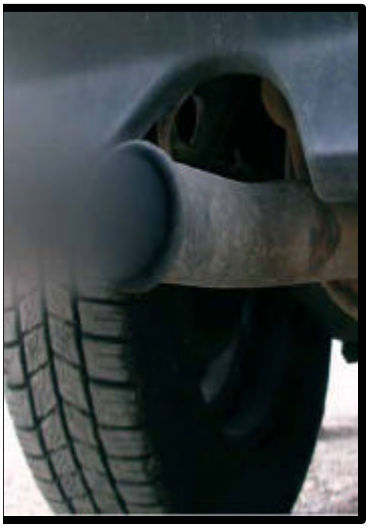
REGULATORY SERVICES

Air Quality Action Plan 2011




July 2011

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Executive Summary

Part IV of the Environment Act 1995 introduced a national framework for air quality management whereby all local authorities are required to annually review the air quality within their boundaries. Following the review local authorities must assess the air quality against the objectives specified for the pollutant of concern. Where the process has indicated that the objective will not be achieved within the statutory timeframe then the local authority is required to designate an Air Quality Management Area (AQMA) at the earliest possible date. The local authority is then required to produce an action plan to demonstrate how the Authority intends to work towards meeting the air quality objectives within its Air Quality Management Area.

Birmingham City Council has carried out an extensive Review and Assessment of Air Quality. This has shown that that there is a likelihood of the Air Quality Objective for the annual average level of nitrogen dioxide to be exceeded in several locations after the target date for compliance, which is the end of 2010. This pollutant is produced primarily by road traffic.

Birmingham City Council declared the whole of the City of Birmingham as an Air Quality Management Area in January 2003 for nitrogen dioxide. This declaration was made in accordance with the requirements of Part IV of the Environment Act 1995.

The review and assessment process was extended to include particulate matter (PM_{10}) in 2004. The assessment showed probable compliance with the existing objective. However, guidance at the time suggested a tightening of the objective that may have meant an exceedence. No changes to the objective were made but the PM_{10} declaration remained in place due to concerns over the impact from the potential use of biomass. However, following further research it has been established that although biomass may lead to increases in the local values of PM_{10} such increases were highly

unlikely to produce concentrations leading to an exceedence. Therefore the AQMA for PM_{10} was revoked in December 2010.

This Action Plan sets out 12 actions that have been identified to reduce levels of nitrogen dioxide. Many of these actions relate to existing Council policies and strategies, notably the Local Transport Plan (LTP2 and its successor LTP3 as LTP2 period finishes 31st March 2011).

The measures in this AQAP are those that are currently considered to be the most cost effective and appropriate for Birmingham. Following consultation with key stakeholders, members of the public, and relevant council committee(s), a final version of this AQAP will be published.

An annual report will be produced following the implementation of this action plan and will outline progress together with the inclusion of any additional actions that may be required.

1. Introduction

1.1. Background to this action plan

Birmingham City Council is the largest local authority in the UK and the largest council in Europe with 120 councillors representing 40 wards and a population of over 1 million residents.

Part IV of The Environment Act 1995, introduced a national framework for air quality management, whereby all local authorities are required to annually review the air quality within their boundaries. Following the review they must assess the air quality against the objectives specified for the pollutant of concern. Where the process has indicated that the objective will not be achieved within the statutory timeframe then the local authority is required to designate an Air Quality Management Area (AQMA) at the earliest possible date.

Birmingham has declared the whole City as an Air Quality Management Area in respect of Nitrogen Dioxide and Particulate matter since 2004.

Birmingham City Council has recognised the importance of environmental factors on the health of its residents for many years. The 2007 annual residents' survey identified that air and noise pollution were significant problems in certain parts of the city and that improving the local environment should rank in the top five challenges facing the city. The commitment to improving the environment for all residents is encapsulated within the

common strategic outcomes in the Sustainable Community Strategy, Local Area Agreement, Big City Plan and the Council Plan. These are:

- Succeed economically
- Stay safe in a clean, green city
- Be healthy
- Enjoy a high quality of life
- Make a contribution.

The mechanism for improving the local environment with regard to air quality in Birmingham is the air quality action plan. This is a statutory element of the local air quality management process. Motor vehicle emissions have been identified as the major contributor of air pollutants within the City boundary. Therefore, the air quality action plan will be integrated in to the Local Transport Plan (LTP). LTP3 will supersede the LTP2 that expires on 31st March 2011.

1.2 The role of Environmental Health in Action Planning

Environmental Health is about making Birmingham a safe and pleasant city in which to live, work and visit and the Environmental Health Section of the City Council carries out work at a local level to promote and protect public health. Our mission is to achieve a safe, clean, green and fair trading city for residents, businesses and visitors

In order to effectively discharge their duties under local Air Quality Management regime, Birmingham City Council is required to monitor air quality at a number of locations throughout the city as well as carrying out detailed modelling of the air quality at known hotspots. This function is carried out by the Environmental Protection Unit located within Environmental Health, a section within Regulatory Services.

A comprehensive emissions inventory has been compiled by the Environmental Protection Unit of Birmingham City Council, which contains details of:

1) All the IPPC authorised A1 installations with releases to the air within Birmingham and six other authorities in the West Midlands.
2) The LA-IPPC (A2 installations) and LAPPC (Part B) installations within the seven West Midlands Authorities;
3) Releases from domestic and commercial sources.
4) Traffic counts and the road network within the West Midlands.

The road network has been digitised along motorways, major roads and areas in which detailed studies have or are being carried out. The emissions inventory also contains the most recent sets of vehicle emission factors released in February 2007.

Traffic data is regularly updated via the Environment, Culture & Development Directorates when it becomes available.

The Environmental Protection Unit, Air Quality team will continue to ensure that ambient air quality is monitored after the implementation of this Action Plan. The team will report regularly on the quality of air in Birmingham both through the local air quality management reporting schedule to Defra and via Birmingham City Council's Public Protection committee.

2. Legal Framework

2.1. National Air Quality Strategy

Part IV of the Environment Act 1995 required the Secretary of State to devise a National Air Quality Strategy, and for Local Authorities to review and assess their local air quality against standards and objectives within the Strategy and effectively manage any areas of concern.

The first strategy was published in March 1997, with the objectives for each pollutant (apart from Ozone) being given statutory force. A revised strategy was published in January 2000 which built on the first Strategy and was itself amended in 2003 where additional objectives were set for particles, and new objectives set for benzene, carbon monoxide and polyaromatic hydrocarbons.

The Strategy placed statutory duties upon local authorities in respect of Local Air Quality Management (LAQM). Regulations made under this Act have established a mechanism for LAQM, including the need to carry out a continuing review and assessment of air quality. The pollutants that must be considered in this review and assessment process are; carbon monoxide, sulphur dioxide, nitrogen dioxide, particles (PM_{10}), lead, 1,3 butadiene, and benzene. There is currently no plan to extend the range of pollutants.

Objectives have been set for each of these pollutants that specify limit values and the dates by which these values should be achieved. These national air quality objectives are shown in Appendix 1.

2.2. Pollutants of concern for Local Air Quality Management

2.2.1. 1,3 butadiene

1,3-butadiene is a colourless, flammable gas at room temperature with a pungent aromatic odour. 1,3-butadiene has varying health effects depending on exposure time and concentration. Short-term exposure to very high concentrations can cause irritation of the eyes, nose, throat and skin. However, long-term exposure is associated with the

induction of cancers of the lymphoid system and blood forming tissues, lymphomas and leukaemia. Like benzene, 1,3-butadiene is classed as a genotoxic carcinogen.

The principal source of 1,3-butadiene in the United Kingdom is vehicle exhaust emissions. Unlike benzene, 1,3-butadiene is not a constituent of petrol or diesel fuel but is produced in the exhaust emissions as a result of combustion of higher olefins in the engine. Vehicles fitted with three-way catalytic converters emit only a minute amount of 1,3-butadiene.

Birmingham complies with the Objective for 1,3 butadiene.

2.2.2. benzene

Benzene is an organic compound belonging to the group of aromatic hydrocarbons. It is a liquid at normal temperature (20^{o}C) but readily evaporates leaving small residual amounts in the atmosphere. Benzene is classified as a genotoxic carcinogen, which has a causal association with acute non-lymphocytic leukaemia. When inhaled, it is readily absorbed and retained in the fatty tissues of the body and also the brain and bone marrow tissues, which are responsible for blood cell production.

In the UK, the major sources of benzene are petrol-engined vehicles, petrol refining, and the distribution and uncontrolled emissions from those forecourts of petrol stations not possessing vapour recovery systems. Of these, the most significant source is considered to be the emissions due to combustion by petrol-engined vehicles.

Birmingham complies with the Objective for benzene.

2.2.3. carbon monoxide

Carbon monoxide is a colourless, odourless, tasteless gas that is toxic to Humans. The toxic properties arise from the displacement of oxygen in haemoglobin in the blood to form the relatively stable carboxyhaemoglobin, thereby starving the tissues of the body of their oxygen supply.

In the UK, the transportation sector is the major source of carbon monoxide. The gas is produced when fuels burn with an inadequate supply of air.

Birmingham complies with the Objective for carbon monoxide.

2.2.4. lead

Lead is a naturally occurring trace metal found in the earth's crust. It is released into the atmosphere by a number of processes including weathering of rocks and volcanic activities. Lead is a toxicant, which can be absorbed through the lungs, stomach and intestines and accumulates in the skeleton. Lead has adverse health effects on haemoglobin (blood) synthesis, the nervous system, the kidneys, the gastrointestinal tract, joints and the reproductive system. Of great concern is the possibility of neuro-physiological effects, which influences the learning ability and general behaviour in children.

In the UK, road transport is the major source of lead; more specifically from the anti-knock lead additives in petrol. However, since 1970 lead emissions declined by 93% and this reduction is due primarily to the lead content of leaded petrol been reduced from approximately 0.34g/l to 0.143g/l in 1986, and more recently at the end of 1999, the phasing out of the use of leaded petrol. Other major sources of lead include industrial processes and mining and smelting of ores.

Birmingham complies with the Objective for lead.

2.2.5. nitrogen dioxide

Nitrogen dioxide is an oxidizing irritant that can cause damage to the lung tissue as a result of this (oxidizing) property. At very high concentrations it is thought to cause inflammation of the airways. At lower concentrations, it is believed to exacerbate respiratory problems. A study by Kubota *et al*. (1987) indicated that long-term exposure to high concentrations could result in lung scarring and emphysema in animals.

The primary sources of oxides of nitrogen are the transport sector and combustion processes. Almost all combustion processes emit nitrogen

oxides in one form or another. In heating boilers and internal combustion engines, the primary pollutant is nitric oxide, which is then further oxidized in the atmosphere to nitrogen dioxide. In more open highly oxygenated combustion, such as in some furnaces and open gas burners, a higher proportion of the nitrogen oxides are emitted as nitrogen dioxide directly.

Birmingham exceeds the Annual Mean Objective for nitrogen dioxide.

2.2.6. particles (PM_{10})

Particulate Matter affects more people than any other pollutant. The major components of Particulate Matter are sulfate, nitrates, ammonia, sodium chloride, carbon, mineral dust and water. It consists of a complex mixture of solid and liquid particles of organic and inorganic substances suspended in the air. The particles are identified according to their aerodynamic diameter, as either PM_{10} (particles with an aerodynamic diameter smaller than 10 µm) or $PM_{2.5}$ (aerodynamic diameter smaller than 2.5 µm). PM_{10} has been associated with a number of health effects including respiratory and cardiovascular systems, asthma and increased mortality. $PM_{2.5}$ are of particular concern since, when inhaled, they may reach the peripheral regions of the bronchioles, and interfere with gas exchange inside the lungs.

A wide range of emission sources contributes to PM_{10} concentrations in the UK. Furthermore, particulate matter is a difficult pollutant to deal with due to the complexity of its derivation. PM_{10} sources can be divided into 3 main categories, namely:

1. *Primary* particle emissions which are derived from combustion sources such as road traffic, power generation, industrial processes *etc.*
2. *Secondary* particles are formed by chemical reactions in the atmosphere and are mainly comprised of sulphates and nitrates.
3. *Coarse* particles comprise of emissions from a wide range of sources including re-suspended dusts from road traffic, construction

works, mineral extraction processes, wind-blown dusts and soils, sea salt and particles.

Birmingham complies with the Objective for particles (PM_{10}) but has adopted a precautionary approach and continues to monitor against the Objective.

2.2.7. sulphur dioxide

Sulphur dioxide (SO_2) is a colourless, acidic corrosive gas with a sharp odour. SO_2 can affect the respiratory system and the functions of the lungs and causes irritation of the eyes. Inflammation of the respiratory tract causes coughing, mucus secretion, aggravation of asthma and chronic bronchitis and makes people more prone to infections of the respiratory tract. Hospital admissions for cardiac disease and mortality increase on days with higher SO_2 levels.

It is produced from the burning of fossil fuels (coal and oil) and the smelting of mineral ores that contain sulphur. The main anthropogenic source of SO_2 is the burning of sulphur-containing fossil fuels for domestic heating, power generation and motor vehicles. In the UK power generation is the major contributor to sulphur dioxide levels.

Birmingham complies with the Objective for sulphur dioxide.

2.3. Duties and functions of Local Authorities

Under sections 82-84 of the Environment Act 1995, and as noted in paragraph 2.1 above, duties are placed on local authorities to review air quality within their area. This review should include the likely future air quality within the relevant period and an assessment of whether the air quality standards and objectives are being achieved, or are likely to be achieved, when measured against the national air quality strategy.

The review and assessment process includes:

- The designation of Air Quality Management Area(s) (AQMA) where standards or objectives are not being met, or unlikely to be met within the designated period.

- Updating and Screening Assessments (USA) to be completed every three years.
- Detailed assessments to be completed every three years where the USA shows a possible breach of an objective, with a view to establishing whether a new AQMA is needed or an existing one needs amending.
- Progress reports to be submitted every three years.

All these reports are to be submitted to the relevant government department, which in the case of Birmingham City Council is Defra.

Once an AQMA is designated the local authority has 12 months in which to draw up an action plan setting out measures and target dates by which the air quality standards are to be met. Part of this process includes consulting on the draft plan. The aim should be to have the AQAP in place within 12-18 months of designation of the AQMA. An AQAP can be revised at any time the local authority feels it to be appropriate.

2.4. Air Quality Action Plans

Action planning is an essential part of the local air quality management process, providing a practical opportunity for improving air quality in areas where review and assessment has shown that national measures will be insufficient to meet one or more of the air quality objectives. An air quality action plan should include the following:

- Quantification of the source contributions to the predicted exceedences of the limit values. This allows the action plan measures to be effectively targeted.
- Evidence that all available options have been considered on the grounds of cost and feasibility.
- Identification of how the Local Authority will use its powers and also work together with others in pursuit of the relevant air quality objectives.

- Clear timescales within which the authority and other organisations propose to implement the measures contained in the plan.
- Quantification of the expected impacts of the proposed measures and, where possible, an indication as to whether these will be sufficient to ensure compliance with the objectives.
- Identification of how the Local Authority intends to monitor and evaluate the effectiveness of the plan.

In 2006 Birmingham produced an AQAP to address the issues arising from nitrogen dioxide and particulates. The chronology of the action planning process within Birmingham is covered in greater detail in Section 4.

3. An Overview of the City of Birmingham

3.1. Location

Birmingham City Council (BCC) is the largest urban local authority in the UK, with a population of nearly 1 million spread over an area of approximately 26,777 hectares (103 square miles). It has a population density of 36.5 persons per hectare, which makes it the most densely populated of the West Midlands local authorities. Birmingham is roughly centrally situated in the UK and is surrounded by seven local authorities, namely (clockwise from north) Lichfield District Council, North Warwickshire BC, Solihull MBC, Bromsgrove DC, Dudley MBC, Sandwell MBC and Walsall MBC as illustrated in Figure 1.

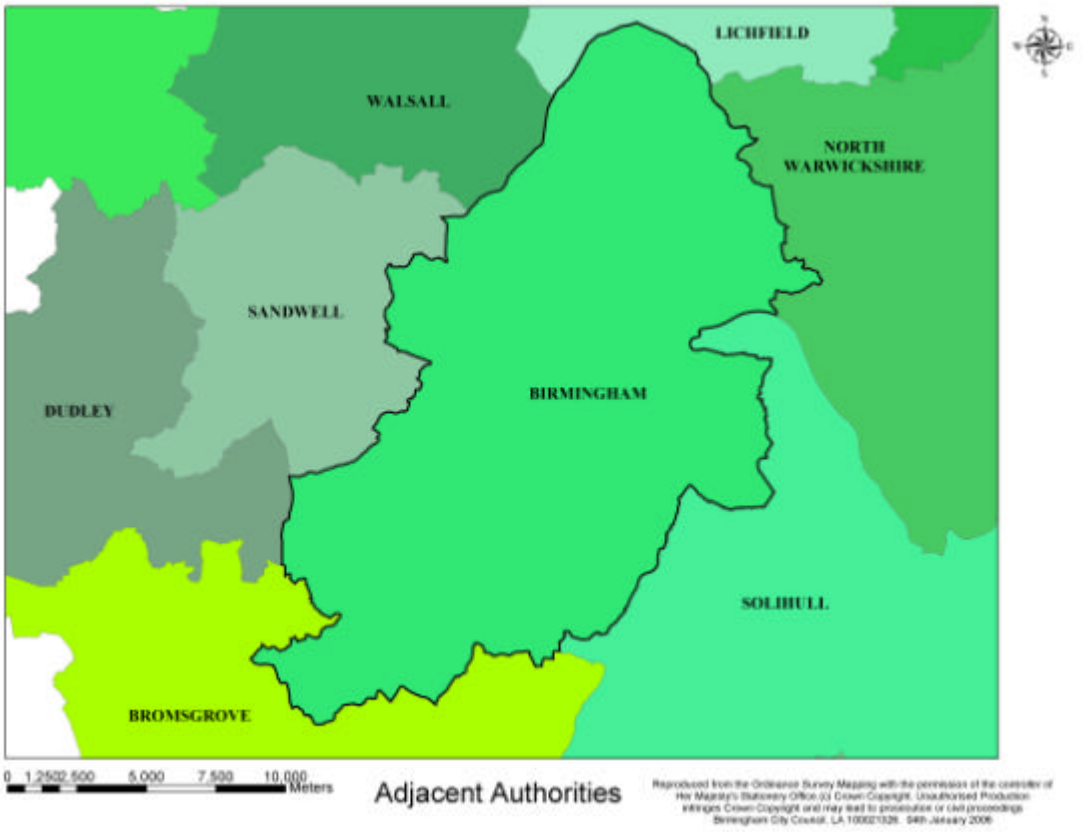


Figure 1: Map illustrating Birmingham's relationship to the surrounding Local Authorities

3.2. Road Network

The city has a very complex road network with about a dozen major radial roads and two ring roads traversing the city. These, along with many other

primary roads are deemed significant in terms of having an **A**verage **A**nnual **D**aily **T**raffic count of greater than 5000 vehicles per day. This road network is illustrated in Figure 2.

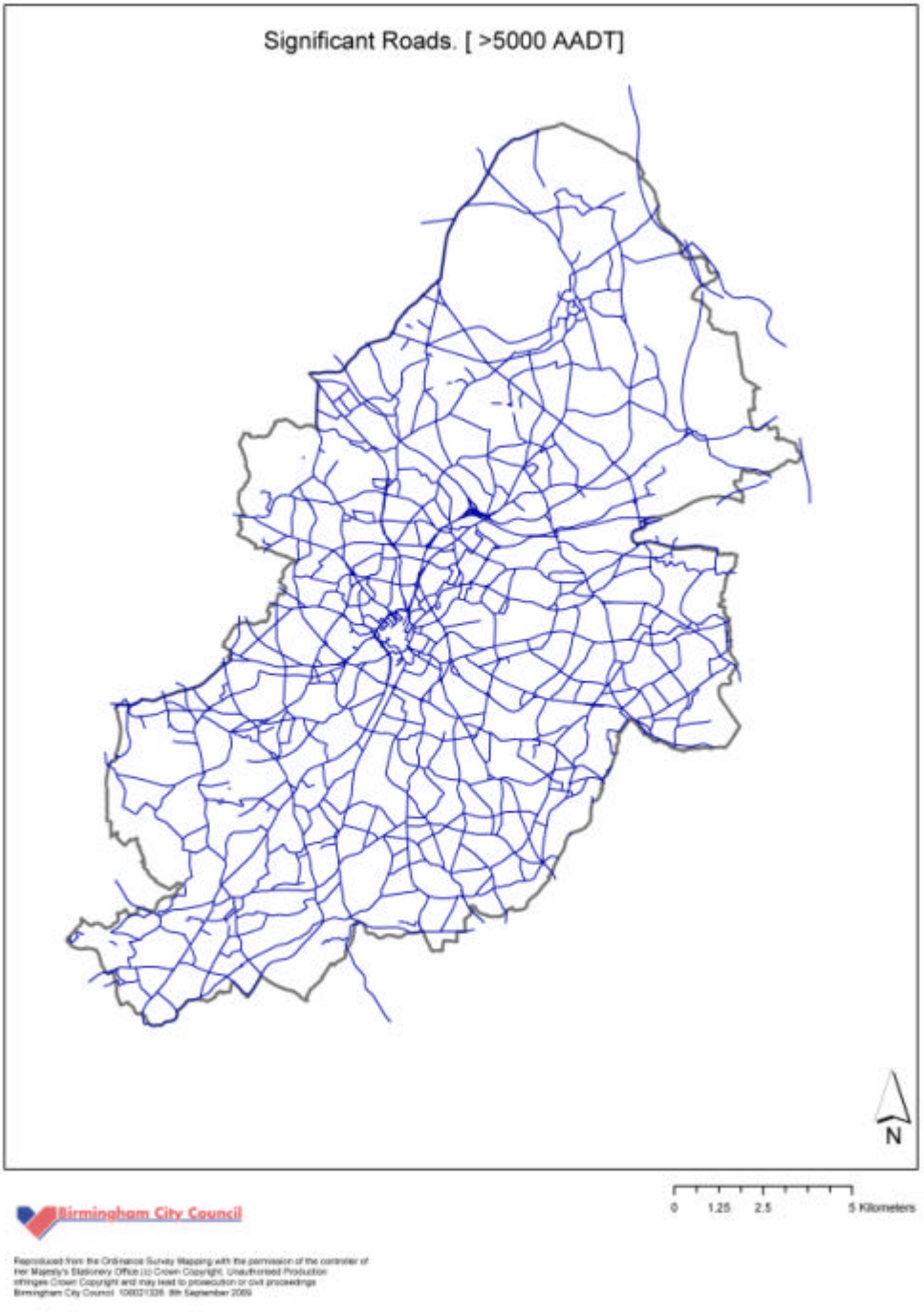


Figure 2: Map illustrating significant roads in Birmingham

In addition, three heavily trafficked motorways, M5, M6 and M42, are situated towards the west, north and the east of the city, respectively. A large section

of the M6 running through the city is elevated. This motorway network is illustrated in Figure 3.

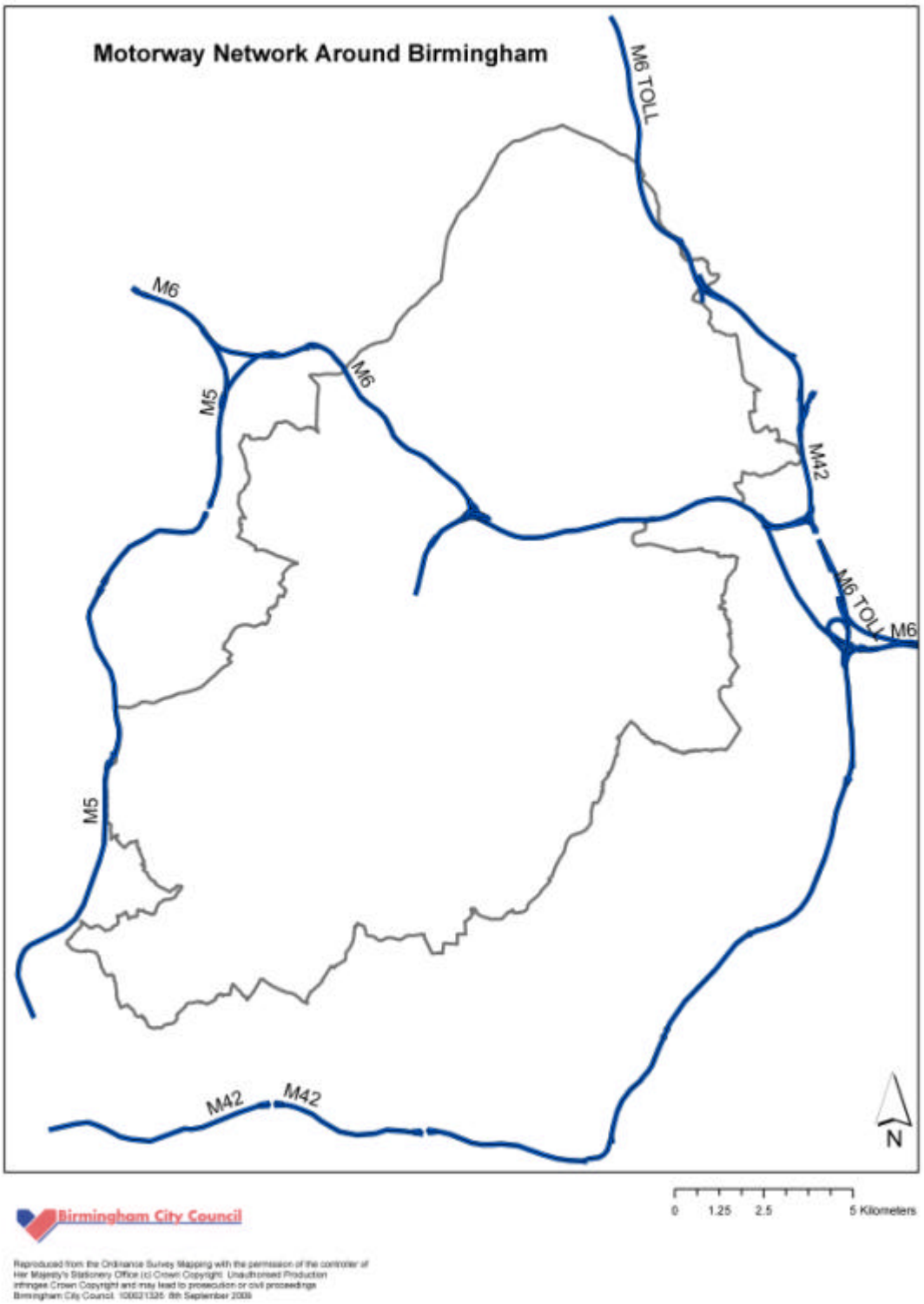


Figure 3: Map illustrating the motorway network around Birmingham

3.3. Regulated Facilities

Under the Environmental Permitting Regulations 2007 certain industrial activities that emit pollution to atmosphere require permitting by the Local authority or by the Environment Agency. Collectively these are known as regulated facilities and are broken down into three categories as follows:

- Part A1 facilities tend to be the largest facilities. They also tend to be the more technically complex and have the greatest inherent risk of pollution across all environmental media. These are regulated by the Environment Agency.
- Part A2 facilities are also large facilities, technically complex and have a significant inherent risk of pollution across all environmental media. These are regulated by the Local Authority.
- Part B facilities tend to be smaller facilities, less technically complex and are regulated solely for their risk of atmospheric pollution. Many relate to reduced risk activities such as dry cleaning, vehicle refinishing, etc which have an inherently lower risk of pollution.

Birmingham is a contributor to a West Midlands wide Emissions Database (EDB) which contains emissions data on all A1, A2 and significant Part B facilities. The table below shows the numbers of differing type of facilities within Birmingham that contribute to local air pollution.

Type of Facility	Quantity within Birmingham
Part A1	10
Part A2	1
Significant Part B	15

The map shown as figure 4 on the following page shows the general location of these facilities.

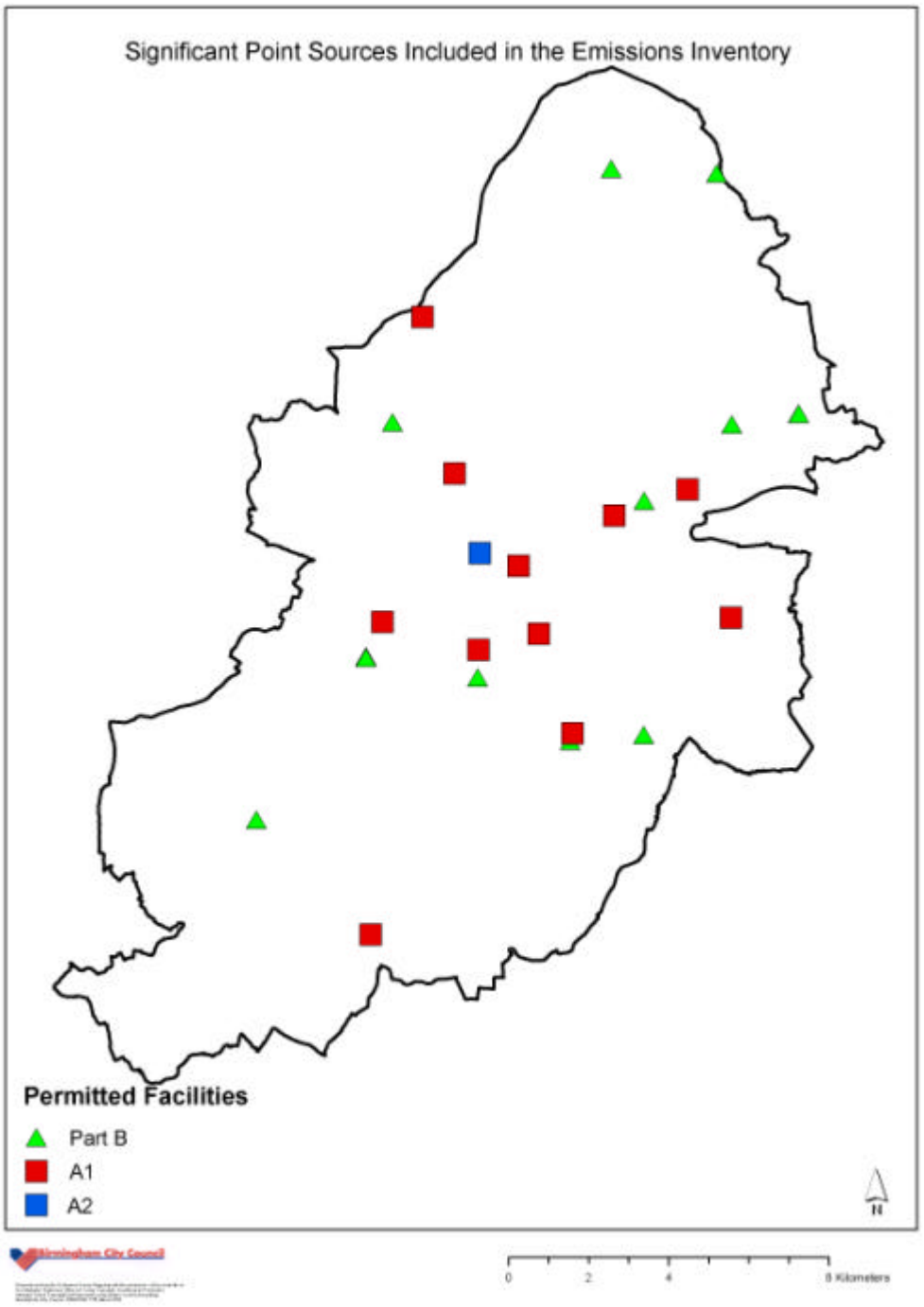


Figure 4: Map illustrating the significant industrial sources within Birmingham.

4. Air Quality Action Planning in Birmingham

4.1. A history of Air Quality Review and Assessment in Birmingham

Birmingham City Council has completed all stages of the Review and Assessment reporting framework as required by Defra. The whole city was designated an Air Quality Management Area (AQMA) for Nitrogen Dioxide in January 2003 and a declaration for particles (PM_{10}) followed in October 2004.

Previous reports within the Review and Assessment framework submitted to Defra are listed below with a short summary:-

1st Round Review & Assessment of Air Quality Stage 1: Review of Significant Sources of Pollution and Current Trends in Air Pollution. (1998)

A consideration of the ambient concentrations of the pollutants indicate that the levels of nitrogen dioxide, sulphur dioxide, PM_{10} particles and lead, have not met their respective air quality standards consistently over the last five years, and may not meet their objectives by the target date of 2005.

In view of the conclusion that the air quality standards and objectives may not be achieved for four of the pollutants, the West Midlands Metropolitan Authorities propose to carry out a detailed Assessment of Air Quality with respect to these pollutants.

1st Round Review & Assessment of Air Quality Stage 3: An Assessment of Air Quality for 1999 and onwards to 2005. (2002)

The air quality in Birmingham, in 2005, is likely to meet all the air quality objectives set out in the Air Quality Regulations 2000. Birmingham City Council will therefore not need to take any local action, under the Environment Act 1995, to control air quality within its area.

Local Authorities in England and Wales are, however, required to carry out a second Review and Assessment of Air Quality by the end of 2003. Birmingham City Council will start that Review and Assessment immediately

in order to gather more robust information on traffic emissions and roadside pollution levels, and to assess the implications for the levels of nitrogen dioxide and PM_{10} particles should the objective for the latter pollutant be tightened after 2005.

1st Round Review & Assessment of Air Quality Stage 3+: A supplementary Assessment of Air Quality for 2001 and onwards to 2005. (2002)

Measurements of nitrogen dioxide, made at the National Automatic Monitoring Network stations, have shown that the annual average level of nitrogen dioxide in 2001 was some 10% higher than in 2000. Extended monitoring of nitrogen dioxide in busy roadside locations indicates that there has been a similar rise in roadside levels. Calculations of the probable annual average in 2005 based on the 2001 measurements indicate that the annual average levels, near some busy roads, are now likely to exceed the objective for this pollutant.

Additional computer modelling, using a finer spatial resolution and revised emission factors, now predicts that the air quality objective for the annual average levels of nitrogen dioxide will be breached in the city centre, along the M6 and A38(M) motorways and in two of the most congested suburban centres.

The air quality in Birmingham in 2005 now appeared likely to exceed the air quality objective for the annual average concentrations of nitrogen dioxide in the city centre area within the Middle Ring Road, along the M6 and A38(M) motorways and around sections of the A38 Bristol Road in Selly Oak and the A34 Stratford Road in Sparkhill. The air quality on the A435 High Street in Kings Heath is expected to be very close to the objective and needs further consideration.

Birmingham City Council are therefore required under Section 83 of the Environment Act 1995 to declare one or more Air Quality Management Areas, for those parts of the city in which the air quality objective is likely to be exceeded.

1st Round Review & Assessment of Air Quality Stage 4: A Further Assessment of Air Quality. (2004)

Under Section 83(1) of the Environment Act, 1995 a local authority must designate Air Quality Management Area(s) (AQMA) where any of the objectives for the seven pollutants prescribed in the Local Air Quality Management Regulations will not be met in the designated timescale. In view of this Birmingham declared the entire city an AQMA in respect of the 2005 nitrogen dioxide annual average objective.

In compliance with Section 84(1) of the Environment Act, Birmingham has carried out a further review and assessment of the air quality in the designated AQMA and have concluded that the 2005 nitrogen dioxide annual mean objective is still being breached in the four areas mentioned above. It is anticipated that the objective will not be achieved by the target date of 31 December 2005, hence the original order made on 10 January 2003, which saw the declaration of the whole city an Air Quality Management Area in respect of the 2005 nitrogen dioxide annual mean objective, remains valid.

2nd Round Review & Assessment of Air Quality: Updating & Screening Assessment 2003. (2003)

The 1st round of R&A resulted in the declaration of a “whole city” air quality management area in respect of nitrogen dioxide. There is no need to progress to a Detailed Assessment for this pollutant as the matter will be addressed in detail in the “further assessment” and Action Plan, required under the Environment Act 1995.

Although a Detailed Assessment for PM_{10} particles, with regards to the 2004 objectives is not indicated, it is likely that the 2010 objectives will be breached and so progression to a Detailed Assessment for the pollutants will be required at that time.

2nd Round Review & Assessment of Air Quality: Progress Report 2004. (2004)

Although The Updating and Screening Assessment in 2003 did not identify the need to progress to a Detailed Assessment for the 24-hour mean objective for PM_{10} particles, last years measurements indicate that the number of exceedences at a roadside location was greater than that permitted. It is therefore the intention of Birmingham City Council to declare an air Quality Management Area with respect to this pollutant.

2nd Round Review & Assessment of Air Quality: A Further Assessment of Air Quality. (2005)

On carrying out a further assessment of air quality in 2004 to assist with the production of the Progress Report (2004), it emerged that there was non-compliance with the 24-hour mean objective for PM_{10} in 2003. Given this, Birmingham City Council designated an AQMA with regards to the 24-hour mean objective for PM_{10} for the entire city using the precautionary principle. Following validation of the data the revised data indicated that in fact the city had complied with the objective.

2nd Round Review & Assessment of Air Quality: Progress Report 2005. (2005)

Stage 3 of the 1st round of R&A resulted in the declaration of the whole city an AQMA in respect of the 2005 annual mean objective for nitrogen dioxide in January 2003. Given this, Birmingham City Council has produced a Stage 4: Further Assessment of air quality (submitted to, and accepted by, Defra in 2004) and is currently finalising the Air Quality Action Plan in pursuit of achievement of the 2005 annual mean objective for nitrogen dioxide.

Stage 2 of the 2nd round of R&A resulted in the declaration of the whole city an AQMA in respect of the 24-hour mean objective for PM_{10} particles in October 2004. Hence a Further Assessment was carried out in respect of PM_{10} and the report will be included as an appendix in the revised Action Plan, which was sent out for consultation in July 2004 and will be finalised by Autumn 2005.

3rd Round Review & Assessment of Air Quality: Updating & Screening Assessment 2006. (2006)

Birmingham has declared the entire city an AQMA for both Nitrogen Dioxide & particulates (PM_{10}). Further assessment is required on the areas identified during this USA based upon improved traffic data and interrogation of GIS data sets.

Air Quality Action Plan 2006. (2006)

An Air Quality Action Planning Steering Group made up of representatives from various responsible Council Directorates, The Highways Agency, private sector transport interests and environmental groups was established in 2003 to produce this Action Plan in line with recommended good practice. This group has reviewed existing policy and strategy and applied cost/benefit analysis in the identification of additional actions.

This Action Plan sets out 41 actions that have been identified to reduce levels of nitrogen dioxide, and PM_{10}. Many of these actions relate to existing Council policies and strategies, notably the Local Transport Plan (LTP).

3rd Round Review & Assessment of Air Quality: A Detailed Assessment of Nitrogen Dioxide and Particles PM_{10} in Birmingham. (2007)

Birmingham has declared the whole City as an Air Quality Management Area in respect of Nitrogen Dioxide and Particulate matter since 2004. The Update and Screening Report submitted to Defra in May 2006 identified that a Detailed Assessment was required for both Nitrogen Dioxide (NO_2) and Particulate Matter (PM_{10}).

This Detailed Assessment has now been concluded and shows that for the period 2001 - 2006 the concentrations of Nitrogen Dioxide are below the air quality objective of an annual average of 40mg/m3 at all background sites. However, the roadside monitoring sites continue to exceed the air quality objective for an annual average of 40mg/m^3. PM_{10} monitoring shows that no site in Birmingham has breached the health objectives since 2000.

3rd Round Review & Assessment of Air Quality: Progress Report 2008. (2008)

Roadside sites continue to exceed the 2005 Nitrogen Dioxide objective but early indications are that the concentrations seem to be decreasing. The reasons for this are as yet unclear as there are many factors that could be influencing this reduction, such as the introduction of measures identified in the action plan, variations in weather and improved engine technology. Birmingham City Council will continue to monitor nitrogen dioxide at all types of sites.

The annual mean concentrations for the period 2000 - 2007 have demonstrated that the concentrations at the specified locations change only marginally from year to year and it is expected that the 2004 annual mean objective will be achieved with relative ease throughout the city.

Air Quality Action Plan Progress Report 2007. (2008)

This report indicates that there has been a steady move toward implementation of the actions within the plan. The impact on air quality of those actions that have been implemented will not become apparent until such schemes have been in place for a longer period of time, and as the AQAP was published in January 2006 there has been only limited time to implement and evaluate many of the actions contained therein.

It should be noted however, that the LTP2 target for nitrogen dioxide of a 1% reduction set across the West Midlands by 2010 would appear to have been achieved within Birmingham. However, the reduction in NO_2 thus far observed may or may not be sustained over the forthcoming years, and therefore should only be regarded as an indicator of pollution levels moving in the right direction.

4.2. The Air Quality Action Plan 2011

The 2011 Action Plan has been developed in line with the principles set out within Section 2.4, and having regard to the current position, and critically a belief that the actions within should be measurable.

5. Development of the Action Plan

5.1. Aims of the 2011 Action Plan

This new plan examines a series of options to tackle air pollution and a package of short, medium and long term actions are identified as appropriate to take forward within Birmingham.

The primary aim of this plan is to improve air quality within the City by ensuring compliance with the National Air Quality Objectives.

This aim also promotes three of the strategic outcomes outlined in the Birmingham City Council Plan 2008:

- Stay safe in a clean, green city
- Be healthy
- Enjoy a high quality of life

5.2. The Process

The lead for drafting the new AQAP has been taken by the Air Quality Team of Environmental Health within Regulatory Services. This draft consultation document has been produced solely within this service.

The proposal was to circulate this document for first consultation to relevant parties within BCC and to encourage their participation in the process as presented in this document. The relevant internal parties are:

- Transportation Strategy
- Planning Management
- Climate Change and Sustainability
- Fleet and Waste Management
- Licensing

Comments from this first round have been considered and, where appropriate, incorporated into this version of the AQAP.

5.3. Public Consultation

The process of public consultation is critical to the success of any Air Quality Action Plan. A range of consultation strategies were evaluated including the use of focus groups set up specifically for this purpose, and utilising existing consultation mechanisms such as the Council's 'Peoples Panel' in Birmingham. However, these types of consultation mechanism are most appropriate for situations where a range of significantly different courses of action are proposed, and a consensus of opinion is required to inform this choice.

In the case of the Air Quality Action Plan little flexibility exists in terms of significantly different courses of action. This is because the most significant source of NO_2 is from transportation sources, and the LTP2 (2006) and LTP3 (2011) covers comprehensive transport policies across the West Midlands.

As a consequence the proposal for consultation has been split into two phases:

Phase 1 – Partner Consultation

Phase 1 consultation involves the inviting of comments from proposed action owners and partners.

Phase 2 – Public Consultation

The second phase of consultation involves the inviting of comments from the public via making the report available in local libraries and on the City Council's website and on 'Be Heard: Birmingham's Consultation Database' at https://www.birminghambeheard.org.uk/. Views will also be sought from other organisations not directly involved in the AQAP.

The list of these organisation is as follows:

- Bromsgrove DC
- CABLED
- CENTRO
- Defra
- Dudley MBC
- Environment Agency
- Friends of the Earth
- Health Protection Agency
- Highways Agency
- Lichfield DC
- North Warwickshire DC
- Sandwell MBC
- Solihull MBC
- Traffic Commissioner
- Walsall MBC
- West Midlands Fire Service
- Westlakes Scientific Consulting

At this stage the AQAP will also be taken to Public Protection Committee (PPC).

Once all comments have been received a decision will be taken on how to progress the Action Plan. Should any of the consultation phases elicit any significant adverse comments then that relevant aspect of the plan will be reviewed in line with those comments and a decision will be taken as to whether to re-consult. Assuming there are no significant adverse comments then the consultation version of the Action Plan will be updated to become a final Action Plan and issued via update to PPC.

The timeline for action is outlined in Section 10.

5.4. Current Position

The review of the 2006 Action Plan has allowed Environmental Health to produce a position statement on the City Council's progress towards meeting the National Air Quality Objectives and towards delivery of each Action.

5.4.1. Pollutants

The completed rounds of the Review and Assessment process in Birmingham have demonstrated that the required standards for benzene, carbon monoxide, lead, sulphur dioxide, and 1, 3 butadiene are likely to be achieved by the required dates through the application of national measures. As a consequence no additional local measures are required for these pollutants.

The required standard for particulates has never been recorded as having been exceeded, despite the precautionary approach taken by the City Council in declaring an AQMA for particulates.

The annual average level of nitrogen dioxide however is likely to be exceeded in a number of areas. The areas of the city with predicted exceedences of the annual average for nitrogen dioxide are shown in Appendix 2.

5.4.2. Actions

There were 41 actions set out within the 2006 Action Plan and various degrees of progress have been made towards meeting the aims of each action. The current status of each action is detailed in Appendix 3.

A number of these actions are deemed as requiring updating and have been converted into new actions for this Action Plan. These are covered in greater detail in Section 7.

A number of these actions are deemed to have intrinsic merit but do not lend themselves to ready assessment of the impacts. These actions are considered to be worthy of support although not be dedicated actions within this Action Plan. These are known as 'principles' and are specified within Section 7.

5.5. Recommended focus for future Action Planning

In light of the historic data, Environmental Health are recommending that the focus of this new Action Plan should be on the reduction of emissions of nitrogen dioxide.

5.5.1. Nitrogen dioxide recommendation

That the AQMA for nitrogen dioxide be retained and that this Action Plan focus on the reduction of nitrogen dioxide emissions.

5.5.2. Particles (PM_{10}) recommendation

That the 2010 revocation of the AQMA for particles (PM_{10}) be recognised within the 2011 Action Plan.

5.5.3. Current Action recommendation

That the 41 actions detailed in Appendix 3 be either *closed* or *updated* as specified.

5.5.4. Updated and new Action recommendation

That the 12 actions detailed in Section 7 form the basis of the new Action Plan.

5.5.5. Option for the inclusion of other Actions

It is recognised that certain of the consultees may wish the AQAP to focus on actions other than those detailed in Section 7 and accordingly as part of the consultation process there is facility for further actions to be considered for inclusion. Where any further actions are proposed the process suggested in Section 5.6 should be followed and the suggested action detailed in the format presented within that section.

5.6. Developing the Actions

When the actions from the 2006 Action Plan were being reviewed concern was expressed that a number of the actions were either unmeasurable, or exceedingly difficult to measure. Furthermore, it was not clear from the Plan as to where the responsibility lay for providing the relevant information to allow a comprehensive review to take place. This was compounded by there being some actions where the effective ownership for the influencing of results lay outside the direct control of Birmingham City Council.

Accordingly it was considered appropriate that the actions within the new plan should be limited to actions where the Council can actually influence change. The Council cannot, for example, reduce the levels of air pollutants blown in from outside the city or from the M6, M5 or A38M (motorways being the responsibility of the Highways Agency).

In order for the Action Plan to be effective it must strike an appropriate balance between the effects of actions, and the likely benefits in terms of air quality. For this reason it is deemed essential to revert to the principle of **SMART** (**S**pecific, **M**easurable, **A**chievable, **R**elevant, **T**ime related) targets, and to establish such targets for each of the new actions proposed.

The principles of action planning as outlined in Section 7 were followed when the new actions were being devised. The main principles are summarised as follows along with how the Action Plan aims to meet them:

- Quantification of source contribution: An updated source apportionment exercise has been conducted to guide the proposed actions, the results of this being detailed in Section 6. ‘Relevant’ under SMART.
- Cost consideration for each action: Each action has been given a ‘Cost – Benefit Summary’. See Section 5.8 below.
- Feasibility consideration for each action: ‘Achievable’ under SMART
- Identification of Birmingham City Council’s use of powers: Discussed in the action ‘Outline’; ‘Specific’ under SMART.

- Identification of how Birmingham City Council will work with others to achieve the Air Quality Objectives: Each action has been designated an owner and the relevant partners identified.
- Setting of clear timescales: 'Time Related' under SMART
- Quantification of the expected impacts: 'Measurable' under SMART.
- Monitoring and evaluation: 'Measurable' under SMART.

5.7. Action Format

Based on the above, each action has been detailed as a project on its' own although they all follow a set format.

– **Action number and title:** each action is given a number and a title to allow easy reference.
– **Outline:** the first few paragraphs gives an overview of the nature of the action and what the action comprises.
– **SMART Targets:** the criterion for setting the targets is detailed within this table.
– **Cost – Benefit Summary:** this section provides a summary statement of the anticipated costs and benefits.
– **Ownership:** a Team, Section, Service or Organisation is specified as the owner of the action and as such will be expected to take full ownership of the action and be responsible for collecting, maintaining and providing data on the action.
– **Partners:** the partners are those Teams, Sections, Services or Organisations who are working in conjunction with the Owner to deliver the action. These partners may collect and / or maintain data which the Owner will draw upon when submitting that data.

5.8. Cost – Benefit Criterion

The process of allocating a cost and benefit to each action necessitated the provision of a means of categorising both the anticipated cost (in £) and benefit (in pollutant concentration reduction) from each proposal. A simple methodology was used to band both criterion into three brackets of 'Low', 'Medium' and 'High'.

Costs

The costs of actions included within the Plan have been provided where possible, however most actions have broad estimates of costs that have been categorized into the bandings of low, medium and high. The range of these costs associated with each action is presented in the Table below

Estimated Financial Costs of Action Plan Actions

Costing Category	Estimated Cost of Action (£thousands)
Low	<50
Medium	50 - 500
High	>500

It should be noted that there are inherent difficulties associated with estimating the costs of actions where the precise nature of the proposals have not been confirmed. Therefore, all estimates given are relative and subject to change.

Benefits

The predicted benefit of the actions listed in the action plan with regard to improving air quality by reducing emissions of Nitrogen Dioxide and Particulate Matter have been assessed. The actions can be categorized into three bandings given in the example table below although the absolute values would be pollutant specific, and possibly influenced by population density.

Predicted Air Quality Impacts of Actions

Air Quality Improvement	Estimated reduction in PM_{10}/NO_2 concentrations
Low	= 0.5 µgm-3
Medium	0.5 – 1.0 µgm-3
High	> 1.0 µgm-3

Birmingham City Council, Regulatory Services will continue to operate its current monitoring networks and will introduce specific monitoring programs to

quantify the actual impact of each action on air quality. (Where resources are made available)

5.9. Cautionary Note

The exact prediction of improvement in air quality that will be brought about through the actions in this Plan is an extremely complex matter, and therefore this report cannot guarantee that the required air quality objectives will be met. It should however, be noted that the combined effect of the actions presented within this Plan are anticipated to bring about a cumulative reduction in air pollution, with the aim of bringing levels to within the statutory requirements.

The uncertainty over predictions is always present when outputs are generated from a computer model. The computer model is an attempt to reconcile two worlds; one is the 'real' world, the other a representation of that world within the computer model. Therefore, the more accurate and representative the input data, the closer the model is likely to be to the real world.

Large amounts of information are required for the computer model. Such data as meteorological and topographical are required, but the most important is the emission information for all dynamic sources. Dynamic sources are those with emissions that vary over time, and this temporal variation has to be accounted for within the model. These datasets are held in what is known as an **E**missions **D**ata**B**ase (EDB). The EDB contains information on all major roads, the modal variations for those roads and the emission values for the vehicles that use the road network. Other information on static sources, such as industry, are also held with information on the operation and other parameters. With natural variations in weather, constantly changing numbers of industrial sources and indistinct or subtle changes in traffic flows the accuracy of these inputs leads to variability in the accuracy of the final outputs. Thus the computer predictions should be used with care and not taken to be absolute.

6. Modelling & Source Apportionment

6.1. The System

Birmingham City Council operates a pollution modelling system known as Airviro. This system collects real-time data from any number of air quality stations, provides for validation of those data sets and their subsequent presentation in a variety of formats. The Airviro system also includes a module known as an Emissions Database (EDB). This database contains information on all major sources of pollution, such as roads, airports and industrial sites. The emission values for each of the sources are based on a dynamic emission, that is, time based. The EDB underpins the entire computer modelling and forecasting of current and future pollution concentrations across the city.

6.2. Types of Models.

The Airviro system includes both Gaussian plume model and a time-dependent grid point model. Algebraic profiles for turbulent diffusion are determined from the boundary layer parameters, together with surface roughness conditions. The numerical technique includes a finite element method in the horizontal plane, using linear base functions in the element description. The solver uses equation-splitting in the three space directions and in time. A central difference scheme is chosen for the vertical advection and diffusion terms. A Grank Nicholson scheme is applied in the horizontal plane and forward time stepping is used in all directions. The grid model allows deposition and chemical processes to be included in a straightforward way.

6.3. Source Apportionment.

It is important to understand the contribution of different sources to the overall concentrations of a given pollutant. This work is known as source apportionment. The Airviro system is used to determine the source apportionment of current and future scenarios, thus a modelled reduction based on a given scenario can be examined for its likely reduction in

emissions, or to determine the reduction required to ensure compliance with objective limits.

All maps (Crown Copyright LA1000021326)

To develop an appropriate action plan it is necessary to identify the relative contribution to the annual mean nitrogen dioxide concentration from different sources at the worst case or typical locations. This will assist in the selection of the most effective actions that can be targeted at the sources primarily responsible for those emissions.

The city has compiled a dynamic emissions database (EDB) that is used to model and forecast air quality for given scenarios. Thus it is possible to test the likely impact of an action or as a minimum, evaluate the change in local emissions needed to ensure compliance.

The non-transport emissions are at times referred to as the background, although this is not really the case. The inputs into the non transport value are those to be found in the National Atmospheric Emissions Inventory (NAEI) as published by DEFRA. The inventory accounts for many sources from industry, commerce and the day-to-day activities of the population. Consideration has been given to the degree of influence that any action may have on this 'background' contribution and it is unlikely that the city will be able to influence the concentrations of pollution brought to it on prevailing winds, or significantly alter the emissions to air from domestic or commercial activity.

Therefore the main focus of the action plan will be on those actions that can have a demonstrable effect on emissions from the transport sector.

Where possible source contributions have been apportioned to the following categories:

- Cars
- Light Good Vehicles (LGV)

- Heavy Goods Vehicles (HGV)
- Buses
- Non- transport

Data used within the EDB is derived from fully attributable sources, such as the NAEI and DEFRA. The road traffic data are sourced from a West Midlands database known as **P**olicy **R**esponsive **I**ntegrated **S**trategy **M**odel or PRISM. The PRISM data contains information on transport mode and traffic flow by forecast year, this is then combined with emission factors for each of the vehicle types to produce the emission total for that particular road (or part thereof). An example of the road network held within the EDB is shown in figure 5 below where the spatial component is clearly displayed.

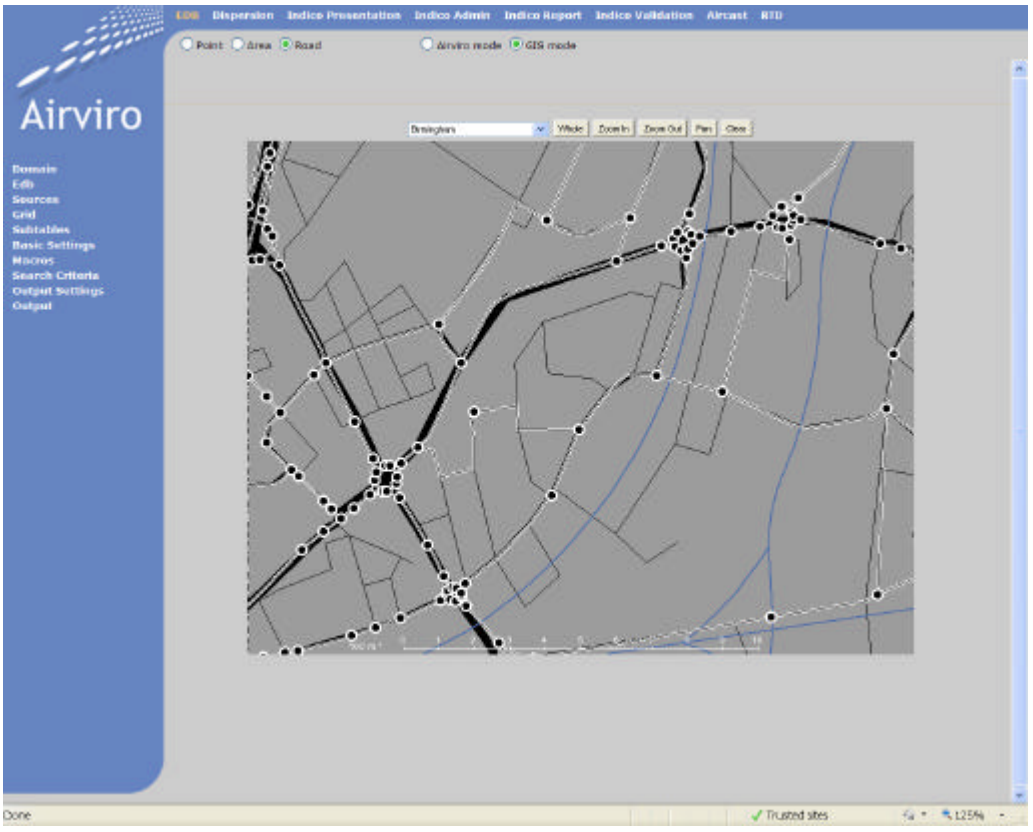


Figure 5: Spatial component of road network in EDB

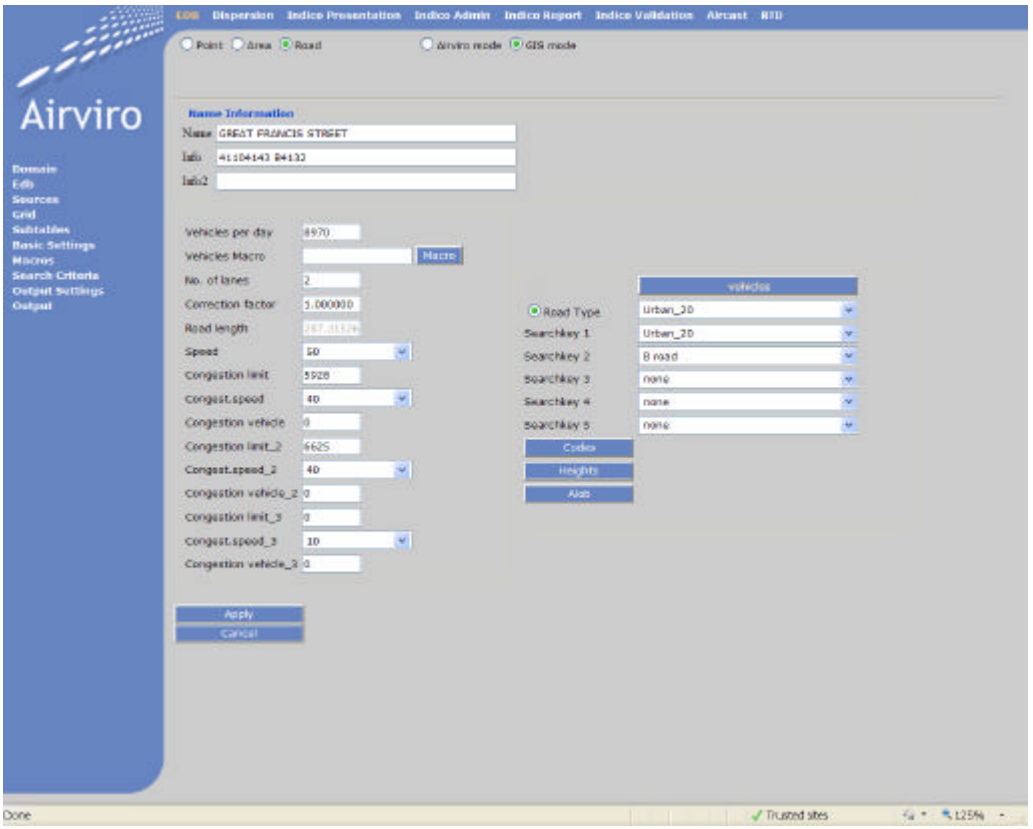


Figure 6: Road link attribute data held within EDB

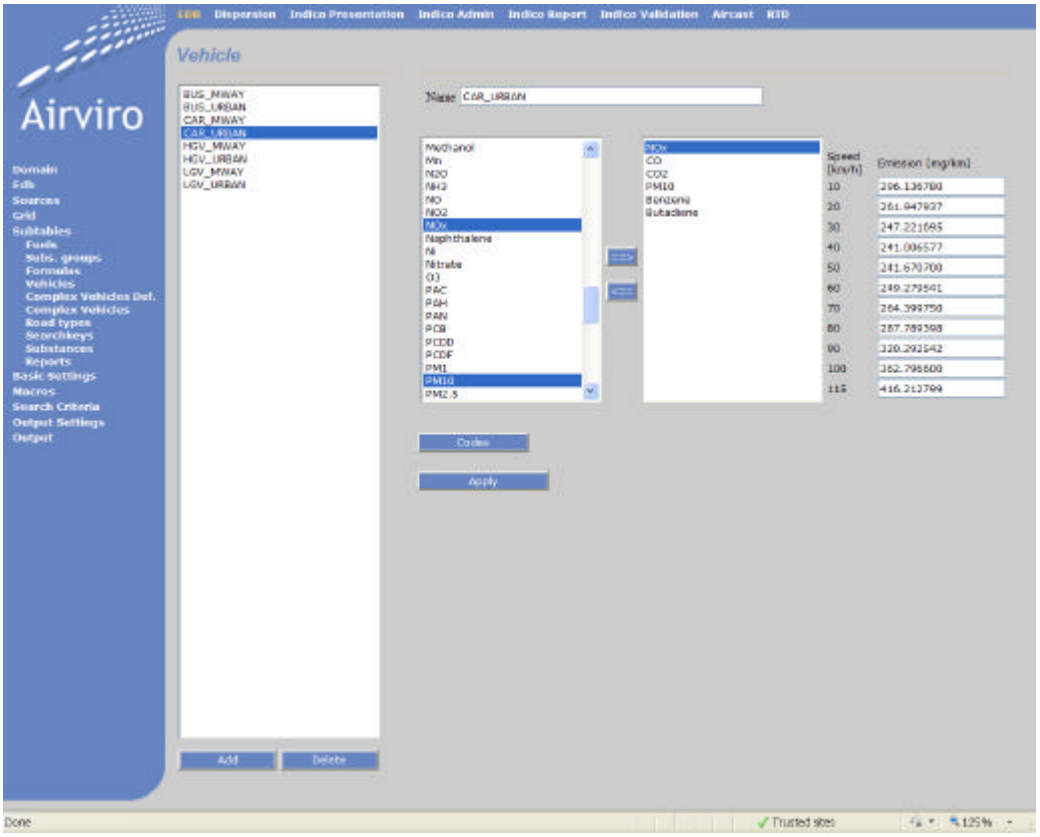


Figure 7: Emission data for vehicle type held within EDB

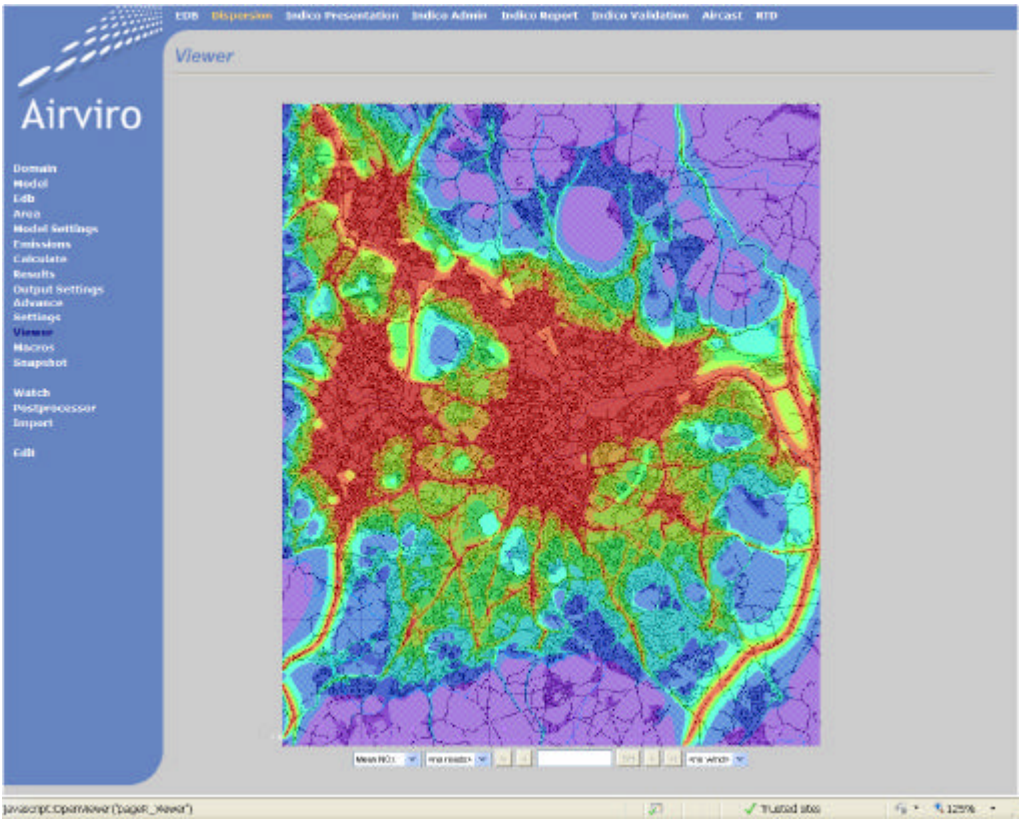


Figure 8: Typical model output. NO_x as annual mean in µg/m^3

It should be stressed that most computer modelling programs output as total oxides of nitrogen (NO_x). However, the objective is set as nitrogen dioxide (NO_2) thus the need to convert any output from NO_x to NO_2. Many methods can be applied but most use fixed inputs across the study area for the background value for NO_2. Birmingham uses a different approach in that the background is calculated and mapped so that a more realist value for the combined concentrations of NO_2 can be arrived at. Other values, such as the typical concentrations of ozone are determined by monitoring with reference method sampling, whilst the proportion of NO_2 emitted as primary NO_2 has been evaluated for the entire city.

Figure 9 following shows a typical background model result, clearly showing the variation in concentrations across the city. Using the values from this analysis provides for a more realist calculation of the annual mean concentrations of NO_2 from all sources.

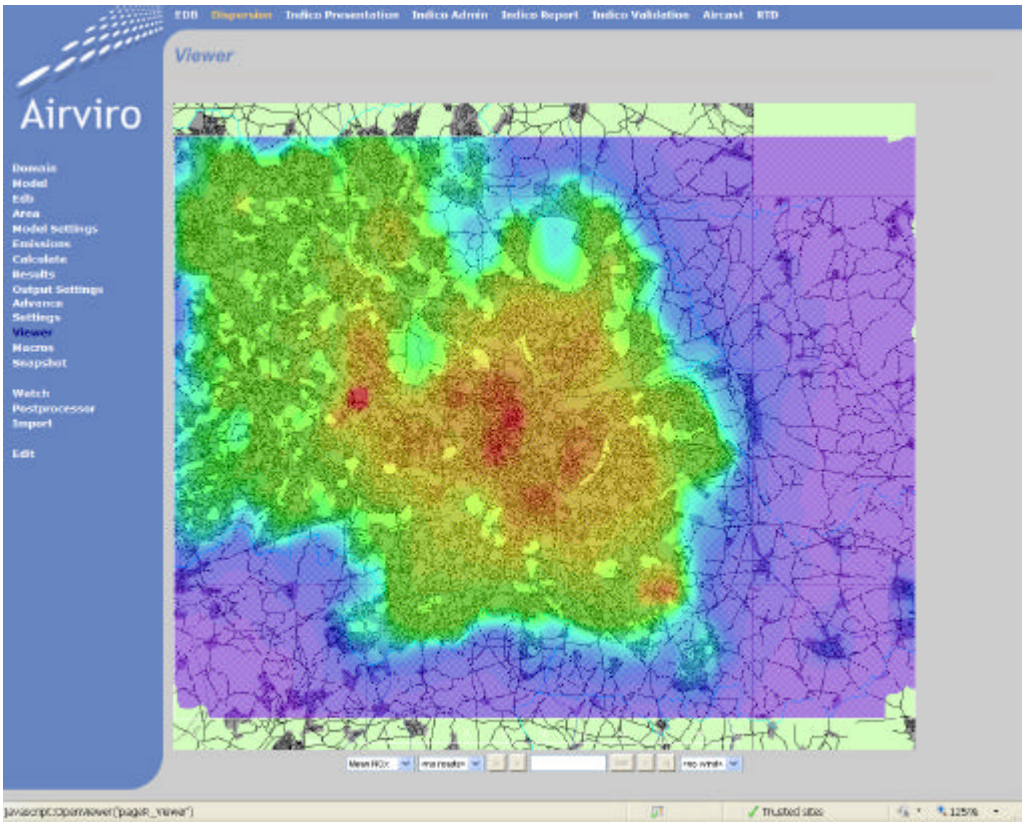


Figure 9: Modeled background concentrations of NO_2

The 'background' analysis is used to calculate the conversion of NO_x to NO_2 with the result that the modeled concentrations are very close to those observed by measurement. A good example of the accuracy is show in figure 10 for an area of the A34 Stratford Road, where the modeled values are within ten percent of those measured.

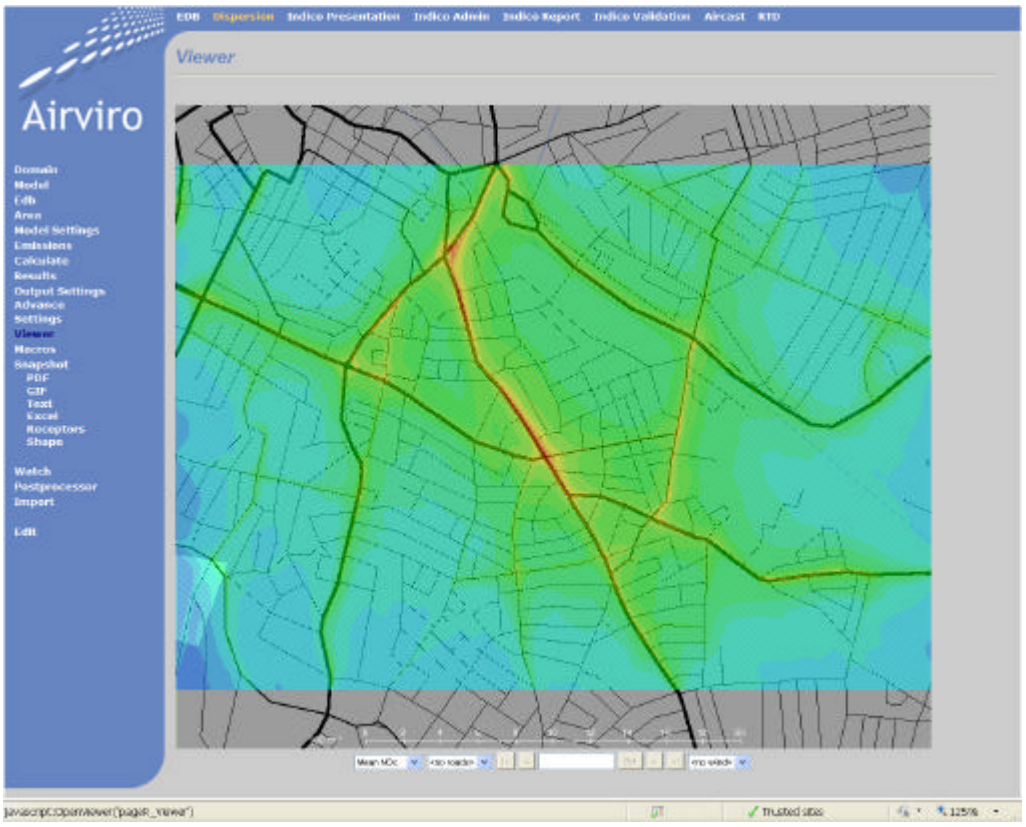


Figure 10: Stratford Road Modeled Values

Example: Source apportionment for Stratford Road.

The method used to calculate the source apportionment for the section of Stratford Road under consideration is based upon the techniques found in Annex Three, Box A3.1 of Technical Guidance (TG09).

Firstly the model is used to establish the annual average NO_x for that section of the road. This has been predicted to be 70µg/m^3. Next the annual mean NO_2 is calculated as previously described and found to be 46µg/m^3.

The background or non traffic concentrations for the same area has been determined to be 26µg/m^3 thus the total concentration from traffic sources is 20µg/m^3.

From the emissions database the road has an AADT of 33,123 with the following fleet composition:

Cars 73%
LGV 5%
HGV 11%
Bus 11%

However, by establishing the emission values for each vehicle type it is possible to apportion the relative contribution from those vehicle types.

Type	Modal Split	Emission rate (mg/km/sec)	% NO_x contribution
Cars	73%	241	2.3
LGV	5%	589	5.7
HGV	11%	5052	48.8
Buses	11%	4473	43.2

Emission on this section of road 10.355g/km/sec

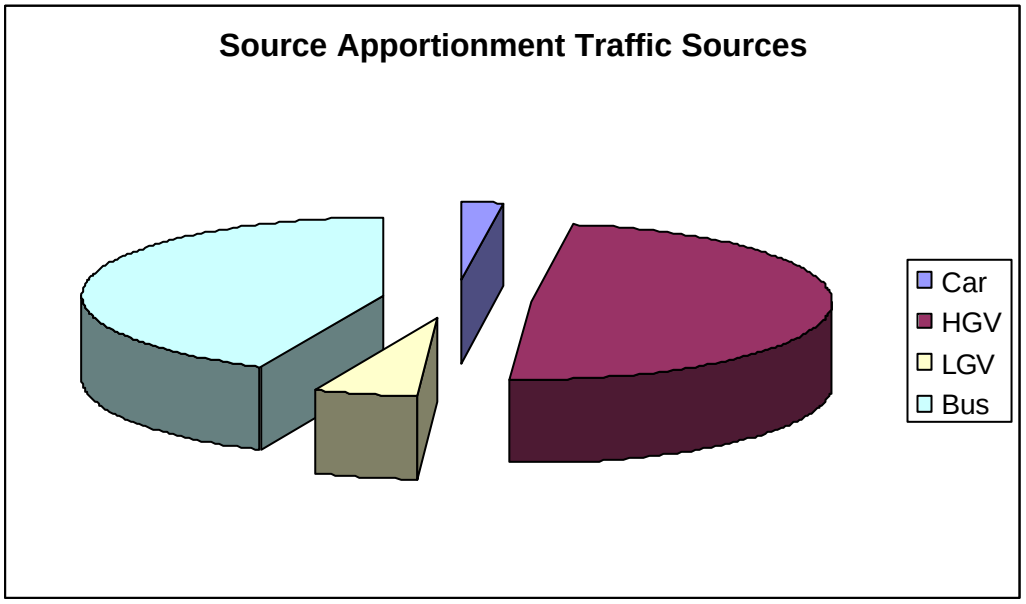


Figure 11: Source Apportionment.

Assuming that no significant change in background concentrations of nitrogen dioxide, the reduction required for compliance is in the order of 37% or 3.831g/km/sec. Even though there are almost ten times as many cars on this road, they contribute only a small fraction of the total emission compared to that of HGVs and Buses.

Minor changes in the number of cars travelling on a road may not have the desired effect whilst even a relatively small reduction in the number (or emission characteristics) of HGVs could produce a very significant change in the overall NO_x emissions and thereby the NO_2.

7. Actions and Principles

7.1. Introduction to the Section

This section details the actions that are proposed to be carried forward to form the basis of this Action Plan.

This section also details those principles which are deemed to have merit and be worthy of general support but which are not deemed to lend themselves to ready assessment / measurement in the form of a true action.

7.2. List of Actions

The 2010 Action Plan seeks to concentrate on 12 actions. These are as follows:

Action 2010/1 - Low Emission Zone within the City Centre
Action 2010/2 – Biomass in Birmingham Schools
Action 2010/3 – Red Routes
Action 2010/4 – New Roads
Action 2010/5 – Air Quality & Planning
Action 2010/6 – Control of Industry
Action 2010/7 – Control of Bonfires and other Unauthorised Fires
Action 2010/8 – Park & Ride
Action 2010/9 – Improvement of the Council Fleet
Action 2010/10 – Introduction of low carbon/electric Vehicles
Action 2010/11 – Improvement of the Public Service Fleet
Action 2010/12 – Taxi Emission Strategy

Each of these actions is documented in detail as its' own specific project on the following pages.

Action 2010/1 - Low Emission Zone within the City Centre

Proposed Action

Birmingham City Council will undertake a detailed feasibility study with a view to introducing low emission zones into areas highlighted to have both levels of NO_2 exceeding Air Quality objectives and relevant exposure to members of the public.

Outline

A low emission zone is a geographically defined area where operators of vehicles must comply with a specified low emissions policy. This zone will encourage operators to move from dependence on liquid fossil fuels to low carbon, renewable energy efficient alternatives. Many cities across Europe have opted for Low Emission Zones as a means of controlling vehicle emissions.

The City is already committed to the introduction of a number of electric cars within the £25m government funded CABLED (Coventry & Birmingham Low Emissions Demonstrators) scheme. Many manufacturers now offer hybrid vehicles that can operate from battery power only with zero emissions, this includes not only passenger vehicles but also commercial and public service vehicles. Accordingly the technology is available.

Cost - Benefit Summary

The **cost** of introducing this scheme would be **high** to both the City Council and businesses and the **benefits** to air quality would be **high** to all members of the public within the controlled zones.

Ownership

Environmental Health

Partners

Climate Change and Sustainability

SMART targets

Specific	The feasibility study will identify defined geographical areas specified for a low emission zone(s) and will provide in-depth analysis of potential improvements in air quality with reference to predictive costs to both the city council and affected businesses.
Measurable	The low emissions zones would be located in areas where Regulatory Services have existing air quality monitoring networks as these are already areas under close scrutiny for air quality. Results would be measured against the air quality objectives contained within the Air Quality Regulations 2000.
Achievable	Funding for this type of scheme is available through the Sustainable Transport Fund. Many cities throughout Europe have already introduced similar schemes.
Relevant	The likely geographical areas would either currently breach Air Quality Objectives, or would be close to the specific limit, and have relevant exposure to the public. The introduction of low emission zones will have beneficial effects on public health.
Time Related	The feasibility study should be completed within 12 months.

Action 2010/2 – Biomass in Birmingham Schools

Proposed Action

Birmingham has successfully gained Defra funding to complete a detailed study on the introduction of biomass boilers to Birmingham Schools under the Building Schools for the Future (BSF) programme.

Outline

BSF is a national building programme that will give Birmingham the opportunity to rebuild or refurbish all 76 secondary schools over the next decade. A key element of this programme is the introduction of wood burning biomass boilers onto the school premises to comply with Birmingham City Council climate change targets. The whole of Birmingham is designated as a smoke control area under the statute of the Clean Air Act 1993 and the BSF contractors 'Catalyst' have agreed that the boiler will be from the exempt appliances list and fuelled accordingly.

The Air Pollution Team of Regulatory Services have raised concerns that the cumulative introduction of biomass boilers into inner city areas may impact adversely upon the local air quality, especially in terms of increased particulate matter (PM_{10} & $PM_{2.5}$), Nitrogen Oxides (NO_X) and Volatile Organic Compounds (VOC^s).

Therefore, with Defra funding a specialist environmental consultancy, Westlakes Consulting, will model the effects of introducing a number of biomass boilers into Birmingham inner city areas.

Cost – Benefit Summary

The **cost** of this project is **low** (£12,000) but the **benefits** may be **high.** If the study proves that the predictive modelled pollution values are raised by more than 1$\mu g/m^3$ at a local level, the introduction of biomass boilers will need to be reconsidered.

Ownership

Environmental Health

Partners

Education & Lifelong Learning

SMART targets

Specific	BCC will contract Westlakes Consultancy to model the effect on air pollution of introducing biomass boilers to a selected number of Birmingham Secondary Schools.
Measurable	Modelled results are measured against the air quality objectives contained within the Air Quality Regulations 2000.
Achievable	Boiler specifications for the selected schools will be provided to Westlakes. Model runs can then be completed using the new, fully validated West Midlands Emissions Database.
Relevant	Particulate matter of PM_{10} & $PM_{2.5}$ fractions is known to cause premature deaths. Any increase in these pollutants values will adversely affect public health.
Time Related	The study should be completed within 12 months.

Action 2010/3 – Red Routes

Proposed Action

Birmingham City Council will continue to extend the red route network and assess the effectiveness in terms of traffic management.

Outline

Red Routes have now been established on the Stratford Rd (A34), Tyburn Rd (A38) and Walsall Rd (A34). Birmingham City Council has plans to further extend the Red Route Network.

Selected roads in Birmingham have been elected as designated Red Routes with the clear aim of improving the traffic network by reducing delays caused by congestion due to inconsiderate parking. The red lines on the road are a clear signal to all drivers to show where stopping restrictions are in place. Drivers who ignore the red route restrictions are liable to a fixed penalty notice.

Red Route options are now included in SMART routes and Low Carbon Corridors. The A45 is a proposed Red Route, with options for parts of A41/A38/A34/A453

Regulatory Services routinely monitor air quality at specified points adjacent to the Red Routes.

Cost – Benefit Summary

The **cost** of introducing this scheme would be **high** to both the City Council and possibly businesses (through lost earnings during installation) and the **benefits** to air quality would be **high** to all members of the public within the controlled zones.

Ownership

Transportation Strategy

Partners

Environmental Health

SMART targets

Specific	BCC will nominate predefined roads for inclusion into the Red Route Network. Regulatory Services can model the effect of the Red Route on air quality via the Airviro System and validate with monitoring if required.
Measurable	Modelled and monitored results will be measured against the air quality objectives contained within the Air Quality Regulations 2000.
Achievable	Red Routes have been installed on busy Birmingham Roads and this experience will enable the introduction of new routes.
Relevant	Red Routes have several relevant objectives namely reducing congestion, improving journey times and improving air quality along the red route corridor.
Time Related	Red Routes are subject to a thorough consultation exercise and road traffic survey before installation. Timescales for Red Routes should be included in the Local Transport Plan (LTP3)

Action 2010/4 – New Roads (Transport Capacity)

Proposed Action

Birmingham City Council will continue to build new roads and modify existing roads as where justified and will monitor the effectiveness in terms of traffic management.

Outline

Birmingham currently has one major new road project - the Selly Oak New Road (Bristol Road A38).

Selly Oak contains The University of Birmingham, The Queen Elizabeth Hospital and the Selly Oak Hospital and extensive areas of housing. Selly Oak Centre is one of the main shopping areas serving the south west of Birmingham. It includes a major superstore (Sainsburys) and a retail park as well as a large number of smaller shops.

Bristol Road, where it passes through Selly Oak, will be downgraded to provide for better facilities for pedestrians, cyclists and buses. However, it is important that the capacity and role of the A38 Bristol Road is maintained for through traffic and as an access route to development sites. The construction of the Selly Oak New Road will provide an alternative route to through traffic, particularly heavy goods vehicles who will be discouraged from using the existing Bristol Road, thereby allowing opportunities to enhance the environment and pedestrian and public transport facilities through Selly Oak. The new road will provide new access to the rebuilt Queen Elizabeth hospital and to new proposed retail, high-technology and mixed use developments.

Regulatory Services have monitored in Selly Oak for many years and, in conjunction with BCC Transportation, have instigated a monitoring programme that will compare levels of Air Quality before, during and after the construction of the new road.

Cost – Benefit Summary

The **cost** of introducing this scheme is **high** and the **benefits** to air quality would be **high** to all members of the public within the Selly Oak area.

Ownership

Transportation Strategy

Partners

Environmental Health

SMART targets

Specific	The Selly Oak New Road will remove the majority of through traffic in Selly Oak Centre with corresponding improvements to air quality.
Measurable	Monitored results will be measured against the air quality objectives contained within the Air Quality Regulations 2000.
Achievable	The Selly Oak New Road and subsequent improvements to the existing Bristol Road are contained within the BCC Transportation portfolio and have full funding.
Relevant	Selly Oak New Road will reduce congestion, improve journey times and improve air quality through Selly Oak thereby benefiting public health.
Time Related	Timescales for Selly Oak New Road are phased and due for completion in 2011

Action 2010/5 – Air Quality & Planning

Proposed Action

Birmingham City Council will devise a policy for assessing the air quality implications of major planning developments in line with the Birmingham City Council Core Strategy.

Outline

Birmingham City Council's Planning & Environmental Health sections have two relevant goals with regard to Air Quality; namely to encourage sustainable high quality design and development through the planning application process and to ensure a safe and healthy built environment for Birmingham.

The Environmental Protection Unit work closely with both planning officers and developers to ensure that air quality issues are addressed at the pre-planning stage where possible.
The Air Quality Team have modelled predictive nitrogen dioxide levels across the whole of the Birmingham area and have produced a map that displays the results. The predictive levels of nitrogen dioxide are split into three catagories that "allow development, no air quality issues", "request a full air quality assessment" or "refuse development on air quality grounds".

This map is central to a new policy being designed by the Air Quality Team which will act as a guide to Pollution Control Officers and Air Quality Officers when assessing planning applications. The policy is currently being drafted and it is hoped that it may be sufficiently robust to form a supplementary planning document in its own right.

Cost – Benefit Summary

The **cost** of introducing this scheme is **low** and the **benefits** to air quality would be **high** by removing or restricting receptors from pollutants and restricting the locating of 'polluting' developments.

Ownership

Environmental Health

Partners

Planning Management

Development Planning

SMART targets

Specific	Planning applications are assessed against a simple policy based upon air quality objectives. A more extensive policy will provide greater consistency in promoting air quality targets.
Measurable	The production of a specific Planning and Air quality document in which decisions on planning applications are set against the air quality objectives contained within the Air Quality Regulations 2000.
Achievable	The GIS based planning applications & air quality tool has been developed by the Air Quality Team and is available immediately.
Relevant	Air quality within the planning framework is required under Part IV of the Environment Act 1995 to restrict public exposure to air pollutants.
Time Related	Planning applications are processed to an agreed timescale. The new policy is scheduled for completion by the end of the 2010/11 financial year.

Action 2010/6 – Control of Industry

Proposed Action

The Council will continue to strictly regulate approximately 270 industrial processes under the Environmental Permitting Regulations 2007. In addition the Council will improve its programme of searching for additional industrial premises that require an environmental permit.

Outline

Birmingham City Council's Environmental Health section enforce the provisions of the Pollution Prevention and Control Act 1999 under the Environmental Permitting Regulations 2010. Under these Regulations certain industrial activities are regulated by the granting of a permit to emit specified emissions to atmosphere. The regime necessitates the identification of such premises, the actual granting of the Environmental Permit, and subsequent regulation in the form of inspections, the assessment of actual emissions, and the auditing of management control documentation and other reports.

The pollutants emitted to atmosphere from the various industrial sectors predominantly include volatile organic compounds, oxides of nitrogen, particulates and some sulphur dioxide.

The regulation of these industries contributes to local air quality management.

Cost – Benefit Summary

The **cost** of the inspection programme is **high**[1] and the **benefits** to air quality are **high** by default because without the inspection programme there would be no restrictions from industry on emissions to air.

[1] The cost of the inspection programme is funded by the industry via subsistence fees in line with the polluter pays principle.

Ownership

Environmental Health

Partners

None

SMART targets

Specific	The process of inspecting regulated facilities with a frequency based on risk, in line with Defra guidance will continue. A formalised programme of seeking out businesses that are not permitted will be introduced.
Measurable	The inspection strategy of regulated facilities is closely monitored and reported to Defra on an annual basis. The number of unregulated premises visited and, of those, the number requiring an environmental permit will be recorded.
Achievable	Inspections of premises are completed by fully trained, experienced and authorised Officers and have been since 1990.
Relevant	Emissions from industry have the potential to release harmful pollutants into the atmosphere.
Time Related	The inspection strategy is determined annually and completion progress is reported annually to Public Protection Committee and Defra.

Action 2010/7 – Control of Bonfires and other Unauthorised Fires

Proposed Action

Birmingham City Council will continue to respond to reports of bonfires under nuisance and clean air legislation. Furthermore, the City will continue to act alongside West Midlands Fire Service as part of the Fire Reduction Partnership.

Outline

There are no restrictions on the lighting of bonfires excepting the need to ensure compliance with clean air legislation and the avoidance of nuisances.

Birmingham City Council enforces the provisions of the Clean Air Act 1993 and Part III of the Environmental Protection Act 1990 in respect of bonfires across the city. The City Council will continue to provide a free bulk collection service to residents in order to reduce the need for bonfires. The City Council will continue to develop its programme of inspections of commercial premises to verify that waste is being disposed of in compliance with the duty of care provisions of the Environmental Protection Act 1990. The City Council will continue to act under the Fire Reduction Partnership alongside West Midlands Fire Service and other partners to discourage unauthorised fires. The City Council will continue in its joint working with West Midlands Fire Service under the Birmingham Building Watch initiative to reduce the incidence of arson in void commercial and residential properties.

Birmingham City Council will seek support for a corporate policy on the permitting of bonfires at Civic events.

Cost – Benefit Summary

The **cost** of introducing this scheme is **low** and the **benefits** to air quality would be **low** but restricting bonfires will ensure localised air quality is not compromised and will contribute to the exposure reduction target for $PM^{2.5}$.

Ownership

Environmental Health

Partners

Fleet & Waste Management

West Midlands Fire Service

SMART targets

Specific	Enforcement of the provisions of the Clean Air Act 1993 and Part III of the Environmental Protection Act 1990 in respect of bonfires across the city
Measurable	The number of requests for assistance relating to bonfires is monitored.
Achievable	BCC has a number of initiatives to help residents and businesses to recycle or remove waste without the need for bonfires. A balance between education and enforcement is required.
Relevant	Uncontrolled bonfires can release harmful pollutants at a local level that are prejudicial to health.
Time Related	Reducing the number of bonfires before 2015 will ensure that Birmingham meets the $PM_{2.5}$ exposure reduction targets set in European directives.

Action 2010/8 – Park & Ride

Proposed Action

Birmingham City Council will fulfil the aims of the West Midlands LTP within Birmingham with regard to park and ride schemes.

Outline

Centro provides Park and Ride schemes that impact upon 2.75 million journeys every year, although it should be noted that park & ride does not necessarily reduce car journeys but decreases the length of trip. More people are making use of the Park and Ride facilities as occupancy levels have increased by 3.3% to 5,425. Usage is now greater than 90% compared to 85% in 2006/07. Sites are equipped with lighting, help points and CCTV. A £1.4million scheme to expand CCTV and lighting coverage at all Centro car parks is currently in progress. Car parking facilities are also provided at 4 of the 23 Metro Line One stops.

Birmingham City Council will fulfil the aims of the West Midlands LTP within Birmingham. These include; increasing the number of park and ride spaces at railway stations in a planned approach whilst recognising the benefits of opportunistic developments that might arise, ensuring that future metro proposals are fully supported by park and ride sites integrated within their development, developing a programme of strategic park and ride sites with the objective of delivering one new site every 2 years, developing the concept of bus based park and ride where suitable opportunities exist.

Cost – Benefit Summary

The **cost** of introducing this scheme is **High** and the **benefits** to air quality would be **low** but removing vehicles from the road will lead to less congestion and less air pollution.

Ownership

Transportation Strategy

Partners

CENTRO

Environmental Health

SMART targets

Specific	Developing a programme of strategic park and ride sites with the objective of delivering one new site every two years. The CENTRO park & ride schemes are embedded within The CENTRO Environmental Strategy 2009 – 2014.
Measurable	Monitored results are measured against the air quality objectives contained within the Air Quality Regulations 2000.
Achievable	Park & Ride schemes have been introduced by CENTRO at several locations without problems.
Relevant	Reducing the number of vehicles travelling into central Birmingham has the potential to improve air quality.
Time Related	The CENTRO Environmental Strategy 2009 – 2014 will provide the time-frame

Action 2010/9 – Improvement of the Council Fleet

Proposed Action

All vehicles procured by Birmingham City Council will by 2015 be either electrically powered or run on liquified petroleum gas.

Outline

Birmingham City Council operates a fleet of over 2000 vehicles within the city. It is essential that the City Council restricts harmful emissions from its own fleet where possible.

The Birmingham Declaration issued by Birmingham City Council on 1st December 2009 commits the Council to a number of actions including the procurement of only electric or liquified petroleum gas vehicles by 2015. This action was primarily aimed to reduce the City's carbon footprint and is sponsored by the Deputy Leader as part of the Sustainability and Climate Change Plan. The additional benefit of this action is that this process of vehicle replacement may improve air quality within the City.

Present policy within the Council is to ensure that only the most efficient and least polluting (highest Euro category) vehicles are purchased/leased. The use of modern low emission vehicles is, however, only part of the solution. Any vehicle used inefficiently will massively reduce the potential benefits to be gained by using modern Euro IV or V engines. It is therefore important that vehicles used are the most suitable for the job, that they are properly maintained and that they are driven in an efficient manner. Birmingham City Council will therefore ensure that replacement vehicles are environmentally assessed for purpose in order that smaller more efficient replacements are obtained where possible.

All Birmingham City Council vehicles are regularly serviced and drivers are required to complete daily checks which are recorded to ensure vehicles are operating safely. These daily checks include measures that also impact on fuel efficiency such as checking correct tyre pressures.

All Birmingham vehicles are “tracked” by GPS and management information relating to vehicle movements and speeds is collated. Drivers of Council vehicles have already been instructed not to idle vehicles unnecessarily and this can be checked via the tracking system. All Birmingham City Council employees are tested every three years for competency to drive City Council vehicles, during this test the drivers are instructed on simple efficient driving styles such as avoiding over accelerating and then braking heavily which can make a huge difference to fuel efficiency, as can reducing speed (e.g. 60mph as opposed to 70 mph).

It is stated under the Birmingham Declaration that by 2015 there will be 500 electric cars in the city and all vehicles procured by the council will be electric or powered by LPG. It is anticipated that some vehicles will also be powered by CNG.

Cost – Benefit Summary

The **cost** of replacing the fleet is **high** and the **benefits** to air quality would be **low/medium** but this measure displays the City Councils’ own commitment to improving air quality with leading by example.

Ownership

Fleet and Waste Management / Sustainability and Climate Change

Partners

SMART targets

Specific	Birmingham city Council will aim to replace its fleet with electric or liquified petroleum gas vehicles.
Measurable	The composition of the fleet can be assessed via purchase records and driver records can be examined.
Achievable	The replacement of the council fleet is incorporated within the City Council plan and the Birmingham Declaration
Relevant	Fuel efficient low emission vehicles will help to reduce air pollution both locally and across the city as a whole.
Time Related	The replacement of the fleet is on-going.

Action 2010/10 – Introduction of low carbon/electric Vehicles

Proposed Action

Birmingham City Council will support the CABLED project as a staging point for the further development of ultra-low carbon vehicles and supporting infrastructure.

Outline

The CABLED (Coventry & Birmingham Low Emissions Demonstrators) project will showcase electric cars across Birmingham and Coventry in the West Midlands. The project will make Ultra Low Carbon Vehicles available to a wide cross section of real world users and will collect data on their everyday use. This is part of a UK wide trial in which the West Midlands plays a major role.

The widespread uptake of electric vehicles will significantly reduce carbon emissions across the UK, and reduce local air pollution and noise levels. Vehicles are becoming available but issues such as initial purchase price, recharging opportunities and range anxiety for longer journeys remain to be resolved before mass deployment.

The CABLED project will be collecting data from the vehicles to understand how the vehicles are used in real life and to assist in the planning of the further expansion of the supporting infrastructure.

This project will:

- Deliver a showcase demonstration of 110 ultra low carbon vehicles across Birmingham and Coventry in the West Midlands. These will be a cross-section of vehicles; 2 seater, 4 seater and SUVs. They will be powered using battery electric, hydrogen fuel-cell and plug-in hybrid technology.
- Deliver the infrastructure required both in the users' property and workplace, and in public areas. The charging infrastructure will be a conventional plug in system currently deployed elsewhere in the UK.

- Allow a large number of available charging point locations and thus vehicle usage of a diverse nature. A range of users with varying driving patterns will be recruited from a diverse socio-economic background.
- Provide extended real world vehicle evaluation and usage data to allow final development and hence ensure the successful production launch of ultra low carbon vehicles.
- Collect data to measure vehicle performance, infrastructure usage patterns, impacts and requirements with a minimum 12 months experience of seasonal conditions from all vehicles.
- Publicise the benefits and progress of low carbon vehicles

Cost – Benefit Summary

The **cost** of this scheme is **high** and the **benefits** to air quality would be **low** but the potential benefits in future years on the promotion of increased use of low carbon vehicles may be high.

Ownership

Climate Change and Sustainability

Partners

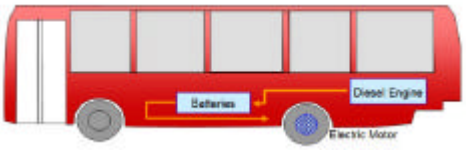
CABLED

Environment & Culture

SMART targets

Specific	Birmingham City Council will provide infrastructure for this project.
Measurable	The amount of pollution reduced by introducing these vehicles will be calculated, however, this assumes a switch by the user from a carbon fuel based vehicle to electric.
Achievable	This is a government-funded scheme that has the backing of several public bodies.
Relevant	The introduction of electric/low carbon vehicles has the potential to reduce local air pollution and cut greenhouse gas emissions.
Time Related	This is a one-year project.

Action 2010/11 – Improvement of the Public Service Fleet



Proposed Action

Birmingham City Council will support the programme for replacement buses as outlined by CENTRO's Environmental Strategy 2009 – 2014.

Outline

Buses provide the majority of public transport journeys in the West Midlands and account for nearly one million journeys a day. There are a number of operators using vehicles of varying types and Euro emission categories, the largest being National Express West Midlands. The Arriva and Rotala groups have also extended their interests in the West Midlands through the acquisition of smaller bus companies. The overall contribution to road traffic emissions of NO_2 and PM_{10} within the AQMAs from buses is significant.

Centro are the West Midlands Integrated Transport Authority, which promotes and develops public transport across the region and is committed to encouraging public vehicle operators to improve vehicle fleets.

The Transport Act 2008 included powers aimed to provide Passenger Transport Executives with a wider range of options for engaging with and influencing commercial bus operations in their area. With the widening of powers there are a variety of routes under which improved fleet emissions might be sought:

- Voluntary Partnership Agreement (VPA);
- Tendered services;
- Statutory Quality Partnership (SQP);
- Quality Contract (QC); and
- Traffic Regulation Condition (TRC).

Approximately 36% of National Express West Midlands vehicles are Euro III or better and the second largest operator the Rotala Group have 30% of vehicles of Euro III or better. All new buses from October 2008 will have to be Euro V compliant. Buses

built between October 2005 and 2006 have had to be Euro IV compliant and Euro III for buses built between October 2000 and October 2005. Operators often support improving the performance of diesel engines running on conventional fuel to reduce emissions as the answer in the short term, but are committed to continue to keep abreast of fuel alternatives as they come onto the market.

CENTRO & National Express, as the largest bus operator in the West Midlands announced on December 5th 2009 that a bid to the Department of Transports Green Bus Fund had been successful. This will see the introduction of new diesel electric hybrid buses on the 22 & 23 bus routes during 2011.

Cost – Benefit Summary

The **cost** of this scheme is **high** and the **benefits** to air quality will be **high.**

Ownership

Transportation Strategy

Partners

CENTRO

SMART targets

Specific	Birmingham City Council will support the programme for replacement buses as outlined by CENTRO's Environmental Strategy 2009 – 2014
Measurable	Improvements in Air Quality can be directly measured against the air quality objectives contained within the Air Quality Regulations 2000
Achievable	The bus replacement programme is a cornerstone of CENTRO's Environmental Strategy 2009 – 2014.
Relevant	The replacement of the bus fleet will have an effect on local air quality. If the City Council can influence bus operators to use the newest buses in areas with known air quality issues the benefits will be greater.
Time Related	The CENTRO Environmental Strategy 2009 – 2014 will provide the time-frame.

Action 2010/12 – Taxi Emission Strategy

Proposed Action

Birmingham City Council will seek to reduce the overall age of the taxi fleet and encourage the use of less polluting vehicles.

Outline

At the start of November 2009 there were over 1200 hackney carriages and over 5600 private hire vehicles registered to operate within Birmingham. Reducing emissions from these vehicles will make an important contribution to improving air quality within the city centre.

Birmingham City Council is to introduce a Vehicle age policy for licensed vehicles from April 1st 2011. This will require hackney carriage vehicles to be no more than 14 years old and private hire vehicles will be no more than 8 years old.

Cost – Benefit Summary

The **cost** of this scheme is **high** and the **benefits** to air quality would be **low initially** but the potential benefits in future years with increased use of more modern vehicles may be high.

Ownership

Licensing

Partners

Environmental Health

SMART targets

Specific	Birmingham City Council have introduced a specific policy on licensed taxi vehicle ages.
Measurable	The amount of pollution reduced by replacing older vehicles can be calculated.
Achievable	This is council policy.
Relevant	The introduction of newer licensed vehicles has the potential to reduce local air pollution.
Time Related	This is an on-going project that will see the modernisation of the taxi fleet over many years.

7.3. Principles

The 2010 Action Plan recognises that certain principles are worthy of support in order to promote reduced car usage, reduce congestion and hence improve local air quality. These are as follows:

Promotion of walking

The City Council actively participates in major initiatives to promote walking across the West Midlands such as by focusing on the development of safer and more convenient walking routes, the production of a good practice handbook and design guide and improving of the pedestrian environment.

Promotion of cycling

The City Council actively participates in major initiatives to promote cycling across the West Midlands such as by focusing on the development of safer and more convenient cycling routes, the support of cycle safety initiatives, and the provision of cycle parking facilities.

Increased use of public transport

The City Council supports the increased use of public transport across the West Midlands through major projects such as the redevelopment of New Street Station to improve passenger capacity, throughput and enhance the passenger experience; and the extension of the Metro project. Support is also provided by minor projects that improve access to bus stops etc.

Government Schemes

The City Council supports various Government schemes such as the Boiler Scrappage Scheme designed primarily to meet Climate Change targets, but which may also reduce direct emissions or indirect emissions via a reduction in the overall energy used.

8. Implementation of the Action Plan

8.1. Action Plan Implementation

The Action Plan 2010 is a complex document that commits the City Council to taking steps to improve the air quality within the City. A significant amount of responsibility falls to various City Council departments and, in order to make the Action Plan 2010 a success it is essential that actions are responsibly owned, that the implementation of actions are closely monitored and that any improvements in Air Quality can be quantified.

Finalisation of Actions

Once the actions have been finalised Environmental Health will make contact will all action owners to identify which officers will be responsible for action implementation and monitoring and reporting to Environmental Health. Environmental Health will then agree with action owners the framework by which this mechanism can be achieved.

Monitoring

The Environmental Health section will take the lead technical role in monitoring the improvements in Air Quality through its' network of city-wide monitoring stations. Environmental Health will meet with individual action owners to discuss progress and to identify improvements where appropriate.

Reporting

It is a requirement of the action planning process that regular reports be submitted to Defra detailing progress towards each of the actions set out within an Action Plan. This is known as the review and assessment process as covered in Section 2.3. The responsibility for interpreting the data supplied by action owners and putting this into the reports to Defra will lie with Environmental Health. It is worth reiterating therefore that the success of this aspect of the process will be dependant upon the accuracy of the base data supplied.

9. Partnership Working

9.1. Local Transport Plan – Transport Initiatives

The most significant source of Nitrogen Dioxide within the Birmingham City boundary stems from road traffic emissions. It is important to note that many improvements in Air Quality through the Action Plan process will only be accomplished via the success of the Local Transport Plan (LTP) and related transport initiatives. It is recognised that it is important therefore that Transportation Strategy and Environmental Health work closely at all levels to ensure the success of both Plans.

9.2. Regional Working

Birmingham City Council, along with 6 other West Midlands Local Authorities, is a member of the West Midlands Chief Officers Air Pollution Group under which a sub group sits to specifically discuss air quality matters.

The members of the sub group are:

- Birmingham
- Coventry
- Dudley
- Sandwell
- Solihull
- Walsall
- Wolverhampton
- Chief Engineers and Planning Officers (CEPOG)

The CEPOG representative is employed by Wolverhampton City Council, the West Midlands Integrated Transport Authority and provides both an input to and feedback from the LTP process.

The sub group has specific aims which include the following:

- To consider and develop Air Quality strategy across the West Midlands Metropolitan area especially with regard to the trans-boundary effects of air pollution.
- To act as a planning and strategic forum to develop and co-ordinate improvements and innovations in service delivery and identify best practice in the field of air quality management across the West Midlands Metropolitan area.
- To highlight any initiatives and new developments in the field of air quality management.
- To aim to promote consistency of approach with regard to air quality management across the West Midlands.
- To receive feedback on planning and strategic issues from each Local Authority's representative.
- To report progress and performance to the DEFRA Air Quality Section and to provide information, reviews and support to representatives.
- To promote the co-ordination of Air Quality Action Plans and their delivery.
- To work in partnership with CEPOG to coordinate LTP air quality input and deliver the LTP air quality target.
- To publicise Air Quality through the website and by other means.
- To raise the profile of Air Quality across the West Midlands.
- To implement the recommendations of the Rogers Review in relation to Air Quality.

Birmingham City Council will continue to work as part of this group to promote a regional approach to air quality management in line with the aims presented above including the progression of the Actions detailed within this Plan.

9.3. Air Quality and Climate Change

It is widely recognised that air quality across the UK has improved significantly in the last couple of decades although there are still negative health effects and environmental pollution associated with modern day pollutants such as particulate matter, volatile organic compounds and oxides of nitrogen.

An added challenge that has been increasingly recognised over the last two decades arises from the direct impact of such pollutants on climate change. Furthermore, climate change scientists recognise other pollutants which are not actively considered under LAQM as being of greater direct importance to their particular field, such as carbon dioxide, methane and water vapour.

Whilst the two disciplines have their own target pollutants to address, in many cases the primary sources are the same, these being emissions from road transport and industry. Accordingly it is recognised that attempts to tackle emissions from these sectors can result in a win-win scenario for both disciplines.

There are however certain controls which can be put in place to tackle air quality which can have a detrimental effect on climate change and vice versa. Accordingly it is critical that both disciplines work in partnership to maximise positive benefits and minimise any negatives.

Environmental Health recognise the important role that Climate Change colleagues can have in supporting and influencing this Action Plan and it is anticipated that all proposed actions be considered in detail as part of the normal consultation process and with specific regard to their impact on green house gas emissions, and conversely those actions taken under climate change that may impact on air quality.

10. Timeline for Action

10.1. Pre-Consultation Phase

A draft copy of the AQAP (v1.4.5) was sent to Defra for pre-consultation comments in September 2010. Comments were requested by the end of November 2010. Comments were received on the 24 November 2010 and were considered in directing further progress.

10.2. Phase 1 - Partner Consultation

The AQAP (v1.5) was sent out to partners and identified action owners on 13 December 2010. Comments were requested by the end of January 2011. Comments were received from some partners / action owners and have been incorporated into this version of the Action Plan.

10.3. Phase 2 - Public Consultation

This phase has commenced with the issuing of this version of the AQAP (v1.6). The consultation period will run up to midnight Friday 24th June 2011. All comments received will be considered and used to direct the final version of the AQAP.

10.4. Ratification by Public Protection Committee

The finalised AQAP will be taken to Public Protection Committee as soon as all consultation comments have been incorporated. It is hoped that this will be in time for the July committee.

11. Responding to this Consultation

11.1. Mechanism for Responding

The consultation process has now ended. However, comments or suggestions can be submitted using the contact points below.

In writing to:

Environmental Health
Birmingham City Council,
Environmental Protection,
PO BOX 15908,
Birmingham,
B2 2UD

By email at:

Pollution.team@birmingham.gov.uk

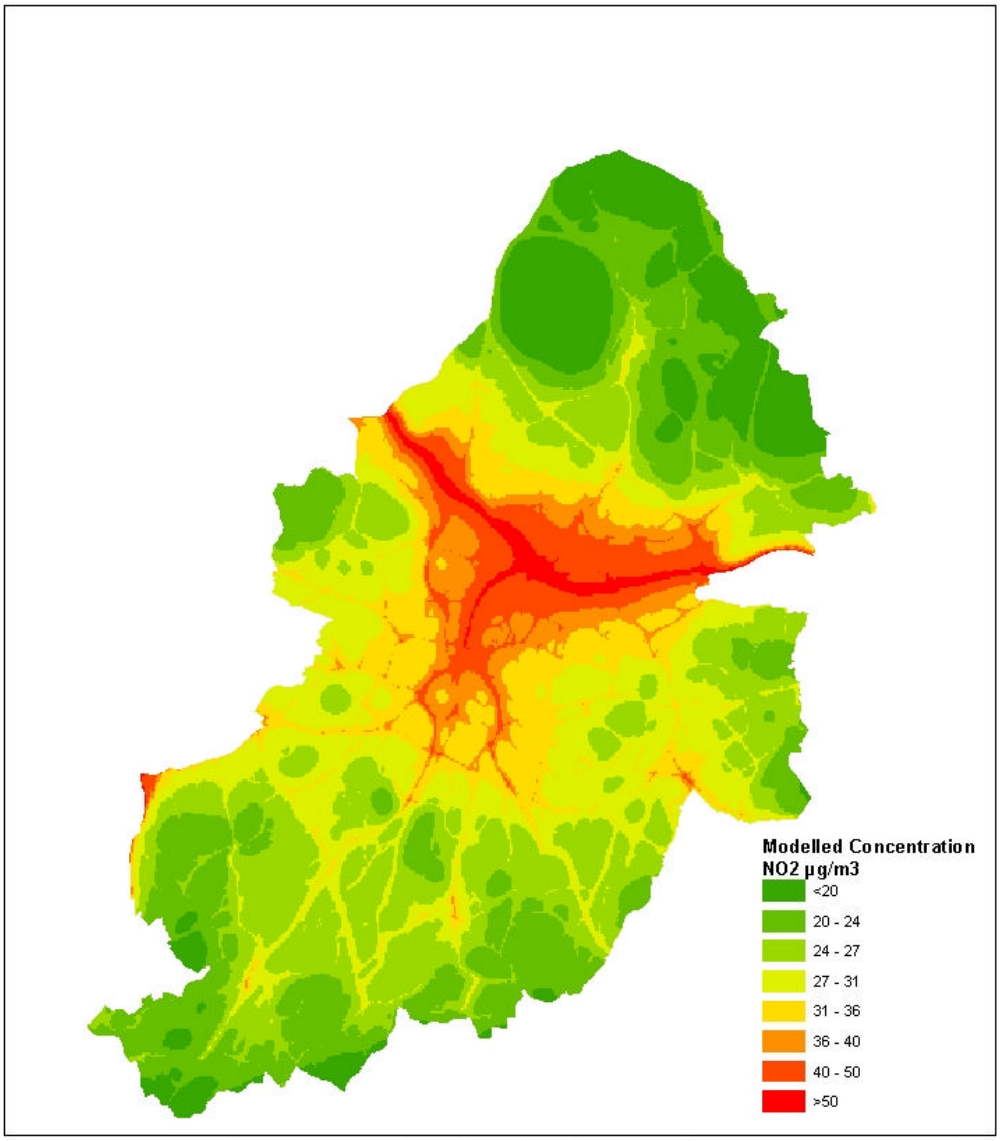
Appendix 1 – UK Air Quality Strategy Objectives

Summary of objectives of the UK Air Quality Strategy

Pollutant	Objective	Measured as	Compliance Date
Nitrogen dioxide	200 µg/m^3 Not to be exceeded more than 18 times per year	1 Hour Mean	01-Jan-10
	40 µg/m^3	Annual Mean	01-Jan-10
Particles (PM_{10})	50 µg/m^3 Not to be exceeded more than 35 times per year	24 Hour Mean	31-Dec-04
	40 µg/m^3	Annual Mean	31-Dec-04

Appendix 2 – Modelled annual mean NO_2 concentration 2008

Modelled Annual Mean Nitrogen Dioxide Concentrations 2008



Appendix 3 – AQAP 2006 Targets

Reducing Vehicle Emissions

Action 1	Testing of vehicle emissions
Details	The Council will establish a programme of free, on the spot vehicle emissions testing targeting the general public
Stakeholder	BCC Regulatory Services
Progress	Historically only a small percentage of vehicles tested actually failed the emission test. Staffing issues and equipment costs are deemed problematic. Consequently the benefit of roadside emission testing would appear to be minimal and not cost effective.
Recommendation	**CLOSED**

Action 2	Assist the setting up of freight partnerships for deliveries to the city centre
Details	The Council will assist schemes put forward to reduce traffic and / or emissions through freight partnerships for delivering goods to city centre businesses
Stakeholder	BCC Transportation
Progress	Set up and investigated the use of canals and proposal for consolidations centre – need revenue to launch.
Recommendation	**CLOSED**

Action 3	Improve the Council Fleet by seeking to use alternatively fuelled/low emission fleet vehicles
Details	The City Council will seek to develop pilot (s) using alternatively fuelled/low emission vehicles in its fleet
Stakeholder	BCC Regulatory Services
Progress	The City Council has recently purchased replacement vehicles that are Euro 4 compliant. The benefits are not deemed to be significant by themselves, but it does demonstrate commitment to using cleaner vehicles.
Recommendation	**UPDATED**

Action 4	Develop promotional strategy to encourage drivers not to allow their engines to idle when parked
Details	The Council will carry out campaigns to raise awareness and to discourage drivers from allowing their engines to idle when their vehicles are parked for prolonged periods
Stakeholder	BCC Regulatory Services and BCC Transportation
Progress	This was carried out as part of the 'Don't choke the City' campaign run by BCC Transportation with Defra funding. There is no evidence to suggest there were any changes to air quality as a consequence.
Recommendation	**CLOSED**

Improving Public Transport to Reduce Traffic Volumes

Action 5	Showcase and Super Showcase route extension and improvements
Details	The Council will implement a programme of enhanced bus routes featuring in part reallocation of road space to bus lanes, real time information at bus stops, improved bus shelters and lighting at stops and bus priority at junctions.
Stakeholder	BCC Transportation / CENTRO (LTP commitment)
Progress	Development of these Bus Showcase Routes is now coordinated with other initiatives under the "umbrella" of Smarter Routes. Work is ongoing on radial routes, eg Walsall Road, Coventry Road and Warwick Road.
Recommendation	**CLOSED**

Action 6	Increased bus lane enforcement
Details	Increase the numbers of forward facing cameras installed in buses and fixed external cameras outside buses for bus lane enforcement.
Stakeholder	Travel West Midlands
Progress	Proposals to enforce through cameras have been evaluated, awaiting funding.
Recommendation	**CLOSED**

Light Rail

Action 7	Extension of Metro – Phase 1
Details	The City Council will continue to support and facilitate the extension of the Metro system from Henrietta Street via Snow Hill, City Centre and Five Ways to Hagley Road, Edgbaston.
Stakeholder	BCC Transportation / CENTRO
Progress	Midland Metro extension to New Street station received "programme entry" status from DfT in March 2010. Costing £127million in total, the scheme is due to start on site in late 2012 with completion in 2014/5.
Recommendation	**CLOSED**

Action 8	Extension of Metro – Phase 2
Details	The City Council will progress Metro phase 2 via detailed analysis of further routes from the City Centre
Stakeholder	CENTRO
Progress	Detailed studies into the Phase 2 Midland Metro extensions to Airport, Quinton and Great Barr, to assess value for money with bus alternatives, have been undertaken. Engineering and technical works have also taken place to commence preparation of robust business cases in line with DfT guidelines. The focus on the Midland Metro is currently on successfully delivering the extension to Birmingham City Centre and the Gateway. Centro will continue to work with all of its partners to ensure that an appropriate light rail network can be delivered to meet the transport needs of the West Midlands as part of an integrated transport network. Improved bus offer called SPRINT is in design pre METRO
Recommendation	**CLOSED**

Heavy Rail

Action 9	Reduction of pollution from diesel locomotives
Details	BCC will support CENTRO in persuading the Strategic Rail Authority to carry out further extension to the electrification of rail lines in the city
Stakeholder	CENTRO
Progress	Network Rail is committed to electrifying the route between Barnt Green and Bromsgrove by 2014 as part of their current Business Plan. Network Rail also published a Route Utilisation Strategy looking at Electrification in 2009, and this includes a recommendation that the electrification of certain rail routes in the West Midlands should be looked at further as part of the West Midlands and Chilterns Route Utilisation Strategy. The previous government announced the electrification of the Great Western Main Line and certain local routes in the North West and the current coalition government has indicated its support for further electrification of the rail network. Centro will continue to work closely with Network Rail on justifying future investment on electrification in the West Midlands.
Recommendation	**CLOSED**

Action 10	Extension of the heavy rail line network
Details	The Council will continue to support proposals to extend local rail passenger service, for example to the Derby/Nuneaton lines
Stakeholder	Strategic Rail Authority / CENTRO (LTP Commitment)
Progress	Centro has undertaken studies looking at the feasibility and business case for introducing local rail passenger services on the Camp Hill, Tamworth and Sutton Park lines. These show that the Camp Hill and Tamworth lines in particular have the potential to generate sufficient demand to justify investment. However services on these routes will require the construction of the Camp Hill chords and a new route into Moor Street station. Centro is currently undertaking further development work on this scheme. The future rail strategy for the region will highlight these particular schemes and funding will be sought from regional or national sources in due course.
Recommendation	**CLOSED**

Action 11	Increase in capacity of heavy rail network
Details	The City Council alongside the other West Midlands authorities will continue to lobby the SRA for early investment in a range of improvements including; platform lengthening at a number of stations, signalling and capacity improvements.
Stakeholder	BCC Transportation / Strategic rail Authority / CENTRO (LTP commitment)
Progress	Network Rail is undertaking a range of investments in the West Midlands as part of its Business Plan for Control Period 4 (2009-14). This includes platform lengthening, signalling and other capacity improvements (e.g. Bromsgrove electrification, Redditch branch enhancements). Planning for the business plan for Control Period 5 (20014-19) is currently underway and this will seek to justify a further package of infrastructure enhancements
Recommendation	**CLOSED**

Action 12	Increase in passenger capacity of rail network
Details	Network Rail and the City Council have a master plan for the redevelopment of New Street Station. This includes plans to substantially increase passenger circulation capacity, and provide additional entrances (one to link with extended Metro Phase 1). The City Council will continue to bid for funding to support its contribution to this work.
Stakeholder	BCC Transportation / Strategic rail Authority / CENTRO (LTP commitment)
Progress	The redevelopment of New Street Station is now at the detailed planning stage and is receiving ongoing City Council support. Gateway scheme under construction for opening 2015
Recommendation	**CLOSED**

Action 13	Improving rail freight capabilities
Details	As part of freight strategy for the West Midlands a number of schemes are being evaluated to both enhance rail freight movements and reduce the conflict between freight traffic and the congested passenger services around Birmingham New Street. The City Council will continue to actively support such schemes.
Stakeholder	BCC Transportation / Strategic rail Authority / CENTRO (LTP commitment)
Progress	Centro has undertaken feasibility and business case work looking at the reinstatement of the route between Stourbridge and Walsall for freight traffic. This route has been identified by the DfT as part of a national strategic Freight Network, and would have significant benefits for the wider West Midlands rail network by creating a freight by-pass route keeping freight trains off the congested central Birmingham network. The scheme has very strong stakeholder support, and Centro is seeking a clear recommendation in the West Midlands and Chiltern's RUS regarding its reinstatement in Control Period 5 (2014-19). Centro is currently seeking Network Rail agreement to fund the further development work on this scheme in order to strengthen its business case and deliverability in CP5.
Recommendation	**CLOSED**

Improving the Road Network to Reduce Congestion

Action 14	Improvements to traffic flow on motorway network
Details	The Highways Agency will implement a programme to deliver a faster response time of 20 minutes for incidents on M6 (previously 60 minutes)
Stakeholder	Highways Agency
Progress	The proposed systems are now in place and subject to periodic review. The theoretical impact is that reduced congestion, particularly at peak times, will reduce the number of air pollution episodes.
Recommendation	**CLOSED**

Action 15	Improvements to traffic flow on motorway network
Details	The Highways Agency will implement an improved system of incident contingency planning for the motorway network
Stakeholder	Highways Agency and Local Councils
Progress	Completed
Recommendation	**CLOSED**

Action 16	Improvements to traffic flow on motorway network
Details	The Highways Agency will implement an improved scheme of diversion routing in relation to the motorway network with local authorities
Stakeholder	Highways Agency / BCC
Progress	Flow metering and continual measurement now in places on Midland Link Motorways
Recommendation	**CLOSED**

Action 17	Improvements to traffic flow on motorway network
Details	The Highways Agency will implement active traffic management on the M42
Stakeholder	Highways Agency
Progress	The M42 Active Traffic Management system became operational on 29 November 2005. The M42 skirts the eastern and southern boundaries of Birmingham being 3km from the city at its closest point. Improvements in air quality in Birmingham from the ATM system will be limited to the contribution of the M42 to air pollution episodes moving across the West Midlands and is anticipated not to be significant in terms of Birmingham meeting its' annual targets.
Recommendation	**CLOSED**

Action 18	Improvements to traffic flow on motorway network
Details	The Highways Agency will carry out an evaluation of the suitability of active traffic management for the M6
Stakeholder	Highways Agency
Progress	The evaluation has determined the suitability of active traffic management on sections of the M6. Construction of the first phase between junctions 4 to 5, incorporating variable speed limits and hard shoulder running has commenced and is due for completion late 2009. The theoretical impact is that reduced congestion, particularly at peak times, will reduce the number of air pollution episodes. Active Traffic Management now designed between junction 5 and 8 on the M6. This will help smooth the flow of traffic. Implementation 2012/13
Recommendation	**CLOSED**

Action 19	Monitor and report the impact of red routes on local air quality
Details	The City Council will undertake a demonstration red route scheme on the A34 Stratford Road and rollout a network of red routes.
Stakeholder	BCC Regulatory Services and BCC Transportation (LTP commitment)
Progress	Red routes have been completed on the Stratford Road, Walsall Road and Tyburn Road and enforcement operations commenced. Real-time and passive monitoring along the red line route is on-going. Data is being gathered to ascertain the impact of the schemes.
Recommendation	**ACTION TO BE UPDATED**

Action 20	Evaluate the impact of new road proposals on air quality
Details	Upgrading for the A38 with bypasses for major congestion hotspots in Selly Oak and Northfield.
Stakeholder	BCC Regulatory Services and BCC Transportation (LTP commitment)
Progress	The Northfield bypass opened on 13 April 2007 and although not identified as a hot-spot for air pollution it is nevertheless anticipated that the rerouting of the A38 will improve the air quality in Northfield High Street. Construction on the Selly Oak bypass commenced in 2007 and this is due for completion in 2010. This section of road is a major pollution hot-spot and is subjected to extensive monitoring with both real

	time and passive monitoring.
Recommendation	**UPDATED**

Action 21	**Improvement of Urban Traffic Control Systems designed to reduce congestion**
Details	Birmingham City Council will participate in development of Urban Traffic Control arrangements for the West Midlands. This has identified the best enhancement linkages between the existing centres and between the urban systems and the Highways Agency systems managing the motorways and trunk roads.
Stakeholder	BCC Transportation (LTP commitment)
Progress	The UTC scheme is still in its infancy but the City Council continues to participate. The impact would be dependant upon the traffic control measures that are introduced with the UTC scheme.
Recommendation	**CLOSED**

Using Area Planning Measures to Reduce Traffic Volumes

Action 22	**City Centre congestion charging**
Details	The City Council will continue to monitor effectiveness of the congestion charging schemes elsewhere and keep all techniques and approaches under review to see whether they are applicable to Birmingham.
Stakeholder	BCC Transportation (LTP commitment)
Progress	Ongoing monitoring process by Transportation. The London scheme appears to improve air quality within the charging zone, but this may have an adverse impact on air quality outside the zone.
Recommendation	**CLOSED**

Action 23	Management of the number of available City Centre car parking spaces
Details	The Council will seek to maintain the number of short stay parking places in the City Centre at the 2001 level. The Council will also will seek to reduce the number of publicly available long stay parking spaces in the City Centre by 3% per year until 2006 and 1.5% per year to 2011.
Stakeholder	BCC Planning (LTP commitment)
Progress	Council parking strategy adopted in 2010. Reports show an overall reduction in demand within the City centre in the last 10 years, and this trend is likely to continue.
Recommendation	**CLOSED**

Action 24	Evaluate City Centre living planning applications for impact on local air quality
Details	The City Council will continue its strategy to encourage City Centre living and will aim to have 10 000 residents living in the city centre by 2008
Stakeholder	BCC Planning and BCC Regulatory Services
Progress	Current planning policy continues to support this aim. There is continued monitoring of air quality across the city. The impact is expected to be minimal across the city as a whole, but may be more significant within the city centre.
Recommendation	**CLOSED**

Action 25	Presumption in favour of mixed use development
Details	The City Council will continue to maintain its policy of encouraging mixed use developments that assist in reducing the need to travel
Stakeholder	BCC Planning
Progress	The policy is maintained and continues. A travel survey would be needed to ascertain the impact on air quality in terms of any changes in car use.
Recommendation	**CLOSED**

Action 26	Develop a workable policy for planning decisions that adversely impact on air quality
Details	When assessing Planning Applications, the implications of new development for air quality will be taken into consideration
Stakeholder	BCC Planning and BCC Regulatory Services
Progress	The air quality impacts of major developments are considered although there is currently no underpinning policy to guide this consideration. A new policy on Air Quality and Planning is being devised by Regulatory Services which should meet the objective of this action.
Recommendation	**UPDATED**

Reducing Pollution from Industry / Commerce and Residential Areas

Action 27	Control of Industrial Emissions
Details	The Council will continue to strictly regulate approximately 300 industrial processes under Part I of the Environmental Protection Act 1990. In addition the Council will continue with its programme of searching for additional industrial premises which require an authorisation or permit.
Stakeholder	BCC Regulatory Services
Progress	All facilities specified for regulation under the Environmental Permitting Regulations 2007 are routinely inspected in line with Defra criteria and appropriate enforcement is taken to ensure emissions remain under specified limits and that the companies comply with their permits. These are not deemed to be a major contributor to overall air pollution, but there is potential for significant release at a local level if not strictly controlled.
Recommendation	**UPDATED**

Action 28	Emissions from chimneys
Details	The Council will continue to enforce the provisions of the Clean Air Act 1993 with respect to emissions of smoke from chimneys across the City.
Stakeholder	BCC Regulatory Services
Progress	The City Council continues to respond to notifications of smoke from industrial, commercial and domestic chimneys and take appropriate action to control any illegal emission. Difficult to assess the impact due to the need for historic data from pre Clean Air Act period.
Recommendation	**CLOSED**

Action 29	Boiler plant and chimney heights
Details	The Council will enforce the provisions of the Clean Air Act 1993 in respect of chimney heights for new plant and smoke control
Stakeholder	BCC Regulatory Services
Progress	The City Council continues to respond to notifications of new chimneys / boilers and take appropriate action to ensure they are properly designed, installed and constructed to legalise emissions. Difficult to assess the impact due to the need for historic data from pre Clean Air Act period.
Recommendation	**CLOSED**

Action 30	Seeking to continuously reduce the number of bonfires
Details	The Council will seek support for a corporate policy on the permitting of bonfires at civic events. The Council will enforce the provisions of the Clean Air Act 1993 and Part III of the Environmental Protection Act 1990 in respect of bonfires across the city. The City Council will continue to provide a free bulk collection service to residents in order to reduce the need for bonfires. The City Council will continue to develop its programme of inspections of commercial premises to verify that waste is being disposed of in compliance with the duty of care provisions of the Environmental Protection Act 1990. The City Council will continue in its joint promotional activity with West Midlands Fire Service to discourage bonfires.
Stakeholder	BCC Regulatory Services & Leisure Services & West Midlands Fire Service
Progress	All actions have been met and in addition the City Council now operates a green waste collection service to further reduce the need for domestic incineration. The majority of bonfires are more of a local nuisance, although on and around November 5th significant pollution is caused across the entire city.
Recommendation	**ONGOING**

Action 31	Energy Efficiency
Details	The City Council will continue to implement its energy efficiency strategy for residential properties by continuing to support the following programmes; Health Through Warmth, Birmingham Energy Efficiency Service, Energywise Direct, The Midlands Energy Efficiency Consortium, West Midlands Housing Energy Strategy, Energy Efficiency Improvement Schemes, and Birmingham Sustainable Energy Partnership. These schemes aim to reduce the level of fuel demand for residential areas.
Stakeholder	BCC Housing
Progress	BCC Housing has a declared target to reduce 30% of green house gas emissions by 2010. The action is deemed irrelevant at a City level as this is a climate change action and not local air quality management.
Recommendation	**CLOSED**

Changing Levels of Travel Demand / Promotion of Alternative Modes of Transport

Action 32	Promotion of walking
Details	The City Council will participate in a major initiative to promote walking across the West Midlands. This could comprise of an annual investment programme £3m across the West Midlands. This will include the production of a good practice handbook and design guide. The programme will focus on the development of safer walking routes and the promotion of walking. The City Council will deliver the initiative in Birmingham. The City Council will continue to take steps to improve the pedestrian environment with improved priorities. The City Centre focal studies will be used to implement suitable measures.
Stakeholder	BCC Transportation (LTP Commitment)
Progress	The City Council has a walking strategy which is being monitored and has set up a pedestrian task force to encourage walking.
Recommendation	**CLOSED**

Action 33	Promotion of cycling
Details	The City Council will participate in a major initiative to promote cycling across the West Midlands. This initiative will include a bid across the West Midlands for £2m of additional investment per annum aimed at cycling. The initiative will include the development of additional safe cycle routes, provision of facilities such as secure cycle parking and support cycling safety initiatives. The City Council will be responsible for delivering this initiative within Birmingham. In addition the City Council will continue to ensure that new residential and commercial developments provide secure cycle storage facilities.
Stakeholder	BCC Transportation (LTP Commitment) / BCC Planning
Progress	The City Council has adopted a revised cycling strategy (2011) and is seeking to increase usage.
Recommendation	**CLOSED**

Action 34	Provision of additional park and ride facilities
Details	The City Council will fulfil the aims of the West Midlands LTP within Birmingham. These include; increasing the number of park and ride spaces at railway stations in a planned approach whilst recognising the benefits of opportunistic developments that might arise, ensuring that future metro proposals are fully supported by park and ride sites integrated within their development, developing a programme of strategic park and ride sites with the objective of delivering one new site every 2 years, developing the concept of bus based park and ride where suitable
Stakeholder	BCC Transportation (LTP Commitment) / CENTRO / BCC Planning
Progress	The Council's parking strategy encourages growth in park and ride. There are now over 6000 spaces that assist in accessing the city centre with a usage of better than 90%. Expansion will continue as well as station travel plans to encourage use of other modes to access the station.
Recommendation	**ONGOING**

Action 35	Incentives offered to companies with travel plans
Details	The City Council will continue to work with partners to offer incentives to support green travel plans
Stakeholder	BCC Transportation / Travel WM / CENTRO / Private Companies
Progress	The company Travelwise continues to grow but at a slower pace due to major companies already involved.
Status	**CLOSED**

Action 36	Use planning conditions to promote Travelwise
Details	The City Council will continue where appropriate to attach planning conditions relating to Travelwise to planning consents.
Stakeholder	BCC Planning
Progress	The proposal has been adopted as policy. It is not deemed possible to quantify the impact.
Recommendation	**CLOSED**

Action 37	Improvements to branding
Details	Private sector providers of Public Transport have undertaken to increase the attractiveness of public transport via a programme of re-branding.
Stakeholder	Travel WM / CENTRO (LTP commitment)
Progress	Network West Midlands now adopted as a brand across the conurbation in the last three years.
Recommendation	**CLOSED**

Action 38	Improving access to information regarding transport options
Details	The City Council will support CENTRO in a comprehensive communications strategy in respect of public transport.
Stakeholder	BCC Transportation / CENTRO (LTP Commitment)
Progress	Help2Travel and Network West Midlands website provide major local access to information as welll as national site..
Recommendation	**CLOSED**

Action 39	Improving access to information regarding transport options
Details	The City Council will work with partners to develop a standardised approach to the Travelwise initiative across the West Midlands
Stakeholder	BCC Transportation / TWM / CENTRO (LTP Commitment)
Progress	LTP3 has created the opportunity for increased Met-wide partnership working on “Smarter Choices”. This develops the TravelWise initiative by encompassing Network West Midlands and other communication and coordination approaches.
Recommendation	**CLOSED**

Action 40	Improving access to information regarding transport options
Details	The City Council will work with partners to encourage Travel Plans for employers, schools, hospitals
Stakeholder	BCC Transportation / TWM / CENTRO (LTP Commitment)
Progress	Company TravelWise and School TravelWise are well-established and successful initiatives. 98% of schools in Birmingham now have School Travel Plans, while 311 Work Place Travel Plans have been negotiated with partner companies or organisations. More recently Community TravelWise has begun working with faith groups, leisure centres, event venues, etc to promote sustainable travel.
Recommendation	**CLOSED**

Action 41	Improvements to real time information systems
Details	The City Council will make improvements to the MATTISSE web site providing traffic information
Stakeholder	BCC Transportation (LTP commitment)
Progress	MATTISSE website now known as Help2Travel. Expansion planned on completion of the UTC major scheme.
Recommendation	**CLOSED**