Brighton & Hove City Council



Air Quality Action Plan

In conjunction with
The Sussex Air Quality Partnership

Part IV of the Environment Act 1995 **March 2007**

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Executive summary.

Local Authorities in the UK have a statutory duty to review and assess air quality against the Air Quality Objectives (AQO). Local authorities have to designate those parts of their areas where the prescribed objectives are not likely to be met by, or at any point beyond the relevant deadline, as Air Quality Management Areas (AQMA's).

Once an AQMA has been declared the local authority under section 84 of the Environment Act 1995, is required to report a Further Review and Assessment (FR&A) of the AQMA with 12 months and produce an Air Quality Action Plan (AQAP) within 18 months.

In light of the NO_2 annual AQO exceedences identified through the Review and Assessment process, Brighton & Hove City Council designated an AQMA on 8th December 2004.

In assessing the way forward in the development of an AQAP the recent Defra policy guidance addendum LAQM.PGA(05) was consulted. At that early stage it was clear that road transport under the governance of the local authority was the primary cause of the NO_2 exceedences. In light of this it was concluded that the AQAP would be incorporated into the second Local Transport Plan 2005/6-2010/11 (LTP2). However given the different submission timetables for the two documents it was decided to produce a separate AQAP document which tied in closely with the LTP2. The two documents will be singularised through annual progress reports.

This AQAP has identified a package of measures designed to improve local air quality in and around the city and especially within the AQMA. In doing so careful consideration has also been given to any secondary effects which could have positive or negative effects on other services or stakeholders in the city.

The aforementioned Defra guidance sets out a suggested approach for summarising the costs, wider scale effects and air quality impacts so the individual measures can then ranked in terms of priority. Measures with high air quality impacts and low costs tend to be ranked high, however factors such as time scale and uncertainty over funding are also important.

In line with the LTP2, progress in delivering the air quality benefits of the AQAP will be assessed through the setting of pollutant related targets, which are to be achieved by 2010/11. The targets have been set at three sites within the AQMA (identified through the review and assessment process) and are based on the NO_2 annual concentrations for 2004.

However, given the annual variation seen in ambient concentrations due to factors such as meteorology, progress in meeting the 2010/11 targets will be assessed through annual traffic assessments. . The AQAP has set a target of 1% annual traffic reduction with a 5% reduction for 2010/11 based on a 2004 baseline.

This report will be subject to an eight week consultation period as detailed in Section 7.

1) Introduction and aims of the AQAP

Under the Environment Act 1995, local authorities are required to Review and Assess air quality on a regular basis. A *review* of air quality means a consideration of the levels of pollutants in the air for which objectives are prescribed in the regulations, and estimations of likely future levels. An *assessment* of air quality is the consideration of whether estimated concentrations are likely to exceed the levels set in the Air Quality Objectives (Table 2). The timescales of this process are given in Table 1.

The main reasons for tackling poor air quality are the links with quality of life and the need to minimise the risk of poor air quality to human health. Largely due to the work undertaken by the Committee on the Medical Effects of Air Pollutants (COMEAP), we now have a better understanding of the short-term and the long-term health effects of air pollution.

The first round of review and assessments (R&A) was completed in June 2000. The conclusion was that the National Air Quality Objectives were not likely to be exceeded in the city of Brighton & Hove.

Since then new guidance has been released by the Department for Environment, Food and Rural Affairs (Defra). This guidance was based on a better understanding of both the science and methods of assessing air pollution. In light of this it could not be assumed that as there were no exceedences in the first round of Review and Assessment there would not be any in subsequent rounds.

The new Defra guidance required local authorities to carry out an Updating & Screening Assessment (USA) of local air quality by the end of May 2003. This assessment identified those aspects that had changed since the first round of review and assessment. The USA indicated which pollutants and specific locations within the city of Brighton & Hove required a Detailed Assessment (DA) that had to be completed by the end of April 2004.

The DA takes a closer look at those areas identified in the USA as requiring further assessment. To achieve this, all the available specific data relating to traffic flows, pollution monitoring and weather over the previous 5 years were collected and assessed.

For years when neither a USA nor a DA are required the local authority is required to produce an Air Quality Progress Report. These reports were developed as the existing Review and Assessment process was seen to be too stop-start, with some local authorities completing their first round of review and assessment and then doing little for several years until the next round. This did not encourage the integration of LAQM into the routine work of local authorities.

Table 1. Local Air Quality Management (LAQM) Review and Assessment Process.

LAQM Activity	Completion Date	Which Authorities?
Progress Report	End of April 2005	All
Updating and Screening Assessment (USA)	End of April 2006	All
Detailed Assessment (DA)	End of April 2007	Identified need through USA
Progress Report	End of April 2007	Those not preparing a DA
Progress Report	End of April 2008	All
USA	End of April 2009	All
Detailed Assessment	End of April 2010	Identified need through USA
Progress Report	End of April 2010	Those not preparing a DA

The review and assessment of air quality is the first step in the LAQM process. Local authorities have to designate those parts of their areas where the prescribed objectives are not likely to be met by, or at any point beyond the relevant deadline, as Air Quality Management Areas (AQMA's). This applies only to those non-occupational locations where members of the public might be exposed over the relevant exposure period (Table 2). The guidance states that providing the AQMA covers the identified areas of exceedence it is at the local authorities discretion to define the exact boundaries.

Once an AQMA has been declared the local authroity under section 84 of the Environment Act 1995, is required to report a Further Review and Assessment (FR&A) of the AQMA with 12 months and produce an Air Quality Action Plan (AQAP) within 18 months. The FR&A is designed to address a number of issues including-

- Confirm the original exceedence and subsequent AQMA declaration
- Establish the extent of the air quality problem within the AQMA and therefore what improvements are required. Including scenario testing.
- Provide a technical justification of the measures to be included in the action plan.
- Provide source apportionment details of the relevant pollutant within the AQMA.

The aim of this AQAP is to identify specific measures or indeed a package of relevant measures which will reduce levels of NO_2 in and around the city and especially within the AQMA. In doing so careful consideration has also been given to any secondary effects which could have positive or negative effects on other services or

stakeholders in the city. For example, many of the measures identified as likely to improve air quality can also improve the traffic flow and as well as congestion. Further to this any potential negative effects must also be identified, such as introducing measures to combat poor air quality in one area which result in problems with congestion and road safety in another. Basically moving rather than re-moving the problem.

It is generally accepted that from improvements to engine and fuel technology NO_2 exceedences should be reduced over time even if little action is taken locally. However it is also recognised that in some heavily trafficked and congested areas this is not likely for some years to come, therefore further local intervention is required. In light of the conclusions of the R&A which identifies road traffic as the primary contributing factor to poor air quality in the city, the majority of improvement measures described in the report are aimed at road traffic.

In the main poor air quality in Brighton and Hove is as a result of the overall high volumes of traffic seen across the city. Therefore it is considered that much of the air quality improvement needed will by brought about through the generic traffic reduction measures identified in the LTP2. However this will be insufficient in some areas.

Through the R&A work a number of specific hotspot areas within the AQMA have been identified which are the result of very localised traffic related issues, such as the congestion seen at Preston Circus and The Vogue Gyratory. Therefore in addition to the generic measures, specific solutions will need to be implemented to tackle the problems seen in these areas.

1.1) Background information on Brighton and Hove

Brighton & Hove is one of the largest unitary local authorities in the South East, with an area of 8,267 hectares and a population of around 248,000 (Census 2001). Awarded city status in 2001, it is a regional centre for shopping and employment; a popular coastal resort with a significant tourist trade (attracting over 8 million people a year) and conference centre; an area that accommodates two universities; major leisure facilities; and is a sub-regional centre for health services.

Situated just over 50 miles south of Central London, the capital is less than an hour away by rail. London Gatwick International airport - the UK's second busiest airport is just 25 miles or 30 minutes rail journey from the city centre. The local seaport of Newhaven only 15 miles away and the channel tunnel 75 minutes drive from the city centre provide Brighton & Hove with excellent links to Europe and beyond.

The city of Brighton and Hove is bounded by the English Channel to the south and the Sussex Downs to the north, which is designated as an Area of Outstanding Natural Beauty and contains some rare and delicate chalk downland identified as a Habitat of European Interest in the EC Habitats Directive. Perhaps the most important site is Castle Hill (north of Woodingdean), designated as a National Nature Reserve. Other species-rich chalk grassland survives at Whitehawk Hill, Ladies Mile, Wild Park and Stanmer Park.

Within the city lie areas of urban woodland, including the National Elm Collection, which consists of 21 species of Elm, most notably at Preston Park and The Level. In addition, the 'vegetated shingle habitat'; a habitat of international conservation importance survives at the beach along the Volks Railway, Black Rock Beach and at Shoreham Harbour.

The city boasts an impressive historic environment, and is renowned for its Regency Stucco architecture. There are now some 3,600 listed buildings in Brighton and Hove (a substantially higher proportion than in other authority areas in the country), and the local authority protects these buildings rigorously. The spectacular Brighton Pavilion built between 1784 and 1822 for the Prince Regent dominates the Old Steine near the city's centre.

1.2) Key sectors

The local economy in Brighton and Hove has performed strongly in recent years with significant falls in unemployment and rises in average earnings. The city's economic activity rate is now higher than the national average, though lower than the average in the prosperous south-east.

Brighton & Hove has a strong service sector economy, with financial services and business services being key drivers of economic growth. The new media sub sector heralded as the largest new media cluster in Europe currently leads the city's growing creative sector. Other developing sectors are environmental technology, biotechnology, healthcare and advanced engineering.

The city has a relatively large public sector, with the universities employing more than 4,000 people between them. In total approximately 20% of the local workforce are employed in industries allied to the public sector.

The working age population is 185,000 of which 96.2% are employed. Major employers include American Express, Lloyds TSB, Epic Multimedia, Kimberly Clarke, BUPA International, Mott MacDonald, Brighton Health Care Trust. and Brighton and Hove City Council.

1.3) Population

Of the total population, there are a high proportion of 20 - 44 year olds in Brighton and Hove (nearly 42% compared to 35% nationally) but a lower than average percentage of under 16's (16% compared to 20% nationally). A significantly lower than average proportion of the population have been or are married (just over a third compared to around half nationally). There are just over 20,000 adult full-time students in the city, many of whom are concentrated around the Universities of Sussex and Brighton near Falmer, where over 40% of the population are students.

The population of Brighton & Hove is concentrated within a relatively small area. It is the fifth most densely populated area in the South East, and the population density is especially high in the southern half of the city partly because over half of all properties in the city are flats or maisonettes (compared to less than 20% nationally).

1.4) Transport

Total traffic flows across the city have been observed to increase in recent years (about 1% per year, but with much of the growth in the outer area) and in some areas traffic flows have been seen to fall (particularly traffic moving into the centre). This compares favourably to the national trend, which shows a much more substantial growth in car use that is expected to continue to grow for the foreseeable future.

The city's main commercial bus operator, the 'Brighton and Hove Bus & Coach Company' has achieved a patronage increase of approximately 5% each year since 1993. In addition, cycling levels have increased by almost 50%, and walking numbers by some 10% in recent years.

Vehicle ownership in Brighton & Hove is the lowest in the south-east region, and one of the lowest nationally. Across the city, there is an average of less than 0.9 cars or vans per household, compared to 1.3 in the South East, and in England and Wales. Most traffic in the city is locally generated – some two-thirds of vehicles on the road at any one time are making trips, which begin and end within the city. Furthermore, a quarter of all trips are made between local areas within the city.

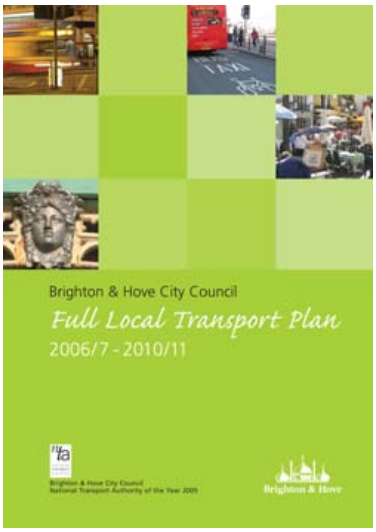
1.5) Future developments

A detailed section on new developments is given in the Brighton & Hove Council 2005 Progress Report with an update in Section 3.10 of this AQAP. These include:

- LR2 Urban Development, London Rd (A23) and Lewes Rd (A270)
- Materials Recovery Facility and Waste Transfer Station, Hollingdean
- King Alfred Development
- Brighton International Arena at Black Rock
- Community Stadium, Falmer
- Brighton Station/New England Quarter
- Outer Harbour Development, Brighton Marina
- Jubilee St Development
- Brighton and Hove water treatment works (Black rock sewer outflow)
- Preston Barracks
- Brighton Centre
- Circus Street Development
- The Edward Street Quarter
- i360' West Pier Observation Tower and Heritage Centre
- Inner Harbour, Explore Living Development, Brighton Marina

There are currently no significant developments in neighbouring authorities which are having a significant effect on local air quality. However, through the Air Quality Progress Report process and the Sussex Air Quality Steering Group (SAQSG), this situation is constantly under review.

1.6) The report structure -Air Quality Action Plan and the LTP2



In assessing the way forward in the development of an AQAP the recent Defra policy guidance addendum LAQM.PGA(05) was consulted as well as information gathered from the Detailed Assessment. At that early stage it was clear that road transport under the governance of the local authority was the primary cause of the NO_2 exceedences. In light of this it was concluded that the AQAP would be incorporated into the second Local Transport Plan 2005/6-2010/11 (LTP2). Unfortunately however, there were some administrative problems in linking the two reports together.

Despite the integration, the LTP2 and AQAP are assessed independently by the DfT and Defra respectively. The two reports also have different statutory submission dates, with the LTP2 needing to be submitted in March 2006 and the AQAP in June 2006. Therefore information on the AQAP is considerably more detailed in this report than that given in the LTP2, which only provided a summary of the proposed measures. The full AQAP will be incorporated into the LTP2 through subsequent LTP Annual Progress Reports.

As the primary reason for the identified NO_2 annual AQO exceedences is road traffic and transport related factors such as, emissions, traffic volume and congestion, the AQAP is largely based on the measures stated in the LTP2. However this AQAP also includes a further package of measures identified by the Environmental Health Department.

In accordance with the Defra guidance, details of the specific AQAP measures to be developed are tabulated in Section 5. For each measure the table sets out a brief description of what is intended, the timescale for implementation, the costs and both the likely air quality and non air quality impacts. The individual measures are then ranked in terms of priority. Measures with high air quality impacts and low costs tend to be ranked high, however factors such as time scale and uncertainty over funding are also important.

2) The Problem and need for an AQAP

2.1) Pollutant sources and associated heath effects.

There are serious health effects to people exposed to the current levels of air pollution in European countries. COMEAP (United Kingdom Government Committee on the Medical Effects of Air Pollution) states that air pollution:

- Has short term and long term damaging effects on health;
- Can worsen the condition of those with heart disease or lung disease;
- Can aggravate but does not appear to cause asthma; and
- In the longer term, probably has additional effects on individuals including some reduction in average life expectancy, though the extent of this is not fully understood at present.

Recent research is suggesting that there is no 'safe' threshold for particulate matter (PM_{10}) and that Air Quality Objectives do not represent a threshold below which air pollutants have no adverse effect.

Fluctuations in air quality are also important. COMEAP confirm there is evidence to show that some people with cardiopulmonary diseases can be adversely affected by day-to-day changes in the levels of air pollutants and that numbers of deaths and hospital admissions go up when air pollution levels are high, particularly for those with cardiovascular and lung disorders and especially amongst the elderly. COMEAP state that while it is not possible, at the moment, to say how premature these deaths are most people studying this field believe that is likely to be a matter of weeks and months rather than years.

Finally, they advise that the scientific evidence suggests that exposure to air pollution has a long-term effect on health, though the effects vary depending on where one lives and the type of pollutant that people are exposed to. Though the full extent of the health effects of air pollution are hard to quantify, if lifelong exposure to fine particles was cut by half, life expectancy from birth could be increased, on average, by between 1 and 11 months (depending on assumptions as described in the COMEAP report on the quantification of the health effects of air pollution).

2.2) Pollutants in the National Air Quality Strategy

2.2.1) Carbon Monoxide

Carbon monoxide is an asphyxiating pollutant that reduces the ability of blood to carry oxygen to the different organs. The main source of carbon monoxide in the UK is road transport, which accounted for 67% of total releases in 2000. Annual emissions of Carbon Monoxide have been falling steadily since the 1970's, and are expected to continue to do so. This is mainly due to improvements in vehicle technology and the fitting of catalytic converters.

Available monitoring data (obtained with automatic infrared analysers) suggest that the carbon monoxide objective is unlikely to be exceeded at any location in Sussex. Data from Hove AURN station has not breached the 10mg/m³ in recent years, with the maximum daily 8 hour mean = 3.9mg/m³.

2.2.2) Benzene

Benzene is a known human carcinogen (cancer causing substance), and also contributes to the formation of ground-level ozone (summer smog). The main source emissions in the UK are petrol vehicles, petrol refining, and the fuel distribution from petrol stations without vapour recovery systems. National benzene concentrations have declined in recent years, due to the increasing use of catalytic converters and vapour recovery systems in petrol stations (Stage 1 and 2 control).

Since January 2000, EU legislation has reduced the maximum benzene content of petrol to 1%, from a previous upper limit of 5%. The European Auto-Oil programme will further reduce emissions for cars and light-duty vehicles, and emissions of Benzene from the storage and distribution of petrol ((LAQM.TG(03)).

2.2.3) 1,3 Butadiene

1,3-Butadiene is a suspected human carcinogen (cancer causing substance). The major source of 1,3-butadiene nationally is motor vehicle emissions, with other major sources being industrial processes (such as petrochemical and rubber processes). As with benzene, the fitting of catalytic converters to petrol vehicles reduces their emissions of 1,3-butadiene. Recently agreed reductions in vehicle emissions and improvements to fuel quality (in the framework of the Auto-Oil programme), are expected to further reduce emissions of 1,3-butadiene from vehicle exhausts ((LAQM.TG(03)).

2.2.4) Lead

Lead has been identified as causing acute and chronic damage to the nervous system, effects on the kidneys, joints and reproductive system. Historically, the major source of lead has been motor vehicle emissions, with other major sources being metal industries and power generation. The agreement reached between the European Parliament and the Environment Council on the Directive on the Quality of Petrol and Diesel Fuels has led to the ban on sales of leaded petrol in the United Kingdom with effect from 1 January 2000. Emissions of lead are now restricted to a variety of industrial activities, such as battery manufacture, pigments in paints and glazes, alloys, radiation shielding, tank lining and piping ((LAQM.TG(03)).

2.2.5) Nitrogen Dioxide

Nitrogen dioxide is a respiratory irritant associated with both acute (short-term) and chronic (long-term) effects on human health, particularly in people with asthma. Nitrogen dioxide (NO_2) and nitric oxide (NO) are both oxides of nitrogen, and are collectively referred to as nitrogen oxides (NO_x). All combustion processes produce NO_x emissions, largely in the form of nitric oxide, which is then converted to

nitrogen dioxide, mainly as a result of reaction with ozone in the atmosphere. It is nitrogen dioxide that is associated with adverse effects upon human health.

The principal source of nitrogen oxides emissions is road transport, which accounted for about 49% of total UK emissions in 2000 ((LAQM.TG(03)). Major roads carrying large volumes of high-speed traffic are a predominant source, as are conurbations and city centres with congested traffic.

Other significant sources of nitrogen oxide emissions include the electricity supply industry and other industrial and commercial sectors. Emissions from both sources have also declined dramatically, due to the fitting of low nitrogen oxide burners, and the increased use of natural gas.

2.2.6) Sulphur Dioxide

Sulphur dioxide is an acute respiratory irritant, hence the short averaging time for its objective. The main source of sulphur dioxide in the UK is power stations, which accounted for more than 71% of emissions in 2000. There are also significant emissions from other industrial combustion sources. Domestic sources now only account for 4% of emissions, but can be locally much more significant. Road transport currently accounts for less than 1% of emissions ((LAQM.TG(03)).

2.2.7) Particulates (PM_{10})

Particulate matter is of major health concern, as it has been linked with both increased morbidity and premature mortality. There is a wide range of emission sources that contribute to PM_{10} concentrations in the UK. Research studies have confirmed that these sources can be divided into 3 main categories (AQEG, 1999): (I) *Primary particle* emissions are derived directly from combustion sources, including road traffic, power generation, industrial processes etc. (II) *Secondary particles* are formed by chemical reactions in the atmosphere, and comprise principally of sulphates and nitrates. (III) *Coarse particles* comprise of emissions from a wide range of sources, including resuspended dusts from road traffic, construction works, mineral extraction processes, wind-blown dusts and soils, sea salt and biological particles.

2.2.8) Ozone

Ozone is a secondary pollutant. It is not emitted directly, but is formed in the atmosphere from the combination under the influence of sunlight, of oxides of nitrogen (which come from combustion sources) and volatile hydrocarbons (mainly emitted from transport and industry). Ozone levels are generally higher usually in rural areas, downwind of the sources (which are usually urban areas) of the primary pollutants which precede it. The original sources can be hundreds or even thousands of kilometres away.

Ozone can make the airways of the lungs inflamed and more responsive to factors causing them to constrict, thus reducing breathing efficiency. There is no evidence of particular long-term effects at this time.

Table 2 Air Quality Objectives (AQO)

Pollutant	**Air Quality Objective**		**Date to be achieved**
	Concentration	***Measured as***	
Benzene	16.25 µg/m³	Running annual mean	31.12.2003
	5 µg/m³	Annual mean	31.12.2010
1,3 Butadiene	2.25 µg/m³	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m³	Maximum daily 8-hour running mean	31.12.2003
Lead	0.5 µg/m³	Annual mean	31.12.2004
	0.25 µg/m³	Annual mean	31.12.2008
Nitrogen dioxide	200 µg/m³ not to be exceeded more than 18 times a year	1 hour mean	31.12.2005
	40 µg/m³	Annual mean	31.12.2005
Particles (PM_{10}) (gravimetric)	50 µg/m³ not to be exceeded more than 35 times a year	24 hour mean	31.12.2004
	40 µg/m³	Annual mean	31.12.2004
	50 µg/m³ (provisional) not to be exceeded more than 7 times a year	24 hour mean	31.12.2010
	20 µg/m³ (provisional)	Annual Mean	31.12.2010
Sulphur dioxide	350 µg/m³ not to be exceeded more than 24 times a year	1 hour mean	31.12.2004
	125 µg/m³ not to be exceeded more than 3 times a year	24 hour mean	31.12.2004
	266 µg/m³ not to be exceeded more than 35 times a year	15 minute mean	31.12.2005

2.3) Conclusions from the second round of Review and Assessment.

2.3.1) 2003 Updating & Screening Assessment

The City Council completed its Updating & Screening Assessment (USA) in May 2003. The results of the assessment showed that the majority of the city had good air quality and would meet the air quality objectives. However, it did identify a few areas that required a detailed assessment.

The results from the May 2003 USA indicated that the levels for nitrogen dioxide (NO_2) may exceed the specific Air Quality Objective at the following roads sections:

- Boundary Rd, Portslade
- Ditchling Road, Brighton
- Grand Parade, Brighton
- London Road, Brighton
- Portland Road, Hove
- Seven Dials, Brighton
- Wellington Rd, Portslade
- Church Road, Hove
- Eastern Road, Brighton
- Lewes Road, Brighton
- North Road, Brighton
- Sackville Road, Hove
- Viaduct Road, Brighton
- Western Road, Brighton

Also, from the USA there was evidence that the levels for PM_{10} particulates may exceed the specific Air Quality Objective (2010- non statutory) at the following junctions:

- Preston Circus
- Vogue Gyratory
- Highcroft Villas/Dyke Rd
- Hangleton/OldShoreham Rd
- Boundary Rd/Wellington Rd

Therefore, the Detailed Assessment only considered the pollutants nitrogen dioxide (NO_2) and PM_{10} Particulate (PM_{10}).

2.3.2) 2004 Detailed Assessment conclusion

The results from the DA concluded there were six locations that were unlikely to meet the Air Quality Objective of 40μgm^{-3} for annual mean nitrogen dioxide and are given in table 3.

Table 3. 2004 Detailed Assessment exceedences

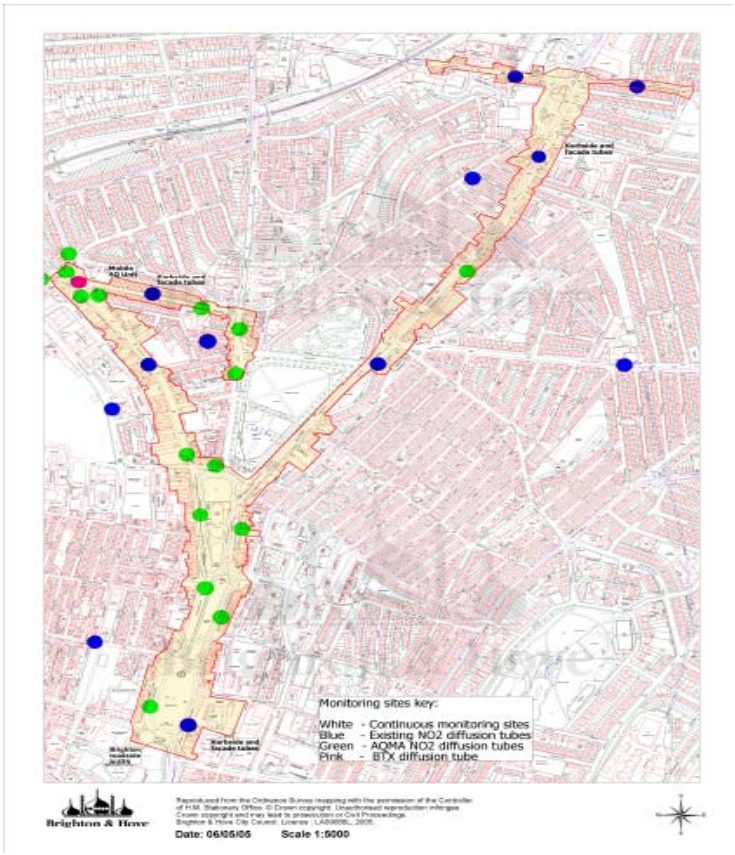
Site	Concentration µgm^{-3}
Lewes Road, south of Vogue Gyratory	58.8
Grand Parade, on the southbound side of the A23	57.3
Preston Circus, in London Road & Viaduct Road	44.6
Bear Road, east of the Vogue Gyratory	40.3
Hollingdean Road, west of the Vogue Gyratory	48.7
Preston Circus and Viaduct Road (dispersion model result)	41.9

Therefore, Brighton & Hove City Council designated an Air Quality Management Area (fig 1) on 8th December 2004 that included these six areas. No excedences were seen for PM_{10}.

The relevant defra guidance states that providing the AQMA covers the identified areas of exceedence it is at the local authorities discretion to define the exact boundaries.

With this in mind the council decided that as the areas shown in Table 3 were linked by the major road networks in the centre of the Brighton it would be prudent to merge them within a single AQMA.

Fig 1. Air Quality Management Area and monitoring sites



2.3.3) 2006 Further Review and Assessment (Stage 4 report)

In light of the AQMA declaration (8th December 2004) the Council under section 84 Environment Act 1995, were required to report a further review and assessment of the AQMA with 12 months and produce an action plan within 18 months. The further review is designed to address a number of issues including-

- Confirm the original declaration
- Establish the extent of the air quality problem within the AQMA and therefore what improvement are required.
- Provide a technical justification of the measure to be included in the action plan.

The council employed the Environmental Research Group, Kings College London (ERG-KCL) to complete the further review and assessment.

The report concluded the following:

- The report has used improved modelling techniques and improved treatment of emissions from that used for the 2004 Detailed Assessment.
- The council was correct in designating the AQMA as the results show that the mean annual NO_2 AQO exceeds where there is risk of public exposure.
- Modelling of the Queens Road and Queens Road quad area confirms exceedence of the mean annual NO_2 AQO. This is in line with the findings of the local diffusion tube results. The area of exceedence is also confirmed.
- Source apportionment work based on NO_x emissions shows that road transport emissions are the primary local source.

The report recommended the following:

- Retaining the existing AQMA and under taking consultation on the findings of the report.
- Use the source apportionment results to identify potential actions that the council can take to improve local air quality.
- Consider relevant exposure in the Queens Road and Queens Road Quad area in terms of the NO_2 annual mean AQO and expanding the AQMA accordingly.

Further to the ERG-KCL findings the council also concluded the following points from the report:

- Consider potential further expansion of the existing AQMA, in light of the mapped results shown in Fig 3.

- Mitigation measures detailed in the AQAP need to take account of the results of the source apportionment results as these give a good indication as to where the greatest improvements can be made. The results show that both buses and HGV's contribute significantly to the overall emissions, despite that fact that cars are the dominant vehicle type.

- Careful consideration should be given to the source apportionment results at some receptor locations in terms if the highway network structure. For example, York Place is spilt into four lanes, two of which are bus lanes and are sited furthest away from the receptor points. Therefore the relative contribution in terms of emissions at the receptor point from buses, is likely to be exaggerated as the model does not take account of this.

2.4) History of air quality in Brighton and Hove

Brighton & Hove Borough Councils began monitoring air quality in 1993. Since unification in 1997 Brighton & Hove City Council has developed extensive monitoring surveys across the city to assess a number of pollutants listed in the Air Quality Strategy. The geographical distribution of these locations is shown in figs. 1 and 2. Details of the monitoring surveys are given in Section 6, Table 7.

Fig.2 Air quality monitoring sites across Brighton and Hove

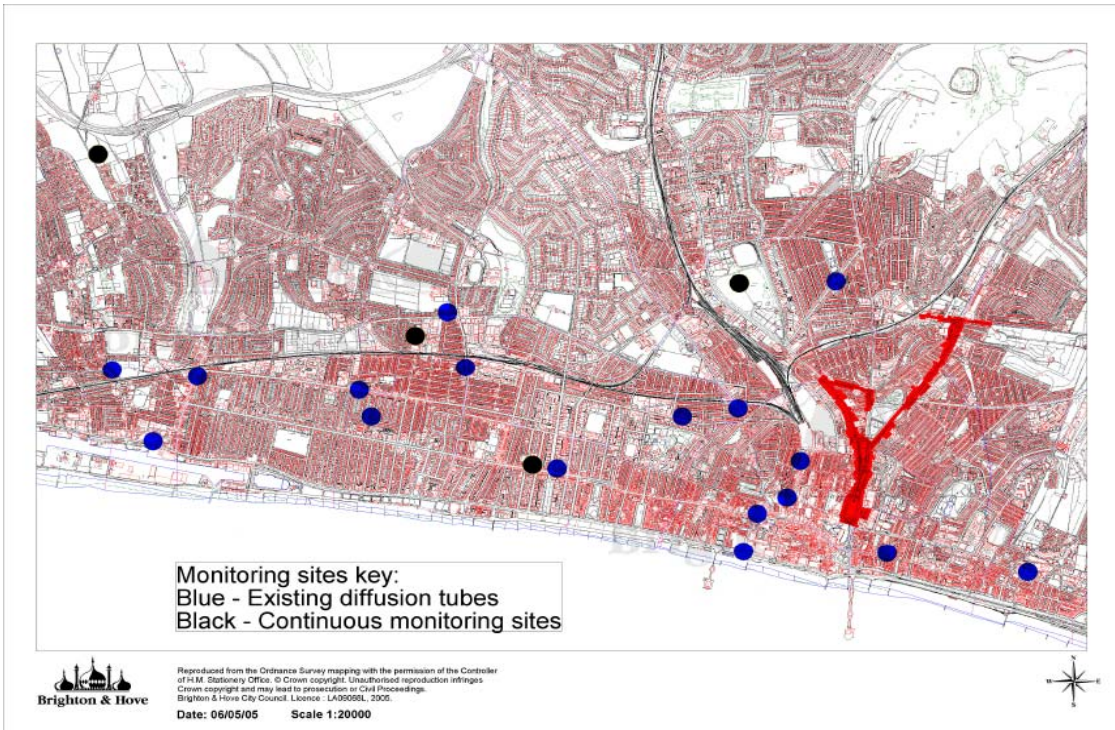
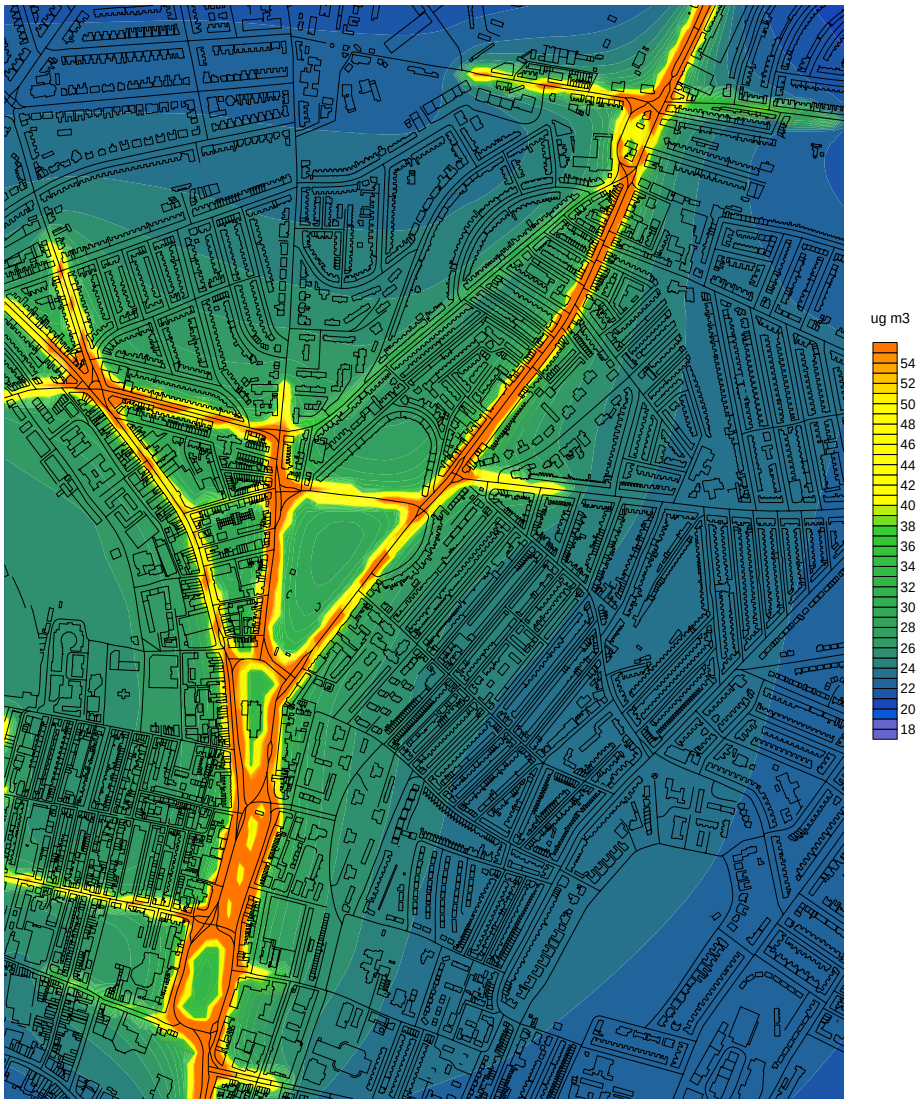


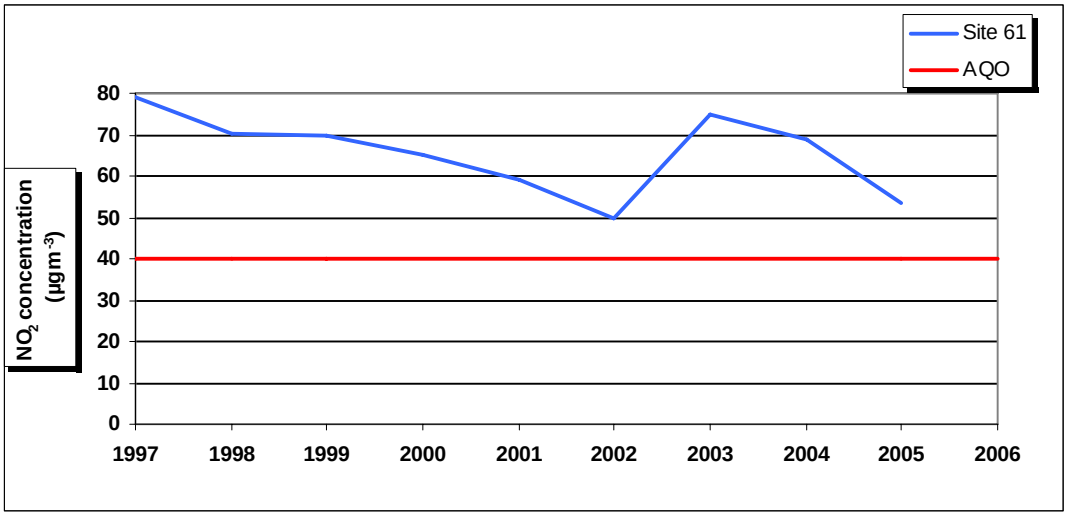
Fig.3 Annual mean nitrogen dioxide (µg m^{-3}) in the AQMA for 2005



In terms of nitrogen dioxide, Fig 4 shows the trend in ambient concentrations for Grand Parade since 1997. Despite showing a general downward trend in measured concentrations since 1997 the graph does show an increase in 2003, which was considered largely attributable to the usual weather conditions seen in that year. Since then however the levels of measured NO_2 have not decreased in line with the previously seen trend as would have been expected. Table 4 shows ratified data from all NO_2 diffusion tube sites 2001-2005. Inspection of this data set since 2003 suggests that concentrations at some sites have reduced, some have increased and some have remained similar to the 2003 elevated levels.

Possible reasons for this are discussed in Section 2.5.

Fig.4 Grand Parade NO_2 Annual Average (1997-2005)



NOTE:

- *The graph is geographically representative only and does not represent human exposure in terms of the NO_2 annual AQO.*

- *The graph has been produced from raw data which has not been subject to a bias adjustment factor.*

Inspection of the AURN results for both Brighton and Hove Roadside sites (fig.5) show a similar pattern to the diffusion tube data given in table 4, however the 2005 results do suggest a downward trend.

The council with its partners in the Sussex Air Quality Steering Group (SAQSG) will be investigating this recent pattern in NO_2 concentrations as part of its ongoing LAQM work. Further details of this are given in Section 6.7.

Fig.5 NO_2 annual means for Brighton and Hove AURN sites

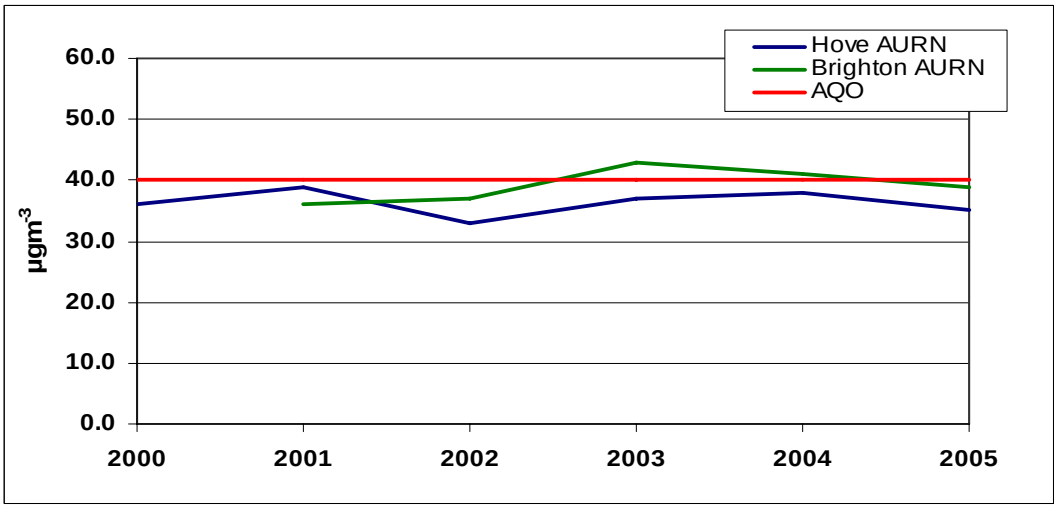


Table 4 NO_2 diffusion tube results 2001- 2005 (with 2010 projection).

Site No.	All NO2 Tube Sites	Bias adjusted annual mean				
		2001	2002	2003	2004	2005
	AQO	40	40	40	40	40
1	Old Shoreham rd / Nevill rd junction	37.8	35.4	42.4	45.7	44.7
5	Wellington rd - north side	40.1	36.4	37.7	46.2	40.4
6	Trafalgar rd - east side near no.15	39.1	31.5	38.4	37.8	38.2
16	Davigdor Road - outside no.55	34.7	31.5	36.3	37.5	37.8
17	Sackville Road - outside no.151	40.7	37.5	50.3	51.1	47.6
21	Portland rd - outside no.274	40.1	35.0	43.6	43.0	39.7
51	Kings road - outside Grand hotel	48.6	36.1	50.2	47.5	45.3
52	Western road - Churchill Square	41.2	44.7	52.4	51.3	52.1
53	Queens road - corner of Brighthelm park	47.0	37.7	46.2	43.0	47.5
54	North road, Brighton - outside old Argus offices	34.7	32.9	40.1	44.1	42.1
55	Elm Grove - outside school	33.4	30.3	36.6	37.7	34.7
57	Seven dials - nth side in Dyke rd	40.7	33.4	45.2	47.9	51.8
58	St Bartholomew school / New England st	34.0	29.9	36.3	36.3	36.3
60	Ditchling Road - St Peters church end	42.6	37.7	40.7	47.0	45.9
62	St James Street - outside camping shop	39.1	37.1	42.8	45.6	48.2
63	Eastern Road - next to zebra crossing	42.8	40.1	49.5	59.8	50.1
19	Boundary Road - outside no.78	40.0	36.8	39.6	43.3	40.8
59	London Road - outside co-op	45.7	46.8	52.3	58.9	53.5
N3	Raphael Road - Background	21.2	19.7	22.0	24.5	23.4
N4	Ashlings Way - Background	22.9	18.3	21.3	21.0	22.1
N6	Kingsbury Street - Background	29.9	27.4	29.0	31.3	28.2
N8	Southdown Avenue - Background	24.1	20.9	22.2	24.0	24.1
L1	Bear Road		35.3	44.8	40.9	40.3
L2	Hollingdean Road		45.2	54.1	55.9	55.7
L3	Upper Lewes Rd		33.0	41.4	41.1	42.5
L4	Richmond Terrance		43.1	52.6	58.0	54.6
80	Lewes road - façade			55.5	55.6	62.3
81	Grand Parade - façade			56.9	50.0	50.1
82	Viaduct Road - façade			45.3	47.1	45.5
AQMA 1	Lewes Rd South	Monitoing only began in 2004/2005 after the declaration of the AQMA. Site locations are a mixture of kerbside and façade so façade calulations have been used accordingly.				64.5
AQMA 2	Richmond Place					52.1
AQMA 3	Upper Grand Parade					58.7
AQMA 4	Marlborough Place					57.0
AQMA 5	Gloucester Place					66.7
AQMA 6	York Place					61.1
AQMA 7	St Peters Place					41.9
AQMA 8	Oxford Place (London Rd)					68.8
AQMA 9	London Rd West					64.5
AQMA 10	London Rd East					44.3
AQMA 11	New England Rd					47.6
AQMA 12	Preston Road					48.7
AQMA 13	Beaconsfield Road					49.3
AQMA 14	Viaduct Road East					48.7
AQMA 15	Ditchling Road North					51.0
AQMA 16	Francis St (Ditchling Road)					46.3
83	Queens Road North					54.0

2.5) Level of reduction needed to meet the NO_2 annual AQO

The pollution concentration at any given location is determined by many factors both direct and indirect. These include emission rates, atmospheric processes and meteorology, topography as well as the influence of the built environment.

To better understand the air quality improvement needed at a location to achieve the AQO's, it is therefore necessary to determine the individual source emissions that contribute to the overall predicted pollution concentration.

In order to identify a suitable package of measures for the AQAP, the Further Review and Assessment June 2006 modelled a number of locations within the AQMA and from this predicted the source apportionment of NO_x for different vehicle types. (The assessment was based on classified traffic data supplied by Brighton & Hove City Council).

Given the complexities of predicting NO_2 source apportionment emissions, the contribution from the different traffic sources can only be understood by examining NO_x sources as the primary emission. This reflects the fact that the relationship between NO_2 and NO_x is non-linear and determined by photochemistry that is highly location dependent. Therefore it is difficult to assess in terms of individual vehicle classifications what effect the various AQAP measures will have on NO_2 reductions. Further to this there are a number of issues associated with direct NO_2 emissions for road traffic that are becoming more apparent.

Carslaw (2005) described how the analysis of data from roadside monitoring sites in London showed that the NO_2/NO_X emissions ratio from road transport has increased markedly since 1997. The research concluded that Diesel Particulate Filters (DPF) are likely to make an important contribution to the increasing trend in the ratio along with other factors such as the increased use of diesel fuel in passenger cars and possibly recent advances in diesel engine design in light and heavy-duty vehicles.

However Carslsw (2005) also concluded that the apparent increase in NO_2 emissions might be considered as an acceptable consequence of controlling particle emissions, especially as there is greater evidence of adverse health effects related to particles than NO_2 (WHO, 2003). Nevertheless, the annual mean EU limit value for NO_2 of 40 μgm^{-3} in 2010 is binding and requires action to meet it.

Another area of uncertainty are the HGV emissions rates for low speeds as comparatively little research has been carried out. Therefore the modelling results for such areas should be treated with care.

Despite the great level of uncertainty associated with NO_2 emissions from road traffic, it is still important to assess the extent of the exccedence within the AQMA and therefore the reduction required, as this will provide a baseline from which future improvements can be assessed. Table 5. shows the reduction required to meet the AQO at all NO_2 diffusion tube sites within the AQMA expressed both in terms of atmospheric concentration and percentage. The required reduction is based on the 2005 data set.

As part of expanding the work done in the FR&A 2006 the council is likely to commission further work in 2007 to test scenarios for predicting the actual emission reduction required within the AQMA to meet the annual NO_2 AQO. The results of both this and the research into the changing profile of direct NO_2 emissions throughout the city will provide technical justification to potential future action planning measures.

Table 5 Improvement required to meet the NO_2 annual mean AQO

Site Ref	Location	2005	reduction to meet AQO	%
53	Queens Rd	47.5	7.5	15.8
54	North Rd	42.1	2.1	4.4
60	Ditchling Rd	41.3	1.3	2.7
59	London Road	48.1	8.1	17.1
L2	Hollingdean Rd	52.9	12.9	27.2
L3	Upper Lewes Rd	40.3	0.3	0.6
L4	Richmond Terrace	40.9	0.9	1.9
80	Lewes Rd (façade)	62.3	22.3	46.9
81	Grand Parade (façade)	50.1	10.1	21.3
82	Viaduct Rd (façade)	45.5	5.5	11.6
AQMA 1	Lewes Road South	58	18	37.9
AQMA 3	Upper Grand Parade	55.8	15.8	33.3
AQMA 4	Marlborough Place	57	17	35.8
AQMA 5	Gloucester Place	60	20	42.1
AQMA 6	York Place	58	18	37.9
AQMA 7	St Peters Place	41.9	1.9	4.0
AQMA 8	Oxford Place (London Rd)	65.3	25.3	53.3
AQMA 9	London Road West	61.2	21.2	44.6
AQMA 10	London Road East	44.3	4.3	9.1
AQMA 11	New England Road	47.6	7.6	16.0
AQMA 12	Preston Road	48.7	8.7	18.3
AQMA 13	Beaconsfield Road	49.3	9.3	19.6
AQMA 14	Viaduct Road East	46.3	6.3	13.3
AQMA 15	Ditchling Road North	51	11	23.2
AQMA 16	Francis Street	44	4	8.4
83	Queens Road North	54	14	29.5

2.6) The Sussex emissions inventory (SAQSG)

2.6.1) Original emissions inventory.

One of the tools used in the assessment of air quality is the emissions inventory. An emissions inventory is a geographically referenced list of pollution sources which estimate the type and quantity of pollutants emitted to the air. The emissions estimates are based on emission factors, e.g., a known amount of NO_x is emitted from a given type of vehicle exhaust at a given speed, per kilometre travelled. An emissions inventory is therefore composed of databases of activity data over the relevant time period (e.g. daily vehicle flows along a stretch of road), and emission factors for these activities (e.g. vehicle emission factors derived from engine testing).

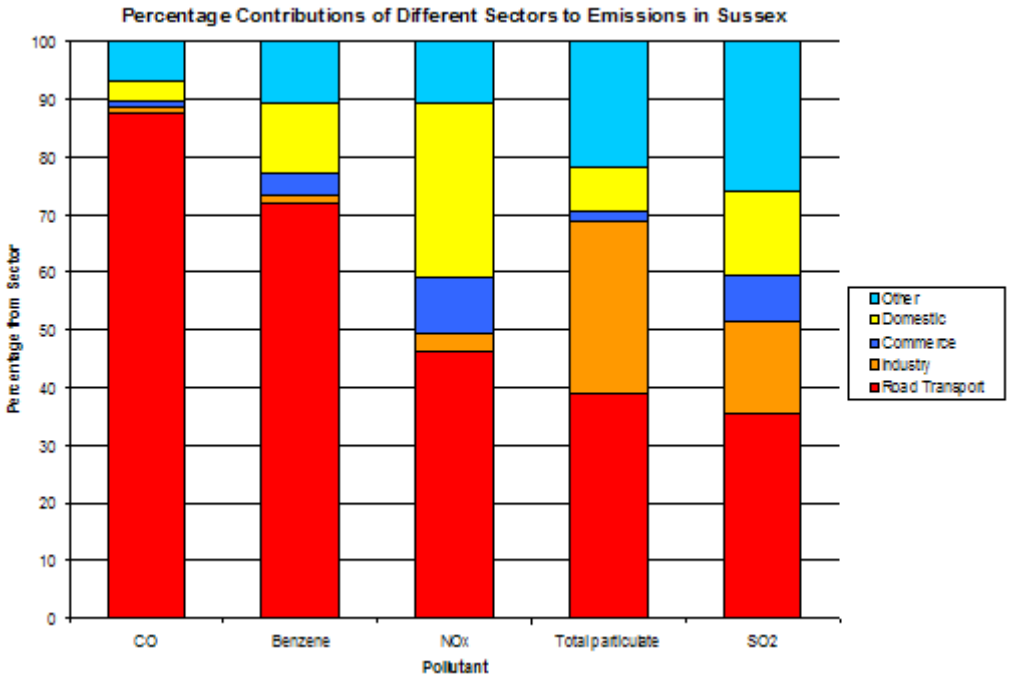
The SAQAG commissioned environmental consultants CES to construct an atmospheric emissions inventory covering East and West Sussex. The final product was the first UK use of CES UKRAPID system. Rather than a static snapshot of

emissions in the County, the group wanted a document which could be easily updated, to allow assessments of changing emission levels through time.

The Sussex Inventory contains information on the following sources: Industrial sources including the four currently active Part A processes (large industries such as chemical works and power stations regulated by the Environment Agency), over 200 Part B Processes (smaller industrial processes such as vehicle resprayers and timber works, regulated by local authorities), Road traffic, Domestic premises, Commercial premises and ports (Newhaven, Shoreham and Gatwick).

The contribution of the different emission sectors to emissions in Sussex is shown in fig. 6:

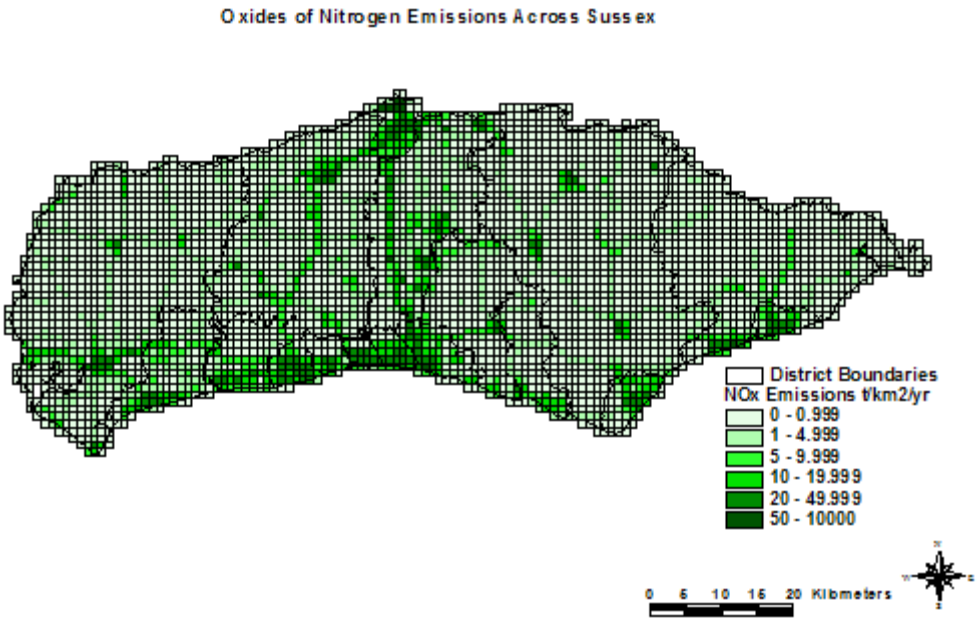
Fig 6 Emissions Inventory for Sussex



This chart shows the dominance of road transport as a source of many air pollutants in Sussex.

It was also possible using a Geographical Information System to map the location of sources of air pollution. Fig 7 shows 1km grid square total emissions of nitrogen oxides.

Fig 7 Oxides of nitrogen emissions across Sussex



Again, the importance of road transport as a source of emissions can be seen for this pollutant, as well as the prominence of emission sources in town centres (due to slower moving traffic and domestic and commercial energy use).

2.6.2) New emissions inventory for climate change.

The Sussex Air Quality Steering Group is committed to updating and building on the existing emissions inventory for Sussex. It is envisaged that an updated version of the inventory will be compiled through 2006/7. As well as updating the inventory for pollutants such as NO_x, SO_2, PM and O_3, the group are widening the inventory to encompass greenhouse gases relative to Climate Change and Sustainability indices. These will include CO_2 and possibly CFC's. There will be a wider focus on emissions to include; domestic, transport (road, sea & air), industry, agriculture and natural habitats.

2.7) Base line air quality and the local environment

When considering the scope for air quality improvements within the city and the move towards a healthier local environment, it is important to firstly assess the potential for improvement in the context of both the existing environment (both natural and man-made) and the existing air pollution levels.

In addition to the traffic pressures highlighted in Section 2.9, Brighton and Hove has some unusual topographic conditions which result in the north-south traffic being funnelled down a relatively small number of corridors and east-west traffic being restricted due to the hilly nature of many of the suburbs and the relatively few crossing points of the London-Brighton rail line. These traffic conditions therefore significantly contribute to the existing congestion within the city. Therefore

significant long-term changes to transport infrastructure in the city will be needed as part of the AQAP in order to make significant improvements in local air quality.

2.8) Scope for air quality improvement

One of the fundamental aims of this AQAP is to affect the modal choice of residents and visitors alike. In order to achieve significant improvement in local air quality the move to more sustainable forms of transport is of the utmost importance.

Significant scope for change in terms of modal choice, has been identified in that most of the traffic within the city is locally generated, with two thirds of vehicles on the road at any one time making trips which begin and end in the city. Further to this, approximately half of the morning peak traffic is associated with the journeys to both work and school (both of which are amenable to travel plans).

Further evidence of this positive scope for modal change has been demonstrated by the seen increase in bus patronage of 5% each year since 1993 and the approximate 50% increase in city centre cycling since 2000. This suggests that when the infrastructure of these more sustainable transport options are developed there is a greater uptake in usage.

In order to improve the transport infrastructure in Brighton & Hove in the short and long term, developments and overall improvements are often considered in the city wide context. Therefore it follows that as transport has been identified as the main source of local pollution, significant air quality improvements will also come from this long-term city wide approach. It is therefore unrealistic to expect instant improvements as the current transport conditions have been building up over a long period and in order to see any significant improvement in terms of air quality a reduction in transport volume of at least 10% may need to be achieved.

Despite this it is also unreasonable to state that the only way to tackle the problems of air pollution with in the city is purely through the long term vision. Therefore a number of proposals have been included in this AQAP to look at increased awareness, education and practical changes to the road network that can be archived in the short term.

2.9) Transport pressures in the city

It takes time to make a difference in the transport environment. Implementing mobility through more local provision of services and dramatically improved public transport requires:

- Investment
- Sustained demand for public transport and
- Adequate levels of accessibility to facilities

Car-based transport is something people have become accustomed to over several generations. Managing such use is only possible when people and facilities are in closer proximity to each other and alternatives to car use are practical, attractive and sustainable on a scale sufficient to make a difference.

Only through changes to travel arrangements (such as encouraging car users to choose alternatives, reduce unnecessary car journeys, switch to more alternative modes) that offer practical alternatives can car use be better managed and as a result we can achieve significant shifts from car use to more sustainable modes which will reduce noise, severance, congestion and improve air quality. However, the council cannot contemplate marginal change. Only reductions in car use of 10% or 20% will achieve significant improvements in air quality that are measurable and noticeable. It is, therefore, about offering an acceptable alternative to car trips for at least one journey in ten. This is not about discouraging car ownership, it is about car use where appropriate, informed by better knowledge of the alternatives. It is also not simply about directing traffic on to other routes but to offer whole journey alternatives.

Many routes in central areas are already operating at close to (or beyond) capacity (so there may be few alternative routes which can accommodate additional traffic especially in the central area). We should also be aware that localised and marginal changes to traffic levels and routes are not sufficient either to address air quality concerns or to sustain greater mobility across the city.

To couple traffic reduction and redirection (where appropriate) and to accommodate larger numbers of people moving in and around the city needs better access for walking and cycling, and improved public transport. Many car-based journeys are for short distances and it is these that are most amenable to transfer to sustainable modes (walking, cycling and public transport). To do this, the council need to persuade all road users of the benefits of such change and this will require a travel behaviour change strategy.

3) Planning policy context and existing strategies

In the context of effective and significant air quality improvements emissions reduction must first be considered in the national and international policy context. This section sets out the main policies and strategies in place to reduce pollutant emissions in both the UK and Europe, before describing the local environmental policies of Brighton and Hove City Council and East Sussex County Council.

3.1) International and national policies.

3.1.1) Air Quality Framework & Daughter Directives

The Air Quality Framework Directive, established a framework under which the EU set limit values for 12 specified pollutants for which subsequent daughter directives were set . These superseded the existing air quality legislation. The pollutants were sulphur dioxide, nitrogen dioxide, particulate matter, lead, carbon monoxide, benzene, ozone, polyaromatic hydrocarbons, cadmium, arsenic, nickel and mercury.

Some of the key European policies in pursuit of achieving air quality improvements in line with the Air Quality Framework are described below.

3.1.2) Road vehicles

- **Auto Oil Program**

Both light and heavy duty motor vehicles emissions are regulated by directives under the Auto-Oil Program. The directives focus primarily on the emissions of carbon monoxide (CO), Volatile Organic Compounds (VOC), nitrogen oxides (NO_x) and particulates.

Under these directives motor vehicles must meet specific standards for exhaust emissions before they can be approved for sale in the European Union. Under the program the European Union adopted catalyst-forcing standards for new petrol fuelled cars in the early 1990s (Euro 1 standards) and have gradually tightened them in several steps: Euro 2 in 1996, Euro 3 in 2000 and Euro 4 in 2005. The program proposes a further Euro 5 standard to be brought in during 2008.

3.1.3) Stationary Source Emissions

- **National Emissions Ceiling Directive (NECD)**

The NECD sets emission ceilings for each Member State in the EU for four atmospheric pollutants to be met by 2010: Sulphur dioxide (SO_2), Nitrogen oxides (NO_x), Volatile Organic Compounds (VOC's) and Ammonia (NH_3).

The pollutants addressed by this Directive can cause a range of harmful environmental effects, often at long distances from their source. The two main problems being addressed are acidification and ground-level ozone.

- **Integrated Pollution Prevention and Control (IPPC)**

The aim of IPPC Directive is to minimise pollution from various industrial sources throughout the European Union. Operators of industrial installations covered by Annex I of the IPPC Directive are required to obtain an authorisation (environmental permit) from the authorities in the EU countries.

- **Large Combustion Plants Directive (LCP)**

The overall aim of the LCP Directive is to reduce emissions of acidifying pollutants, particles, and ozone precursors. Control of emissions from large combustion plants – those whose rated thermal input is equal to or greater than 50 MW – plays an important role in the European Union's efforts to combat acidification, eutrophication and ground-level ozone as part of the overall strategy to reduce air pollution. The plants that are covered by the LCP Directive are also covered by the Integrated Pollution Prevention and Control (IPPC) Directive. In this respect, the LCP Directive only sets minimum obligations which are not necessarily sufficient to comply with the IPPC Directive.

- **Waste Incineration Plants**

The aim of the Directive is to prevent or to reduce as far as possible negative effects on the environment caused by the incineration and co-incineration of waste. In particular, it should reduce pollution caused by emissions into the air, soil, surface water and groundwater, and thus lessen the risks which these pose to human health. This is to be achieved through the application of operational conditions, technical requirements, and emission limit values for waste incineration and co-incineration plants within the Community.

3.2) Emerging national and international policy.

3.2.1) The CAFE Program -Implementation of the Thematic Strategy on Air Pollution (Europe)

The European Commission has proposed (September 2005) a strategy for achieving further significant improvements in air quality across Europe. The Thematic Strategy on air pollution aims by 2020 to cut the annual number of premature deaths from air pollution-related diseases by almost 40% from the 2000 level. It also aims to substantially reduce the area of forests and other ecosystems suffering damage from airborne pollutants.

While covering all major air pollutants, the Strategy pays special attention to fine dust, also known as particulates, and ground-level ozone pollution because these pose the greatest danger to human health. Under the Strategy the Commission is proposing to start regulating fine airborne particulates, known as $PM_{2.5}$, which penetrate deep into human lungs. The Commission also proposes to streamline air quality legislation by merging existing legal instruments into a single Ambient Air Quality Directive, a move that will contribute to better regulation.

3.2.2) Consultation on the review of the Air Quality Strategy – options for further improvements in air quality (UK)

Defra have recently been seeking views on potential additional new policy measures which, if implemented, could secure further improvement in air quality and move the UK closer to achieving the Strategy's air quality objectives. These include:

- New tighter European vehicle emission standards (Euro-standards)
- Incentives for cleaner vehicles
- Further reductions in emissions from small combustion plants
- Further reductions from emissions from ships

The consultation is also seeking comments on the Strategy's current objectives for air pollutants and in particular:

- an option for a new policy framework and objectives for controlling pollutants for which there is no safe level such as particulates.
- Improved protection of sites of Special Scientific Interest. And other protected habitats.
- A new objective for ozone.

The consultation document also set an agenda for longer term action to improve our understanding of air pollutants and attempts to qualitatively assess the potential for further air quality improvements in the very long term. The document is due for publication in 2007.

3.3) Sussex and local policies

3.3.1) Planning Policy for East Sussex and Brighton & Hove City Council (General)

The planning framework consists of a Planning Act, which sets out the statutory powers and limits to planning. The current planning framework is changing. The Planning and Compulsory Purchase Act 2004 is now in force and this has changed the 'development plan' although transitional arrangements are currently in force.

Before the 2004 Act, the 'development plan' consisted of a Structure Plan plus a Local Plan (or a single UDP – Unitary Development Plan). The Structure Plan set out the main strategic issues and the local plan turned these into more detailed, site specific policies. The government set out planning guidance and regional guidance but these were not statutory.

Brighton & Hove was unusual in that it was a unitary authority but shared a jointly prepared Structure Plan with East Sussex County Council (and shared jointly prepared minerals and Waste Local Plans) but prepared its own Local Plan. The Brighton and Hove Local Plan was adopted in July 2005.

The new planning system replaces regional guidance and the statutory Structure Plan with the Regional Spatial Strategy - in our case called the South East Plan. – which is a statutory plan – not just regional guidance and must be taken into account when framing local policy. The Local Plan will be replaced with a portfolio of documents which will make up the Local Development Framework for Brighton and Hove, some of which are statutory and some not. These include a Core Strategy (section 3.5.2), a Statement of Community Involvement (public and stakeholder consultation) site allocations plans, generic development control policies, any Area Action Plans and Supplementary Planning Documents (section 3.5.2).

Currently we are in the transitional state. The adopted Local Plan and will be saved for three years from adoption, while the new plans are prepared. The Structure Plan is also being saved for three years from the date of the Act i.e. until September 2007. However as the South East Plan nears adoption it will carry more weight and be what is known as a 'material consideration' in making planning decisions.

More details on the strategies and policies referred to in this section are available on the councils website. www.brighton-hove.gov.uk

3.4) Existing local plans and policies

3.4.1) East Sussex and Brighton & Hove Structure Plan 1991 – 2011

Structure plans establish a framework that more detailed local plans must conform to. District and borough councils are responsible for producing district wide local plans for their areas, covering all topics other than minerals and waste. County councils or unitary authorities are responsible for preparing mineral and waste local plans.

- **Section B1. Strategy for a more environmentally sustainable future**

In order to meet the needs for development and change in the plan area in a way that is more environmentally sustainable in the longer term, the plan identifies that all planning activities and development decisions should take account of 21 criteria points. Where appropriate, local planning authorities may require proposals for development to demonstrate how far they contribute to the achievement of these criteria. The criteria with respect to air quality is-

S1(i): *Protecting and enhancing air quality, including the reduction of air pollution and the emission of greenhouse gases.*

- **Section B6. Environment**

Development and change will be required to sustain, conserve and, where possible, enhance the character, local diversity and quality of the landscape and natural and built environment of the plan area including, where appropriate, the creation of new, equally good and distinctive local character. Features contributing to landscape character will be protected. The plan states that a landscape assessment of the plan area will be carried out and advice provided as supplementary planning guidance for use in local plans.

In terms of air quality the plan states the following-

EN13: *Support will be given to the monitoring of air quality and the development of policies and action programmes to maintain air quality and, wherever possible, to improve it.*

3.4.2) Brighton and Hove Local Plan

The Brighton & Hove Local Plan was adopted on 21 July 2005 as the final stage of the plan making process. The adopted plan supersedes all other versions of the Brighton & Hove Local Plan and, together with the adopted East Sussex & Brighton & Hove Structure Plan 1999- 2011, provides the basis for land-use planning over the next few years.

- **Section 1. Making the connection between land use and transport- promoting accessibility and managing demand.**

The council's aim is to improve travel to and within Brighton and Hove. It seeks to limit the growth of traffic to help it move more freely but also promote forms of transport that are less damaging to the environment with lower levels of air and noise pollution. The policies of this chapter are intended to reinforce and support the council's aims and complement the proposals in the Local Transport Plan.

The plan introduces the key principle of planning for the demand for travel that any development generates. When considering planning applications, it will be important that the development site is considered in relation to neighbouring uses. For example, applicants and developers will need to consider how the development of their sites can contribute to the provision or improvement of sustainable transport links in Brighton and Hove.

- **Section 2 Energy, Water, Pollution and Waste**

Policy SU9 Pollution and nuisance control

Development that may be liable to cause pollution and / or nuisance to land, air or water will only be permitted where:

- human health and safety, amenity, and the ecological well-being of the natural and built environment is not put at risk;

- it does not reduce the planning authority's ability to meet the Government's air quality and other sustainability targets; and

- it does not negatively impact upon the existing pollution and nuisance situation.

All proposed developments that have a potential to cause pollution and / or nuisance, will be required to incorporate measures to minimise the pollution / nuisance and may invoke the need for an Environmental Impact Assessment. Where appropriate, planning conditions will be imposed and / or a planning obligation sought in order to secure the necessary requirements. Planning permission will only be granted for development on a site adjacent to an existing pollution / nuisance generating use and / or within an air quality 'hotspot' or potential 'hot spot' where:

- the effect on the proposed development, its occupiers and users will not be detrimental; and

- the proposed development will not make the pollution and / or nuisance situation worse and where practicable, helps to alleviate the existing problem(s).

In applying this policy, particular attention will be given to a proposal's location and its impact on other development, land uses and nature conservation.

Since the adoption of this policy the national policy guidance PPS23 has been published (Section 3.6.2). Therefore when assessing planning applications in the city, account will be taken of PPS23 as well as existing council policies

3.4.3) Brighton and Hove Local Transport Plan 2001/02-2005/06

At the time of publishing the provisional Brighton & Hove City Council Local Transport Plan in July 1999 there were no predicted air quality exceedences within the city. The completion of the first stage 2/3 Review and Assessment report in June 2000 confirmed this situation before the LTP was submitted to the Government Office for the South East (GOSE) in July 2000. However policy on air quality was included in the LTP in order for future progress in this area to be monitored. Air quality is discussed within three main areas of the report, however only two sections are detailed below as the third was a description of local authority responsibilities on air quality and the review and assessment process which is detailed in section 1 of this report.

- **Section two: setting the scene**

Congestion and pollution

The first LTP identified the following areas as experiencing congestion in Brighton & Hove.

- A23 Primary Route leading directly into and out of central Brighton;
- A259 between Rottingdean and Peacehaven/Newhaven (East Sussex);
- slip roads at the junction of the A23 and A27 Trunk Roads;
- Falmer interchange on the A27 adjacent to Sussex University campus;
- Falmer Road between Falmer and Woodingdean; and
- A270 between the Seven Dials and Preston Circus junctions.
- A293 Hangleton Link Road.
- Dyke Road/Dyke Road Avenue.

With these areas in mind the LTP1 identified the need to reallocate road space to more sustainable forms of transport.

The report also considered the wider implications of congestion such as motorists who may seek to use alternative, but less suitable, routes to reach their destinations (often referred to as 'ratrunning') so measure for traffic calming were also considered.

Air quality can be degraded by queuing vehicles with idling engines and poorly maintained vehicles make this worse. The LTP1 identified that developments in the field of cleaner vehicle fuel and emission controls will contribute towards reductions in air-borne pollutants. Therefore investment by the oil and motor industry in continuing research, and by fleet operators (including the council), freight distribution companies and public transport operators in vehicles with these capabilities will bring benefits by reducing environmental impacts.

Protecting the environment

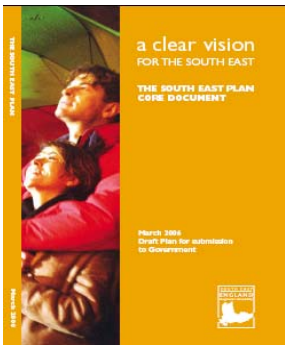
Proposals were considered to assist in reducing the need to travel and increase the available choices of more environmentally-friendly forms of transport that would also help to reduce harmful emissions.

- **Section three: developing a strategy**

reduce road traffic, pollution and congestion within and around the city

The Government requested that each local highway authority produced a report containing targets for reducing local road traffic or reducing its rate of growth. Although this is not an end in itself, it was considered that reducing the adverse impact of road traffic on the environment, economy and society would gain important benefits, in particular reducing congestion. The report acknowledged that road traffic contributed significantly to greenhouse gases and that it was the fastest growing source of carbon dioxide and in light of this committed to supporting the Government's international responsibilities for climate change. Fundamental to the strategy the LTP1 considered that creating a road network that improved vehicle movement would increase efficiency and help minimise the environmental impact of their use. This was particularly applicable along key corridors where the use of sustainable transport use was to be encouraged.

3.5) Emerging local plans and policies



3.5.1) The South East Plan

The plan acknowledges that despite improvements over recent decades there are still hotspots of poor air quality in the region, largely due to emissions from transport, trans-boundary pollution and high ozone levels. In such areas action is being taken locally to address the problems. Spatial planning can help to address the causes of poor air quality through influencing movement, mode and management of transport. Planning can also help guide the location of development away from areas of poor air quality. The transport policies of the plan propose measures that address poor air quality and contribute to delivery of Air Quality Management Area plans.

Policy NRM7: Air Quality

Local authorities and other relevant bodies should seek an improvement in air quality in their areas so that there is a significant reduction in the number of days of medium and high air pollution by 2026. Local Development Documents and development control can help to achieve improvements in local air quality through:

- Ensuring consistency with Air Quality Management Plans
- Reducing the environmental impacts of transport and congestion management, and support the use of cleaner transport fuels
- Mitigating the impact of development and reduce exposure to poor air quality through design, particularly for residential development in areas which already, or are likely to, exceed national air quality objectives
- Encouraging the use of best practice during construction activities to reduce the levels of dust and other pollutants.

3.5.2) The Local Development Framework (LDF)

- **Core Strategy**

The Core Strategy is the planning document that will provide the overall spatial vision and strategy for Brighton & Hove through to 2026. It will address important city-wide spatial matters including housing, the economy, retail, community safety, tourism, transport, areas of regeneration and social infrastructure. It will conform to the South East Plan and will take forward the planning-related aims of the Community Strategy. It will also take into account other city-wide plans and strategies, including those produced by other agencies.

In order to achieve the spatial vision for the city, the Core Strategy will need to include a number of spatial objectives. These will provide a starting point for all further, more detailed policies in the other documents that will make up the Local Development Framework (LDF). It is envisaged that there will be around 30 spatial objectives. In terms of the local environment and air quality these have been drafted as follows:

S01 Contribute to addressing the causes of climate change through reducing the emissions of greenhouse gases and ensure that new development in Brighton and Hove is prepared for the predicted impacts of climate change.

S02 Ensure that all new development in the city maximises the potential for sustainable construction methods, minimises demolition and construction waste, maximises energy efficiency and minimises impact upon natural habitats.

S18 Work with partners to support a reduction in car use so that there will be less congestion, less air borne pollution, less traffic noise and less greenhouse gas emissions.

S19 Ensure that development proposals provide for the travel demand they create and maximise the use of sustainable means of transport.

S20 Work with partners to achieve safe and effective access across the city by foot, by bicycle or by using public transport.

S21 Support the provision of a rapid transport system to move people efficiently to and between major leisure, retail and tourism sites as well as between major high density residential developments.

S28 As a member of the World Health Organisation's 'Healthy Cities Network', apply the principles and approaches of healthy urban planning to Brighton and Hove.

- **Supplementary Planning Documents. (SPD's)**

These will provide guidance on how policies in the saved Local Plan and replacement Development Plan Documents (within the LDF) will be implemented and include:

SPD01 - **Brighton Centre: Area Planning and Urban Design Framework**

SPD03 - Construction and Demolition Waste
SPD04 - Edward Street Quarter

SPD05 - Circus Street Municipal Market Site

- **Future Air Quality SPD**

Draft proposals for an air quality SPD are currently being drawn up for assisting with the development control process. This guidance will initially take the form of a Planning Advice Note (PAN) with the intention of developing a subsequent SPD. Progress on this will be reported through the AQAP progress report.

3.6) National development control guidance documents

At present the council regularly makes reference to the following two planning guidance documents to assist with the air quality assessments of planning developments in the city.

3.6.1) Development Control: Planning for Action (NSCA)

The guidance provides the framework for air quality considerations to be accounted for in local development control processes and includes guidance on air quality impact both outside and within existing AQMA's.

The guidance contains a new approach to addressing potential air quality impacts from development in qualitative terms, rather than relying on the more traditional numerical thresholds which allows the involvement of professional judgement at a local level.

This method is linked to a process for developing recommendations to reduce the air quality impacts of development proposals.

The guidance also addresses some specific concerns relating to low-polluting developments, cumulative impacts, impacts from construction, and the importance of exposure in local air quality management.

3.6.2) PPS23: Planning and Pollution Control (Annex1)

PPS23 starts from the premise that the planning system plays a key role in deciding the location of development that may give rise to pollution. This pollution, significantly, may arise directly or indirectly. The planning system must also safeguard other developments and uses from existing of future pollution. Because of this role, the impact of development on land, air and water quality is a material consideration.

The PPS also seeks to simplify the procedures for reviewing pollution issues as part of the planning process. It requires that where pollution issues arise, intending developers should hold informal pre-application meetings with the local planning authority, the relevant pollution control authority and any other legitimate stakeholders.

Annex 1 contains specific guidance on LAQM, directing Local Planning Authorities to pay particular note to the impact of development on AQMA's. With respect to assessing air quality as a material consideration in development control decisions PPS 23 sates:

It is not the case that all planning applications for developments inside or adjacent to AQMAs should be refused if the developments would result in a deterioration of local air quality. Such an approach could sterilise development, particularly where authorities have designated their entire areas as AQMAs. LPAs, transport authorities and pollution control authorities should work together to ensure development has a beneficial impact on the environment, for example by exploring the possibility of securing mitigation measures that would allow the proposal to proceed.

It may be appropriate in some circumstances for the developer to fund mitigation measures elsewhere inside the AQMA to offset any increase in local pollutant emissions as a consequence of the proposed development. These measures could be secured through Section 106 Agreements.

3.7) Development control

Development Control is responsible for the determination and monitoring of planning applications and other associated applications (listed building consent, advertisement consent, etc) submitted to the council under the Planning Acts.

In terms of potential air quality and environmental implications from major developments, applicants are required to submit a formal environmental statement for all development proposals exceeding the relevant thresholds or meeting at least one of the criteria set out in Schedule 2 of the Environmental Impact Assessment Regulations. Proposals below these thresholds may also be required to submit a comprehensive environmental statement where there is potential for significant impacts on people or the built and natural environment.

3.8) Construction Environnemental Management Plans (CEMP'S)

The construction impacts of major developments including traffic routeings of the individual projects are considered by the council in Construction Environmental Management Plans. All CEMP's are drawn up in conjunction with the council in order to minimise the impacts of construction on the environment and local air quality.
In drawing up CEMP's careful consideration is given to the existing AQMA and other known local air quality hot spot areas.

3.9) Other local policies and strategies

3.9.1) Sustainability Strategy (Local Agenda 21)

The aim is to provide a framework for improving the environment and the quality of life enjoyed by people who live in Brighton and Hove and those who visit the City.

The Strategy sets out the council's commitment to take action for a more sustainable future and is intended to provide a starting point for a Local Agenda 21 for Brighton and Hove. The Strategy identifies 12 'key objectives' which provide the basis for preparing a series of Action Plans. To help achieve the 12 objectives, the Action Plans will set out specific activities together with a clear indication of how they will be achieved; by when; and who will be involved.

The key sustainability objective in terms of air quality is to reduce air pollutants and maintain a commitment to improving good long-term air quality by influencing ourselves and others to provide and use sustainable forms of transport and encouraging energy sources that are not based on fossil fuels.

3.9.2) Climate Change Action Plan

The recent AQEG report on Air Quality and Climate Change concluded that there exist many complex linkages between air quality and climate change and that a holistic approach to both is essential if progress is to be made in limiting the impact of human activity.

The council has now drawn up a Climate Change Action Plan to address the following issues:

- To reduce greenhouse gas emissions as a result of the council's actions, specifically reducing energy use, waste, and the use of unsustainable forms of transport.

- To encourage other sectors of the city to reduce their greenhouse gas emissions.

- To prepare for the changes that will happen because of the changing climate.

- To create a behaviour change around how we use natural resources.

- To illustrate the economic, social and environmental benefits of taking action on climate change.

The report is currently in draft form and is out for consultation, therefore further details on this will be given through AQAP progress reporting. Given the important relationships between air quality and climate change highlighted in the AQEG report the council will continue working on integrating the two issues together both in terms of policy and planning.

3.9.3) The Councils Cycling Strategy

- ***Objective 1 Maximising Cycling***

Maximise the role of cycling as a transport mode, in order to reduce the use of private cars, improve health and reduce social exclusion.

Increasing cycling will help reduce congestion and pollution and being at a humanscale can contribute positively to the street scene and sense of attractiveness and security of an area. Most people are not active enough to benefit their health. Regular cycling can provide such activity and give a variety of health benefits. The maximisation of cycling will help the Brighton & Hove City Primary Care Trust (PCT) to meet its health targets. For people with no car available (which includes those in car-owning households who cannot drive or when the car is already in use),

cycling can offer an alternative to public transport for local journeys which are perhaps too time consuming on foot.

- ***Objective 2 Transport Infrastructure***

Develop a safe, convenient, efficient and attractive transport infrastructure which encourages and facilitates walking, cycling and the use of public transport and powered two-wheelers, and minimises reliance on, and discourages unnecessary use of private cars.

The encouragement of infrastructure for non-cycling modes reflects the integrated way in which transport provision is delivered. Increased attractiveness and wider choice in transport provides for greater use of these modes and should mean fewer cars on the roads. Roads can then become, or be made more cycle-friendly.

- ***Objective 3 Related Strategies***

Ensure that policies to increase cycling and meet the needs of cyclists are fully integrated into the council's Structure Plan, Local Plan, Local Transport Plan and Road Safety Plan and into all complementary strategies including transport studies and strategies, and regeneration, social inclusion, environment, education, health and leisure strategies and community initiatives.

3.9.4) Sussex Air Quality Steering Group

- **Aim**

The main aim of the Group is to support all participating local authorities with their duties under Environment Act 1995 and implementation of the United Kingdom Air Quality Strategy. This aim is to be supported through promotion of collaboration and co-ordination, collation, interpretation and dissemination of information.

- **History**

The Sussex Air Quality Steering group was formed in 1995 as a response both to Central Government, who had produced a document "Air Quality: Meeting the Challenge", and to more local work looking at air quality in Sussex.

The group is made up of representatives from City, Borough and District Councils in East and West Sussex, East and West Sussex County Councils, the Sussex Primary Care Trusts, the Environment Agency, the University of Sussex and the University of Brighton.

The group is made up principally of Environmental Health Officers and other officer level staff, with Chief Officer representation. The Group has always sought economies of scale and consistency of approach (through joint working and purchasing) and has sought to make the linkages between air quality and other policy areas (such as land use planning). The Group has also tried to provide relevant timely information on air quality to decision-makers.

One of the first tasks the Group completed was to carry out an inventory of all major pollution sources across Sussex (Section 2.6). This emissions inventory was subsequently linked to mapping tools and continues to provide valuable information about local sources of air pollutants. The Group appointed a full-time Project Development Officer to support its technical work, to assist in the air quality management process and to raise the profile of the Group.

3.9.5) Sussex Air Quality Strategy

The document sets out the current understanding of air quality in Sussex, describing the tools used to assess and monitor air quality, and how we affect air quality both beneficially and adversely. The document explains policies and actions currently in place to protect air quality and the possible "threats" to our current levels of air pollutants.

The aim of the document is to act as an Air Quality Strategy template for the agencies in Sussex that belong to Sussex Air Quality Steering Group. The National Air Quality Strategy recognises that every local authority can make a contribution to continued improvements in air quality by the development of their own strategies. By developing and implementing local air quality strategies an integrated approach to air quality can be obtained.

However, vital to ensuring a consistent approach is maintained in the aim and purpose of every authority's strategy, all agencies participating in Sussex Air Quality Steering Group have agreed to the Guiding Principle and Aims of improving air quality in Sussex.

- **Guiding principle**

To promote and encourage the improvement of air quality throughout Sussex, to protect public health, quality of life and the environment.

- **Aims**

- To maximise the opportunities for improving air quality throughout Sussex.
- To provide a framework for dealing with local air quality issues on a Sussex wide basis in co-operation and consultation with regional stakeholders.
- To ensure air quality is fully considered by public authorities when carrying out their functions and duties.
- To encourage air quality to be considered by residents, businesses and organisations when making decisions about their behaviour.
- To promote the importance of air quality as a determinant of public health and well being.
- To address air pollution more widely.

All of this work is set against a changing policy, economic and technical background and therefore it is vital that any strategy is reviewed, updated and implemented. Sussex Air Quality Steering Group will be undertaking extensive consultation with its partners to ascertain their response to this document and will be undertaking wider consultation to ascertain the public's view.

- **Implementation timescale**

The strategy is currently being revised by the SAQSG in light of new developments within Sussex such as the declaration of AQMA's and subsequent development of AQAP's. Once completed the document is likely to by adopted by Brighton & Hove City Council.

3.10) New developments within the city

The 2005 Progress Report identified a number of new developments and provided an update on ongoing developments within the city. Specific details of these developments are therefore given in the Progress Report and only a summary of recent developments and associated air quality information is provided here. This section should be read in conjunction with the 2005 Progress Report.

Fig 8 Brighton and Hove

New Developments include small Part B processes through to major commercial/residential and road network development projects. These developments are at various stages in the development control process from conceptual design right through to the constructional/operational phase.

3.10.1) Part B Processes

There are currently 30 Part B processes authorised under the Pollution Prevention and Control Act 2000 in the city of Brighton and Hove. These were most recently assessed in the 2006 USA and none were found to be significantly polluting in terms of the AQO's.

As described in Section 2.6 the council along with its partners in the SAQSG will be compiling an emissions inventory, and therefore details from all part B processes will be included.

3.10.2) New road schemes

- **A270 Lewes Road - Sustainable Transport Corridor**

The A270 Lewes Road Sustainable Transport Corridor project has been divided into 3 phases as follows:

- Phase 1 - Elm Grove/Lewes Road junction - completed 2003
- Phase 2 - Elm Grove to Vogue Gyratory - completed 2004
- Phase 3 - Vogue Gyratory junction. *

  * The final phase is subject to a detailed review of the area.

- **LR2 Urban Development London Rd (A23) and Lewes Rd (A270)**

Urban Capacity Study has now been completed and a feasibility study is underway.

3.10.3) Major projects

a) Materials Recovery Facility (MRF) and Waste Transfer Station (WTS)

The application has now been approved by the Planning Committee. The development is due for completion in 2008.

The site is situated on the southern part of the existing Hollingdean Depot adjacent to Upper Hollingdean Road. Part of the Hollingdean Road section is designated as part the of existing AQMA (fig 1). The application requires for the articulated bulk carriers to be routed from the site along Upper Hollingdean Road, around the Vogue Gyratory system (within the AQMA) and then north to the A27 via Lewes Road (not within the AQMA). The worst case scenario in terms of vehicle movements is an extra six vehicle movements an hour, which is what the air quality section within the environmental statement is based on.

The air quality assessment of the operational emissions of the addition vehicle movements concluded the following:

Nitrogen Dioxide: The air quality modelling for the operational phase has calculated an increase of 0.60 $\mu g/m^3$ above the predicted baseline for receptors closest to the access roads.

This represents an increase of approximately 1.1 %.

Particulate Matter: For annual averaged PM_{10} concentrations, operational traffic is predicted to add 0.15 $\mu g/m^3$, which represents 1.4% of the 2005 baseline concentration.

For the 98.08th percentile of 24-hour mean PM_{10} concentrations, the construction traffic is predicted to increase this figure by 0.26 $\mu g/m^3$, which is equivalent to approximately 1.1%

The council was satisfied with the methodology used in the assessment.

In assessing the suitability of the development in terms of air quality, reference was made to the NSCA guidance *Development Control: Planning for Air Quality* and *Planning Policy Statement 23*.

For the purpose of mitigating against the impact of the development on local air quality the following conditions are stated in the 106 agreement:

- *To ensure that all vehicles currently within and added to the Developer's fleet in relation to the use of the Property as a materials recovery facility and/or a waste transfer station are at least Euro 4 compliant in terms of emissions or should Euro 4 have been superseded by a higher industry standard by the date on which the Proposed Development is first brought into use to ensure that the aforementioned vehicles are compliant with that higher standard and the Developer shall produce evidence to the Council's satisfaction that any vehicles subsequently purchased are of the most recent industry standard for "environmentally friendly" clean vehicle engines.*

- *means sum of £10,000 to be used as a contribution towards the construction of a cycle lane along Upper Hollingdean Road or towards the enhancement of alternative sustainable modes of transport in the vicinity of the Property.*

- *means sum of £30,000 as a contribution towards the monitoring and/or implementation of works associated with the Air Quality Action Plan associated with the Air Quality Management Area in the vicinity of the Property.*

b) King Alfred Development

The application has been submitted and is under consideration by the council as the local planning authority.

c) Brighton International Arena at Black Rock

Awaiting planning application for the approved design to compete RIBA stage D.

d) Community Stadium

This application is currently subject to a legal challenge with any decision unlikely in the next 12 months.

e) Brighton Station/New England Quarter (NEQ)

A Master plan for the regeneration of this 8ha (24acre) site in Brighton city centre was approved by Brighton & Hove City Council in September 2003.

The site is split into individual plots. The final designs for some portions of the site have been agreed in detail whilst others are agreed in principle and have yet to receive full planning approval.

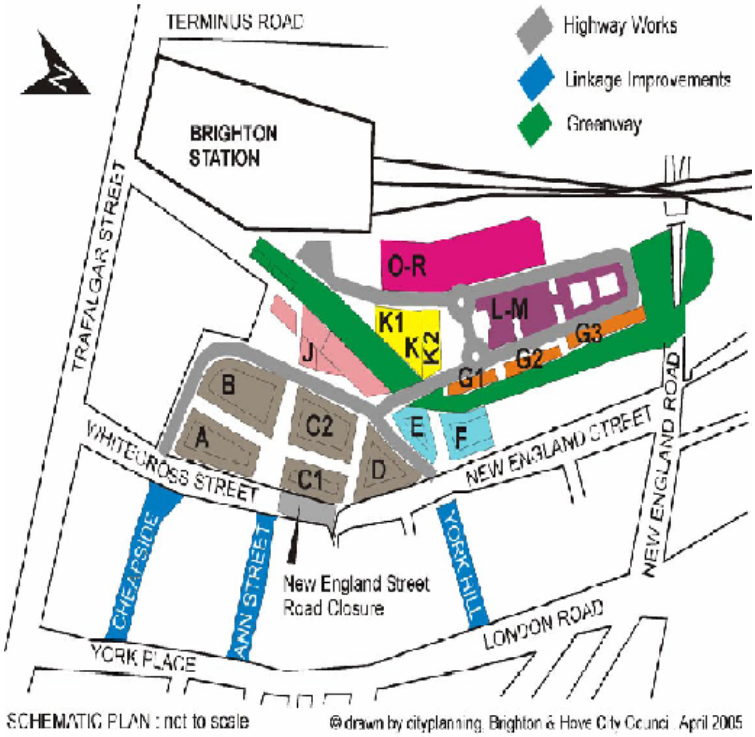


Fig 9 Schematic view of the New England Quarter

The current status of each is the block is as follows:

- **Block A, B, C and D (The Core Site)**

This part of the site has full planning permission for 247 residential units, a training centre (1,987 sq m) and three retail units.

- **Blocks E-F**

This block has outline permission for 84 residential units, a retail unit (440sq m), a community facility (929 sq m) and a biomass boiler unit. The council is currently assessing the full application.

- **Block G**

This block has outline planning permission for 24 residential units and 883 sq m of workspace, with a maximum indicative height of 3 storeys.

- **Block J**

This block has outline permission for a four star hotel with a maximum height of 7 indicative storeys, a floor area of 17,000 sq m and a combined heat and power unit (CHP). The application is currently under going a public enquiry.

- **Block K**

This block has full planning permission for a budget hotel (3,640 sq m) and offices (3,159 sq m), with a maximum 4 storey indicative height. The council is presently discharging conditions.

- **Block L-M**

This block has full planning permission for a Language School. The school includes a residential element for students.

- **Block O-R**

The Station Car Park has full planning permission and has been built.

- **The SNCI/Greenway**

The southern Site of Nature Conservation Importance (SNCI)/Greenway is to be enhanced. Details in relation to plant specifications, lighting, footpaths/cycle link have been submitted for the northern SNCI and are in the process of being finalised with the City Council.

- **Air quality impacts**

The modelling predictions in the environmental statement concluded that the NEQ would have a small negative impact on local NO_2 and PM_{10} concentrations at those roadside receptors which would experience an increase in traffic flow directly as a result of the proposed development.

The assessment was conducted in 2001 at the master plan application stage, so the AQMA did nit exist at this time. However the results of the EIA demonstrate that a significant worsening of local air quality as a result of the development is unlikely. All subsequent applications of the various blocks are assessed against the environmental impacts stated in the original master plan application.

In order to meet the requirements of the Section 106 agreement the NEQ site is required to meet 40% CO_2 reductions targets (bascase agreed with BRE prior to commencement) Some individual sites are proposing the use of biomass and CHP for power generation in order to achieve this, therefore-0 will be careful assessed with respect to existing air quality and the AQO's.

f) Inner Harbour Explore Living Development, Brighton Marina

The council is current awaiting a planning application for development comprising of the following:

- up to 1400 residential units (Class C3)

- a reconfigured ASDA store of approximately 13,800 sq.m an increase of 5,000 sq.m above the existing Asda store

- a reconfigured McDonald's restaurant;

- a mix of uses, typically at ground floor level, within Class Al, A2, A3, A5 and DI of approximately 4,750 sq.m.

- new public realm comprising an under-cliff park along the cliff side to the north of the existing Asda store, publicly accessible roof gardens linking the cliff top to the heart of the marina via improved pedestrian walkways.

f) Outer Harbour Development, Brighton Marina

On Friday 30th June 2006 the Planning Applications Sub-Committee was minded to grant planning permission for the revised planning application (submitted 4th April 2006) for a mixed use development of 853 flats and retail, commercial, office and community uses in 11 buildings ranging from 6 to 40 storeys in height, subject to a S106 Agreement.

Based on the NSCA criteria set out in *Development Control: Planning for Air Quality* the environmental statement for the application concluded that the predicted changes will not:

- interfere with or prevent actions within an air quality action area or plan:

- lead to a breach or significant worsening of a breach of an EU limit value, as there are currently none and none will result from the implementation of the Outer Harbour development;

- lead to a breach of an AQO or cause a new AQMA to be declared;

- interfere the implementation of a local air quality strategy.

Based on this evaluation the changes in air quality were judged to be of low significance.

G) Jubilee St Development

The major building works of the development as detailed in the 2005 Progress Report have now been completed apart from the hotel section which is scheduled to be completed in early 2008.

The air quality impact of the operational traffic is considered to be minimal, as the site largely relies on the existing traffic infrastructure.

h) Brighton and Hove water treatment works (Black rock combined sewer outflow)

The application requires the permission of local planning authorities in both Brighton and Hove City Council, and Lewes District Council. The second submitted application (as detailed in the 2005 Progress Report) has been accepted by Brighton and Hove and is still being considered by Lewes DC.

i) Preston Barracks

In light of problems relating to the wider scheme (originally agreed by the council in November 2005) the developers are now working on alternative proposals for the site. The proposals are in the early stages and more development is needed in some fundamental areas to demonstrate the scheme can be delivered successfully. These areas include both transport and impacts on air quality within the existing AQMA. The final scheme proposals are timetabled for consideration by the Project Board in March 2007, after which a planning application will be drawn up.

j) Brighton Centre

A viable option for the development of the site has been agreed and the planning process will now move on to RIBA stage B. A planning application for the redevelopment is not expected until 2008. Further details on the site development are contained in SPD01

http://www.brighton-hove.gov.uk/downloads/bhcc/local_plan_2005/Brighton_Centre_SPD.pdf

k) Circus Street Development

The development brief was adopted in March 2006 by the council as SPD 05.

http://www.brighton-hove.gov.uk/downloads/bhcc/local_plan_2005/CIRCUS_STREET_ADOPTED_SPD.pdf

l) The Edward Street Quarter

The development brief has been adopted by the council as SDP 04, in March 2006.

http://www.brighton-hove.gov.uk/downloads/bhcc/local_plan_2005/EDWARD_STREET_QUARTER_ADOPTED_SPD.pdf

m) i360' West Pier Observation Tower and Heritage Centre

This application seeks planning permission for the partial demolition of the existing pier structure and construction of an observation spire (approximately 183 metres in height above ordnance datum) and heritage centre (use class D2) with ancillary retail uses at lower promenade level, provision of coach parking area and all works incidental to the development of the site.

3.10.4) Section 106 Agreement of the Town and Country Planning Act 1990

In line with the guidance note PPS23, developers in the city may enter into an agreement to fund mitigation measures elsewhere in the AQMA, to offset any increase in local pollutant emissions as a consequence of the proposed development.

4) Proposed measures

4.1) Developing the action plan measures

It is clear from the results of the Review and Assessment process that given the relative absence of major industrial polluting processes in Brighton and Hove, road transport under the governance of the council is by far the most dominating source of local air pollution.

In addition to the exceedences currently within the AQMA, there are a number of other areas in the city which show elevated levels close to the objective. These areas must also be targeted by the actions within this AQAP. In addition it is clear from the level of exceedence seen across the AQMA (as shown in Table 5) and from the transport pressures previously identified in Brighton and Hove, that there is no single short term solution for tackling the problem. Therefore the council has concluded that an integrated package of long term and short term measures are needed to bring about significant change and improvements in local air quality. The package of measures described in this AQAP can be categorised into the following headings:

- **Major intervention measures (long-term)** – such as road construction and road infrastructure changes.
- **Soft measures and smarter choices** – such as bus quality partnerships, travels plans and walking and cycling,
- **Emissions reduction** – such as roadside emissions testing, changes to the local vehicle fleet and idling enforcement.
- **Education and public information-** such as campaigns, work with local schools and businesses and website development.
- **Congestion management** – such as SCOOT, UTMC and the use of variable electronic message signs.
- **Development Control** – ensuring minimum impact from major development and sufficient mitigation measures.

As described in Section 2 the Further Review and Assessment has both quantified the level of NO_2 exceedence within the AQMA and more specifically identified the source apportionment of NO_x with respect to the vehicle classification split. These findings therefore provide the main during force and technical justification for the measures described in this AQAP.

The source apportionment spilt shows that although private vehicles are the dominant class (see 2006 FR&A report), emissions are disproportionate in that emissions from HGV and Buses are many times greater than for cars. Therefore the package of measures needs to tackle the current impact from Buses and HGV's as well as general target of overall traffic reduction.

It is important to note however, that a number of the measures detailed in this report have been developed through the LTP2, which needs to consider other key objectives in addition to air quality, namely-

- Road Safety
- Accessibility
- Congestion

When designing measures targeted at air quality improvement careful consideration has therefore been given to the potential negative secondary effects on these key priorities. Some measures however will have positive secondary effects. For example, higher emissions in urban areas are often associated with stop-start congested traffic, therefore reduced congestion will have the effect of smoothing the traffic and reducing emissions.

The LAQM.PGA (05) Defra guidance states that all options must first be considered and then an explanation given to why certain options have been discounted. In order to ensure that the assessment of potential measures is robust, account was taken of the Defra action plan appraisal checklist as shown on the action plan help desk website. The following table describes the measures not being taken forward as part of this AQAP.

Table 6 Options not taken forward in the AQAP.

Measure	Reason	Future Likelihood
Low Emission Zones	For LEZ to have the intended impact it would need to be in implemented in high density commercial areas which carry large amounts of vehicles such as the London Road area. LEZ could potentially lead to an economic down turn in this area already struggling to compete with the city centre.	LEZ is unlikely to progress in the life-time of LTP2 if traffic levels and Air Quality levels remain stable.
Road User Charging	This will not be adopted in the foreseeable future. The council, through the LTP, have been extremely successful in increasing the number of people using sustainable modes and reducing the number of private vehicles coming in and out of the city without the implementation of Road User Charging.	In the long-term (10 to 15 years) Road User Charging may need to be considered if levels of traffic congestion increased at an unsustainable rate. However, any decision towards Road User Charging will always depend on the political climate at the time.

4.2) National and international emissions reduction.

In the context of effective and significant air quality improvements emissions reduction must first be considered on a national and international level. A summary of the main EU and UK policies are given in Section 3.

The following sections describe the measures that will be taken forward in the Brighton and Hove City Council AQAP.

The tabulated summary of action plan measures in Section 5 specifically identifies proposals that have been development as part of the second Local Transport Plan 2005/6-2010/11. Further details of these measures are given in the LTP2 document and can be viewed in the council website.

http://www.brighton-hove.gov.uk/index.cfm?request=c1146323

4.3) Major intervention measures

4.3.1) Rapid Transport System (RTS)

RTS is designed to enhance the existing sustainable transport infrastructure on offer in Brighton & Hove by providing an attractive public transport option for current private vehicle users. By reducing dependency on private vehicles, RTS will contribute towards increased capacity of movement within the constraints of the existing highway network. In doing so it offers environmental and economic benefit to the city.

Fig 10 Artist impression of Rapid Transport

RTS will initially link key social, leisure, residential, business and employment destinations between King Alfred (West), Brighton Marina (East) and Brighton Rail Station (City Centre). Utilising a high quality, frequent, limited stop service RTS will invest in high quality vehicles and benefit from significant infrastructure investment. It will complement and utilise an integrated fare structure with existing bus services.

It is anticipated that delivery of RTS will support the council in achieving its "Green Heart" objective, (4.3.3) which will add further weight to the council's ability to achieve increased modal shift and sustainable growth in public transport and the local economy respectively.

The Rapid Transport System proposal is focused on establishing two key corridors (east and west) with high levels of segregated route, operated with environmentally friendly, low emission vehicles on high frequencies. By combining the corridors two new routes can be operated:

- Brighton Station – North Street –Eastern Road – Royal Sussex Hospital – Brighton Marina.

- Brighton Station – West Street – Kings Road – King Alfred Centre.

The routes meet travel demand from the railway station, the retail centre, major businesses such as American Express, the hospital and tourist destinations such as the Marina and the seafront.

The bus priority for RTS will be achieved through the necessary signing, street markings, coloured tarmac where possible and junction redesign if necessary, to the standards adopted by the City Council for the Sustainable Transport Corridors (STC's) and meeting all appropriate highway standards.

RTS is based on the concept of high frequency, limited stop services meeting the needs of passengers who otherwise may not have considered conventional local bus services. There will be 9 RTS stops:

- **Brighton Railway Station** – a key interchange for longer distance passengers seeking links to the American Express, Hospital, Marina or King Alfred developments

- **Clock Tower** – access to Churchill Square and other retail areas in Brighton centre

- **North Street** – access to the Cultural Quarter, tourist, retail and employment areas, plus bus to bus interchange

- **American Express** (Eastern Road) – serving one of Brighton's major employers

- **Royal Sussex County Hospita**l (Eastern Road) – a key sub regional destination

- **Brighton Marina** – a new bus station to meet leisure and tourism needs, as well as serving major residential development and the proposed Brighton International Arena

- **Brighton Conference Centre** – give access to the Brighton seafront as well as an important attraction

- **Hove Seafront** – offering an intermediary stop serving residential and employment uses, as well as offering a tourist link

- **King Alfred Centre** – a major redevelopment site

At this stage of the development process the Designline Hybrid Electric vehicle (Olymbus) has been selected. This New Zealand built vehicle utilises a turbine and battery technology to reduce significantly emissions within a similar initial capital cost

and operating cost base as conventional vehicles. The vehicles have a strong performance record in Australasia and Japan, and recently Stagecoach have imported 8 for operation on services in Newcastle.

4.3.2) Urban Realm Developments

There are a number of recent or imminent developments in and around the centre of the city, many of which are located in a very small area stretching south from Brighton station to Brighton Pier and the seafront, and east to the Valley Gardens. This area has nominally been branded the 'Cultural Quarter'.

As these improvements begin to roll out in this area, the City council will seek to enhance the surrounding urban realm to – among other things - encourage pedestrian and cycling movements, leading up to the major environmental improvements in Valley Gardens, which will link the Cultural Quarter to that linear park. As such, the City Council plans to improve the urban environment at a minimum of five key locations:

- New Road
- Pool Valley Coach Station
- Ship Street
- Brighton Station
- Valley Gardens

Outcomes of urban realm developments

1. Reduced congestion by encouraging better provision for, and use of sustainable modes. Also better designed and rationalized carriageway space and junction

2. Improved air quality from reduced private vehicle usage and reduced congestion

3. Better road safety from rationalized carriageway space and junctions

4. Improved quality of life from enhanced urban parkland and increased contribution to the tourist economy

5. Improved accessibility to enhanced public space and public green space

4.3.3) Valley Gardens Environmental Improvement (Green Heart)

At the southern end of the A23, the northern and southern carriageways are divided by a series of green spaces, known as the Valley Gardens, the North Steine and the Level.

Fig 11. Valley Gardens

What appears from the air to be a vast city-centre park, in fact operates as a series of large roundabouts that allow vehicles to circulate. As a result, the green space – which is segregated from the rest of the city on both east and west – does not operate as well as it could; no single green space has the size to overcome the proximity of significant vehicle numbers (and associated noise and pollution) on all sides. Further, the various traffic management and bus priority measures make the operation of the carriageway confusing to pedestrians and require significant amounts of guard-railing, thereby exacerbating the segregation of the area.

In order to attempt to return this space to those who could make best use of it - that is, pedestrians - the City Council intends to investigate the feasibility of re-connecting the green space with the Pavilion Gardens, St Peter's Church, the North Laine and elsewhere. This would:

- allow safe and convenient access to the green space for pedestrians,
- afford the opportunity to reduce crime and disorder in some of the secluded green spaces that currently exist in the area,
- create public space with increased size and reduced vehicle noise and pollution, thereby allowing the space to be enjoyed to its full extent

Early analysis suggests that significant benefits could be achieved by locating both the north and southbound carriageway on the eastern side, without negative impacts upon traffic flow. Indeed, the fact that such a proposal would allow for considerable rationalisation of the carriageway and its junctions means that the potential exists for improved traffic flow with an overall reduction in carriageway space.

The proposal would build on work undertaken throughout the course of the LTP2 via other programmes, most clearly the walking programme and the urban design improvements located within it.

The area is on the edge of the AQMA and the proposal could be one of the key drivers to achieving improvements in air quality in this area, in the longer-term. The City Council is also aware that the scheme would need to be developed against the background of a rapidly improving city. For example, the RTS – part of the Major

Scheme bid – is likely to operate within the area under discussion and careful consideration will be needed to combine the two schemes. Of course, given the physical size of the Valley Gardens, this consideration will apply for a wide range of other programmes, which may have direct or peripheral impact.

In terms of air quality improvement, both RTS and the Valley Gardens proposals have the potential to have a major positive impact on the central area of the AQMA. The current level of congestion seen in the area as a result of both the level of traffic and existing road structure, results in significantly greater emissions. The stop/start and idling nature of the traffic in this area results in considerably higher rates of emissions per vehicle than would be seen if the traffic flow was smoothed and travelling at a more constant speed. This is particularly important in terms of the source apportionment spit shown in the further review and assessment, as smoothing out the traffic flow and using RTS low emission vehicles would significantly reduce the emissions currently attributable to buses and heavy vehicle traffic.

4.3.4) Sustainable Transport Corridors (STC's) and the Quality Bus Partnership.

The ongoing five per cent growth in public transport patronage is one of the great success stories in Brighton & Hove. Key to the continued success of this is the partnership between Brighton & Hove Bus Company and the City Council. In recognition of this and to cope with the pressures ahead, the current partnership agreement will be strengthened - formalising the linkage between improvements to service performance and continued infrastructure investment.

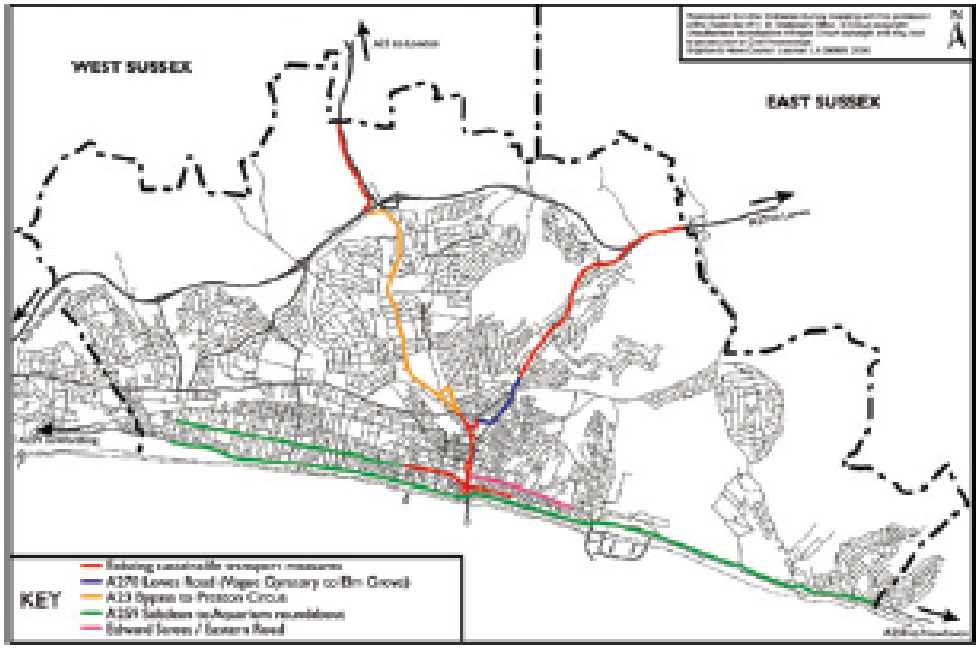


Fig 15 proposed Sustainable Transport Corridors

As part of the bus company's commitment to this partnership, it is expected that they will:

- maintain the high service frequencies to appropriate areas of the City such that 80% of passengers have a daytime frequency at least every 10 minutes.

- offer a range of attractive ticket deals including a highly successful bus ID scheme to encourage travel among young people aged 5 – 18.

- develop high profile marketing initiatives including On Route magazine and Bus Times as well as the launch of a new livery and development of the METRO brand. This includes slogans and imagery reflecting the positive impact that modern Brighton and Hove buses can have on local air quality.

- provide the highest standards of information including 'Bus Times', the most comprehensive web site for a bus company and detailed information displays at almost all bus stops.

The City Council will, in return, continue to improve conditions along the existing bus routes and to better manage bus transit across the city. As part of this the City Council will build on previous works by implementing Sustainable Transport Corridors on the following routes:

- Church Road/Western Road

- A259 between Ovingdean Roundabout and Telscombe Cliffs (jointly with East Sussex County Council)

- A23 London Road corridor (extension of previous works).

As well as continuing with the STCs identified above, the City Council will look to identify other possible corridors that are not key bus routes now, but could be in the future.

4.3.5) LR2

The LR2 Study will be an on going assessment which seeks to identify regeneration opportunities through economic investment, retention of the mixed land uses and provision of a multi purpose living space for all users of the current and future facilities.

The study area encompasses two strategic corridors and subsequent feeder links, which have fundamental and opposing attributes, firstly to provide a strategic link between the city and the surrounding regional areas, and secondly to provide local access and facilities for those who live along the corridors.

The study will seek to achieve a balance between these competing needs by the provision of improved access to the current facilities and enabling future expansion of these facilities for both local and regional users. The area is nominated as an Air

Quality Management Area due to its links to the heart of the city centre and additionally the London Road is one of the Sustainable Transport Corridors set out within the LTP2 and therefore the area has been identified for additional supporting studies.

4.4) Softer Measures and Smarter Choices

4.4.1) Walking and cycling

The City Council has nominated 2009 as the Year of Walking and Cycling, so that a significant proportion of the City Council's capital expenditure in late 2008/9 and early 2009/10 will be directed toward walking and cycling projects.

Fig.13 Seafront Cycle Path

Partly as a result of this commitment, Brighton & Hove was awarded Cycling Demonstration Town (CDT) status in 2005, which will result in some £500,000 p.a. grant funding for cycling projects over three years (2005-8). The City Council will match this funding from a diverse range of funding streams (e.g. urban regeneration funding or planning gain) to create a funding stream for cycling totalling at least three million pounds over three years.

The purpose of the CDT programme is to test the assertion made by Cycling England that cycling measures – funded to European levels – can deliver European levels of cycling. In 2009, the City Council intends to implement the following to promote walking and cycling:

- **Walking**

An identifiable and accessible Walking Network.

Between 2006 and 2009, the City Council will work with specialist consultants and local groups to identify 'areas of attraction' – that is, locations (or clusters of locations) that act (or could act) as popular destinations for people. These may be as diverse as Brighton rail station, the North Laine shops and restaurants, the Pier, the Royal Sussex County Hospital or Kemp Town.

Having agreed the 'areas of attraction', walking corridors between them will be identified which will be the focus of substantial pedestrian improvements.

The City Council will also seek opportunities to link the walking corridors with green areas of the city to create an Urban Greenway, improving accessibility to green areas within the city along pleasant routes that will further enhance the benefits of moving around the city on foot.

A coherent, state-of-the-art pedestrian signing programme,

This will give pedestrians the same confidence to be able to find their destination without having to rely on traffic signing, as well as encouraging pedestrians to walk by identifying walking times from their current location.

- **Cycling**

Cycling freeway routes

The City Council will work with specialist consultants and local groups to identify appropriate cycle freeway routes, such that they offer the ability for potential cyclists to travel between the most popular destinations within the city segregated from traffic.

Enhanced system of cyclist signing

The City Council will develop an enhanced cyclist signing network to co-ordinate with the new CycleFreeways, the national and the local cycle lanes and the new pedestrian signing programme. Analysis will be undertaken to identify where individual signing elements can best be located in the context of European best practice.

The Year of Walking and Cycling will be supported by ongoing walking and cycling work programmes of incremental improvements such as:

- installing dropped kerbs
- rationalising street furniture
- improving pedestrian facilities and reducing waiting times at traffic signals.
- providing sitting and resting opportunities.
- extending the existing national and local cycle network.
- provision of cycle parking facilities across the city (£10,000 p.a.)
- incorporating the City Council's cycling strategy.

4.4.2) Travel planning

The city council will implement travel planning on three separate levels.

Personalised Travel Planning

Personalised Travel Planning is a community-based programme that encourages people to use alternatives to travelling in their private vehicle. From 2006/7, the City Council will be developing and implementing the largest Personalised Travel Planning Programme in the UK.

The scheme works with a group of people to find out about their lives and then help them to use public transport, walk or cycle where they would ordinarily use their car. This links with Brighton & Hove's status as a 'Healthy City', as one of the incentives for participants is to get fitter.

Workplace Travel Planning

In 2005, the City Council formally launched its Staff Travel Plan, which is designed to reduce car use and provide improved travel options to employees of Brighton & Hove City Council. The types of journeys covered in this plan include:

- staff journeys to and from work
- travel within the working day

The Staff Travel Plan aims to:

- remove the requirement for any employee to use their private vehicle for work if they choose not to
- reduce unnecessary car usage by employees
- encourage the development and use of alternative methods of travel
- encourage those who have to travel as part of their work, to do so in a way that minimises the environmental impact
- adopt the principal that car usage should not attract financial gain
- allow equality of access to work places for those who do not have access to a private car

The plan will identify schemes (both pre-existing and proposed) towards these aims, including:

- discounted bus tickets for staff
- free bus travel between Brighton Town Hall and Hove Town Hall
- interest free public transport season ticket loans
- interest free bicycle purchase loan
- showering and changing facilities at the City Council's main administrative bases
- car sharing programme, including preferential parking and a guaranteed ride home

- pool car and pool bike provision

Once the council's scheme is up and running officers will begin to work with other organisations to draw up travel plan options.

School Travel Planning

Brighton & Hove's school travel planning programme forms the core of the City Council's first School Travel Strategy (STS).

The School Travel Planning (STP) programme is a mechanism through which the City Council works with schools and nurseries to help them introduce and implement travel plans, with a view towards attempting to limit the negative impacts of the school run. At present, there are schools that have written school travel plans, with more joining all the time. Through the AQAP and LTP2, the school travel planning work programme will contain the following elements:

- walking buses
- cycling proficiency courses
- child pedestrian training

4.4.3) Home Zones

Over the past 50 years the design and management of UK residential streets has been dominated by the needs and demands of private motorised transport. Residential streets once formed the building block of civilised living where children could play and people could meet. Today many of our residential streets simply function as routes for traffic. In order to recapture the original function and purpose of these spaces, the design and management of our streets will need to take into account people, and not simply the vehicles that move in these areas. It is now widely acknowledged that there is a need to change the way that our streets are designed and used so they can satisfy more needs and improve quality of life. New and innovative ways need to be found to control traffic in residential areas.

Fig 12 Worthington Street, Leicester

Home Zones creates a number of benefits**:**

- create a safer environment
- promote the use of public spaces
- make the street visibly more attractive

- improves local air quality
- encourage people to walk or cycle
- bring the streets community together
- contribute to improving people's quality of life and the urban environment

In response to requests from local residents and councillors, Brighton & Hove City Council has assessed a number of streets in the Hanover and Goldsmid Wards to find out how suitable they are to be developed as Home Zones, and identify the top priorities for further investigation as pilot schemes. Further details on the development of Home Zones will be given through future progress reports.

4.4.4) Accessible bus stops

The City Council has implemented over 100 accessible bus stops, either as 'stand-alone' projects, as part of wider integrated transport projects, or through S106 agreements.

In order to make public transport a more attractive option the City Council will continue to add further accessible bus stops, featuring Kassel Kerbs, which make boarding and alighting easier for people with buggies, shopping trolleys and those with other mobility impairments. The City Council has just won the Accessibility Award from the Institute of Highways and Transportation Engineers for their work.

The City Council has recently successfully trialled a solar powered "glowing" Kassel kerb, aimed at assisting the driver to pull fully into the kerb at night, particularly in poorly lit areas. This programme will be developed to offer comprehensive end to end journey opportunities across the network prioritised in accordance with the main journey flows.

4.4.5) Sussex Coastal Fastway

The City Council is working with West Sussex, East Sussex and Hampshire County Councils, as well as Portsmouth City Council, on the concept of a "Sussex Coastal Fastway" bus route to achieve a step change in passenger transport provision along the southcoast.

As a group, these authorities will build on the success of individual bus schemes in Brighton & Hove and elsewhere to achieve improvements in ticketing, branding, information, facilities and services throughout the area with the overall aim of improving accessibility, increasing bus patronage and reducing congestion and pollution.

Within Brighton & Hove, this route will be based partly on the existing Service 700, for which there is already a Quality Bus Corridor. West Sussex County Council will be submitting a Major Schemes bid in 2008/9 to seek funding for this scheme.

4.4.6) Passenger transport (rail)

Train use in the South East (and nationally) is growing. Locally, journeys are predominantly made between Brighton and London, and the City Council will be seeking ways to further develop the east-west links across Brighton and Hove as a further sustainable solution to traffic problems. This will of course only be possible in conjunction with Network Rail and the relevant Train Operating Companies. (TOC's)

- **Access to rail stations**

The City Council has started on a programme of work supported by funds from the current LTP with the relevant TOCs to enhance local stations across the City to encourage make better use of the network. This programme will be continued into the second LTP period. During 2004/05, accessibility has been improved at London Road station (as part of the first LTP).

These improvements led to London Road being named 'Station of the Year' at the National Cycle-Rail Awards. The City Council was also highly commended at those awards for 'Best Local Government Contribution' for its partnership with Network Rail and local Train Operating Companies for delivering cycle parking improvements to Brighton Station. Further, the authority was commended for delivering measures that can be replicated by other authorities.

Across the next five years, all other local stations will see similar improvements (including enhanced security through CCTV cameras, provision of provision of disabled access ramps, cycle parking facilities and better lighting). The City Council will also seek improvements to security and staffing from the TOCs at all these stations.

The City Council has made good progress on stations on the Coastway East line, and intend to prioritise future work on Coastway West and including Preston Park station with the ambition of achieving "Safer Station" accreditation.

4.4.7) Kick Start

The City Council has put in a submission for the DfT "Kickstart" programme. The bid is for funding for a night bus service N25, along the route of the existing service 25 (Universities to Palmeira Square), but with the route extended to Portslade. The route and timetable are designed to interconnect with the existing night bus service N7, thus allowing connections between East Brighton and Brighton Station, to employment opportunities at Gatwick Airport.

The two services also link the Marina, an area with a substantial night-time economy, and the Royal Sussex County Hospital, providing public transport links for shift workers, and those working in pubs, clubs, and restaurants. Brighton & Hove Buses have supported the submission, in the belief that the proposed service would become commercially viable after the third year of operation.

Programs such as this will reduce further the reliance of local residents on the private car.

4.4.8) Car Clubs

The central concept of a car club is to allow people access to a car in their neighbourhood without having to own it. A car club operator will provide one or more vehicles in a given area (either on-street or off-street) which are available for members to hire.

Brighton and Hove has been one of the leading proponents of Car Clubs in the UK and has had Car Club vehicles operating within the city boundaries since 2003, when an agreement was drawn up between the City Council and Smartmoves to operate vehicles within the Hanover area.

Currently, there are 14 Car Club vehicles operating within Brighton & Hove with over 100 members through two operators. In 2006/7, the City Council will seek to tender for an exclusive contract with one operator (meaning that the City Council will provide spaces on-street for a sole operator; off-street spaces would remain outside the City

Fig. 17 on street car club parking

Council's control and as such, could be made available to any operator).

4.4.9) Powered two wheeler parking (P2W)

The City Council recognises the significance of this increasingly popular component of transport provision. Ownership and use of motorcycles and scooters (collectively referred to here as Powered Two-Wheelers) has grown enormously in recent years. There are many reasons for this, but they include over-demand for commuting space, whether it be overcrowding on the trains and buses, too much congestion on the roads, and difficulty finding parking for a car.

In response to requests from P2W representatives, the City Council will also be seeking to provide provision of secure parking at new and existing onstreet motorcycle parking bays. In addition, the City Council will be working with interest groups to find the most effective way of making sure that P2W users know where secure motorcycle parking is provided.

4.5) Education and public information

4.5.1) Education and campaigns

In pursuit of air quality education and awareness, the council is already involved with a number of schools, universities and local groups for the wider promotion of air quality issues within the city. The aim in this regard is to further develop both the current plans and as well a those in the pipeline. A number of these plans will have clear links through to work being developed as part of the LTP2.

- **Presentations and lectures.**

For a number of years the council has been part of the teaching curriculum for different two courses at the University of Brighton. The students attending the lectures have wide ranging academic interests, from heath through to environmental science and chemistry. The purpose of the lectures is to give the students an overview of the councils responsibilities on air quality management as well as provide details on local air quality issues and concerns. Given the large student population in Brighton and Hove this is considered a vital part of public involvement on local air quality issues.

- **School projects**

The environmental health department has now established strong links with a number of local schools, many of which send students through for work experience weeks. Further to this the department is currently working with two schools (Hove Park and Dorothy Stringer) on local air pollution monitoring projects. The projects involve students designing their own monitoring surveys in order to investigate the human impact on local air quality and the environment. The intention is to develop these links further by giving presentations to school children, parents and teachers alike on local transport developments and sustainable travel options that may reduce their impact on the local environment. This will include details on school travel plans.

- **Campaigns and events.**

Given the strong links between air quality and transport, much of this work will involve linking in with existing campaigns such as those detailed in the LTP2. This work includes the development of travel plans, road safety information and behaviour change and sustainable transport information.

Fig 20 In town without my car day

Once such campaign which has been very successful in the past is the 'In town without my car day'. Environmental Health has linked in with this by setting up

monitoring equipment in town and providing the public with information on local air quality issues.

4.5.2) Air Alert text message service.

airALERT text is a telephone and text service which vulnerable members of the public can sign up to. The free service (current running as a pilot project) informs the individual when air quality is forecast to be moderate or high. They can then make informed choices on their activities for that day. The project is being run by the SAQSG and ERG-KCL.

4.5.3) Travel behaviour change, education and road safety

Education on travel options and road safety play a vital part in maximising the benefits of the measures detailed in this AQAP, and ensures that members of the public are fully aware of all the transport options available for travelling around the city. The greater awareness the public has on the various modal options and road safety information the greater the positive impact on local air quality as usage of these options is likely to be increased.

Fig 14 Child Road Safety Training

- **Road Safety Engineering Plan (RSEP)**

As part of the councils RSEP the following measures are being considered:

- enhanced pedestrian crossing facilities
- improved road line and junction markings and signage
- changes of priority at junctions and accompanying measures e.g. mini-roundabouts
- programme for installation and removal of temporary speed and hazard warning signs on routes that meet the criteria approved by the City Council.
- traffic calming facilities

The RSEP will be supported by the following programmes:

- **Safer City Programme**

A city-wide education and publicity programme, proposed to establish and develop an over-arching "Safer City" profile and identity with integral, practical engineering measures to improve safety on identified sites, routes and areas. This combined and fully integrated approach will be applied to all Road Safety solutions to ensure that publicity and educational methods are used to best effect, and will significantly enhance the benefit gained from hard engineering works and vice versa.

- **Education and Training Programmes**

These include:

- cycling proficiency

- Child Pedestrian Training Programme

- resource provisions to schools to enable teachers to incorporate road safety and risk assessment elements within the curriculum.

- **Safer Routes to School**

The Safer Routes to School programme focuses safety engineering measures around a school or group of schools to improve Road Safety around the school and encourage children and their parents to walk or cycle to school. These measures will also benefit the wider local community and encourage local people away from private car use.

- **Road Safety Education, Training and Publicity Plan**

The Road Safety Education, Training and Publicity Plan forms part of the City Council's forthcoming Road Safety Plan, and will include a combination of city-wide foundation programs together with specifically targeted initiatives that are integrated with the Engineering Plan and the School Travel and Safer Routes to School programmes.

4.5.4) Transport campaign

In 2006/7, the City Council will implement an extensive transport marketing campaign to support the Council's approach to transport and road safety and improve general public's understanding of transport problems and what can be done to solve them (including changing behaviour).

This approach stems from the success of established campaigns applied to road safety (notably drink-driving and seat belt use). It would maximise awareness of the city's sustainable transport strategy and demonstrate that all schemes from a dropped kerb to major traffic or residents' parking schemes contribute to the strategy.

4.5.5) City Transport Website

The development of the city transport web site is a key element of the City Council's strategy to allow the traveller to make informed choices about their transport mode in advance of starting their journey. The intention is to develop the site further to incorporate:

- visual displays of all road works in the city.
- consultation opportunities on schemes in the city.
- air quality information
- interactive cycling information

The City Council is seeking to invest £100,000 over the first two years of the LTP to provide web development and linkage of external computer systems with the UTMC database.

4.5.6) Public information sources

The aim is to expand (in terms of both detail and public access) the existing promotional information as well as develop further options.

Presently the council has well developed air quality and travel websites, however through the AQAP more detailed information will be included for the purpose of informing the public on both sustainable transport options and air quality issues within the city. In addition promotional material will be produced for issue to schools, hospitals, public buildings and for those without internet access and special needs.

4.5.7) Website development

The council presently has an air quality section on the website (www.brighton-hove.gov.uk/cityairwatch) which contains detail and information on all the work that is carried out by the council in terms of LAQM. This includes:

- All LAQM reports
- Monthly pollution graphs and daily bulletins and forecasts.
- Details on all pollutants including sources and health effects.
- All archive data for local air quality surveys and links to the national air quality website for AURN data.
- Education packs for teachers
- What's new section: informing the public of the latest air quality issues.
- Links to many other relevant air quality websites.

The website was voted as the third best local authority website in the county in 2005 by Air Quality Management Magazine. The intention is to expand the website to include a section on air quality action planning and specifically what's happening in Brighton and Hove. There will also be a public comments sections on the site to allow the public to offer ideas and criticism of the work the council is undertaking.

This is a vital part of the on going consultation process which will encourage public involvement. Details of comments will be included in future AQAP progress reports. In addition to this the council will shortly be upgrading its weather station soft ware. The intention is to provide up to date weather data on the *city airwatch* website for public information.

As described in Section 4.3.14, the council now has a city transport website for providing the public with details of travel options within the city as well as real time bus information. Options will be considered to include air quality information within the site. This is likely to take the form of air quality forecast data and general information.

4.5.8) Air quality forecasts and bulletin.

For a number of years the council has been submitting daily air quality bulletins to the public through the local Argus newspaper and via the www.brighton.co.uk website. More recently through the SAQSG the Environmental Research Group at Kings College London has been producing daily forecasts for local authorities affiliated to the steering group. This now allows us to give a more accurate forecast of local air quality and to better inform the public.

Due to the observed summer episodes of ozone pollution in Sussex the council occasionally puts out a forecast alert bulletens via the press office to inform vulnerable groups of potential high pollution. Through the AQAP the council will investigate options for further options for informing the public through local media.

4.6) Emissions reduction

4.6.1) Roadside Emissions Testing (RET)

Through the provisions of the Environment Act 1995 roadside emissions testing has been extended from the Vehicle Inspectorate to any local authority declaring an Air Quality Management Area (AQMA). The original funding, which has since been ceased by the Department for Transport provided local authorities with the opportunity to test vehicles associated with an AQMA, under the Road Traffic (Vehicle Emissions) (Fixed Penalty) (England) Regulations 2002. The general aims of the emissions testing were to establish compliance with the MOT standards, and to raise public awareness of the issues concerning polluting vehicles. Targeting specific vehicles during testing could increase the identification of high-emitting vehicles.

In its recent report (February 2005) the National Society for Clean Air (NSCA) concluded the following:

a.) During the period 2002 to 2004, approximately 25,196 roadside emission tests were undertaken through local authority activities. RET has been operated in very different ways across the UK, with a surprisingly wide range of experiences and results. For most local authorities, it has been a useful and positive initiative. As requirements to meet air quality objectives become more demanding, RET remains one of the few direct control options available to local authorities.

b.) The relatively small number of vehicles which are identified as polluting, and subsequently rectified, is unlikely to result in a measurable contribution to air quality improvement. However from a wider perspective of public information, through its deterrent effect, RET may be playing a useful role within air quality action plans. Some authorities ran very effective and wide-reaching information campaigns linked to RET. Authorities are divided on the question of whether such action is cost effective compared to other air quality measures currently being considered by Defra and local authorities.

NSCA recommendations:

1. RET should remain an option for local authorities wishing to tackle air quality and increase public awareness of air pollution issues.

2. Consideration should be given to continuing central funding for RET programs where they can be demonstrated to have a worthwhile impact on air quality and/or public awareness.

3. Local authorities and VOSA should collaborate in targeting air quality hotspots.

4. Where defective vehicles are identified, owners should be required to provide evidence of rectification and retest.

5. Taxis are a particularly polluting sector. Local authorities need to use their licensing powers to encourage modern, clean taxi fleet. Consideration should also be given to more frequent MOT testing for taxis.

6. Guidance should be developed to help RET target the more polluting types of vehicles. Further research on the range of discrepancy between vehicles of the same age or size would also be helpful.

7. Further work on the relationship between in-service testing and overall air quality objectives is needed.

Brighton and Hove City Council will investigate the possibility of undertaking RET as part of the AQAP, however issues with funding need to be considering in more detail.

4.6.2) Promote cleaner fuel use

- **Energy Saving Trust (EST)**

The work with the EST was to target local employers such as the City Council, NHS Trusts, the Police and a number of private sector employers to promote cleaner fuel options for their vehicle fleets, and along with the work within the LTP2 develop sustainable travel plans. Unfortunately Central Government has recently scrapped some of the schemes funded through the EST. In light of this the council will now be liaising with the trust on options currently available and how they can assist the Brighton and Hove AQAP. Details on this will be reported in the annual progress reports.

- **Buses.**

fig 18 Bus in Churchill Square

The results of the Further Review and Assessment 2006 have shown that Buses are responsible for a significant proportion of NO_x emissions in parts of the AQMA. However these results are based on the national emission factors and do not necessary reflect the emission for the Brighton and Hove buses. Current EU Directorates dictate that all new purchased vehicles must be compliant to the latest Euro emissions standard.

In recent years the development of the Brighton and Hove bus fleet through the Bus Quality Partnership has been in line with the minimum emission standards. The break down in terms of emission standards and age of the local fleet is as follows:

- The average age of the bus fleet is 6.5 yrs and they are generally replaced at 10-12 yrs.

- 78% of the fleet are Euro 2 standard, rising to 85% in September 2006 and 100% by 2010.

- 10% of the fleet is replaced annually so approximately 40% of the local fleet will be Euro 4 compliant by 2010/11. This is in line with the relevant EU Directorate which dictates that all new purchased vehicles must be compliant to the latest Euro emissions standard.

As previously discussed the comparatively higher emission rates of buses will be significantly exacerbated by the stop start congested traffic patterns currently seen in and around the AQMA. Therefore the smoothing of traffic flow by improving the road network and reducing the reliance on private vehicles will bring about improvements in air quality.

Brighton and Hove Bus and Coach Company have a strict idling policy which they enforce on the drivers. The policy requires drivers to switch off their engines when stopping at terminus points along the route. Failure to comply with this is considered a disciplinary offence.

- **Taxi's (inc. Private Hire and Hackey Carriage)**

Taxis are recognised as a key component in the City Council's sustainable transport solution, and facilities are gradually being improved towards their greater use. The City Council has now provided new waiting facilities at key ranks and are encouraging taxi operators to invest in new vehicles including wheelchair accessible taxis.

The introduction of bus lanes to ease the flow of public transport through congested areas of the city area has worked very well. From their inception, any licensed hackney carriage or private hire vehicle has been permitted to use them and that has undoubtedly contributed to quicker and cheaper taxi journeys within the city. This will therefore reduce the impact of the local taxi fleet on congestion and emissions. Further to this Hackey Carriage drivers are required by local by-laws to return to the ranks when they are not on call.

The council ensures through licensing conditions that old polluting vehicles are not permitted to operate within the city, with no new licensed taxi's being more than 5 years old and no re-licensed taxis being more than 10 years old. To improve emissions further, options for introducing LPG upgrades to the local taxi fleet have recently been considered, however was not considered a viable option at the time due to issues of costs, reliability and lost storage space.

4.6.3) Cut engine cut pollution signs

West Sussex County Council commissioned a study into the feasibility and effectiveness of erecting signs at levels crossings to encourage drivers to switch off their engines when waiting. A design was agreed with other authorities in Sussex (including Brighton and Hove City Council) as well as the neighbouring county of Surrey. It was considered that having a single design would be potentially more effective as it would be instantly recognisable over a wider area.

Fig 19. Sign at a Sussex Level Crossing

Research to date suggests that the signs continue to be effective even after the first

six months. Therefore given the effectiveness of the signs the council will investigate options to further promote this measure to other areas, such as drop off points at stations and public places. This could be implemented in line with the Road Traffic (Vehicle Emissions) (Fixed Penalty) (England) Regulations 2002, or as part of a road side emissions testing program.

4.7) Congestion management

4.7.1) Freight and distribution.

The source apportionment results shown of the Further Review and Assessment 2006 showed that HGV's contribute significantly to the traffic related NO_x emissions profile. Therefore management of freight and distribution within the city is of the utmost importance in improving local air quality.

Central to the lifeblood of the city's economy, market forces suggest that the demand for goods in Brighton and Hove will continue to increase in coming years. The challenge for the City Council is to ensure that the activities and requirements of the freight industry are understood, and that schemes are developed so that freight movements are managed in a more sustainable way. The intention is that this approach will not only provide benefits to the freight operators but will also help to achieve environmental, safety and social targets in the city centre.

- **Urban Freight Management Plan**

To this end, the City Council will develop an Urban Freight Management Plan. Without pre-empting the outcomes of this analysis, some of the key issues to be reviewed are likely to be:

- Freight demand and capacity on existing and reconfigured routes
- Assessment of the appropriateness of alternative routes for freight

- Locations of businesses whose servicing would be directly affected by new traffic scheme, and any associated changes in traffic volumes

- Assessing opportunities for specific servicing roads,
- traffic management measures and signage for freight

- potential conflicts with buses and transport modes on constrained routes

- **Strategic Freight Working Group**

In seeking to achieve a more sustainable approach to the impact of distribution activity on Brighton and Hove, the City Council will develop policies for two distinct types of freight movement:

1. Strategic freight issues are associated with the movement of goods between key supply chain nodes such as ports, distribution centres and manufacturing sites. By their very nature, strategic movements tend to be long distance, and therefore the

geographical scope of Brighton and Hove Unitary Authority places limits on the extent of influence the City Council can have. However, it is essential to understand the impacts of strategic freight upon the area, and to work with neighbouring authorities to develop co-ordinated policies and targets in this regard.

2. Local freight issues are those concerned with deliveries or collections taking place within Brighton and Hove, and is more directly-affected by transport schemes or restrictions implemented by Brighton and Hove City Council. The local impacts of freight on businesses, residents and visitors all need to be considered and measures developed that encourage sustainable urban distribution.

To ensure that Brighton & Hove sets an agenda for improvements in both strategic and local freight sustainability, the City Council will initiate a Strategic Freight Working Group (with public and private sector interests including ESCC, WSCC, HA and Industry Representatives)

4.7.2) Decriminalised Parking Enforcement (DPE)

The city of Brighton & Hove introduced DPE in 2001, which has helped to improve the flow of traffic on important corridors within the City, particularly along bus routes and at bus stops, where illegal parking can obstruct vehicles and can result in further congestion and affect the reliability of the service.

Since DPE was introduced, there has been a reduction in car traffic in the city centre and associated increases in bus use, walking and cycling.

- **Residents' Parking Schemes**

The current Residents' Parking Schemes (RPSs) have reduced illegal parking in Brighton & Hove but unfortunately this can mean displacement to other areas, often in the form of commuters and a small number of residents from other zones using roads without parking restrictions.

- **Strategic review of on-street parking**

A recent review of residents parking schemes found that a number of operational differences within and between schemes were resulting in confusion amongst both drivers and enforcement officers

As a result, in 2006/7, the City Council intends to introduce a simplified approach to parking controls and their enforcement in order to create a fairer and more effective operation for both drivers and enforcement officers.

The introduction of revised and new schemes would continue be subject to public consultation.

- **Parking charges**

The strategic review of on-street parking proposes a rationalised 'zoned' approach

to charging in order to simplify the charging structure. Reviewing parking charges will help to redress the imbalance that currently exists between the costs of using the car compared to public transport. The price of a bus saver ticket (£2.60 from driver) exceeds the cost of parking in some parts of the city (for example, £2.50 all day in the Norton Road car park). This represents a significant disincentive to use public transport for some journeys and is therefore not consistent with the City Council's transport objectives and targets.

4.7.3) Intelligent Transport Systems (ITS)

The role of Intelligent Transport Systems in Brighton & Hove is a key element for supporting the City Council's sustainable transport goals, as well as the economic vitality of the city. While Brighton & Hove is well placed in its development of ITS in the city, there are areas where there could be real benefits in terms of reducing delays and congestion, assisting modal shift and improving traveller information. As such, the authority is seeking to continue the development of ITS in Brighton & Hove, building on the current systems to improve the efficiency of road network management in the city. This will take the form of the following work programmes:

- **SCOOT and UTMC (traffic light management)**

The traffic lights in the main corridors of the city operate under SCOOT but there is scope for inclusion of further areas:

- **The Queens Road corridor** has two junctions currently controlled by fixed time plans. This is a key corridor for buses linking the city centre to the train station.

- **Western Road corridor** has two junctions operating independently under normal detectors. The introduction of SCOOT will enable the implementation of bus priority measures here to improve bus punctuality.

- **The Lewes Road corridor** has junctions currently controlled by fixed time plans. This is a major strategic corridor and the introduction of SCOOT here will effect improvements in network performance, enabling the introduction of bus priority and other traffic management measures to reduce congestion i.e. gating of traffic or queue relocation techniques. Lewes Road is located within the City Council's AQMA.

The schemes will optimise the junctions, reducing stops and delays and provide network information; thereby helping to reduce congestion and pollution levels at these locations. Further to this, the City Council will study the possibility of implementing UTMC outstations. Some of the traffic control equipment within the city is now reaching the end of its expected life and needs to be updated. The development of the UTMC system requires that this equipment meet new performance standards if it is to be integrated with other systems. It is proposed that this be undertaken as part of a rolling programme of replacement.

- **Real Time Passenger Transport Information (RTPI)**

The RTPI system was implemented in Brighton and Hove at a cost of £2.4 million and has been viewed nationally as a successful implementation of a state-of-the-art system, recognised by the winning of national awards such as the National Transport Awards 2002 and the E-Government award at the LGC awards in 2005. The Bus operator has so far provided significant support with a contribution of £900,000. The project is now being extended into East Sussex County Council with an ESCC investment of £500,000 for Eastbourne and potentially the partnership will extend across the whole of the county area, providing significant cost sharing and integration of public transport networks.

Fig 16 Churchill Square RTPI

- **Variable Message Signs**

The City Council has invested in four traffic information signs to provide visitors and residents with information about their trips within the city, but it is recognised that scope exists to improve the information for people travelling between Brighton & Hove's roads and those of the Highways Agency. The City Council is therefore working with the Highways Agency to share information, although this is currently a manual process.

The A23 suffers from particular problems during the summer months due to the large number of visitors to the city. The interchange of A23/A27 becomes congested causing extensive queuing on the A23, which has contributed to the air quality problems leading to the declaration of an AQMA. This causes particular difficulty when events are planned in the city.

The introduction of Variable Message Signs (VMS) on the approach to Brighton – in partnership with the Highways Authority - could provide information on suitable alternative routes into the city, as well as general traffic information to assist drivers. The City Council is therefore seeking to provide one VMS sign and linked static signing on the A23 approaching Brighton in both 2007/8 and 2008/9. The Highways Agency has agreed in principle to provide additional funds towards this project, the extent of which is under negotiation.

As part of the AQAP the council will investigate the possibility of introducing air quality information to the Variable Message Signs to further inform local residents and visitors alike.

- **Journey time analysis**

The use of Automatic Number Plate Recognition (ANPR) camera technology could provide detailed information on the road network. Sussex Police are utilising this technology and there may be scope for partnership working between the police and

the City Council to obtain live information on network incidents. The police are looking to introduce cameras in the city for crime and safety purposes and it may be feasible to share the information gathered to establish journey times.

Linking the UTMC open standard database with the information gathered on the network by the police could enable better data collection for future forecasting of the impacts of schemes and journey time on particular roads. This programme is at a feasibility stage and further information on the development of a scheme should emerge in 2006.

This technology can be utilised to obtain vehicle age information for the city in order to assess future changes to the local vehicle fleet, which can have significant implications for air quality in terms of emissions. Such technology could be utilised in the future should the council consider introducing a Low Emissions Zone (LEZ) in the city.

4.7.4) Highway maintenance and the implications for air quality.

In line with the LTP2 Highways Maintenance programme, when maintenance is required, individual sites will be inspected to determine what other neighbouring works can be undertaken concurrently to make the most of the resources, maximise the benefits for the network whilst minimising the impact on road users and congestion and air quality.

4.8) Other local authority air quality work

Prior to the development of the action planning process the city council had a number of measures and practices in place for reducing local air pollution which will continue.

4.8.1) Local Air Pollution Prevention and Control (LAPPC)

Under the Pollution Prevention Control Act 1999 (and PPC Regulations 2000) the council is responsible for authorising the emissions to air, water and land for Part A2 process and emissions to air from Part B processes. Currently there are 33 authorised processes in the city (this figure does not include Dry Cleaning processes which will be authorised from 31st October 2006).

As part of our LAQM responsibilities under the Environmental Act 1995 the council carried out an Updating and Screening Assessment which was submitted to Defra April 2006. With reference to the Defra guidance notes LAQM.TG (03) none of the identified processes were considered to be significantly polluting in terms of the Air Quality Objectives.

4.8.2) Domestic Smoke Control (SCA)

Under the Clean Air Act 1993, the Local authority has statutory powers to control smoke from domestic and industrial sources. The legislation allows Authorities to create Smoke Control Areas (SCA's) which place restrictions on domestic fuel combustion. The original Clean Air Act 1956 was set up to tackle the then Pea Souper smog problems which had detrimental heath effects on those living in urban areas. Thankfully, the days of such smogs are long behind us, however the SCA remains in place to minimise the contribution from domestic and industrial sources to background ambient air pollution concentrations. Brighton currently has five such areas covering the central area of the city.

4.8.3) Domestic bonfires

Bonfires can cause statutory nuisance in the form of smoke and odour to local residents and result in fine particulates (PM_{10}'s) being released into the air. Therefore controlling these emissions is important in terms of public health and background pollution levels.

Under the Environmental Protection Act 1990 the local authority has enforcement powers to mitigate against the problems associated with bonfires which have potential fines of £5000.

The council policy clearly discourages unnecessary bonfires advising that household refuse is collected by the dustman and that bulky and garden refuse can go the Civic Amenity sites at Wilson Avenue, or Leighton Road, Hove. The Council can often help those without transport, or the elderly or infirm, by collecting but usually for a charge. However, many things can be recycled and the best example of recycling is the compost heap.

Woody material can be shredded and used for composting or mulching. If people have a lot of woody waste then shredders can be bought or hired and some allotment societies have their own.

In many parts of Brighton, it is not possible to have a bonfire without causing a nuisance because gardens are so small. However, a bonfire can be a convenient way of getting rid of waste, or for recreational purposes -on Guy Fawkes night for instance. If a bonfire is the best practical option for disposing of garden waste, the council states the following guidelines:

- only burn dry material
- never burn household rubbish, rubber tyres or anything containing plastic, foam or paint
- never use old engine oil, meths or petrol to light of encourage the fire
- avoid lighting a fire in unsuitable weather conditions. Smoke hangs in the air on damp still days and in the evening. If it is windy smoke may be blown into neighbour gardens and across roads

• avoid burning at weekends and on bank holidays when people want to enjoy their gardens

• where possible inform the neighbours of your intention to have a fire. This will give them the opportunity to shut windows, bring in washing etc

• never leave a fire unattended or leave it to smoulder

4.8.5) Commercial bonfires

Under the duty of care provisions contained within the Environmental Protection Act 1990, the Environment Agency permits only the burning of green waste which has been produced on site and no other materials. However, Brighton and Hove City Council can take enforcement action on any commercial/industrial operations if they cause a statutory smoke nuisance. This action can result in a fine of up to £20,000.

4.8.6) Development control

Effective land use planning and development control are vital for the future development of the city and are key factors in combating current and future impacts of development on congestion and air quality. Section 3.7 details the councils policy on planning and development control.

4.9) Specific measures in light of the findings of the 2006 FR&A.

Certain measures are specifically targeted at directly reducing the emissions impact of Buses and HGV's such as Freight Management, walking and cycling initiatives and the Rapid Transport System. However in the main part the purpose of the measures is to reduce congestion, reduce traffic volume and improve traffic flow, which in turn will significantly reduce the emissions from all vehicle types. For example reallocation of road space and development of STC's will smooth the flow of public transport and reduce the emissions.

5) Impact assessment

The Defra guidance LAQM. PGA(05) sets out a suggested approach for summarising the costs, wider scale effects and air quality impacts so the individual measures can then ranked in terms of priority. Measures with high air quality impacts and low costs tend to be ranked high, however factors such as time scale and uncertainty over funding are also important. The various measures have been summarised to the following tables.

5.1) Air auality benefits.

Before making an assessment as to the potential gains in terms of air quality from the various measures, careful consideration needs to be given to the number uncertainties associated with such assessments. For example reducing traffic levels by the same amount in two different parts of the city is unlikely to yield the same results due to a number of variables such as traffic composition, traffic speed, distance from the road to the receptor, height of the receptors and prevailing meteorological conditions etc. Therefore unless these factors can be quantified then assessing the direct impact is extremely difficult.

This of course can be achieved through dispersion and forecasting modelling. However in order to do this the model requires specific traffic reduction data for the various measures. Unfortunately given that many of the measures detailed in the AQAP are generic and target general traffic reduction across the city as a whole, it becomes extremely difficult to identify the specific reductions in traffic numbers and associated AQ improvements that will be seen at any given location.

With regard to the more direct measures such as the Valley Garden Improvements, the Rapid Transport System, the introduction of STC's and modifying traffic light times to reduce congestion, it is more viable to model the direct effects on local air quality. However, many of these measures are in the early stage of development so detailed traffic reduction data is not yet available. Therefore loosely based on the Defra guidance LAQM. PGA(05) the Council has adopted the following system for ranking the AQ benefits of the described measures:

NEGLIGIBLE

Not possible to model, likely impact to be $< 0.2 \mu gm^{-3}$

LOW

Not possible to model, likely impact to be $< 1 \mu gm^{-3}$

MODERATE (1)

Not possible to model, likely impact to be between 1-2μgm^{-3}

MODERATE (2)

Lends itself to modelling, likely impact to be < 1-2μgm^{-3}. (Provisional as traffic data not currently available)

HIGH (1)

Not possible to model, likely impact to be > 2μgm^{-3}

HIGH (2)

Lends itself to modelling, likely impact to be 2μgm^{-3}. (Provisional as traffic data not currently available)

The tables will be updated through the annual progress reports as more detailed traffic data becomes available for analytical assessment.

5.2) Costs.

The defra guidance, LAQM.PGA(05) states that there are no strict rules on how an assessment of cost-effectiveness should be carried out, only that the authority should take a consistent approach. In doing so the council considered the following:

- what are the over all costs for each measure?

- has the measure been developed primarily for improving air quality?, for other transport related problems? or to achieve several objectives including air quality improvements?

Clearly if a measure has been developed in the AQAP to specifically target air quality, such as RET and the expansion of measures within the LTP2 to target air quality, then the costs can be directly included in the assessment of cost benefit analyses. However, as most measures have been developed through the LTP2 the cost assessment is considerably more complex. After consultation with the Action Plan Help Desk, the council identified the following options:

1. include the costs in the assessment of cost-effectiveness for only those measures which require new funding

2. include all costs for AQAP measures in the assessment of cost-effectiveness, but make it clear whether funding has been secured (and through what source)

DfT guidance states that all measures described in the LTP2 should be developed in line with the 4 key objectives, one of which is AQ. Therefore as AQ is one of the main issues behind why the measures have been/are being developed, the council concluded to assess costs in line with option 2. Adopting this approach has helped to establish the priority of those schemes with respect to AQ. Further to this, as some schemes for Brighton and Hove are still under development this cost-effectiveness

assessment may provide greater support for a scheme in terms of justification and priority in the future.

For measures derived through the LTP2 the costs shown in the tables are taken directly from those given in the LTP2 report.

Certain measures included in the AQAP are statutory requirements for the council at present and have been for some time, such as LAPPC, statutory nuisance controls and enforcing SCA's etc. so in effect can be discounted in terms of cost direct implications. Where relevant this is noted in the tables.

LTP2 AIR QUALITY ACTION PLAN OPTIONS.

General Measure	Specific Project	Description	Authority	Year of start and Timescale	AQ Impact	Costs (£'000s) LTP	Other Impacts	Geographical Target Area	Ranking
ROAD TRANSPORT MEASURES									
Rapid Transport System		Integrated rapid public transport system to link major new and existing developments.	BHCC and Brighton and Hove Bus Co.	2008-2009	HIGH (2)	11,400	Reduce impact of private car use resulting in less noise, congestion and improved road safety.	Targeted at specific road network but will also reduce private vehicle traffic citywide.	**1**
LR2		Regeneration project for the London Road/Lewes Road area. This will have significant implications of the local road network within the AQMA.	BHCC	Urban capacity study completed, feasibility study underway.	Impact unknown due to early stage of project development	(see Urban Realm Developments)	Reduce congestion and enhance local environment.	Area specific	**TBC**
Home Zones		Redevelopment of urban areas for traffic calming and increased pedestrianisation.	**OPTIONS UNDER REVIEW**				Reduced impact of car so improving the local environment. Increased road safety through traffic calming measures.	Area specific	**TBC**
Year of walking and cycling 2009	**Walking Network**	Establishing greater links and corridors between 'areas of attraction'	BHCC	2006-2009	MOD (1)	4466	Enhanced accessibility for sustainable traffic modes. Reduced congestion.	City wide	**2**
	Pedestrian Signage	To give direction/ location and walking time info etc. without relying on traffic signs	BHCC	2006-2009			Enhanced accessibility for sustainable traffic modes. Reduced congestion.	City wide	
	Cycle freeways	a radically enhanced form of on street cycle lane, fully segregated from traffic.	BHCC	2006-2009			Enhanced accessibility for sustainable traffic modes. Reduced congestion.	City wide	
	Cycle Signage	to give cyclists the same level of info on destination as drivers.	BHCC	2006-2009			Enhanced accessibility for sustainable traffic modes. Reduced congestion.	City wide	
	Walking/Cycling facilities rolling program	incremental year on year improvements	BHCC	2006-2009			Enhanced accessibility for sustainable traffic modes. Reduced congestion.	City wide	

Pool Valley Coach Station		Redevelopment of the existing station.	BHCC and National Express coach network.	2006-2007	LOW	1000 (500 from LTP and 500 from other funding)	Reduced congestion and increase in tourism revenue.	Local/Regional/ National	**3**
Urban Realm Developments		Land Use planning developments to promote cycling and walking and improve traffic flow.	BHCC	2006/7	Impact unknown due to early stage of project development	Total for Urban Realm Developments: 5716 (incs 500 from non LTP source)	Reduce congestion and enhance local environment.	Area specific	**TBC**
Valley Gardens Environmental Improvement		Redevelopment of the entire area to reduce congestion and improve traffic flow.	BHCC	2010-2011	HIGH (2)	2,386	Enhanced both access and use of existing urban parkland. Reduced congestion and road safety from rationalised carriageway space/junctions.	Area specific	**1**
Road Safety	**Road safety engineering plan**	to improve crossing facilities, road markings, junction priority and traffic calming.	BHCC	LTP period	LOW	3250 (funding also from other source, 334)	Improved road safety and accessibility. Reduced congestion.	City wide	**3**
	Road safety education and publicity programmes	including targeted training programmes and cycle proficiency.	BHCC	LTP period	LOW	1200	Improved road safety and accessibility. Reduced congestion.	City wide	**3**
Passenger Transport	**Quality Bus Partnership**	Continue to develop in terms of service information and ticket deals. Further develop the sustainable transport corridors.	BHCC and Brighton and Hove Bus Co.	LTP period	further research needed to quantify impacts due to recent developments with respect to direct NO2 emissions.	2870 (also funding from other sources, 1000)	Improved accessibility and journeys. Reduced congestion and improved road safety through enhanced pedestrian facilities.	City wide	**TBC**
	Accessible bus stops	Raised and glowing kerbs to improve access.	BHCC and Brighton and Hove Bus Co.	LTP period	NEG	850	Improved access for the mobility impaired. Encouragement of bus use and reduced congestion.	City wide	**TBC**
	Real Time Passenger Transport Information (RTPTI)	system for informing passengers of bus times so to be expanded to include suburban areas.	BHCC and Brighton and Hove Bus Co.	2006-2009	LOW	240 (also funding from other sources, 40)	Increased accessibility through information. Reduced congestion through increased bus patronage.	City wide	**2**
	Sussex Coastal Fast way	project to achieve a step change in passenger transport along the south coast.	BHCC, WSCC, ESCC, Hampshire County Council and Portsmouth City Council.	major schemes bid in 2008/9	LOW	TBC	Reduced congestion from less reliance on private vehicles.	City wide	**TBC**
	Kick Start	programme to improve the night time bus service for night and shift workers.	BHCC and Brighton and Hove Bus Co.	TBC	NEG	bid submitted	Reduced congestion from less reliance on private vehicles.	City wide	**TBC**

	Passenger Transport	To developed the east - west transport links across the city	BHCC and Brighton and Hove Bus Co.	TBC	LOW	TBC	Reduced congestion and improved journey time.	City wide	**TBC**
	Access to Rail Stations	Programme of accessibility enhancement to promote greater use.	BHCC	2007-2011	LOW	200	Reduced congestion , environmental enhancement and improved security and disability access.	City wide	**2**
Traffic Management (intelligent transport systems)	**SCOOT**	Assess and expand the current SCOOT system to included other areas such as the AQMA and known AQ hotspots.	BHCC	LTP period	MEDIUM (2)	240 (also funding from other sources, 410)	Reduced congestion through improved traffic flow.	Area specific/City wide	**2**
	Urban Traffic Management Control (UTMC)	Development of UTMC out stations	BHCC	2006-2008			Better provision for public transport through greater information. Enhanced improved network efficiency to met with the requirements of the Traffic Management Act.	Area specific/City wide	
	Variable Message Signs	Further develop to possibly include AQ info.	BHCC and Highways Agency	2006-2008	NEG	160 (also funding from other sources, 120)	Visual information allowing public to make informed choices on routes and traffic modes.	Area Specific	**3**
	City Transport website	Develop AQ information within the site.	BHCC	2006-2008	NEG (increasing with greater promotion)	100	Visual information allowing public to make informed choices on routes and traffic modes.	City wide	**3**
Decriminalised Parking Enforcement		Continue to review/develop and enforce both the residents parking and on street parking schemes, including a strategic review of charging.	BHCC	LTP period	HIGH (1)	5000 from parking funding	Reduced congestion from enhanced parking provisions and enforcement. Provides incentive towards sustainable transport modes.	Area specific/City wide	**1**
Urban Freight Management Plan		Assessment of existing and alternative routes, assess opportunities for servicing roads, traffic management and signage for freight. Also consider businesses affected by new traffic schemes.	BHCC, WSCC, ESCC, Highways Agency and industry representatives.	LTP period	MEDIUM (2)	TBC	Reduced congestion and parking problems for freight vehicles.	Targeted at specific road networks.	**TBC**

Travel Behaviour Change	**Transport Campaign**	Implement an extensive transport marketing campaign, including road safety, local transport problems and how behaviour can solve them.	BHCC	LTP period	NEG	500	Improved accessibility through better information regarding transport modes. Reduced congestion from modal shift. Increased road safety.	City wide	**3**
	Personalised Travel Planning.	A community based programme for encouraging alternatives to private vehicle use.	BHCC	LTP period	LOW (increasing with greater promotion)	690	Improved accessibility through better information regarding transport modes. Reduced congestion from modal shift. Increased road safety.	City wide	**3**
	Staff and Business Travel Planning.	Improved travel options for employees of B&HCC and further development of plans for external organisations.	BHCC	LTP period			Improved accessibility through better information regarding transport modes. Reduced congestion from modal shift. Increased road safety.	City wide	
	School Travel Plans	Expand on the 44 LEA schools who are currently implementing plans.	BHCC	LTP period			Improved accessibility through better information regarding transport modes. Reduced congestion from modal shift. Increased road safety.	City wide	
Car Clubs		Develop where possible the existing car clubs to improve the public travel options.	BHCC and TMO	LTP period	NEG (increasing with greater promotion)	50 from grant funding and 80 from TMO subsidy	Improved model option and accessibility for those with out cars. Reduced congestion and parking pressure.	Area Specific	**3**
Powered two-wheelers		Expand the provision of both resident and on street parking provisions.	BHCC	LTP period	NEG	0 from LTP and 25 from parking funding	Improved model option and accessibility for those with out cars. Reduced congestion and parking pressure.	City wide	**3**
Journey Time Analysis		Can be used to assess the age of the local vehicle fleet and enforce LEZ's in the UK.	BHCC	LTP period	N/A	1870	Improves accessibility to public transport	City wide	**N/A**

NON-LTP2 AIR QUALITY ACTION PLAN OPTIONS.

General Measure	Description	Authority	Year of start and Timescale	AQ Impact	Costs	Target Impact	Other Impacts	Link to LTP measures	Geographical Target Area	Ranking
ROAD TRANSPORT MEASURES										
Road side emissions testing	Stop vehicles on highway to inspect engine emissions.	BHCC, Police, SAQSG and VOSA	TBC	NEG	TBC	Enforces emission control and improves the emissions of the local vehicle fleet.	Promotes the issues of local AQ and the AQMA/AQAP		Area Specific	3
Promote cleaner fuel vehicles	Work with local business and employers to increase use of cleaner fuels.	BHCC and the Energy Saving Trust.	TBC	NEG (increasing with greater uptake)	TBC (grant system set up under the Energy Saving Trust)	Improves the emissions of the local vehicle fleet.	Promotes the issues of local AQ and the AQMA/AQAP. Promotes sustainability	Can be developed as part of Business travel plans.	City wide/organisation specific	TBC
Cut Engine Cut Pollution Signage	**OPTIONS FOR EXPANSION UNDER REVIEW.**					Reducing the impact of idling emissions.				TBC
Taxi and Bus idling and emissions enforcement	Continue to enforce local emission conditions and polices.	BHCC and the Brighton and Hove Bus Co.	on going	High (1) - on going impact as condition s are enforced and the bus fleet is renewed.	Not possible to quantify	Reducing the impact of idling emissions.	Promotes sustainable travel use in the city and reduces congestion.	Promotes sustainable travel use in the city and reduces congestion.	City wide	N/A
Campaigns and events	Involvement with sustainable travel campaigns and events such as in town without my car day.	BHCC and local education organisations.	2006 (LTP period)	NEG/INFORMATIVE	TBC	public information	Promotes knowledge and discussion in the community on air quality and transport issues.	Linked to travel and road safety education.	Campaign specific/City wide	3
Leaflets	Detailing LAQM and the AQAP.	BHCC	TBC	NEG/INFORMATIVE	TBA	Inform public and interested bodies of AQAP and LAQM	Promotes knowledge and discussion in the community on air quality.	Can be linked in with the transport campaigns.	City wide	3
Website development	Develop details of AQAP on the councils existing City Airwatch website	BHCC	2006 with on going development.	NEG/INFORMATIVE	officer time	Consultation and inform public and interested bodies of AQAP actions.	Promotes knowledge and discussion in the community on traffic air quality.	web links	City wide	3

AQ Bulletins	Produce daily AQ forecast and monthly graphical displays.	BHCC and local media.	on going (LTP period)	NEG/INFORMATIVE	officer time	public information	Helps people make informed choices on health the transport.		City wide	**3**
Forecasts in local media	OPTIONS UNDER REVIEW.	BHCC and local media.	2006 (LTP Period)	NEG/INFORMATIVE	TBC	public information	Helps people make informed choices on health the transport.		City wide	**3**
Air Alert text se4rvice	Telephone and text service for advising public of poor air quality	SAQSG	pilot project run in 2006 to be further promoted in 2007.	N/A	TBC	public information for public with respiratory health problems.	Promotes education on air quality issues.	N/A	N/A	**N/A**
Talks and training	Talks to local groups/schools universities etc on AQ issues.	BHCC and local education organisations.	on going (LTP period)	NEG/INFORMATIVE	officer time	public information	Improved road safety, increased knowledge on air quality issues and reduced congestion.	Linked to travel and road safety education.	City wide	**3**
School Projects	Work with local schools on AQ projects	BHCC and local education organisations.	2006 (LTP period)	NEG/INFORMATIVE	officer time and some basic scientific equipment costs	Inform schools and parent groups on the impacts of the school run (e.g.) on AQ.	Reduce congestion and improve road safety.	Linked to travel and road safety education.	City wide	**3**
Monitoring and assessment	For fill the statutory requirements for LAQM	BHCC and SAQSG	on going	n/a	in internal budget for statutory work.	Report on local air quality.	Informs the Transport Planning an Development Control processes.	Provides information for the APR's and LTP8 indicator.	City wide	**N/A**
INDUSTRIAL AND DOMESTIC MEASURES										
Smoke Control Area Info	Continue to enforce SCA policies.	BHCC	on going	LOW (domestic air pollution)	on going statutory duties	Smoke control public information within existing SCA's	Reduces the impact on background air pollution levels.	Assists in reducing local pollution levels.	The City has five SCA's declared under the Clean Air Act.	**2**
Bonfire policies	Continue to enforce bonfire policies.	BHCC	on going	LOW (domestic and commercial air pollution)	on going statutory duties	Prevent nuisance and pollution.	Reduces the impact on background air pollution levels.	Assists in reducing local pollution levels.	City wide	**2**
LAPPC	Continue to enforce LAPPC policies.	BHCC	on going	LOW (commercial air pollution)	on going statutory duties	Ensure relevant industrial processes meet emission standards.	Reduces the impact on background air pollution levels.	Assists in reducing local pollution levels.	Industry specific	**2**

Energy use in terms of domestic change initiatives and CHP	Assess the location and impacts of the potential switch to sustainable fuels	BHCC	on going	Difficult to quantify due to variable technology impacts.	officer time	Minimise or eliminate impact from emissions and location assessment.	Potentially positive impact on climate change and CO_2 emissions.	Assists in reducing local pollution levels.	City wide	**N/A**
OTHER MEASURES										
Involvement with large planning applications	Have informed scientific input on the AQ impact of developments.	BHCC	on going	BHCC works with all developers to minimise negative impact and mitigate where necessary.	on going statutory duties	To assess the air quality impact and potential mitigation options of developments.	Reduces the impact on background air pollution levels.	Traffic and pollution closely liked in developments.	Application Specific	**N/A**
Links to sustainability team and climate change	Involve council sustainability and climate change teams with AQAP, given strong links between climate change and air quality.	TBC	2006	N/A	officer time	Develop further understanding of the links between local air quality management and climate change.	Potentially positive impact on climate change and CO_2 emissions.	Requirement of LTP process to assess CO_2/climate change Impact.	City wide	**N/A**
Emissions Inventory	Development of local emissions inventory for LAQM work	BHCC and SAQSG.	2006	N/A	TBC (costs relate to subscription membership of the SAQSG)	Develop an more accurate analytical data set for local emission to assist in dispersion modelling projects and development control.	Could be linked to climate change emissions inventories.	Requirement of LTP process to assess CO_2/climate change Impact.	City wide	**N/A**
Data Monitoring - TRAFFIC	Develop agreed monitoring programme for the purpose assessing future improvements	BHCC	LTP period	N/A	250 (total spent on traffic monitoring for entire LTP)	Assesses improvements in vehicle numbers and model change for LTP/AQAP listed measures.	N/A	Traffic data used for transport planning purposes	City wide	**N/A**
Data Monitoring - AIR QUALITY	Continue and develop where necessary the extensive AQ monitoring network for informing both the public and the LAQM process.	BHCC	LTP period	N/A	on going statutory duties	Assesses actual improvements in annual air pollutant levels to assist in the LTP/AQAP process.	N/A	Provides air quality data for assessing transport measures during life of LTP	City wide	**N/A**

6) Implementation and monitoring

6.1) Implementation of measures

In accordance with the Defra guidance LAQM.PG(03) the council is required to implement an AQAP Progress Report at the end of April each your. Ideally the action planning Progress Reports should be submitted in parallel with the review and assessment Progress Reports. However as the council is incorporating the AQAP into the LTP2 , progress on the AQAP will be reported through the LTP progress report which is required for submission in July each year.

The report will list the measures within the action plan (Section 5) and include the timescales by when they are/were due to be implemented and give an update on progress in terms of implementing them.

In addition to this, the following mandatory indicators are included in the LTP2 (to be achieved by 2010/11) for assessing the success of the transport measures that will bring about air quality improvements over the coming years. (more details on these are given in the LTP2 report)

Bus patronage

Performance Indicator	LTP2 Target
BVPI 102 - Public Transport Patronage	18% Increase
BVPI 104 – Satisfaction with Service	2% increase in customers satisfaction
LTP5 – Bus Punctuality	To achieve 95% Punctuality

Congestion

Performance Indicator	LTP2 Target
LTP2 – Change in area wide traffic mileage (million vehicle km)	Stabilise year on year traffic growth at 10 million vehicle km from the baseline figure of 1106 million vehicle km.
LTP6- Change in peak period traffic flows to urban centres.	To reduce peak period traffic flows by 5% to urban centres within Brighton and Hove by 2010/11.

Level of cycling

Performance Indicator	LTP2 Target
LTP3 – Cycling Trips	5% Year on year growth in usage on existing sections of the network

Mode share of school journeys

Performance Indicator	LTP2 Target
LTP4 – Mode share of school journeys	6% reduction in journeys to school by car and increase journeys by public transport, walking and cycling.

6.2) Air quality - the LTP8 performance indicator

For the purpose of producing the LTP8 indicator and assessing progress in improving air quality throughout the five year period of the LTP2, a 2004 base line has been set. Given the extent of the AQMA (in that it covers a number of major roads and junctions within the centre of Brighton & Hove) three locations have been identified for assessment during this period. The baseline data is from bias adjusted NO_2 diffusion tubes.

Table 7 LTP8 Indictor Baselines

Site Location	2004 Baseline
Lewes Road (south of the Vogue Gyratory)	54.2µgm^{-3}
Grand Parade (north of pavilion parade)	48.7µgm^{-3}
Viaduct Road	46µgm^{-3}

These specific locations were chosen because they:

- reflect some of the highest pollution levels seen within the AQMA (2004)
- were identified as areas of exceedence in the 2004 Detailed Assessment.
- are areas where repeatable traffic counts can be performed annually for the purpose of assessing LTP2 progress and improvements.
- are approximately equidistant from each other and represent different areas of the AQMA.

The following three graphs show the trajectories for the 'do nothing' scenario versus LTP2 scenario over the life time of the LTP2. Due to the projected annual reduction in vehicle emission rates the 'do nothing' scenario shows an overall decrease regardless of the LTP2. The trajectories have been produced using the Breeze Roads dispersion model.

Fig 21 Lewes Road LTP8 Trajectory

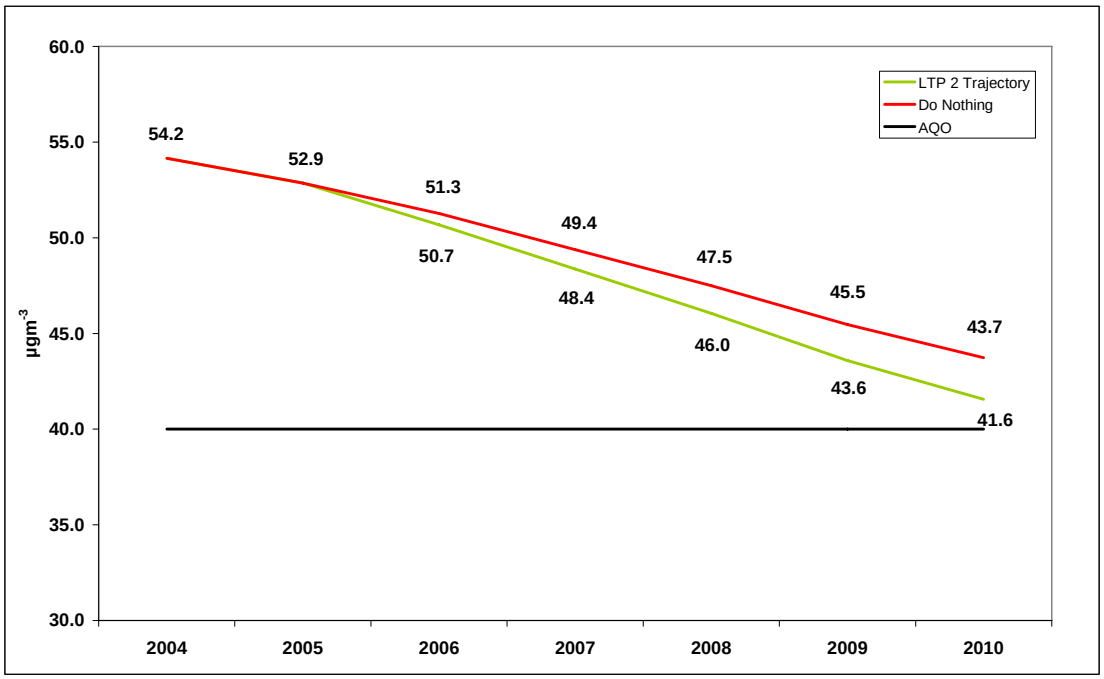


Fig 22 Grand Parade LTP8 Trajectory

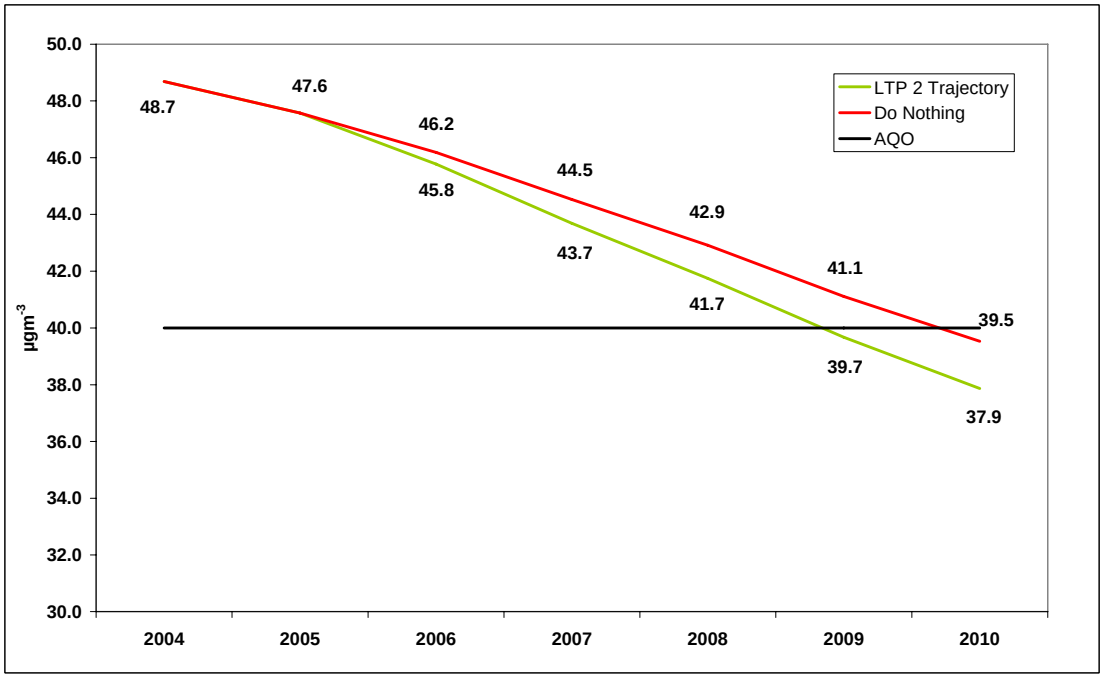
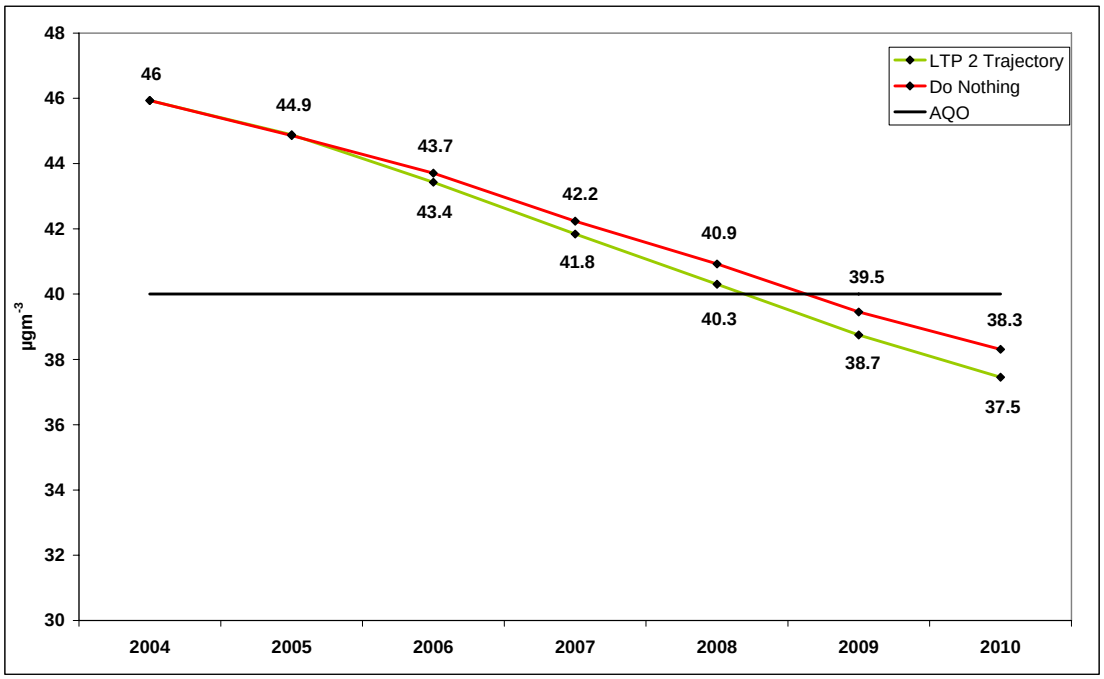


Fig 23 Viaduct Road LTP8 Trajectory



Given the annual variation seen in ambient concentrations due to factors such as meteorology, progress in meeting the 2010/11 targets will be assessed through annual traffic assessments. The LTP2 has set a target of 1% annual traffic reduction with a 5% reduction for 2010/11 based on a 2004 baseline. However it should be noted that this is a city wide generic reduction based on the impact of the LTP2 on traffic growth as a hole and does not necessarily reflect the impacts of individual measures. For example measures that have been developed to target specific areas such as the Valley Gardens Urban Realm Improvement.

Each District in the County has its own traffic growth factor which can be used to convert traffic data into predicted future flows, assuming that there is no local development nearby likely to increase traffic flows before this date. Despite the predicted growth of 1% per year in areas of the city (with no LTP2 intervention) a factor of 2% increase per year has been used in this assessment, for the do-nothing scenario. This is more in line with national figures and therefore represents a worst case scenario of potential traffic growth in the area.

6.3) Timescales for meeting the objectives.

As shown in figs 21,22,23 the EU 2010 limit value of 40µgm^{-3} is predicted to be met at both Grand Parade and Viaduct Road by 2010 but not in Lewes Road despite the implementation of the measures stated in the LTP2 and this AQAP. In light of this congestion reduction options involving traffic light technology such as SCOOT, UTMC and roadside pollution management systems will be considered for junctions such as Lewes Road and the Vogue Gyratory.

6.4) Air quality monitoring surveys

Air quality monitoring takes place at a number of locations around the city of Brighton & Hove using passive diffusion, pumped diffusion, gravimetric and continuous methods. The various surveys are as follows:

Table 8 Air Quality Monitoring in Brighton and Hove

Station	Analysers	CMCU	Network
Hove Roadside	CO	BV/ERG*	AURN -affiliated
	NO_x	BV/ERG*	AURN -affiliated
	Benzene	NPL	UK Hydrocarbon
	O_3	ERG	B&HCC local
	SO_2	BV/ERG*	AURN-defra
BTN Roadside	CO	BV/ERG*	AURN -affiliated
	NO_x	BV/ERG*	AURN -affiliated
	O_3	ERG	BHCC Local
	PM_{10}	BV/CRE Air	AURN-defra
Preston Park	NO_2	BV	AURN-defra
	O_3	BV	AURN-defra
Mobile AQ Unit	CO, NO_x, PM_{10}	ERG	BHCC local
Foredown Tower	O_3	ERG	B&HCC local
Leighton Road	PAH	AEAT	PAH
Diffusion Tubes	NO_2	NETCEN	National NO_2
	NO_2	B&HCC	B&HCC local
	O_3	SAQSG	Interegg project
	VOC	B&HCC	B&HCC local

* Bureau Veritas (BV) are the official CMCU (Central Management and Co-ordination Unit), Environmental Research (ERG) Group, Kings College London are only employed by the SAQSG to analyse AQ data from Sussex local authority sites. (which include both Brighton Roadside and Hove Roadside AURN sites).

The national data can be viewed on the air quality archive, www.airquality.co.uk and the local data on the city council's website at www.brighton-hove.gov.uk/cityairwatch.

Further details on the these monitoring surveys and associated data is given in the 2005 Progress Report and will be updated annually through the review and assessment progress report process.

6.4.1) Quality Control/Quality Assurance

AURN Sites

All AURN/AURN-affiliated sites/analysers are subject to the quality assurance/quality control objectives set out in the Netcen site operators manual.

B&HCC sites

All remaining continuous analyser sites not covered by the AURN are subject to the following QA/QC procedures.

- Overnight 24hr IZS calibration checks
- Fortnightly manual zero/span calibration using certified cylinders.
- Full data analyses and ratification through ERG
- Six monthly services visits.

Diffusion tube surveys

- NO_2 and VOC diffusion tubes are supplied and analysed by Bristol Scientific Services
- Ozone diffusion tubes are analysed by Harwell Scientific.
- all diffusion tube results from 2001-2005 are subject to a triplicate chemiluminescent collocation bias correction factor. (Hove Roadside AURN)

6.5) Traffic monitoring surveys

Transport monitoring is required for both local dispersion modeling and to assess the progress in reducing traffic within the AQMA (LTP8 indicators) and throughout Brighton and Hove as whole.

There are five main programs of transport surveys carried out on a periodical basis. Which are detailed in the LTP2. These are:

- Permanent Automatic Traffic Count
- Regular Base Monitoring Program
- City Centre Cordon
- Annual Footfall Surveys
- Scheme specific surveys

6.6) The next steps in LAQM for Brighton and Hove

Section 2 details the stages of Review and Assessment which led to the declaration of the AQMA (fig 1). Since the declaration the council has completed the 2006 USA as required by the statutory R&A process. From the results of the assessment there was evidence that the levels for nitrogen dioxide (NO_2) may exceed the annual Air Quality Objective at the following locations:

- **Diffusion tube sites**

- Site 17 Sackville Road
- Site 1 Old Shoreham Road/Nevil Road
- Site 62 St James St
- Site 63 Eastern Road
- Site L3 Upper Lewes Road
- Site 54 North Road
- Site 57 Seven Dials
- Site 53 Queens Road
- Site 83 Queens Road North
- Site 60 Ditchling Road

- **DMRB modelling**

- North Street

In light of these exceedences the Council is undertaking a Detailed Assessment of air quality at the above sites. Further to this the following locations will also be assessed in the DA.

Western Road -currently not showing an exceedence, however has recently been re-sited to represent relevant exposure and therefore given the elevated levels seen in that area, will be taken through to a DA.

Chatham Place/Old Shoreham Road/New England Road junction - as this junction carries traffic between Preston Circus and Seven Dials (both of which show current annual NO_2 exceedences) it will be taken through to a DA for further investigation, despite the results of the modelling indicating the AQO will be met. This is in line with the DMRB guidance notes that advise that complex junctions are better assessed by monitoring. Two diffusion tubes have recently been sited in this area as part of the assessment.

Terminus Road.- as this road carries traffic to and from the Queens Road North area (which shows a current annual NO_2 exceedence) it will be taken through to a DA for further investigation. A diffusion tube has recently been sited at the façade as part of this assessment.

The Detailed Assessment has a statutory deadline of April 2007.

- **Particulates (PM_{10})**

Given that the monitoring data and some of the modelling results for PM_{10} show that there are areas close to the 2004 PM_{10} 24 hr AQO, the council commits to under taking further monitoring within the city.

The 2010 AQO for PM_{10} is provisional and non statutory, therefore there is no requirement to go to a DA based on the predicted 2010 PM_{10} exceedences.

If the DA identifies the existence and extent of further exceedences then the council will need to either make further AQMA declarations or extend the area covered by the existing AQMA. Further to this from the results given in figs 5 and 7 in the FR&A report, the extra identified areas of exceedence will be assessed in terms of relevant exposure. This will be reported in the in the 2007 DA.

6.7) Investigation in to recent ambient NO_2 levels in Brighton and Hove

The data in Section 2, Table 4 shows that since 2003 many of the annual NO_2 monitoring sites have seen elevated levels when compared to 2002. This recent pattern is not consistent with the general downward trend seen for all NO_2 monitoring sites 1997-2002 (as shown in Fig 4 Section 2). These results coupled with the recent work by Carslaw (2005), suggest that further investigation is needed to better understand of the past and present NO_2 emissions profile throughout the city.

This research will be linked to the planned emissions inventory work described in Section 2 and reported through future progress reports.

7) Consultation

Following initial consultation with Defra, the action plan will now go through an 8 week consultation which will end on the 7th May 2007.

7.1) Statutory consultees.

The Defra policy guidance sets out all the statutory organisations which must be consulted on as part of the AQAP consultation process. They are:

- the Secretary of State;
- the National Assembly for Wales for local authorities in Wales;
- the Environment Agency;
- the highways authority (for English authorities only);
- in London, the Mayor (for London authorities only);
- all neighbouring local authorities;
- the county council (if applicable to English local authorities);
- any National Park authority;
- other public authorities as appropriate; and
- bodies representing local business interests and other organisations as appropriate.

7.2) Historic consultation

The council has historically worked closely with local residents and stakeholder groups in a two way process to establish a better understanding and appreciation of air quality issues within the city.

In 1999 the council commissioned a workshop program entitled The Public Perception of Air Quality. The objectives of the program were:

- To establish what air quality means to Brighton & Hove residents,
- To gauge perceptions of current methods of communication and consider alternatives,
- Evaluate resident responses to French AQ information indices - 'ATMO'

In order to assess this, the following survey groups (of mixed ages) were drawn up:

1) Those that didn't necessarily know about air quality issues-

   - Lewes Road area, Brighton

   - St Anne's Wells/Wilbury Road area, Hove

2) People with health problems (self or family member, such as asthma, heart conditions, chest infections etc)

   - Fiveways area, Brighton

   - Portland Road/New Church Road area, Hove

Additionally, 216 street interviews were conducted.

The results of the survey provided the council with vital public information with respect to issues such as:

- public perception on what affects air quality,
- methods used by residents to detect poor air quality,
- who the public think should take the lead in tackling air quality problems,
- how the public should be informed on air quality issues.

The detailed findings of the program are shown on the councils *city airwatch* website. The results of the workshops have helped shape the way that Brighton & Hove City Council present information to, and liaise with, the public on air quality issues.

Given the success of the study, the council is looking into options to conduct a further such study. Especially in light of the major changes that have occurred and are occurring in the city, with respect to air quality, transport and landuse developments.

7.3) The AQAP consultation process

Formal consultation with respect to many of the measures described in this AQAP has already been implemented through the LTP2. The measures were prepared in consultation with a wide range of interested parties (including input from the public, key stakeholders, the 2020 Local Strategic Partnership and Council Members) and takes into account the progress to date made by the City Council and its stakeholders in addressing local transport issues. Further details of this are given in the introductory section of the LTP2 which can be found on the councils website:

http://www.brighton-hove.gov.uk/index.cfm?request=c1146323

Therefore it must be noted that this AQAP consultation is only concerned with the package of measures in terms of air quality impacts and should not be seen as

consultation of transport planning in general. However one of the aims of the AQAP is to identify any potential secondary effects that may arise from these measures, therefore comments are welcome with respect to this.

Please note that the AQAP also contains a package of measures which are not included in the LTP2 and so have not previously been consulted on. Therefore general comments, including those relating to transport planning and traffic management issues, are welcome on these measures.

This consultation is primarily aimed at all local residents, business and interested parties who have concerns on local air quality issues. However as part of the wider consultation process the council welcomes comments from other interested individuals and organisations throughout Sussex and beyond. The document has already been amended based on initial consultation with Defra and will be resubmitted to defra for assessment once this 8 week consultation is complete.

For effective consultation of the action plan the following questions have been set:

1) Do you understand and/or agree with the objectives and reasons for the AQAP?

2) Do you think the measures listed in the plan are relevant and suitable for tackling air quality in Brighton and Hove?

3) If not what other measures do you think the council should be considering?

4) Of the listed measures, do you think they go far enough or should they be developed further?

5) In producing the AQAP the council had to assess the potential secondary affects of the listed measures. Do you have any concerns over other secondary effects? (effects maybe economic, social or environmental etc.)

6) Do you feel overall that the AQAP can bring about worthwhile change?

7) Do you have any other comments relating to the AQAP process?

In the interest of sustainability, paper copies of the document have not been issued to consultees and instead copies of both the full and summary documents can be sourced from the following:

- The council website
  http://www.brightonhove.gov.uk/index.cfm?request=c1164866
- Public libraries (summary version only)
- Council City Direct offices at Brighton Town Hall and Hove Town Hall
- Brighton and Hove Town Halls and Portslade Neighbourhood Office

In addition to the statutory consultees a consultation letter has been issued to the following:

- All Local Schools and Universities
- Brighton and Hove PCT
- All Brighton and Hove Councillors and MP's
- The Cycle Forum
- NSCA
- Friends of the Earth, South East
- Sussex Air Quality Partnership

Local resident, business and community groups will be consulted via the following

- Local Strategic Partnership
- The Brighton and Hove Community and Voluntary Sector Forum
- Neighbourhood Renewal Area Forums.
- Business Forum and the Economic Partnership in Brighton and Hove

Paper copies and CD ROMs of the full or summary reports can be made available if the documents cannot be accessed via the council website.

7.4) Ongoing and future consultation

The council recognises that the formal adoption of the AQAP and LTP2 is not the end of the consultation process. As the implementation process begins it will continue to involve regional bodies, key stakeholders, and crucially the public. Furthermore, it is also recognised that as time progresses unforeseen events and circumstances may change, especially at the current rate at which Brighton & Hove is developing. Therefore, future consultation will again play an important part in how the council and AQAP/LTP2 react to these developments.

Consultation comments will be incorporated into the AQAP through annual progress reporting.

Consultation comments should be sent to:

Brighton and Hove City Council
Pollution Control Team (Environmental Health)
Bartholomew House
Bartholomew Sq.
Brighton
BN1 1JP

ehl.pollution@brighton-hove.gov.uk

Tel: 01273 294490

Fax: 01273 292196

Glossary of terms

ANPR	Automatic Number Plate Recognition
APR	Annual Progress Report
AQ	Air Quality
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQEG	Air Quality Expert Group
AQMS	Air Quality Monitoring Station
AQO	Air Quality Objectives
AURN	Automatic Urban and Rural Network
BHCC	Brighton and Hove City Council
BHEP	Brighton and Hove Economic Partnership
BRE	Building Research Establishment
BV	Bureau Veritas
CDT	Cycle Demonstration Town
CHP	Combined Heat and Power
CO_2	Carbon Dioxide
CEMP	Construction Environmental Management Plan
CFC	Chlorofluorocarbons
CO	Carbon monoxide
COMEAP	Committee on the Medical Effects of Air Pollutants
DA	Detailed Assessment
defra	Department for Environment Food and Rural Affairs
DMRB	Design Manuel for Roads and Bridges
DPD	Development Plan Document
DPF	Diesel Particulate Filters
DPE	Decimalised Parking Enforcement
DfT	Department for Transport
EC	European Community
ESCC	East Sussex County Council
EST	Energy Saving Trust
ERG-KCL	Environmental Research Group -Kings College London
EU	European Union
FR&A	Further Review and Assessment
HA	Highways Agency
HGV	Heavy Goods Vehicles
IPPC	Integrated Pollution Prevention and Control
ITS	Intelligent Transport Systems
IZS	Internal Zero Span
LA	Local Authority
LR2	Lewes Rd/London Rd Urban Development
LDF	Local Development Framework
LAQM	Local Air Quality Management
LAPPC	Local Air Pollution Prevention and Control
LEZ	Low Emission Zone
LCP	Large Combustion Plants Directive
LPA	Local Planning Authority
LPG	Liquid Petroleum Gas
LTP (2)	Local Transport Plan (second)
MRF	Materials Recovery Facility
mg/m^3	Milligrams of the pollutant per cubic metre of air
NAQS	National Air Quality Strategy
NECD	National Emissions Ceiling Directives

O_3	Ozone
QA/QC	Quality Assurance/Quality Control
µg/m³	Micrograms of the pollutant per cubic metre of air
ppb	Parts per billion
PAN	Planning Advice Note
PATC	Permanent Automatic Traffic Count
PPC	Pollution Prevention and Control
ppm	Parts per million
PPS 23	Planning Policy Statement 23
NAQS	National Air Quality Strategy
NETCEN	National Environmental Technology Centre
NSCA	National Society for Clean Air
NO	Nitric Oxide
NO_x	Oxides of Nitrogen
NO_2	Nitrogen dioxide
P2W	Powered Two Wheelers
PAH	Polycyclic Aromatic Hydrocarbons
PCT	Primary Care Trust
PM_{10}	Particles with diameter less than 10µm
$PM_{2.5}$	Particles with diameter less than 2.5µm
QA/QC	Quality Assurance / Quality Control
R & A	Review and Assessment
RBMP	Regular Base Monitoring Program
RET	Roadside Emissions Testing
RIBA	Royal Institute of British Architects
RSEP	Road Safety Engineering Plan
RPS	Residents Parking Schemes
RTPI	Real Time Passenger Information
RTS	Rapid Transport System
SAQSG	Sussex Air Quality Steering Group
SCA	Smoke Control Area
SCOOT	Split Cycle Offset Optimisation Technique
SO_2	Sulphur dioxide
STC	Sustainable Transport Corridor
SPD	Supplementary Planning Document
SNCI	Site of Nature Conservation Impotence
STC	Sustainable Transport Corridor
STP	School Travel Plan
STS	School Travel Strategy
TATC	Temporary Automatic Traffic Counters
TOC	Train Operating Companies
UDP	Unitary Development Plan
USA	Updating & Screening Assessment
UTMC	Urban Traffic Management and Control
UWE	University of the West of England
VMS	Variable Message Signs
VOSA	Vehicle and Operator Services Agency
VOC	Volatile Organic Compounds
WASP	Workplace Analysis Scheme for Proficiency
ESCC	East Sussex County Council
WHO	World Health Organisation
WTS	Waste Transfer Station

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