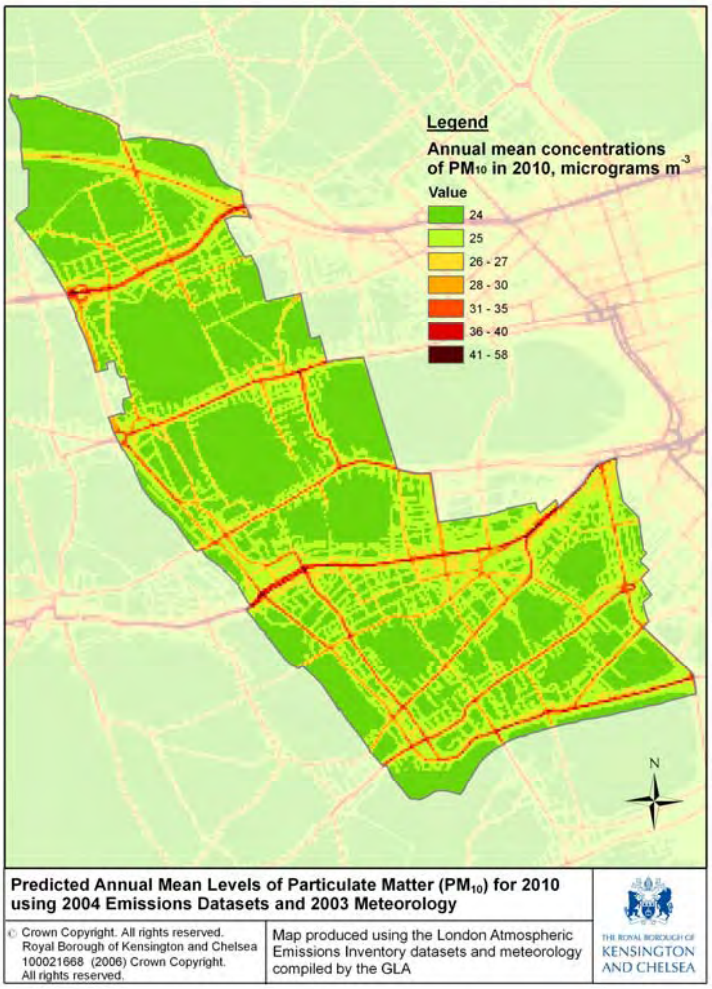
The map for PM_{10} shows a better picture, but close inspection reveals a number of points along the major routes which are predicted to fail the objective and adjacent areas that are at serious risk of failing. The actual outcome may be largely dependant on factors such as weather conditions and the rate at which cleaner vehicles are purchased. One can conclude from this that we should pay close attention to other sources of pollution aside from road traffic.

The study of source apportionment (of sources within the borough) confirms that nitrogen oxide emissions from burning gas for domestic and commercial heating are potentially as important as those from vehicles and may become more significant in the future.

Detailed information on levels of key pollutants and monitoring methods can be found in the latest Local Air Quality Management report (2008) available at:
http://www.rbkc.gov.uk/environmentandtransport/airqualityandpollution.aspx

Figure 5: Modelled predicted exceedences of the national objectives for PM_{10} and NO_2 for 2010. National air quality objectives: PM_{10}: 40µgm^3 (annual mean) to be met by 2004; NO_2: 40µgm^3 (annual mean) to be met by 2005.





Section 3: Progress towards improvement

3.1 Air Quality Action Plan progress

Over the past six years, many of the measures in the original action plan have been implemented, and for some actions progress is continuing beyond the original target. Changing circumstances and technological advances have made some of the previously proposed measures inappropriate or impractical, and wherever possible, alternative options have been pursued. We briefly review below the progress made by the Council in successfully implementing the actions proposed in the original action plan.

In regulatory terms, the Low Emission Zone has been implemented across London by Transport for London (TfL). The first phase, which began in February 2008, requires operators of diesel heavy goods vehicles (HGVs) to use vehicles that meet prescribed emission standards for particulate matter of Euro III or better. Vehicles not complying with the standard in the zone are paying a £100 or £200 daily fee (depending on the vehicle and its weight), or facing a fine of £1000.

A vehicle emissions testing scheme was run for ten days in cooperation with the Metropolitan Police and neighbouring boroughs, between August 2003 and March 2004. The scheme was found to have been successful in generally raising awareness of air quality issues and vehicle maintenance; however difficulties in the time taken to stop and test vehicles and subsequently to trace the vehicles' owners, which involves Driver and Vehicle Licensing Agency (DVLA) and Metropolitan Police resources, has meant that this is an inefficient enforcement tool. Remote emission sensing techniques may in future offer a quicker testing method, provided the evidence is sufficiently robust for the Courts, however further collaborative work would still be needed to ensure sufficient priority is given to the processing of ownership enquiries.

Enforcement of the idling engines legislation, which gives the Council power to require drivers of stationary vehicles to switch off 'idling' engines, has been operating since 2005. Council enforcement officers have attended 44 complaints to date, warning drivers to switch off their engines, and they have done so in every case; no Fixed Penalty Notices have been issued yet. Local bus stands now have signs up demanding that bus drivers switch off engines and this has had a positive effect. The enforcement team continues to monitor hotspots and use the available enforcement powers whenever possible.

The Council has pioneered a car club network, which now spans the entire borough. The first car was launched in February 2003 and the Council now leads the London Car Club Consortium (LCCC). The scheme has been very successful, attracting approximately 4,500 members in the borough to date. We now have 97 on-street spaces (with 30 additional bays off-street) in Kensington and Chelsea which are run by three different operators. In terms of convenience 98 per cent of residents are within five minutes walk of a car club bay. Following negotiations with the operators, hybrid vehicles now form a third of the car club fleet. Active consideration is also being given to doubling of the on-street car club bays.

The Council has also continued to encourage responsible cycling and free cycle training has been made available to all who live or work in the borough. Cycle racks have been installed in response to individual requests wherever possible, and a review of cycle parking at major attractions has also been undertaken. An investigation into the innovative provision of cycle racks in under utilised pay and display parking bays where there is a high demand and little scope for further racks on the footway is also underway. In addition, Council officers are undertaking reviews and safety assessments of bicycle routes which make up the London and local cycle route networks. These and other interventions across London have helped see cycling levels increase on London's major roads by 83 per cent since 2000.

Other actions which have been completed in terms of their original targets, but where further work continues to be beneficial include:

- Cleaner Council and contractor vehicles;
- Encouraging walking and cycling: e.g. travel planning;
- Graduated parking permits;
- Green building site code of practice;
- Freight Quality Partnership.

The work that the Council has been doing to reduce vehicle emissions and unnecessary car trips within the borough has resulted in a number of improvements. For example, the implementation of travel plans in schools has led to a 12 per cent reduction in car trips since 2005 with a corresponding increase in walking, cycling or riding a scooter.

The introduction of the car club network has also benefited air quality. Residents who switched from private car use to the car club have reduced their emissions by as much as 95 per cent for NO_x and 97 per cent for PM_{10}. These dramatic reductions result from the use of vehicles with markedly higher Euro emissions standards and a reduction in casual car use. Residents make a more informed choice before deciding to use a car in preference to another mode. However, while these figures are encouraging they do not account for a large proportion of total emissions and there is still much work to be done.

Unfortunately, these reductions in themselves are not significant in terms of their effect on local air quality and will not produce a noticeable trend in monitoring results. This is partly because the reductions are so small compared with the overall quantity of emissions, and partly because pollutants can be persistent (often still detected some time after the source has been removed).

As an inner London borough Kensington and Chelsea is crossed by a number of arterial roads carrying millions of vehicles per week. In fact, a large proportion of emissions in the borough come from through-traffic over which the Council has little control. This highlights the potential contribution of London-wide measures if national air quality objectives are to be met.

Nonetheless, local measures can make a difference, every gain helps, and it is important that the positive trend seen in recent years is continued. Poor air quality

results from our individual choices and it is ultimately up to everyone to consider the environmental effects of their decisions, for example, when renewing their domestic boilers or using a particular means of transport.

A comprehensive summary of the progress made with measures in the original action plan can be found in the latest Air Quality Action Plan Update, which can be found on the Council's website, www.rbkc.gov.uk.

A brief summary of actions from the 2003 action plan with targets and implementation timeframes is contained in Table 1 on the next page.

Table 1: Progress in implementing 2003 actions

No	Action	Relative air quality benefit	Costs Low:<10K Medium 10-100K High 100K	Other benefits	Priority	Progress:(1=minimal, 5= major, 6=complete, 6* =complete and ongoing)	Main partners
1	LEZ	Predicted low	Predicted High		Medium	**6***	GLA
2	Emission testing	Low-medium	Low	Climate change	Low/ Medium	**6**	London Councils
3	Idling engines	Medium	Low	Noise	Medium	**6***	Coach operators, TfL
4	Cleaner Council and contractor vehicles	Medium	Medium	Climate change	Medium	**6***	Council contractors/ London Councils
5i	Improved cleaner fuel infrastructure	Medium	Medium		Medium	**4**	Sita/ GoBioFuels
5ii	Electric charging points in car park	Medium	Low		Medium	**6**	Council contractors
6	Working with local fleet operators	Low-medium	Low		Medium	**6***	Local fleet operators
7.	Graduated parking permits	Low	Low	Climate change	Medium	**6**	
8i	Green Travel Plan within the Council	Low -medium	Low	Climate change	Low	**5**	TfL
8ii	School Travel Plans	Medium	Low	Climate change	High	**6***	Schools
9	City Car Club	Medium	Low	Climate change	High	**6***	Streetcar, ZipCar, CityCar Club
10	Supplementary Planning Guidance	Medium	Low		Medium	**6**	
11	Public transport improvements	Medium	Medium		Medium	**4**	TfL, SRA, Railtrack,
12	Encouraging walking (through streetscape improvements)	Medium	High	Climate change noise	High	**4**	TfL

No	Action	Relative air quality benefit	Costs Low:<10K Medium 10-100K High 100K	Other benefits	Priority	Progress:(1=minimal, 5= major, 6=complete, 6* =complete and ongoing)	Main partners
13	Encouraging cycling	Medium	Low	Climate change noise	Medium	**5**	TfL
14	Parking charges	Low	Low		Low	**5**	
15	Permit free housing	Medium	Low	Climate change	Medium	**5**	
16	Taxi ranks	Low	Low		Low	**3**	TfL
17	Traffic signals to smooth traffic flow	Medium	Low		Low	**3**	TfL
18	Review coach parking	Low	Low		Low	**1**	TfL
19	Freight	Low	Low	Noise	Low	**6**	Central London Freight Partnership
20	Green Building Site code of practice	Medium	Low	Noise	High	**6**	BRE, GLA
21	Composting	Low	Low		Medium	**6**	Network Recycling, SITA, Ealing Community Transport
22	Smoke control zone	Low	Low		Medium	**6**	Defra
23	Regulating industrial emissions	Medium	Low		High	**5**	Defra, LFEPA
24	Energy Efficiency	Medium	Low	Climate Change	Medium	**5**	Other LAs, Powergen
25	Air quality monitoring	Low	Medium		High	**5**	Defra

Section 4: The Council's new action plan proposals

4.1 Main points

As highlighted in the introduction, over the next five years the Council wants to re-emphasise the health impacts of poor air and broaden the scope of its measures to reduce air pollution, with more attention devoted to non-traffic emissions. There will also be a drive to integrate energy saving and affordable warmth initiatives with reducing combustion emissions from buildings. At the same time the Council wants to raise its profile in setting an example of how local improvements can be achieved.

This section is divided into five parts representing areas in which we believe action is required and which reflect the main objectives of the action plan. The parts that follow are:

(A) protecting public health and the environment,
(B) leading by example,
(C) reducing emissions from new development,
(D) reducing emissions from existing buildings, and
(E) reducing emissions from transport.

A. PROTECTING PUBLIC HEALTH AND THE ENVIRONMENT

Since the smog of the 1950s, there has been a considerable improvement in air quality through the introduction of the Clean Air Acts with tight controls over domestic hearths and tougher regulation on emissions from industry and road transport. In the UK, it has been estimated that between 1990 and 2001, policies to improve air quality have resulted in more than 4,200 fewer premature deaths and 3,500 fewer hospital admissions per year. Much of this is probably attributable to the decline in pollution from sulphur dioxide and coal generated particles and early improvements in road vehicle fuels. However conditions in London, with a rising population and increasingly congested roads, are likely to hamper progress.

It is important that this positive trend is continued and that health inequalities between those in more polluted areas and those with cleaner air are reduced. Minimising negative impacts on human health, by reducing exposure and environmental pollution levels, is an important issue both at local and national level. In addition to the detrimental effect on human health, air pollution also affects the natural environment and, through acidification, the fabric of buildings and other structures.

A number of measures that the Council is implementing though various departments should address both aspects (these are outlined below). For instance building control and the land use planning system can be used effectively to ensure human exposure to air pollution is minimised, while strategic tree planting and building design can minimise effects on building materials.

4.2 Air quality monitoring - review the scope of $PM_{2.5}$ monitoring

The Council will maintain its financial commitment to air quality monitoring and modelling. We will continue monitoring the key pollutants. We produce high quality data enabling us to identify the long term pollution trends as well as helping assess whether the borough is meeting its objectives. The latest data are fully reported in the annual review and assessment report. Data are also reported on the London Air Quality Network website.

We will continue to monitor emissions from road and rail and will continue to lobby the Government against further expansion of Heathrow, since aircraft emissions add to the overall background of pollution (even light aircraft and helicopters, in a different context, also contribute). The Council will also seek funding to carry out more extensive monitoring near the railway in the north of the borough (Paddington Main Line) as our modelling work is showing increased pollution levels in the locality.

We will review the scope of the current monitoring network recognising the increasing concerns about the health effects of particulate matter, and the shift in emphasis of the EU directive which has replaced the more stringent indicative objectives for PM_{10} with a new exposure reduction regime for $PM_{2.5}$.[7] $PM_{2.5}$ is an even smaller size fraction of particulate matter, which reaches deeper into the lungs. The fine particles within this fraction may even be reaching the body's circulation which carries potentially serious health implications. In the borough, $PM_{2.5}$ is monitored at the North Kensington site by Defra. New $PM_{2.5}$ objectives suggest that the network needs to be reassessed and that there is a need to expand the number of sites capable of monitoring $PM_{2.5}$.

The Council will lobby the Government to set an accurate baseline year for $PM_{2.5}$. The national Air Quality Strategy (2007) introduced a cap of 25µg/m^3 for fine particulate emissions ($PM_{2.5}$) and a 15 per cent reduction target (from baseline) in annual mean concentrations at urban background locations by 2020. The baseline year has been set as 2009/2010. However, monitoring of $PM_{2.5}$ is only undertaken at a relatively small number of locations in the London area and additional sites are needed to provide an accurate picture of the current situation. This will ensure that subsequent measures to reduce emissions are based on adequate and robust data of existing pollution levels.

4.3 Regulating industrial emissions

Emissions from large industrial processes such as cement manufacturing, power generation and waste incineration in the London region are regulated by the Environment Agency. Regulating the emissions from smaller processes (for example petrol filling stations) is the responsibility of the local authority. The

[7] DIRECTIVE 2008/50/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 May 2008 on ambient air quality and cleaner air for Europe

Council will continue to carry out regular and rigorous statutory inspections in accordance with Defra guidance, to ensure that emissions of volatile substances from small industrial processes (Part B processes) do not exceed national air quality objectives, and are minimised as far as is practically possible. Part B processes in the borough currently include 6 petrol stations and 26 dry cleaners. All dry cleaners are required by law to obtain a permit and these were most recently inspected and risk assessed in 2009. All have now been issued with permits under the new scheme.

4.4 Public health collaboration

The Council will seek to strengthen collaborative projects with the local NHS and the Health Protection Agency (HPA). We will work closely with internal Council departments, NHS Kensington and Chelsea (formerly PCT) and the local Health Protection Unit (HPU) to coordinate efforts in tackling pollution related illness and health inequalities in the following areas:

- Asthma awareness
  We will work to put communication with residents on air pollution and health issues on a new footing, by commencing an extensive information campaign to target particularly vulnerable groups (i.e. asthma sufferers and the elderly). The campaign will highlight environmental precursors of asthma such as outdoor and indoor air pollution and smoking, and explain how to minimise exposure. A leaflet *Take Action on Asthma* has been designed and is available on the Council's website. We will seek further funding to expand the campaign and to offer asthma awareness training to interested groups such as parents and teachers. The Environmental Health Business Training Team is also looking at developing an Occupational Asthma course for high risk local business.

- Indoor air quality and boiler emissions
  We will inform residents of the importance of indoor air quality and will work with the HPA and the Council's Housing and Health and Safety Teams to raise awareness of boiler emissions (carbon monoxide in particular) and potential effects on health as well as the importance of regular servicing of heating appliances. This could include comparisons of emissions from different types of boilers, information on grants available and useful tips on how to minimise exposure.

- Smokefree homes and tobacco control
  The Council launched a pilot run of a campaign looking into the effects of second hand smoke in 2008. The Smokefree Homes campaign targets people who smoke in their homes, particularly families with children and pregnant women. Funding has been received from the NHS Kensington and Chelsea to extend the campaign for another ten months.

4.5 Raising awareness

The Council will continue to raise awareness of air pollution through participation in schemes such as airTEXT and Walkit.com. We will extend our work with schools to involve colleges of further education and youth groups in air quality activities and workshops. The Council is also looking to combine air quality and climate change issues with sustainable transport and other related information to make presentations more attractive for schools.

We will produce an informative leaflet on garden bonfires, outdoor chimneys and barbecues. This will cover the types of fuels that can be burned in the Royal Borough (the whole of the borough is a Smoke Control Zone) and pollutants they may produce. The leaflet will also include dos and don'ts, best practice and safety and legal considerations.

4.6 Other initiatives

Other ongoing actions which will have a beneficial effect on air quality and will help to minimise human exposure to pollutants include preserving the borough's tree stock, encouraging recycling and composting. The Council recognises the role trees play in improving air quality and will seek to plant new trees in streets and parks and also to protect the existing tree stock, both public and private, from development pressure. We will continue to encourage local residents to compost garden waste rather than burn it in bonfires. The Council now offers an all year round service collecting garden waste for municipal composting and will continue to promote home composting via its website.

Actions relating to protecting public health and the environment:

1. *Review the scope for $PM_{2.5}$ monitoring*
2. *Work to strengthen collaboration with local health organisations and coordinate efforts in tackling pollution related illness*
3. *Continue to raise awareness of air pollution and its effects on health and promote air quality schemes such as airTEXT.*

B. LEADING BY EXAMPLE

The Royal Borough is one of the largest organisations in the area with over 100 buildings and 74 vehicles under its direct management, as well as employing a large number of contractors. This puts the Council in a good position to lead by example, by improving the energy efficiency of its premises and reducing emissions from its fleet. Additionally, two new government performance indicators (NI 185 and NI 194) introduced in 2007 require councils to work towards reducing carbon dioxide (CO_2), particulates (PM_{10}) and nitrogen dioxide (NO_2) emissions from their estate and operations. As part of this work the Council will continue to improve its own emissions and to require contractors to do the same, and will report on improvements annually.

4.7 Council and contractors' fleets

We will work to improve emissions from Council and contractors' fleets by requiring the latest Euro standard where possible, increasing the number of alternatively fuelled "low emission" vehicles, fitting abatement equipment and providing green driver training to Council and contractors' staff.

We have worked hard to improve the emissions of our vehicles including mini-buses, with approximately 98 per cent of our leased fleet meeting Euro III and Euro IV emission standards[8], with a significant proportion of these vehicles being either hybrid, or dual fuel vehicles. Our Commercial Waste team are currently trialling Bio-methane as an alternative fuel for the waste management contractor's fleet. The Council will continue to build on the work already done to reduce emissions from its fleet and encourage the uptake of low emitting vehicles, including alternatively fuelled vehicles by contractors. We will be setting ourselves a target of reducing emissions from this sector for 2014 based on 2008/09 baseline data. The Council is also keen to find substitutes for conventional vehicles and has purchased an electric bike to be used by the Pest Control section as an alternative to using a van.

The Council will revise its Green Fleet Policy and Fuel Hierarchy document to integrate air quality and climate change considerations as effectively as possible. The Council will work to improve emissions from its own fleet, commuting and business travel as well as its contractors' fleet, and will report on progress annually to the Government. Data collected for National Indicators 185 and 194 will be used to identify the most effective measures to reduce emissions. The Council will make these figures publicly available in order to increase transparency and lead by example and will set emissions reduction targets shortly.

[8] **Euro standards -** European emission standards for new vehicles – a series introduced since 1992 (Euro 1) Euro IV came into force in 2005

4.8 Commuting and business travel

We will continue to improve emissions from Council staff commuting and business travel by encouraging staff to use less polluting vehicles, providing bicycle training and grants for the purchase of bicycles (including electric) and for annual travel cards.

We will continue to develop our own green travel plan, paying particular attention to flexible working and home-working to reduce commuting journeys. The travel plan will identify potential areas for improvement and provide information on help and incentives available to staff to encourage more sustainable, cleaner travel options. We have also set ourselves a corporate target of achieving a 50 per cent increase in the number of days that staff homework.

4.9 Council buildings

The Council will work to reduce emissions from Council owned or leased buildings. We are already doing work to improve emissions from our own premises and have set a number of targets bearing down on carbon dioxide emissions as part of the Council's Carbon Management Programme. Managers of large public buildings (over 1000m^2) are required to place Display Energy Certificates (DECs) in clearly visible places for the public to inspect and to improve their energy performance. Such measures, which are primarily aimed at reducing the impact on climate change, should also lead to reductions in NO_x and PM_{10} emissions. Measures could include energy efficiency improvements, such as better insulation, replacing inefficient heating plant, and introducing energy saving schemes, etc. These principles are driving forward the Council's Space Programme which is currently concentrated on the refurbishment of the Town Hall and modernisation of its mechanical and electrical systems.

Another way of improving energy performance and reducing emissions is to increase the application of renewable technology to Council buildings and operations. A comprehensive review of the Council's Renewable Energy Options was commissioned and completed in 2008. Findings of the review will provide the Council with a strategic assessment of the long-term renewable energy supply options for meeting the demands of its property portfolio. This could potentially result in the replacement of gas fired heating plant (which is responsible for a large proportion of local NO_x emissions) with alternative renewable technology (e.g. ground source heating). We will work to reduce NO_2 and particle emissions by setting ourselves a challenging target to be achieved by 2014 and to install on-site renewable technology in at least one Council managed building in the borough.

We will explore the feasibility of using hydrogen fuel cell technology in Council buildings and operations; funding for feasibility studies may be available from the Hydrogen Fuel Cell Viability Fund. Possible projects could include using a portable hydrogen fuel cell generator at the Notting Hill Carnival and/or a small fuel cell

combined heat and power plant (CHP) in a suitable building; at least one private company in the borough is already using a fuel cell for back-up power.

4.10 Social Housing Stock

The Council will assess its TMO and social building stock as part of work on National Indicator NI 194. This will be in addition to data required by the Government as part of the above performance indicator. As heating plant in buildings is the largest and growing source of NO_x in the borough, we believe that more work is needed in this area. Collecting data on social housing buildings will help to establish the proportion of NO_2 emissions from this sector and identify appropriate areas for improvement, recognising that these are costly and inevitably long-term.

Actions relating to leading by example:

4. *Reduce emissions from Council and contractors' fleet*
5. *Reduce emissions from Council staff commuting and business travel*
6. *Reduce emissions from Council owned and/or leased premises*
7. *Assess the Council's social housing stock as part of work on National Indicator 194*

C REDUCING EMISSIONS FROM NEW DEVELOPMENTS

The population of Kensington and Chelsea is expected to increase by an additional 8.3 per cent from 2006 to 2010 and this will add to increasing pressure for sustainable housing. Owing to a greater intensity of use and the development of vacant sites, all new developments are likely to add to the already elevated levels of air pollution in the borough. As the whole of the borough is already an Air Quality Management Area, cumulative effects from new development will lead to worsening of air quality and need to be mitigated. The planning system regulates the development and use of land in the public interest and is, therefore, well placed to control emissions from this sector.

4.11 Air Quality Supplementary Planning Document and Low Emission Strategy

The Council has produced an updated Air Quality Supplementary Planning Document (SPD). This essential piece of guidance was adopted in May 2009. The revised SPD changes the way the effects of proposed developments on local air quality are assessed by moving away from requiring air quality assessments and towards requesting emissions assessments and explicit mitigation proposals.

The SPD will require all large developments to submit an emission assessment and, if required, a site specific low emission strategy (LES) with adequate mitigation measures. The Council may use planning conditions or obligations which will require large developments to implement a number of LESs to reduce the impacts of additional transport associated with the development.

We will ensure that air quality issues are fully integrated into the emerging Local Development Framework (LDF). The Unitary Development Plan (principal planning policy document) is currently being replaced by the LDF, which will form the principal set of documents guiding planning decisions in the borough. The Council will ensure that suitable guidance is produced and will aim to strengthen air quality policies that control emissions from new development.

4.12 Air quality action fund

The Air Quality SPD 2009 sets a requirement for most applicants proposing large developments to make a one-off financial contribution to an air quality action fund. The Council may use S106 obligations to secure this funding which will be used towards the implementation of measures contained within the air quality action plan. Details of how the contribution will be calculated and worked examples will be included in the Royal Borough's S106 Obligations SPD, which is currently being drafted.

4.13 Green Developers guide

The Council will produce a Green Developers Guide which will provide guidance to developers on energy efficient building design and use of renewable technology. There are a number of UK comprehensive guides currently available, but due to the specific nature of the Royal Borough, i.e. the high proportion of conservation buildings, a local guide is needed. The London Plan sets a requirement for all new build to meet high energy efficiency standards (Code level 4 from the Sustainable Homes strategy for residential units and BREEAM excellent rating for commercial uses) and to meet 20 per cent of its energy demand from renewable sources. The Green Developers Guide will facilitate developers in meeting these targets without compromising the historical nature or environmental amenity of the borough.

4.14 Construction sites

We will continue to work to minimise emissions from construction sites. The Council requires all developers to follow the London Councils' Best Practice Guidance to Control Dust and Emissions from Construction and Demolition 2006, as a minimum standard. We will require developers to undertake specific construction site emissions monitoring and modelling. This would help to understand better the contribution of construction works to local air pollutant concentrations.

The Council will require developers to achieve accreditation of their construction machinery before use on site for large sites. The recently launched 'non road mobile machinery' accreditation scheme run by the Energy Saving Trust and linked with the London Councils' Best Practice Guidance, aims to reduce levels of particulate emissions from construction machinery, by encouraging the fitting of abatement equipment in order to achieve accreditation.

Actions:

8. Adopt a revised Supplementary Planning Document on Air Quality

9. Produce a Green Developers Guide

10. Continue work to minimise emissions from construction sites

11. Require large developments to make a financial contribution to an air quality action fund.

D. REDUCING EMISSIONS FROM EXISTING BUILDINGS

Gas combustion from the domestic and commercial sectors currently constitutes the largest source of NO_x emissions in Kensington and Chelsea, accounting for 54 per cent of total NO_x emissions (2004). The proportion of contributions from this source is predicted to increase to 62 per cent by 2010. This illustrates the importance of implementing effective measures to improve energy efficiency including better insulation, and reduce gas usage in the borough's existing building stock. There are a number of ongoing initiatives in this area aimed at eliminating fuel poverty and reducing carbon emissions which will also help deliver improvements to local air quality.

A further opportunity to reduce emissions presents itself in the requirement to reduce greenhouse gases such as carbon dioxide. The usually combined sources of CO_2, NO_2, and PM_{10} means that measures to tackle climate change are likely to benefit air quality and the converse is also generally true. The national Air Quality Strategy recognises the significance of this relationship and states that 'where practicable and sensible, synergistic policies beneficial to both air quality and climate change will be pursued'. Although, broadly speaking, acting to reduce emissions of CO_2 brings a corresponding reduction in emissions of local air pollutants, there are some potential conflicts where it is necessary to ensure that the impacts on both air quality and climate change are considered.

4.15 Energy efficiency of existing building stock

The Council will continue to promote energy-efficiency measures in homes in the borough, within its Home Energy Conservation Association (HECA) and Affordable Warmth work. All Registered Social Landlord (RSL) and Tenant Management Organisation (TMO) housing stock in the Royal Borough is already required to meet "decent homes" standards (including thermal efficiency) by the end of 2010, and a number of grants are also available to residents in the private housing sector. We are working to increase the number of qualifying households taking up grants to improve the energy efficiency of their homes. One example is the Warmzones Scheme which has been very successful at a regional level. As part of the scheme qualifying households are offered the opportunity to have thermal insulation and gas central heating systems installed, or an old inefficient system replaced, free of charge. The scheme also offers fire safety checks and advice on benefit entitlement.

We are also working with the Centre for Sustainable Development to produce a detailed map of 'fuel poverty' hot-spots in the borough. The Council piloted a trial run of a 'Green Homes Concierge Scheme' in November 2008. The scheme received funding to send invitations to 100 private properties in the borough, offering home visits from a Home Energy Adviser and free detailed energy assessments. This will provide individually tailored advice on how to improve the energy efficiency in the home. If successful, the scheme could be expanded to building owners. Approximately 60,000 energy surveys and information letters

were sent to residents in October 2008 in a joint mailing with the Energy Savings Trust.

The Council is also working to raise awareness of energy efficiency and climate change by participating in local events and running 'Cool it' days in schools in the borough.

4.16 National Indicator 187

This performance indicator was introduced by the Government in 2008 to monitor the proportion of households containing someone on income-related benefits that occupies either a dwelling with a Standard Assessment Procedure (SAP) rating of less than 35 or a SAP of 65 or greater. Low SAP scores indicate a poor energy rating i.e. inefficient heating and/or insulation. The aim of this is to give an indication of fuel poverty rates in the area. This indicator has been adopted by the Royal Borough of Kensington and Chelsea as part of its Local Area Agreement and the Council will be setting targets in negotiation with the Government Office. The aim of this target will be to increase the number of properties with a high SAP rating over a period of three years.

4.17 Environmental advice for businesses

We will work with local businesses to improve energy efficiency and provide advice on environmental issues. This will include information on boiler emissions and efficiency. The Council will seek financial support for a scheme which will offer free energy efficiency surveys and advice for local business premises. This would follow the receipt of Energy Performance Certificates. The Council's public health training team is already developing a number of affordable accredited Environmental Awareness courses for local businesses concentrating on air quality and climate change. In 2009 the Council is taking part in ECOVATE, an EU funded project which will offer 20 Small and Medium Enterprises in the borough 30 days of free environmental consultancy services.

4.18 Boiler survey

We will research the emissions associated with existing heating plant in Kensington and Chelsea by carrying out a borough-wide boiler survey. We will aim to gather information on the state of boiler stock in the private housing sector as well as buildings run by the TMO and inform residents of assistance available to help them to improve the energy efficiency of their homes. This could involve:-

- Making an approach to all RSLs with property within the borough to assess the efficiency/life expectancy of heating plant and offering advice on replacement options that reduce energy costs and emissions.
- Compiling a database of commercial boiler stock in the borough and associated emissions.
- Carrying out a survey of all TMO buildings to compile a database of heating systems. This could assess the advantages of replacing aging equipment with modern high efficiency boilers.
- Looking into the feasibility of 'smart' meters and more localised thermostatic control.

4.19 Mitigating climate change

Mitigating climate change is a top priority for the Royal Borough, and is being integrated into policies and strategies across the Council, including major strategies such as the Community Strategy and Local Development Framework. The Council is also participating in the Carbon Trust's Local Authority Carbon Management Programme which looks at the Council's environmental performance.

The Royal Borough Climate Change Strategy (2008) set the Council's aspirational targets for reducing carbon emissions. The current target is set at a 60 per cent cut in CO_2 emissions from 1990 levels by 2050, with a 30 per cent cut by 2025. This reflects the target set by the Mayor of London in his Climate Change Action Plan, 'Action today to protect tomorrow' 2007.

Local authorities are expected to play an important role in national and regional programmes and to set targets for reducing CO_2 emissions from their areas. The Council is required to report annually on a number of national performance indicators. Four main indicators directly relate to climate change:

- NI 185 – reducing carbon emissions from the Council's own estate, including schools and contractors;
- NI 186 – reducing carbon emissions of the borough's domestic, commercial and transport sectors;
- NI 188 – measures the Council's performance in adapting to climate change, and;
- NI 194 – measuring the reduction in NO_X and primary PM_{10} emissions from the Council's own estate.

4.20 Air quality and climate change inventory

We will aim to identify the most effective emissions reduction measures which provide the greatest reductions in both greenhouse gas and air quality emissions. This will be done as part of work on National Indicators 185 and 194 and should result in air quality being taken into consideration where proposed CO_2 reduction measures are likely to result in increased NO_x and particle emissions. Increasing energy efficiency and the inclusion of sustainable design in buildings, cutting energy demand, and the adoption of low emission strategies for transport will play an important role in tackling greenhouse gas emissions from new developments (see actions in Section C: Reducing emissions from new developments).

4.21 Controlling biomass emissions

The Council will make use of planning conditions and S106 obligations in order to set requirements for controlling pollutant emissions from biomass and biofuel combustion appliances. There have been some concerns about emissions produced from biomass combustion and a number of studies have recognised that biomass is likely to emit higher levels of certain air pollutants, such as fine particles. The Council is therefore concerned at the prospect of increasing emissions of particulate and gaseous pollutants in urban areas, which are already Smoke Control and Air Quality Management Areas.

Environmental Protection UK have set up a working group in partnership with London boroughs and developed national guidance for controlling air pollution emissions from biomass heating appliances. The Royal Borough will require developers to comply with this national guidance. Additionally, anyone submitting a planning application which includes proposals for heat generation from biomass combustion will be required to demonstrate that utilising biomass is an effective alternative to conventional fuels, and that it will not conflict with measures in the AQAP and requirements of the Clean Air Act[9]. The same considerations apply to biofuels.

Actions:

12. Continue to promote energy-efficiency measures in homes in the borough

13. Carry out a borough- wide boiler survey

14. Integrate climate change and air quality measures to achieve the greatest overall benefit

15. Set requirements for controlling pollutant emissions from biomass and biofuel boilers and CHP.

[9] The Royal Borough of Kensington and Chelsea Smoke Control Order 2004 made under Section 18 of the Clean Air Act 1993.

E REDUCING EMISSIONS FROM ROAD TRANSPORT

Road transport constitutes the largest combined source of emissions in the borough with over 70 per cent of PM_{10} and a large proportion of NO_x emissions coming from road vehicles. This area has been and continues to be the main focus of attention for the AQAP. Many London-wide policies and measures, such as the introduction of the Congestion Charge and Low Emissions Zones have also been implemented to mitigate the impacts of this sector on air quality. The Mayor of London's Transport Strategy and Air Quality Strategy are also aimed at reducing traffic and emissions from road transport. Despite all these measures, pollution levels are not improving significantly and modelling shows that objective levels will not be reached by 2011. It is, therefore, important to consider new areas for improvement.

The Royal Borough has maintained an explicit aim to reduce levels of motor traffic in the borough for some years and has produced a Local Implementation Plan (LIP) which sets out the Council's policies and proposals for the implementation of the Mayor of London's Transport Strategy (MTS). It is designed to improve road safety and encourage shifts to more sustainable modes of transport such as walking and cycling. The LIP contains targets for bus waiting and journey times, road accidents, school travel plans, congestion and traffic flow and sets out measures which the Council is taking or planning to take to achieve those targets.

These include paragraphs 4.22 – 4.35 below:

4.22 Encouraging walking

The Council has been active for a number of years in encouraging a shift from car use to alternative forms of transport such as cycling and walking. Improving public transport and facilities for cycling and walking, preparing travel plans for schools and businesses, and raising awareness have been and continue to be important tools in achieving this aim. Actions to encourage and support walking include:

- Developing travel plans in schools in the borough. We have set ourselves a target to have 100 percent of all schools in the borough with approved travel plans by March 2010.
- Practical pedestrian training started in autumn 2008. The Council is working to ensure that all year 4 and 5 pupils in the borough attend training.
- Maintaining the highest possible standards of urban design and streetscape to ensure that streets are attractive and free of obstructions, providing a favourable environment for pedestrians. The Council's approach to streetscape design is internationally recognised as one of high quality and vision.
- Maintaining the highest possible standard of street cleanliness as part of an integrated approach to making walking a pleasant and inviting option in the Royal Borough.

- The Council will continue to participate in schemes to encourage walking and cycling such as Walk Once a Week, Walk to School and others.

4.23 Encouraging cycling

The Council offers free cycle training to all residents in the borough. Other new measures to encourage safe cycling include further trial schemes to allow cyclists to cycle in both directions on certain one-way streets. This scheme has been successful and is expected to be introduced on more streets in the Royal Borough. Additionally, the Council is converting underused pay and display bays to cycle parking, in areas of high demand.

4.24 London cycle hire scheme

The Council will support TfL in implementing an on-street cycle hire scheme which is planned to open in April 2010. The scheme will introduce 6000 hire bicycles to Central London. Approximately 50 docking stations will be located within the Royal Borough in place of residents' inactive parking bays.

4.25 Public transport improvements

We will push TfL even harder to improve access/ facilities for alternatives to the car. New measures to improve public transport include investigating the feasibility of new rail stations at North Pole Road (West London Line) and Ladbroke Grove (Crossrail) and lobbying Network Rail, the London Mayor and Crossrail for support in creating new access to London's rail network. Early indications from a feasibility study are that a station at North Pole would be technically possible; more work is now being done to assess likely patronage.

We welcome the opening of the station at Imperial Wharf as we had been lobbying for it for some time, however we are concerned about overcrowding on West London Line trains and will be pressing for more capacity. We will continue pressing TfL for improvements to bus stops within the borough, which would result in reducing "waiting" and "loading times".

We will also press TfL for earlier improvements to the emissions standards that London buses and taxis are required to meet and encourage the faster adoption of hybrid engined buses.

4.26 Traffic Management

The Council will continue to work with TfL to improve traffic flow and to review the progression of traffic at Urban Traffic Controlled sites within the borough. These reviews use current traffic flows to reduce delays and congestion. We will work to reduce the number of traffic signal aspects in order to smooth traffic flow and reduce energy and maintenance costs.

The Council is a member of the South and West London Transport Conference (SWELTRAC) and the new Central London Freight Quality Partnership. The Council will work with other boroughs through the Central London Freight Quality Partnership and TfL to develop innovative delivery schemes, freight consolidation centres and delivery and servicing plans. Commercial fleets of delivery and servicing vehicles (i.e. lorries) could both be considered for inclusion, although such a scheme would need the backing of the industry.

4.27 Car clubs

The Council will support a significant expansion of the car club scheme. The Council pioneered a car club network, which now spans the entire borough. The first car was launched in February 2003 and the Council now leads the London Car Club Consortium (LCCC). The scheme has been very successful, attracting approximately 4,500 Car Club members in the borough to date. The scheme currently has 97 on-street spaces (with 30 additional bays off-street) in Kensington and Chelsea run by three different operators. In terms of convenience 98 per cent of residents are within 5 minutes walk of a car club bay. Following negotiations with the operators, hybrid vehicles now form a significant proportion of the car club fleet. Further off-street car club spaces are also sought in new developments and an expansion of on street bays is planned this year. We are working to double the number of car club bays in the borough by 2014 and to increase the proportion of low emission vehicles in the fleet.

4.28 Idling engines

Following previous enforcement of the idling engines legislation introduced in 2005 (see section 3.1, paragraph 4), the enforcement team will continue to monitor hotspots and use the available enforcement powers whenever possible. An awareness campaign will be carried out in order to raise awareness of the legislation and encourage drivers to switch off their engines when stationary. We have made a commitment to carry out at least three large enforcement actions every year in order to raise awareness of the idling regulations.

4.29 Local fleet operators

The Council will continue partnership working with local fleet operators on the development of travel plans and improving their fleets**.** We will extend the existing partnership with the Metropolitan Police, local fire service and the Kensington and Chelsea NHS (formerly PCT) to include practical support and encouragement to businesses in cleaning up the emissions of their vehicle fleets and adopting policies that reduce emissions. The Council is now working with eight organisations to deliver their travel plans, including Chelsea and Westminster Hospital and EC&O Venues (which owns and manages the Earl's Court Exhibition Centre and Olympia). Encouraging drivers of older vehicles to fit pollution abatement equipment and the early uptake of the latest Euro Standard vehicles are also important in minimising emissions produced by vehicles on our roads.

4.30 Low Emission Zone

The Council will work with the London Air Quality Cluster Group to assess the effectiveness of a number of scenarios for an alternative central London Low Emission Zone (LEZ). The existing LEZ was introduced across Greater London in February 2008 by TfL. It requires the most polluting HGV diesel vehicles to comply with Euro III standard and since July 2008 these restrictions also apply to smaller Lorries and HGVs. In response to the current financial situation, the Mayor of London has recently announced his decision to suspend the third phase of the scheme, which was due to begin in October 2010. This and the concerns of our residents have prompted us to look at the potential benefits of a revised LEZ. Results of the study will be presented to the Air Quality Cluster Group and submitted to the Mayor.

We will continue to lobby for taxis to be included in any LEZ as they are responsible for approximately 20 per cent of transport emissions in London.

4.31 Permit-free and on-site parking

The recently adopted Transport Supplementary Planning Document provides detailed guidance for developers. The guidance requires all new residential development to be car parking permit-free. In order to reduce car use and improve local air quality the guidance seeks levels of on-site car parking significantly below the maximum standards set out in the UDP and welcomes zero parking. It also seeks the provision of electric charging points in new car parking facilities.

4.32 Parking charges

The Council will continue to reduce emissions from residential parking through the use of the differentiated parking permit system. We will increase differentials in the graduated fees for parking permits to favour small petrol driven cars and low emission vehicles. The Council would like car-owning residents to choose vehicles which are the least polluting. One way that we can encourage residents to think about vehicle emissions, and provide a financial incentive to choose 'cleaner' models, is through the residents' parking permit system. The current graduated parking system favours smaller vehicles (smaller engine size) of the latest Euro Standard. There is also an additional fee of £5 for diesel vehicles and a supplementary charge for additional vehicles. The new graduated charging system was introduced on 1 June 2009.

Diesel fuelled vehicles can result in an increase in emissions of PM_{10} and NO_2. We will review the surcharge for diesel cars as a means to facilitate a behavioural change. We recognise that the number of diesel fuelled vehicles has been increasing partly because of the price of the fuel relative to petrol, but also because of reliability and longevity of the engines.

The Council will continue to ensure that its charges for on-street visitor parking spaces are effective in managing demand. Pressure for visitor parking spaces is very high within the borough and without such tight parking controls, traffic and emission levels would be higher than they are.

4.33 Encouraging the uptake of alternatively fuelled vehicles

The Council will actively encourage a switch from the car to electric bicycles, motorcycles and scooters, which could relieve congestion and reduce air pollution from traffic sources. Electric motorcycles use less road and parking space and are thus beneficial in terms of their impact on congestion and parking pressure. They also produce no tailpipe emissions and do not add to local air pollution levels. Financial incentives will be introduced in the form of discounted residents parking charges. We will continue to encourage a rise in the proportion of hybrid vehicles in the car club.

4.34 Electric recharging infrastructure

We will generally encourage and support the creation of electric recharging infrastructure within the borough. This will be done through the promotion of infrastructure grants available from the Energy Saving Trust, and by requiring new developments to provide charging points on site. We will look into the benefits of joining regional groups promoting alternative refuelling infrastructure and ways to raise awareness of the benefits of electric vehicles (both environmental and financial).

Electric vehicles have a role to play, particularly when "plug-in" hybrids enter the market. However we need to know more about:

- the risk of encouraging people to switch from more sustainable modes to the private car;
- the risk of increasing parking stress if new electric cars were bought as second cars in a household, rather than replacing existing petrol or diesel vehicles;
- the impact of charging points on streetscape; and
- the difficulty of reserving parking bays for a particular type of car.

We support the development and use of hybrid vehicles as these are a more realistic alternative to traditional petrol or diesel vehicles and look forward to the extra hybrid buses promised by TfL.

The results of the action plan consultation showed increased demand for on-street electric recharging infrastructure and for active promotion of this technology. However it is not yet clear if the benefits of installing substantial numbers (up to 500) on-street charging points would repay the huge logistical difficulties involved. On-street bays will be challenging to deliver and could become obsolete in a few years. The widespread installation of fast charging points and battery exchanges, where depleted batteries are swapped for charged ones, could negate the need for local on-street charging points.

If electric vehicles are to be a viable alternative then there must be standardisation in terms of connecting to the supply. We recognise the need for a coherent and easy to use recharging infrastructure, in order to meet the likely demand for electric vehicles. There needs to be a clear justification for any kind of parking concession, or incentive for electric cars, before we decide whether and how to make these consistent across boroughs. On-street parking charges are set with the objective of managing demand for scarce parking spaces. They also help to constrain traffic and should not be used to stimulate demand for electric vehicles. Parking concessions for electric vehicles might need to be withdrawn if they were successful. This has already happened in one part of London.

4.35 Electric recharging points

We already have six off-street electric charging points in the Town Hall car park, which were installed in response to residents' demand. There have been nearly 700 uses of the charging points since installation of the facilities in spring 2007.

Actions:

16. Encourage walking by requiring school travel plans in all schools in the Royal Borough

17. Encourage safe cycling by improving facilities and providing free cycle training

18. The Council will support TfL in implementing a Central London cycle hire scheme

19. Encourage and support a continued expansion of the Car Club scheme

20. Raise awareness of the idling engines regulations

21. Assess the effectiveness of a number of scenarios for an alternative central London LEZ

22. Review the surcharge for diesel vehicles and change the graduated parking permits system to introduce discounts for low emission vehicles (electric vehicles)

23. Actively encourage the creation of electric recharging infrastructure within the borough.

Table 2: Summary of Actions

No.	Action	Description	Responsible Department	Target	To be achieved by	Monitoring method
Protecting Public Health and the Environment						
1.	**Review scope for $PM_{2.5}$ monitoring**	Review the scope of the current monitoring network to account for the increasing concerns for health effects of fine particles $PM_{2.5}$	Environmental Health	At least one road side $PM_{2.5}$ monitoring station in the borough	Dec 2010	Annual monitoring reports
2.	**Public Health Collaboration**	Work to strengthen collaboration with local health organisations and coordinate efforts in tackling pollution related illness and health inequalities by raising awareness of asthma and indoor air quality and the dangers of second-hand smoke.	Environmental Health	Joint projects on asthma and IAQ, CO/boiler emissions and smoking	2009/ ongoing	No. of joint initiatives, surveys
3.	**Raising awareness**	Continue to raise awareness of air pollution and its effects on health and promote air quality issues by participation in schemes such as airTEXT and Walkit.com, and working with schools.	Environmental Health	Established links with all schools in the borough; 300 airTEXT users	March 2012	No. of airTEXT users/ school presentations and workshops
Leading by Example: Reducing Emissions from Council Buildings and Operations						
4.	**Council and contractors' fleet**	Improve emissions from Council and contractors' fleet by requiring the latest Euro Standard, where possible, increasing the number of alternatively fuelled "low emission" vehicles, fitting abatement equipment and providing green driver training.	General Services Procurement	Reduction target in emissions from 2008/09 baseline level	March 2014	NI 194 toolkit

5.	**Council staff travel**	Continue to improve emissions from Council staff commuting and business travel and maintain an up to date Council Green Travel Plan.	Highways and Transportation	Green Travel Plan in place 50% increase in number of days staff homework	Dec 2009 March 2014	Staff surveys/ Home working figures
6.	**Council and contractor buildings**	Improve emissions from Council owned and/or leased premises by improving energy efficiency and increasing the use of renewable technology.	Personnel and General Services / SSD	Reduction target in emissions from 2008/09 baseline level. On-site renewables in at least one Council building	March 2014 March 2014	NI194 toolkit
7.	**Social and TMO housing stock**	The Council will assess its social housing and TMO building stock as part of work on National Indicator NI194 and set targets for reducing emissions	Environmental Health	Baseline year data collected and target set	Dec 2010	NI194 toolkit
Reducing Emissions from New Development and Construction						
8.	**Air Quality SPD and LES**	Adopt a revised Supplementary Planning Document which requires large developments to submit a Low Emission Strategy and implement mitigation measures in order to offset impact of the development.	Planning policy/ Environmental Health	SPD adopted and requirements being implemented	Dec 2009/ ongoing	Planning conditions or obligations /LES
9.	**Air Quality Action Fund**	Make use of S106 obligations to require large new developments to make a one-off financial contribution to an air quality action fund.	Planning policy/ Environmental Health	Low emission strategies in all large developments	Jan 2010/ ongoing	S106 Obligations report/ Record of contributions

10.	**Green Developers Guide**	Produce a Green Developers Guide which will provide guidance to developers on energy efficient building design and use of renewable technology.	Planning Policy/ Building Control/ Environmental Health	Green Developers guide in place	Dec 2010	Energy assessments
11.	**Construction Emissions**	Continue work to minimise emissions from construction sites by requiring all developers to follow the "London Best Practice Guidance to Control Dust and Emissions from Construction and Demolition" 2006 as a minimum standard.	Planning policy/ Environmental Health	Construction risk assessments required for all large developments	April 2009/ ongoing	Planning conditions
Reducing Emissions from Existing Buildings						
12.	**Energy Efficiency**	Continue to promote energy-efficiency measures in homes in the borough, within the Council's HECA and Affordable Warmth work.	Environmental Health	100% RSL and TMO homes in the borough meet "decent homes" thermal efficiency standards; Year on year increase in the number. of qualifying households taking grants	Dec 2010 Dec 2009/ ongoing	Energy surveys/ Grants received
13.	**Borough-wide Boiler Survey**	Research the emissions associated with existing heating plant in Kensington and Chelsea by carrying out a borough- wide boiler survey	Environmental Health	Compile an emissions inventory	Dec 2011	NA

14.	**Integrating air quality and climate change measures**	Aim to identify the most effective emission reduction measures which provide the greatest benefits in terms of CO_2 and air quality emissions.	Environmental Health/SSD	Produce toolkit with options	March 2011	NI194 toolkit/ policy changes
15.	**Controlling Emissions from Biomass**	Make use of planning conditions and obligations in order to set requirements for controlling pollutant emissions from biomass and biofuel boilers and CHP.	Environmental Health/ Planning Policy	Detailed air quality assessments required for all developments proposing the use of biomass or bio-fuel	April 2009/ ongoing	Planning conditions or obligations/ dispersion modelling
Reducing Emissions from Road Traffic						
16.	**School Travel Plans**	Requiring school travel plans in all schools (LEA and independent) in the borough	Highways and Transportation	100% schools in the borough with approved travel plans	March 2010	No. of approved School Travel Plans
17.	**Encouraging Cycling**	Continue to encourage safe cycling in the Royal Borough by improving facilities and providing free cycle training to residents	Highways and Transportation	Year on year increase in cycling	March 2010/ ongoing	Annual cycle counts
18.	**London Cycle Hire scheme**	The Council will support TfL in implementing a Central London cycle hire scheme based on the Paris model.	Highways and Transportation	50 docking stations installed in the Royal Borough	April 2010	Number of bays/user reports
19.	**Car club Expansion**	Double the number of on-street car club bays available in the borough and increase the number of low emitting vehicles in the car club fleet.	Highways and Transportation	200 on-street car club bays in the borough. 33% of the fleet within VED band A-B.	Dec 2014	No. of car club members in the borough and % A-B VED band vehicles in the fleet
20.	**Idling**	Undertake an awareness raising	Waste	3 add-hoc large	Dec 2009-	Number of

	Engines	campaign to inform drivers of the idling engines regulation and continue to monitor hotspots and use the available enforcement powers to encourage drivers to switch off their engines.	Management	enforcement actions per year	ongoing	warnings and complaints
21.	**Investigate the effects of a more robust LEZ**	Assess the effectiveness of a number of scenarios for an alternative central London Low Emission Zone (LEZ) and lobby the Mayor of London to implement the most cost-effective option.	Highways and Transportation/ Environmental Health	Investigation completed and results submitted to TfL and GLA.	Jan 2011	Investigation completed and submitted to the Mayor.
22.	**Parking Charges**	(i) Review the surcharge for diesel vehicles (ii) Review the graduated parking permits system to incorporate discounts for low emission vehicles (electric vehicles)	Highways and Transportation	Changes implemented.	March 2010	Residents parking permit charges
23.	**Encourage the creation of electric recharging infrastructure**	Actively encourage the creation of electric recharging infrastructure within the borough by requiring charging points to be incorporated in development and promoting grants to local businesses.	Highways and Transportation/ Environmental Health	50% of on-site parking spaces in new development with ECPs 100% parking spaces with ECPs	March 2012 March 2014	Charging points installed by developers and on business premises

Section 5: Cost benefit analysis

The Council has undertaken a brief appraisal of the air quality benefits, costs and cost effectiveness of the individual plans, along with whether other impacts (for example, on climate change) are likely to occur. It also shows what priority has been assigned to the plans over the five year period. It is based on officers' best estimates rather than the results of a detailed study.

Whilst all actions work towards meeting the air quality objectives, hence their inclusion in the plan, it is impossible to know the improvement in terms of concentrations each individual action has resulted in. Many of the actions are being delivered for reasons other than the improvement of air quality.

Table 3: Cost Effectiveness analysis

No	Action	Relative air quality benefit ✓-negligable ✓✓-medium ✓✓✓-significant	Extent of impact	Costs Low:<10K Medium 10-100K High >100K	Other benefits	Priority	Main partners
1.	Review scope of monitoring network	✓	Borough	Medium	Health	High	
2.	Public Health collaboration	✓	Borough	Low	Health	High	KC NHS/ HPA
3.	Raising awareness	✓	Borough	Low	Health	Medium	CERC, Other LAs/Walkit.com
4.	Cleaner Council and contractor vehicles	✓✓	Borough	High	Climate change	High	Contractors
5.	Council staff travel	✓	Borough	Med	Climate change	Medium	TFL

No	Action	Relative air quality benefit ✓-negligable ✓✓-medium ✓✓✓-significant	Extent of impact	Costs Low:<10K Medium 10-100K High >100K	Other benefits	Priority	Main partners
6.	Council and contractors buildings	✓	Local	High	Climate change	High	EST/CENEX/ Hydrogen Fuel Partnership
7.	Assess emissions from social housing stock	✓	Local	Low	Climate Change	Low	
8.	Air Quality SPD and Low Emission Strategies	✓✓	Borough	Low	Noise	Medium	
9.	Air Quality Action Fund	✓	Local	Low	Climate change	Medium	
10.	Green Developers Guide	✓	Borough	Low	Climate change	Medium	
11.	Controlling construction emissions	✓✓	Local	Low	Climate change/Noise	High	
12.	Home energy efficiency	✓✓	Borough	High	Climate change/fuel poverty	High	Energy Saving Trust
13.	Boiler survey	✓	Borough	Medium		Low	
14.	Integrating climate change and air quality	✓	Borough	Low	Climate change	Medium	
15.	Controlling emissions from biomass	✓✓	Borough	Low		High	London Councils/Inner London LAs
16.	School Travel Plans	✓	Borough	High	Climate change/ Noise/ Congestion	High	TfL

No	Action	Relative air quality benefit ✓-negligable ✓✓-medium ✓✓✓-significant	Extent of impact	Costs Low:<10K Medium 10-100K High >100K	Other benefits	Priority	Main partners
17.	Encouraging cycling	✓	Borough	High	Climate change/ Noise/ Congestion	High	TfL
18.	London bicycle hire scheme	✓	Borough	High	Climate change/ Noise/ Congestion	High	TfL
19.	Car Club scheme	✓✓	Borough	Low	Climate change/Congestion	Medium	Car clubs
20.	Idling engines	✓	Local	Low-Medium	Climate change	Medium	Coach operators/Hotels/Bus garages
21.	Impact of LEZ	✓✓	Inner London	Medium	Climate change	High	TfL/ GLA/ Other LAs
22.	Parking charges	✓	Borough	Low		Medium	
23.	Encourage the creation of electric recharging infrastructure	✓✓	Local	Medium	Climate Change/Noise	High	EST/TfL/GLA

Appendix I

List of acronyms and abbreviations

AQAP- Air Quality Action Plan

AQMA- Air Quality Management Area

AQS- Air Quality Strategy

BRE- Building Research Establishment

BREEAM- BRE Environmental Assessment Method

CCAL- Campaign for Clean Air in London

CCZ- Congestion Charging Zone

CCHP- Combined Cooling Heat and Power

CENEX- Centre of Excellence for low carbon and fuel cell technologies

CERC- Cambridge Environmental Research Consultants

CHP- Combined Heat and Power (unit)

CO- Carbon Monoxide

CO_2- Carbon Dioxide

DEC- Display Energy Certificate

Defra- Department for Environment, Food and Rural Affairs

EC- European Commission

EC&O- Earl's Court and Olympia Venues

ERT- Environment Round Table

EST- Energy Saving Trust

EV- Electric Vehicle

GLA- Greater London Authority

GHG- Greenhouse Gas (emissions)

HECA- Home Energy Conservation Association

HGV- Heavy Goods Vehicle

HPA- Health Protection Agency

HPU- Health Protection Unit

IAQ- Indoor Air Quality

KC NHS- Kensington and Chelsea NHS (formerly known as PCT)

LA- Local Authority

LAEI- London Atmospheric Emissions Inventory

LAQM- Local Air Quality Management

LAQN- Local Air Quality Network

LCCC- London City Car Club Consortium

LDF- Local Development Framework

LEA- Local Education Authority

LES- Low Emission Strategies

LEZ- Low Emissions Zone

LFEPA- London Fire and Emergency Planning Authority

LIP- Local Implementation Plan

LPG- Liquefied petroleum gas

MTS- Mayor of London's Transport Strategy

NAQS- National Air Quality Strategy

NI- National Indicator

NO_2- Nitrogen Dioxide

NO_x- Nitrous Oxides

PAHs- Polycyclic Aromatic Hydrocarbons

PCO- Police Community Support Officers

PCT- Primary Care Trust

PM_{10}- Particulate Matter with an aerodynamic diameter of 10 micrometers

$PM_{2.5}$- Particulate Matter with an aerodynamic diameter of 2.5 micrometers

RSL- Registered Social Landlord

SPD- Supplementary Planning Document

SAP- Standard Assessment Procedure to apply an energy rating to dwellings

SRA- Strategic Rail Authority

SSD- Strategy and Service Development

SWELTRAC- South and West London Transport Conference

TfL- Transport for London

TMO- Tenant Management Organisation

UDP- Unitary Development Plan

VED- Vehicle Excise Duty

Appendix II

Table 4: National Air Quality Objectives

Pollutant	Air Quality Objective		To be achieved by
	Concentration	Measured as	
Benzene	16.25 µg m^3 5.00 µg m^3	Running annual mean Annual mean	31 December 2003 31 December 2010
1,3-Butadiene	2.25 µg m^3	Running annual mean	31 December 2003
Carbon Monoxide	10.0 mg m^3	Maximum daily running 8 hour mean	31 December 2003
Lead	0.5 µg m^3 0.25 µg m^3	Annual mean Annual mean	31 December 2004 31 December 2008
Nitrogen Dioxide	200 µg m^3 (not to be exceeded more than 18 times a year) 40 µg m^3	1 hour mean Annual mean	31 December 2005 31 December 2005
Particles (PM_{10})	50 µg m^3 (not to be exceeded more than 35 times a year) 40 µg m^3	24 hour running mean Annual mean	31 December 2004 31 December 2004
Fine particles ($PM_{2.5}$)	25 µg m^3 (target) 15% cut in urban background exposure	Annual mean Annual mean	2020 2010 - 2020
Sulphur dioxide	350 µg m^3 (not to be exceeded more than 24 times a year) 125 µg m^3 (not to be exceeded more than 3 times a year) 266 µg m^3 (not to be exceeded more than 35 times a year)	1 hour mean 24 hour mean 15 minute mean	31 December 2004 31 December 2004 31 December 2005
Ozone	100µg/m^3 (not to be exceeded more than 10 times per year)	8 hour mean	31 December 2005
PAH (Polycyclic aromatic hydrocarbons)	0.25ng/m^3	Annual mean	31 December 2010 (provisional)

THE ROYAL BOROUGH OF
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