Gravesham Borough Council

Local Air Quality Management – Action Plan

A226 One-way system Gravesend Air Quality Management Area,
B262/B261 Pelham Arms Junction Air Quality Management Area, and
A227/B261 Wrotham Road/Old Road West Junction Air Quality Management Area.

July 2006

CONTENTS

1 EXECUTIVE SUMMARY

This Air Quality Action Plan is the culmination of the second round of local air quality review and assessment for Gravesham Borough Council (GBC). The process of Local Air Quality Management (LAQM) review and assessment has been set down in Part IV of the Environment Act 1995, which forms part of the Government's response to European Directives on Air Quality to which the UK Air Quality Strategy responds.

The first round of review and assessment resulted in the declaration of two Air Quality Management Areas (AQMAs): the 'A2 Trunk Road AQMA' for nitrogen dioxide and PM_{10} largely due to road traffic emissions from the A2, and the 'Northfleet Industrial Area AQMA' for PM_{10} largely due to 'fugitive' (uncontrolled) emissions from industrial processes in and around the surrounding the area.

The results of the second round review and assessment showed exceedences of Air Quality Objectives in addition to those identified in the first round. Exceedences of the NO_2 annual mean Objective were predicted at relevant receptors along the:

- A226 One-way system in Gravesend,
- B262/B261 Pelham Arms Junction, and
- A227/B261 Wrotham Road/Old Road West Junction.

In compiling this Action Plan, Government guidance LAQM.PG (03) and guidance from the National Society for Clean Air has been referred to, alongside guidance provided by the Department for Environment, Food and Rural Affairs through its Air Quality Action Plan Help Desk.

The aim of this Action Plan is to identify how Gravesham Borough Council will use its existing powers and work together with other organisations in pursuit of the annual mean Air Quality Objective for nitrogen dioxide. Measures are proposed to improve air quality both within the three AQMAs and across the Borough as a whole.

Kent County Council is responsible for the management of the local road network and as such is responsible for any direct actions proposed for the AQMAs in order to reduce road traffic emissions. Gravesham Borough Council will work together with the local transport authority Kent County Council (KCC), to improve air quality within the AQMAs and throughout the Borough.

The direct measures proposed for the AQMAs are:

- Traffic rerouting using VMS
- HGV rerouting
- New road infrastructure (Rathmore Link Road)
- Traffic Management (UTMC and junction improvements)
- Pedestrianisation
- Improve emissions standards for Council Fleet and Public Service Vehicles
- Road prioritisation (Bus priority)
- Public transport improvements
- Car parking strategy

The general measures to improve air quality across the whole Borough are:

- GBC will implement the Council's Travel Plan measures and encourage uptake of sustainable modes of transport including the use of Kent Car Share Scheme
- GBC will continue to work together with KCC to encourage the uptake of Employer and School Travel Plans within the Borough.
- GBC will continue to work with KCC to improve the facilities for cycling and walking within Gravesham and encourage greater uptake.
- GBC Environmental and Public Health Services will continue to work closely with the Planning and Regeneration Services to ensure that air quality is taken into account in the planning process when located in or close to the AQMA or in areas marginally below air quality objectives.
- GBC will continue to work together with developers to improve sustainable transport links serving new developments.
- GBC will develop, through the Kent and Medway Air Quality Partnership (K&MAQP), supplementary planning guidance to assist with air quality assessments of development proposals
- GBC will develop a local air quality strategy to provide a framework for ensuring long-term commitment and support for air quality issues
- GBC will continue their commitment to local air quality monitoring within the Borough to ensure a high standard of data is achieved to assess against air quality objectives
- GBC will make details of the Action Plan measures and annual progress reports available on the Website to ensure broad access to the consultation and implementation process.
- GBC will continue to work together the Kent and Medway Air Quality Partnership on promotional activities to raise the profile of air quality in Gravesham
- GBC will continue to work together with the Kent Energy Centre to promote and implement energy efficiency measures in Gravesham
- GBC will encourage the planting of trees which benefit air quality within the Borough through the planning process, Gravesham's Open Space Strategy and Green Initiative Partnerships.
- GBC will provide advice and pursue an advocacy role to assist in minimising the effects of poor air quality in public buildings.
- GBC will ensure adequate enforcement of unlawful on-street parking in Gravesend Town Centre.

The proposed actions will help work towards the NO_2 annual mean objective. Further Assessment modelling of the direct measures (proposed within the 2nd LTP) to improve air quality in the AQMAs predicts significant improvements in air quality, but the air quality objective and EU Limit is not predicted to be met by 2010. It was not possible to assess the air quality impacts of all the measures to improve air quality within this Plan, through detailed modelling, so additional benefits beyond those assessed may be achieved. The impacts of direct measures (proposed within the 2nd LTP) will be further considered through future progress reports.

2 INTRODUCTION AND AIMS OF THE ACTION PLAN

2.1 Project Background

Gravesham Borough Council has drawn up, with the assistance of Bureau Veritas, a Local Air Quality Management Action Plan for the three Air Quality Management Areas within GBC identified through the second round of review and assessment of air quality. The Action Plan is required to be undertaken as part of the local authority's statutory duties as defined within Part IV of the Environment Act, 1995.

Bureau Veritas, formerly Casella Stanger, has undertaken previous review and assessment reports for GBC, which includes the Further Assessment (2005).

2.2 Legislative Background

Part IV of the Environment Act, 1995, places a statutory duty on local authorities to periodically review and assess the air quality within their area. This involves consideration of present and likely future air quality against air quality standards and objectives. Guidelines for the 'Review and Assessment' of local air quality were published in the 1997 National Air Quality Strategy (NAQS) [1] and associated guidance and technical guidance. In 2000, Government reviewed the NAQS and set down a revised Air Quality Strategy for England, Scotland, Wales and Northern Ireland[2] (AQS). This set down a revised framework for air quality standards and objectives for seven pollutants, which were subsequently set in Regulation in 2000 through the Air Quality Regulations 2000[3]. These were subsequently amended in 2002[4].

Where it appears that the air quality objectives will not be met by the designated target dates local authorities must declare an Air Quality Management Area (AQMA) and develop action plans in pursuit of the air quality objectives. Following the Further Assessment outcome, GBC are required to develop an Action Plan for the three AQMAs in the Borough.

Policy Guidance LAQM.PG(03) was published by the Government in 2003, which included guidance on the development of action plans. The NSCA have published guidance 'Air Quality Action Plans (2000)' and 'Air Quality: Planning for Action (2001)'. These guidance documents have been taken into account in development of this Action Plan for GBC, alongside guidance provided by the Department for Environment, Food and Rural Affairs through its Air Quality Action Plan Help Desk, which provides examples of best practice and an Action Plan appraisal checklist.

2.3 Scope of the Action Plan

The purpose of the Action Plan is to provide the means through which a local authority through joint working with the County Council and other relevant organisations can deliver viable measures that will work towards achieving the Air Quality Objectives within an AQMA. The aim is also to encourage active participation in the achievement of action plan measures by consulting the local community and raising awareness of air pollution issues.

[1] DoE (1997) The United Kingdom Nation Air Quality Strategy The Stationery Office
[2] DETR (2000) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland – Working together for Clean Air, The Stationery Office
[3] DETR (2000) The Air Quality Regulations 2000, The Stationery Office
[4] Defra (2002) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland: Addendum, The Stationery Office

Local authorities are required to prepare a written Action Plan for an AQMA, setting out the action plan measures they intend to take forward and the potential costs and benefits of these measures. The Further Assessment provides the technical backup for the measures to be included within the Action Plan. The Action Plan should refer to the findings of the Further Assessment in terms of source apportionment (i.e. where emissions are coming from) so that action plan measures are targeted appropriately.

The Action Plan should contain simple estimates of the costs and benefits and timescales for implementing the proposed action plan measures, so that measures can be prioritised for implementation and subsequently monitored. The Action Plan should also indicate how far the measures will work towards achieving the Objectives.

2.4 Reporting of Action Plan

The A226 One Way System Gravesend, B262/B261 Pelham Arms Junction and A227/B261 Wrotham Road/Old Road West Junction AQMAs have been declared due to road traffic emissions.

Kent County Council (KCC) is the relevant transport authority for roads on the local network and is working jointly with GBC on transport measures within the Borough. County Councils have a duty under section 86 (3) of the Environment Act 1995 to put forward proposed actions which they themselves can implement to work towards meeting the air quality objectives in AQMAs. KCC have included measures within the air quality section of the 2nd Local Transport Plan (LTP).

The Action Plan reflects the relevant organisational responsibilities for actions within the AQMAs and proposed measures (Section 7) are reported as:

- Direct actions proposed for the A226 One Way System Gravesend, B262/B261 Pelham Arms Junction and A227/B261 Wrotham Road/Old Road West Junction AQMAs (responsibility of KCC in partnership with GBC);
- Indirect actions Borough-wide to improve air quality throughout the Gravesham area, including the AQMAs (responsibility of GBC and KCC).

3 OVERVIEW OF AIR QUALITY IN GRAVESHAM

The main source of air pollution in the Borough is road traffic emissions from major roads, notably the A2 Trunk Road and a number of strategic urban roads through Gravesend town centre. In addition, 'fugitive' dust emissions from industrial processes in the Northfleet Industrial Area have been shown to be a problem in a localised area. Other pollution sources, including commercial and domestic sources, also make a contribution to background pollution concentrations.

A summary of GBC's second round of review and assessment of air quality, which commenced in 2003, is shown in table 1. The individual stages are summarised briefly with respect to outcome below:

- *Updating and Screening Assessment*

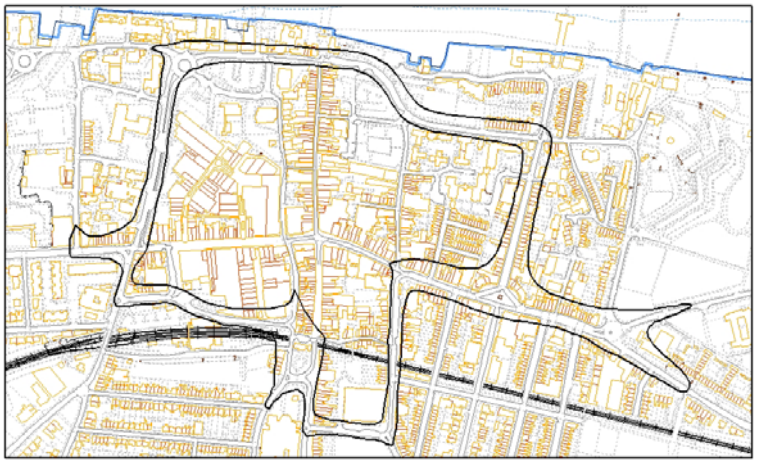
The Updating and Screening Assessment (2003) was the first phase of the second round review and assessment. Similar to Stage One of the previous round, there was consideration of the seven pollutants of concern to health and an assessment was made as to whether Air Quality Objectives for these pollutants would be met. Gravesham Borough Council completed this in July 2003, with the conclusion that a Detailed Assessment was required for NO_2 due to emissions from road traffic on the Gravesend Town Centre one-way system, four heavily trafficked junctions ((1) Wrotham Road/Old Road West (2) Parrock Road/Old Road East (3) Old Road West/Pelham Road (4) Perry Street/Vale Road) and the A226 through Northfleet. All other Air Quality Objectives are expected to be met.

- *Detailed Assessment*

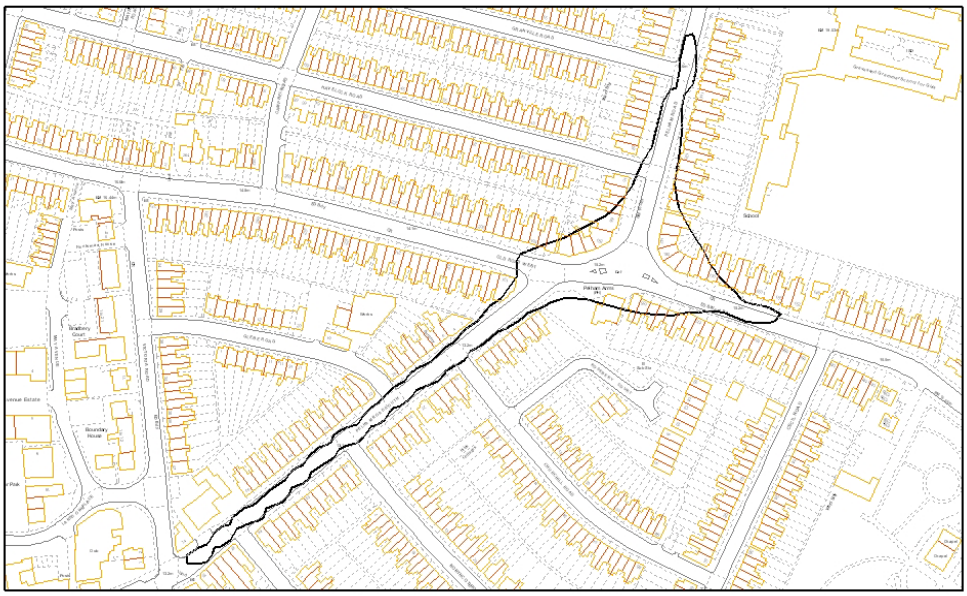
The Detailed Assessment (2004) and subsequent Addendum Report considered the nitrogen dioxide (NO_2) annual mean objective at the six locations identified in the Updating and Screening Assessment, through dispersion modelling using ADMS-Roads and additional monitoring undertaken at relevant receptor locations.

The results showed that there were predicted exceedences of the NO_2 annual mean Objective identified at the nearest receptors within three of the areas that underwent Detailed Assessment:

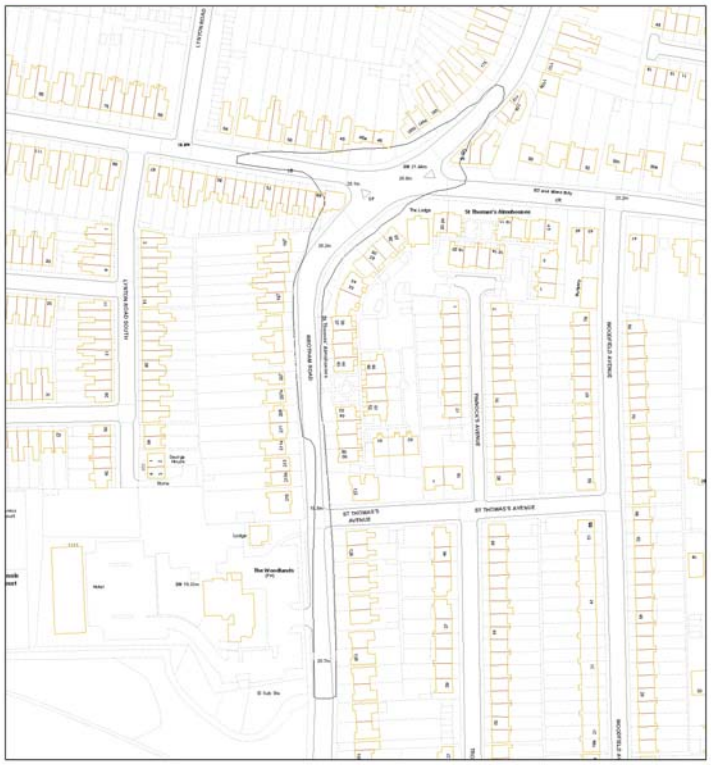
- A226 One-way system Gravesend



- B262/B261 Pelham Arms Junction



- A227/B261 Wrotham Road/Old Road West Junction



The detailed assessment concluded that Gravesham Borough Council should consider declaring Air Quality Management Areas (AQMAs) on the basis of the potential exceedences in the assessment areas as highlighted in the Detailed Assessment Report where exposure criteria are fulfilled. The Department for Environment, Food and Rural Affairs (DEFRA) accepted the Detailed Assessment conclusions.

GBC declared the three areas as AQMAs on 1st April 2005.

➢ *Further Assessment*

The results of the source apportionment work from the Further Assessment indicate that road traffic emissions are the main source of NO_X concentrations in the AQMAs. The HDV class vehicles are contributing disproportionately to NO_x concentrations in the AQMA areas; contributing approximately half of NO_X from road traffic but being a relatively small proportion (1.6 – 10.9%) of the vehicle fleet.

Source apportionment of NO_X concentrations at building façades within the AQMAs

Location/ AQMA	NO_X concentrations 2005	%	µg/m^3
Harmer Street A226 One way system Gravesend AQMA	Background	14.4	47.3
	Road traffic	85.6	281.4
	HDV contribution	45.5	149.5
	LDV contribution	40.1	131.9
B262/B261 Pelham Arms Junction AQMA	Background	28.4	47.3
	Road traffic	71.6	119.1
	HDV contribution	32.6	54.2
	LDV contribution	39.0	64.9
A227/B261 Wrotham Road/Old Road West Junction	Background	28.7	47.3
	Road traffic	71.3	117.7
	HDV contribution	35.4	58.4
	LDV contribution	35.9	59.3

The maximum predicted concentrations of NO_X/NO_2 at worst case receptors and required reduction in NO_X emissions for the 3 AQMAs are shown below.

o **A226 One-way system Gravesend AQMA**
The maximum NO_x reduction required within the A226 One-way system Gravesend AQMA at the façade in the Harmer Street [street canyon] (x=565067, y=174263) is 230.1µg/m^3 (equivalent to a 70% improvement in NO_X) in 2005 and NO_2 reduction is 27.7µg/m^3 (equivalent to a 41% improvement in NO_2). Consequently, the proposed action plan measures aim to reduce the levels of NO_x/NO_2 within the AQMA by this amount.

o **B262/B261 Pelham Arms Junction AQMA**
The maximum NO_x reduction required within the B262/B261 Pelham Arms Junction AQMA at the façade (x=563949, y=173362) is 67.8µg/m^3 (equivalent to a 41% improvement in NO_X) in 2005 and NO_2 reduction is 10.8µg/m^3 (equivalent to a 21% improvement in NO_2). Consequently, the proposed action plan measures aim to reduce the levels of NO_x/NO_2 within the AQMA by this amount.

o **A227/B261 Wrotham Road/Old Road West Junction AQMA**
The maximum NO_x reduction required within the A227/B261 Wrotham Road/Old Road West Junction AQMA at the façade (x=564530, y=173172) is 66.4µg/m^3 (equivalent to a 40% improvement in NO_X) in 2005 and NO_2 reduction is 10.6µg/m^3 (equivalent to a 21% improvement in NO_2). Consequently, the proposed action plan measures aim to reduce the levels of NO_x/NO_2 within the AQMA by this amount.

Scenario Testing

Five scenarios were modelled in the Further Assessment to provide information on the impact of action plan measures, through LTP proposals, which are expected to have a direct impact on the AQMAs. The scenarios have been run for the year 2010, when the LTP proposals will be completed.

A226 Town Centre One Way System AQMA

1) Demolition of West Street former railway bridge (85% HGV rerouting away from A226 town centre one way system AQMA)

2) Pedestrianisation of King Street (diversion of buses along Parrock Street)

3) Town Centre junction improvements

B262/B261 Pelham Arms Junction AQMA

4) Junction improvements (linked to UTMC)

A227/B261 Wrotham Road/Old Road West Junction AQMA

5) Junction improvements (linked to UTMC)

For scenarios 1) and 2), changes in traffic flows have been provided by Kent County Council. For scenarios 3), 4) and 5), the proposals are expected to improve flows across the junctions and reduce congestion and queuing of traffic. To model these scenarios, a prediction of potential improvements has been made by increasing the average speed of traffic in the approach to junctions (5kph).

At the worst case receptor in the A226 town centre one way system AQMA (Harmer Street [street canyon]), in 2010, the predicted NO_2 concentration is 58.5µg/m^3. With scenario 1, a significant reduction of 9.2 µg/m^{3}is predicted at this receptor, as substantial reductions in HGV movements are expected and HGV movements are a major contributor to NO_X emissions in the AQMA. With scenario 2, there is no impact on the worst case receptor, but improvements of up to 1.1µg/m^3 are expected along King Street and the upper part of Stone Street. Conversely, along Parrock Street near the junction with Lord Street, increased levels of NO_2 of up to 4.2µg/m^3 are predicted due to the additional bus movements. With scenario 3, the improvements to traffic flows through junction improvement are predicted to improve emissions by up to 1.1 µg/m^3 (Stone Street/Clive Road junction). At the worst case receptor (Harmer Street [street canyon]), scenario 3 is predicted to lead to a 0.7µg/m^3 improvement. The combined impact of scenarios on the worst case receptor is predicted to reduce NO_2 concentrations by 9.9 µg/m^3, which would give a NO_2 annual mean concentration of 48.6 µg/m^3 in 2010.

At the worst case receptor in the B262/B261 Pelham Arms Junction AQMA, in 2010, the predicted NO_2 concentration is 44.1µg/m^3. With scenario 4, the expected improvements in traffic flows is predicted through modelling to lead to an improvement of 0.8µg/m^3 which would give a NO_2 annual mean concentration of 43.3 µg/m^3 in 2010.

At the worst case receptor in the A227/B261 Wrotham Road/Old Road West Junction AQMA, in 2010, the predicted NO_2 concentration is 41.8µg/m^3. With scenario 4, the expected improvements in traffic flows are predicted through modelling to lead to an improvement of 0.4µg/m^3 which would give a NO_2 annual mean concentration of 41.4µg/m^3 in 2010.

Table 1: Summary of the second round review and assessment process for GBC

Source	Updating and Screening Assessment (2003)		Detailed Assessment (2004)	Further Assessment (2005)
Road Traffic	SO_2		Exceedence of the annual mean NO_2 Objective resulted in declaration of the A226 One Way System Gravesend, B262/B261 Pelham Arms Junction and A227/B261 Wrotham Road/Old Road West Junction AQMAs due to road traffic emissions.	Further assessment of NO_2 in AQMAs. Support for continuance of three AQMAs – Action Plan required.
	NO_2	➔		
	PM_{10}			
	Carbon monoxide			
	Benzene			
	1,3 Butadiene			
	Lead			

4 EXISTING POLICIES AND STRATEGIES TO IMPROVE AIR QUALITY

There are a number of related policies and strategies at the local and regional level that can be tied in directly with the aims of the Air Quality Action Plan, and will help contribute to overall improvements in air quality across the Borough.

4.1 Local Plan / Local Development Framework

The Planning and Compulsory Purchase Act 2004 has introduced a new national planning system which has seen Local Plans replaced by Local Development Frameworks (LDFs) which will comprise of a series of inter-related Local Development Documents (LDDs). The aim is for all local planning authorities to have Local Development Frameworks in place by 2007. The new proposals are intended to speed the plan-making process up by producing more focused, flexible, and slimmer plans. A Strategic Environmental Assessment/ Sustainability Appraisal needs to be undertaken alongside plan preparation and also a Statement of Community Involvement. This Statement will identify how the Council intends to consult on the plan, in particular engaging those groups that are traditionally hard to reach.

The new Act makes transitional arrangements for local planning authorities to transfer from local plans to LDFs. Current adopted local plan policies can be "saved", which means that they can still be used as the statutory basis for determining planning applications.

The Gravesham Local Plan First Review (November 1994) is the current adopted Local Plan but it does not include any policies on air quality. However, the Gravesham Local Plan Second Review (Deposit Version) includes the following policy, although it has limited weight because the Review was not completed in view of the introduction of the LDF system.

Air Quality

'Policy NE16 Development likely to results in emissions to air, by reason of its operational characteristics or the traffic generated by it, will require the submission of details to enable a full assessment of the impacts on air quality to be carried out. Such development will only be allowed if it does not have an unacceptable effect on health, amenity or the natural environment, taking into account the cumulative effects of other existing and proposed sources of air pollution in the vicinity. In making such an assessment, consideration will be given to whether or not the development would cause current national air quality standards to be exceeded.'

The above air quality policy has been adopted for development control purposes and will be a material consideration in the determination of planning applications. No objections were received at the first deposit stage of the Local Plan Review, only a request for clarification. However, four provisional policies have been drawn up to ensure air quality is appropriately considered in the evolving development planning process. These policies will be taken forward as part of the new Gravesham Local Development Framework. (GLDF)

Air Quality: Minimisation of Pollutants Development proposals will only be permitted where they are sited and designed to minimise the emission of air pollutants and the impact of air pollutants on the local environment.

Air Impact Assessments Development proposals that give rise to a potentially polluting activity, including the emission of dust, will only be permitted where they are accompanied by an assessment of the potential impact of the proposal on local air quality arising either from the operational characteristics of the development or the traffic generated by it.

Development in Air Quality Management Areas Development within an Air Quality Management Area will only be permitted if it can be demonstrated that the resulting long-term air quality situation will be satisfactory, and that short and medium term impacts can be minimised to an acceptable level.

Development sensitive to Air Pollution Development which would be sensitive to adverse levels of air pollution will not be supported where such conditions exist, or are in prospect, and where mitigation measures would not afford satisfactory protection.

The following policies are also included in the Gravesham Local Plan Second Review (Deposit Version) and their status is as explained above. They will also be taken forward as part of the new GLDF.

Energy Efficiency

'**Policy NE24** New build development will only be allowed where it will give optimal energy efficiency through site layout, orientation, form and design.'

Location of Development

'**Policy T1** In considering development proposals, the Local Planning and Highways Authorities will consider the impact of the generated travel demand on the transport system as a whole and on the environment. Contributions towards the improvement of public transport provision and highways will be required, depending on the scale, location and local circumstances of the proposal. Major development will be required to provide Travel Assessments, including a Parking Strategy and Green Travel Plan.

Policies T2 – T6 relate to the safeguarding of land for and encouragement of public transport improvements, including the Fastrack rapid transit network and the Gravesend Station Public Transport Interchange, and the Channel Tunnel Rail Link and Ebbsfleet International and Domestic Stations. With major development proposed in the Kent Thameside area, the improvement of public transport facilities and encouragement of uptake will be essential to minimise the impact on air quality.

Cycling

'**Policy T7** The Borough Council will encourage the use of cycles as a means of travel for short and medium distance trips and for recreation and, to this end, will seek to implement a network of cycle routes throughout the Borough. It will work with all relevant agencies and funding sources to achieve this, as part of the Green Grid. In particular, it will encourage the completion of National Cycle Route 1 and protect this route from any development which would prejudice it.'

Walking

'Policy T8 The Borough Council will encourage walking as a means of travel for short distance trips and recreation. It will encourage the maintenance and enhancement of the network particularly in the context of the development of the Green Grid.'

Freight
'Policy T14 The Borough Council will seek to encourage commercial traffic to use the most appropriate routes to reach the trunk road network. Any major new development which generates a significant volume of commercial traffic will require the production of a Traffic Impact Assessment on how it can be acceptably handled, given the other policies and proposals of this Local Plan Review. Transportation by rail and water will be encouraged.'

Construction Traffic
'**Policy T15** Developers of sites which will generate large volumes of construction traffic will be expected to produce Traffic Management Plans and to co-ordinate these with the relevant agencies and other developers who may be having an impact on the transport routes concerned. Use of rail and water transport will be encouraged where compatible with other policies.'

4.2 Gravesham Borough Council Local Agenda 21 (LA21) Strategy

LA21 originated from the Earth Summit in Rio de Janeiro in 1992. It incorporates the concept of sustainable development – meeting current needs without compromising the needs of future generations. The LA21 process enables communities to take an active role in conserving their local environment and improving their quality of life. GBC finalised its LA21 Strategy in May 2001 and this set out objectives and actions which can be tied in directly with the Air Quality Action Plan aim to improve local air quality.

These objectives include actions to:
- promote sustainable development of land within the Borough;
- ensure that energy efficiency of all housing within the Borough is improved;
- minimise the impact of all human activities undertaken within Gravesham on the environment;
- work towards a more efficient and integrated transport system;
- reduce traffic and congestion through its land use policies; and
- promote the movement of people by public transport, walking and cycling thereby improving air quality and health.

The LA21 Strategy objectives have largely been incorporated into the Kent Thameside Community Strategy and GBC Corporate Plan 2003 - 2007.

4.3 Kent Thameside Community Strategy (2003)

The Community Strategy (2003) has been drawn up for Kent Thameside, which includes the Boroughs of Gravesham and Dartford, by the Kent Thameside Local Strategic Partnership. The Strategic Partnership includes representatives from the Borough Councils, as well as a wide range of community organisations. The Environment is listed as a key issue within the Strategy and the Strategy promotes sustainable development and transport in the area. One of the objectives is to:

'act to address local air quality issues where necessary and traffic pollution in particular. This will include promotion of clean fuel technology, Green Travel Plans and influencing the patterns of development to help reduce the number of dwellings impacted by poor air quality. In addition, we will continue to work with firms to monitor and control industrial emissions'.

4.4 Gravesham Borough Council Corporate Plan (2003 – 2007)

The Corporate Plan outlines a four-year programme which includes challenging targets aimed at improving the quality of life in Gravesham. The Corporate Plan sets out how GBC will take forward the actions proposed in the Community Strategy for the local area. With regard to air quality, the Plan includes targets to ensure sustainable development of proposed major development sites, such as Ebbsfleet Valley, North East Gravesend and Lord Street/Parrock Road/Eden Place area, in addition to securing a dramatic improvement in public transport, notably through the Fastrack rapid transit network which will link the new developments to urban centres and transport interchanges.

4.5 Kent Environment Strategy (2003)

The Kent Environment Strategy was drawn up by Kent County Council in partnership with the District Authorities. The objectives of the Strategy relevant to air quality are shown below.

How will we get there?

What?	Why?	Who?	When?
Meeting National Air Quality Objectives			
Develop and implement strategies and action plans to work towards achieving the National Air Quality Objectives.	To reduce the risks on health and the environment from high levels of pollution.	DCs & MC assisted by KMAQP	Prepare, implement and revise AQMA Action Plans from 2002; designation of further AQMAs as necessary
Reducing the impact on environmental health			
Establish and disseminate information about Nitrogen Dioxide (NO_2), Sulphur Dioxide (SO_2), Carbon Monoxide (CO), Particulates (PM_{10} and PM_{25}) and Ozone (O_3) levels.	To provide a better understanding of air pollution, determine trends, inform the future action required and raise the awareness of those susceptible to high levels of pollution.	Kent and Medway Air Quality Monitoring Network (DCs & MC)	• Monthly and annual monitoring reports • Daily bulletins via the internet (www.kentair.org.uk)
Planning new development appropriately			
Incorporate air quality policies in the Kent and Medway Structure Plan and District Council Local Plans informed by the Kent and Medway Air Quality Model's (KMAQM) predictions of the air quality impacts associated with cumulative effects of proposed new development.	To minimise the impact on air quality from future development across Kent, particularly in areas identified as having poor air quality.	KCC, DCs & MC	• KMSP - Draft on deposit 2003 • Local Plan Review – ongoing • Ongoing use of the KMAQM to inform planning application decisions
Raise awareness and encourage greater interaction amongst the relevant decision-makers including environmental health, transport and land use planning officers.	To ensure that the impact of development on air quality is appropriately assessed.	Kent and Medway Air Quality Partnership	Ongoing
Regulate industrial processes through Integrated Pollution Prevention Control (IPPC) and Local Air Pollution Control (LAPC) and raise environmental standards through the use of environmentally friendly technology.	To minimise the impact of current and proposed industrial processes and associated emissions such as volatile organic compounds.	EA, District Councils, DCs & MC	• Ongoing IPPC and LAPC regulation • Raised environmental standards as part of 4 year review of IPPC and LAPC authorisations • Ongoing through planning application decisions
Incorporate more sustainable forms of transport, incentives and traffic management measures into the Local Transport Plan (LTP).	To move towards methods of transport which cause less pollution and promote walking, cycling and public transport.	KCC in consultation with DCs & MC	Strengthen policies in Local Transport Plan by 2004
Tackling transboundary pollution			
Tackle transboundary pollutants (i.e. ozone and particles) at a regional level by sharing information and working together with neighbouring authorities in the UK and northern France.	To address pollution at a regional level as airborne pollution does not recognise local authority boundaries.	KCC on behalf of the KMAQP	Ongoing through transnational projects

In February 2005, Kent County Council launched the 2005 Kent Environment Strategy Progress Report (2005). Progress with actions relating to air quality is shown in Table 2.

4.6 Kent Local Transport Plan for Kent 2006-11

In 1998, the new Labour Government published a Transport White Paper "A New Deal for Transport" which outlined their commitment to a more integrated and sustainable transport system with greater emphasis on alternative forms of transport to the private car. The Government also introduced a system of Local Transport Plans (LTPs) which each highway authority had to prepare every five years which

would outline their aims to improve local transport and the funding they required to do this. In the second round of LTPs 2006-11, the Government outlined four shared priorities for local transport, one of which was air quality and required LTPs to consider improvements to the transport network which would reduce air pollution in all declared Air Quality Management Areas.

The Local Transport Plan for Kent 2006-11 which was submitted in March 2006, aims to "stabilise and, where possible, reverse the adverse effect of transport and its infrastructure on the natural and built environment and on local communities". Specifically, the LTP contains an air quality policy "to seek a reduction in traffic polllution on the local road network". A target to reduce air pollution has also been set in the LTP to "reduce the annual average level of NO2 emissions at Kent's AQMAs to 40ug/m3 by 2010/11."

Relevant proposed schemes likely to have both a direct and indirect impact on local air quality within the AQMAs are incorporated within this LTP and form the foundation for this Action Plan.

Table 2 Kent Environment Strategy Progress Report 2005 –Air Quality

What we said we would do	What has happened?	What next?
Develop and implement strategies and action plans to work towards achieving National Air Quality Objectives -implement and revise Air Quality Management Area (AQMA) Actions Plans and designate further AQMAs as necessary	•Detailed Assessments completed for Ashford, Dartford, Dover, Gravesham, Maidstone, Tonbridge and Malling and Tunbridge Wells, identifying potential AQMAs •Action Plans prepared by Medway, Dartford, Dover, Gravesham, Sevenoaks and Tonbridge and Malling •Some Air Quality Management Plans stalled or not yet adopted by local authorities –no implementation of actual measures	•Quantify results of modelling undertaken in Detailed Assessments -areas predicted to exceed National Air Quality Objectives will be formally designated as AQMAs •Action Plans to be (i)implemented (ii)produced where further AQMAs designated(iii)incorporated in Local Transport Plans •Thanet and Canterbury to proceed to Detailed Assessment for NO_2 and PM_{10} •Develop awareness raising campaigns to change behaviour, especially in problem areas
Establish and disseminate information about levels of Nitrogen Dioxide (NO_2), Sulphur Dioxide (SO_2),Carbon Monoxide (CO) Particulates (PM_{10} and PM25) and Ozone (O_3)	•Continuous monitoring network exists in the County and a number of new sites have been brought on-line to assist with Local Air Quality Management •New sites located in Swale	•Continue monitoring, including annual reports •Relaunch Kent Monitoring Network website in 2005 to improve user-friendliness •Address further monitoring requirements identified in Ashford (M20 and Canterbury Road)and Tunbridge Wells
Incorporate air quality policies in Kent and Medway Structure Plan (KMSP) and local plans informed by Kent and Medway Air Quality Model (KMAQM) predictions of cumulative impacts of proposed new development	•KMSP includes policies to improve air quality and reduce pollution •Some local plans have incorporated air quality policies •KMAQM used to assess impact of major developments (e.g.Cliffe Airport)	•Emerging LDFs to take on board changes in National Air Quality policy •Apply policies in ongoing consideration of planning applications •Update KMAQM in 2005 to allow modelling at regional and local level •Produce Supplementary Planning Guidance for developments
Raise awareness and encourage greater interaction among decision-makers on environment, health, transport and land use	•County wide air quality seminar held in 2003/•Local Air Quality Management action has raised awareness	•Hold air quality seminar April 2005 •Re-launch website •Increase involvement of planners and health sector in KMAQP
Regulate industrial processes through Integrated Pollution Prevention Control (IPPC) and Local Air Pollution Control (LAPC)and raise environmental standards through the use of environmentally friendly technology	•EA and district councils regulate industrial processes – new system of regulation introduced in past 2 years •KCC and district councils assessing planning proposals on a case by case basis	•Ongoing •Run KMAQN where appropriate to assess cumulative impacts
Incorporate more sustainable forms of transport, incentives and traffic management measures into the LTP 2006-11	•LTP reviews and Strategic Environmental Assessment underway	•Submit Draft LTPs July 2005 – Strategic Environmental Assessments will test sustainability
Tackle transboundary pollutants (i.e. ozone and particles)at regional level by sharing information and working together with neighbouring authorities in the UK and northern France	•Work underway to understand composition of dust particles and their cross-Channel Movement	•Complete project June 2006 – concluding with conference •Conduct further work on ozone with a bid being progressed with Sussex Air Quality Steering Group

4.7 Draft Kent and Medway Structure Plan

The Deposit Draft Kent and Medway Structure Plan was published in September 2003 and is due to be adopted in May 2006, following consultation. The adopted Plan will take on board consultation comments, the Examination in Public and the Inspector's Report. The Structure Plan policies will provide the foundation for the Gravesham Local Development Framework, together with the emerging South East Plan. This will replace the Structure Plan when adopted.

There are three policies relating to air quality in the Deposit Draft Structure Plan.

Policy NR4: Pollution Impacts
The quality of Kent's environment will be conserved and enhanced. This will include the visual, ecological, geological, historic and water environments, air quality, noise and levels of tranquility and light intrusion. Development should be planned and designed to avoid, or adequately mitigate, pollution impacts. Proposals likely to have adverse implications for pollution should be the subject of a pollution impact assessment. In assessing proposals local authorities will take into account:
a) Impact on prevailing background pollution levels; and
b) The cumulative impacts of proposals on pollution levels; and
c) The ability to mitigate adverse pollution impacts; and
d) The extent and potential extremes of any impacts on air quality, water resources, biodiversity and human health.
Development which would result in, or significantly contribute to, unacceptable levels of pollution, will not be permitted.

Policy NR5: Development Sensitive to Pollution
Development which would be sensitive to adverse levels of noise, air, light and other pollution, will not be supported where such conditions exist, or are in prospect, and where mitigation measures would not afford satisfactory protection.

Policy NR6: Air Quality Management Areas
The local authorities are required to:

a) review and assess air quality and, where necessary, declare Air Quality Management Areas;
b) work towards improving air quality in Air Quality Management Areas through preparation of an Air Quality Action Plan

The scale and character of development in, or adjoining such areas, should be controlled so as not to adversely affect this improvement.

5 FINANCING

Direct measures proposed for the three AQMA are the responsibility of Kent County Council (KCC), and will be required to be assessed in more detail for their cost-effectiveness through feasibility studies. These will largely be funded through LTP bids.

Indirect general measures to improve air quality in the area will be funded by GBC, such as air quality monitoring and promotional activities, or by KCC through the Kent LTP. The LTP has allocated funding to a number of schemes in the Borough of Gravesham that tie in with Action Plan measures to improve air quality in the area.

LTP1 2001/2 - 2005/6 Funding Allocations:

- £50,000/a 'Support for Travel Plans' in Kent Thameside;
- £40,000/a for 'Safer Routes to School – Gravesend Challenge'; and,
- Gravesend Station Passenger Transport Interchange and *Fastrack* high quality public transport system (~£15 million for Phase 1).

LTP2 2006/7 – 2010/11 Funding allocations (proposed):

- £10,000/a 'Support for Travel Plans' in Kent Thameside;
- £50,000/a for Safer Routes to School
- £10,000 in 2006/07 for Bus Net, improved bus information
- £50,000 available per annum after 2006/07, for Bus Net, improved bus information
- £650,000 for Gravesend Station Quarter, integrated transport interchange with associated link road and junction improvements
- £250,000 for pedestrianisation of King Street and bus improvements to Parrock Street
- £100,000 for West Street Bridge demolition works, which will allow HGV rerouting
- £200,000 for signalisation (linked to UTMC) of Pelham Arms Junction
- £300,000 for signalisation (linked to UTMC) of Echo Square Junction
- £100,000 KCC contribution via LTP for Lion Roundabout Junction improvements
- £100,000 for VMS (linked to UTMC) for traffic information east and west of Gravesend
- £100,000 for lorry route signage
- £65,000 plus a contribution of £65,000 from GBC for VMS for parking facilities in Gravesend
- £575,000 KCC contribution via LTP for Lion Roundabout Junction Improvements

Annual funding for Quality Partnerships, Safer Routes to School, Railfreight Strategy, Cycle Strategy and Walking Strategy has been made available through LTP bids. GBC will work together with KCC to review current bids for the area in the light of the findings of the review and assessment of air quality. Additional bids will be made as necessary to secure further improvements in air quality.

6 CONSULTATION

Under Schedule 11 of the Act, Local Authorities are required to consult on their draft LAQM Action Plan. It is important for the success of the Action Plan to have involvement by all local stakeholders including local residents, community groups and local businesses in the drawing up the Action Plan in addition to their active participation in achieving the action plan measures. The Action Plan has been drawn up having due regard to comments from relevant environmental health and transport representatives from GBC and KCC.

The draft Action Plan was sent to the following statutory and non-statutory consultees:

- The Secretary of State
- The Highways Agency
- The Environment Agency
- Kent County Council
- GBC Planning and Regeneration Services
- Primary Care Trusts
- GBC Air Quality Working Group
- GBC Councillors and Officers
- Neighbouring local authorities
- Local residents within the AQMAs
- Relevant local businesses, community groups and forums
- Other relevant local stakeholders

All comments from both Statutory and non-statutory consultees received on the draft Action Plan were considered and incorporated where appropriate into the current Action Plan**.** The time period of the consulation was 9 weeks.

7 DIRECT AND INDIRECT MEASURES

The two sections below outline the direct measures for the three second round AQMAs and indirect measures to improve air quality throughout the Borough.

Direct measures to reduce NO_2 concentrations within the AQMAs concentrate on the dominant sources of emissions – road traffic. Direct measures incorporate the following themes:

- Theme 1: Reduction of traffic flows within the AQMAs
- Theme 2: Reduction of pollutant emissions within the AQMAs
- Theme 3: Encouragement of public transport uptake

Indirect measures target those general emissions within an area that aim to further reduce background levels of pollution above and beyond that likely to be achieved by existing national and international agreements. Indirect measures incorporate the following themes:

- Theme 1: Reduction of the need to travel by car
- Theme 2: Reduction of background concentrations

7.1 Direct Measures for the 'A226 One Way System Gravesend', 'B262/B261 Pelham Arms Junction', and 'A227/B261 Wrotham Road/Old Road West Junction' AQMAs

The following provides the outcome of discussions with GBC and KCC representatives with respect to a number of action plan measures that have been proposed to reduce NO_X/NO_2 emissions in the three AQMAs in pursuit of the NO_2 annual mean Air Quality Objective. The three AQMA are interrelated, as the B261 provides an alternative east-west route across the Borough diverting traffic from the A226 through the town centre. In addition, the majority of traffic is commuter-based through traffic and therefore proposed measures need to take these factors into account.

Theme 1: Reduction in traffic flows

- **Action 1: Traffic Rerouting using Variable Message Signage (VMS)**

The 2nd LTP includes proposals for VMS linked to the UTMC system to the east and west of Gravesend Town Centre at Lion Roundabout and STDR 4 Thames Road. This would provide information on the traffic situation in the town centre, thus allowing traffic to be rerouted at peak times of congestion. This will improve flows at peak times and reduce traffic emissions, leading to potential air quality benefits.

Objective	To divert traffic away from pollution hotspots (AQMA), particularly at peak hours. Reduce emissions of NO_X in AQMA.
Responsibility	KCC
Air Quality Impacts	Moderate –all AQMAs
Non Air Quality Impacts	Potential reduction in journey time; reduction in congestion.
Perception	Likely to be perceived as positive.
Cost-effectiveness & Feasibility	Cost – Low. High cost-effectiveness/feasibility.

- **Action 2: HGV Rerouting**

The 2nd LTP includes proposals for rerouting HGV traffic through two schemes:

1) Coloured lorry routes to direct HGV by most appropriate route to industrial parks
2) Demolition of West Street former railway bridge which is currently a constraint to HGV traffic flows and would allow significant numbers of HGVs to be rerouted away from the town centre to the west via Thamesway

HGV traffic contributes disproportionately to NO_X emissions in the vehicle fleet for the low %HGV present. As such, removing high polluting vehicles away from Gravesend Town Centre would be expected to have a significant impact on NO_X concentrations.

Objective	To divert high polluting vehicles (HGV) away from pollution hotspots (AQMA). Reduce emissions of NO_X in AQMA.
Responsibility	KCC
Air Quality Impacts	Moderate/high –all AQMAs. Further assessment impact assessment of proposed demolition of West Street former railway bridge predicts a reduction in NO2 annual mean concentration of 9.2µg/m^3 at the worst case receptor location in Harmer Street (street canyon).

Non Air Quality Impacts	Potential reduction in noise.
Perception	Likely to be perceived as positive.
Cost-effectiveness & Feasibility	Cost – Low. High cost-effectiveness/feasibility.

- **Action 3: New Road Infrastructure**

The 2nd LTP includes proposals for a new two-way link road - Rathmore Road - which will divert traffic from Clive Road, currently one-way, and ease congestion south of the railway station. This forms part of Gravesham Transport Quarter project and is part of the phased approach to remodelling Gravesend Town Centre. Traffic flows will be removed from Clive Road, with bus priority added to form a dedicated bus corridor. The scheme is linked to the train station improvements.

Objective	To improve links to integrated public transport interchange, and allow greater priority to bus services to enhance public transport uptake
Responsibility	KCC
Air Quality Impacts	Low overall/ High locally.
Non Air Quality Impacts	Potential reduction in journey time, through reduced congestion and increased public transport uptake.
Perception	Likely to be perceived as positive.
Cost-effectiveness & Feasibility	Cost – Medium. Cost-effectiveness and feasibility to be investigated through traffic modelling.

Theme 2: Reduction in pollutant emissions

- **Action 4: Traffic Management – UTCM and Junction Improvements**

There are a number of proposals in the 2nd LTP which have the potential to improve local air quality through improvements to signalisation (linked to UTMC) and junctions improvements.

1) One Way System (AQMA) junction improvements:
The 2nd LTP includes proposals for Gravesend Town Centre junction improvements to the One Way System (including Harmer Street, West Street, Bath Street, Lord Street, and Windmill Street). This scheme forms part of the phased approach to remodelling Gravesend Town Centre and would have a direct impact on the 'A226 One Way System Gravesend' AQMA notably on streets such as Harmer Street, where stop, start driving is a major cause of elevated NO_2 concentrations.

2) Lion Roundabout junction improvements
The 2nd LTP includes proposals for remodelling the Lion Roundabout. The proposals would results in improved access for pedestrians and changes in HGV access, in addition to reductions in congestion. VMS will be located at this junction (linked to UTMC) to direct traffic away from congestion hotspots.

3) Signalisation Pelham Arms Junction (AQMA)
The 2nd LTP includes proposals for signalising the existing priority junction (removing the mini-roundabout). The signals would be linked into the UMTC system to allow management of traffic flows across the junction and through adjacent junctions on Old Road. This would have a direct impact on the 'B262/B261 Pelham Arms Junction' AQMA

4) Signalisation of Echo Square Junction

The 2nd LTP includes proposals for signalising the existing roundabout – to be compatible with UTMC. This junction has been identified as a marginal air quality area, which falls just below the annual mean NO_2 Objective. These improvements aimed at improving flows through the junction, could therefore reduce NO_X emissions from traffic and help maintain levels below the Objective.

5) Signalisation of Old Road East and Valley Drive Junction

The 2nd LTP includes proposals for signalising the existing junction to reduce congestion. This junction will be used to Fastrack feeder bus services and would include bus priority measures. Improving the attractiveness of this junction would have benefits for other junctions, such as Echo Square, by providing an alternative to the town centre route.

Objective	To smooth traffic flow through improvements to junctions in order to reduce emissions from stop, start driving. Should tackle congestion hotspots.
Responsibility	KCC
Air Quality Impacts	Moderate – all AQMA. Air quality improvements will largely be localised, where NO_X emissions are due to low speeds and congestion. Further Assessment impact assessment predicts reductions of up to 1.1µg/m^3 in the A226 town centre one-way system AQMA; 0.8µg/m^3 in the Pelham Arms Junction AQMA; and 0.4µg/m^3 in the Wrotham Road/Old Street West Junction AQMA.
Non Air Quality Impacts	Improvements in journey times; potential for public transport improvements
Perception	Likely to be perceived as positive
Cost-effectiveness & Feasibility	Medium Cost.

- **Action 5: Pedestrianisation**

The 2nd LTP includes pedestrian proposals for King Street, which currently has a bus priority route. Buses will be diverted via Parrock Street. There are also proposals to improve pedestrian access to Clive Road (following installation Rathmore Road link road).

Objective	To alleviate congestion completely along specific streets. May be part of a wider environmental improvement scheme.
Responsibility	KCC
Air Quality Impacts	High locally within pedestrianised areas. Low in AQMAs. Further Assessment impact assessment predict localised reductions of up to 1.1µg/m^3 in the A226 town centre one-way system AQMA (King Street and upper part of Stone Street), but there are additionally increases in NO_2 due to diversion of buses along Parrock Street.
Non Air Quality Impacts	Potential for reduction in noise levels
Perception	Likely to be perceived as positive
Cost-effectiveness & Feasibility	Medium cost.

➢ **Action 6: Emissions Standards for Council Fleet and Public Service Vehicles**

This measure would lead to reductions in emissions of NO_X by improving emissions standards of vehicles in the public service sectors. Bus Quality Partnerships are already established in Kent, in Canterbury and Thanet Districts. The potential to explore improvements in emissions standards in Kent Thameside is high, notably through the proposed Fastrack public transport system. Emissions from taxis are already checked 6 monthly as part of the requirements of licensing. Further consideration could be given to setting minimum emissions standards for taxis through the licensing system.

The scope for improvements in the Council fleet and for contractor vehicles is being investigated through the Council Travel Plan. The Government is keen for local authorities to demonstrate their commitment to delivering cleaner air by leading by example and therefore the implementation of the Council Travel Plan is a key measure to take forward in the Plan.

Objective	Reduce NO_X emissions within the AQMA, through improvement in emissions standards of Council vehicles, buses and taxis. To be achieved through promotion of Energy Saving Trust (EST) grants, Quality Partnerships, contract review and licensing
Responsibility	GBC/KCC/Transport operators
Air Quality Impacts	Low – Moderate.
Non Air Quality Impacts	Socio-economic implications of increased costs to transport operators, contractors and GBC.
Perception	Likely to be viewed as positive by majority of local stakeholders.
Cost-effectiveness & Feasibility	Cost-effectiveness & Feasibility to be investigated.

<u>Theme 3: Encouragement of Public Transport Uptake</u>

➢ **Action 7: Road Prioritisation (Bus priority)**

The 2nd LTP includes proposals for improving bus priority in relation to the one way system – Parrock Street, Lord Street, Windmill Street, and Clive Road – as part of the phased approach to remodelling Gravesend Town Centre. Parts of the town centre one way system do not have the capacity to allow additional lanes and as such the priority routes are likely to be incomplete and therefore limited in their effectiveness.

Objective	Speed up public transport by prioritised lanes and signalisation. Improve bus service quality and reliability. Improve public transport uptake.
Responsibility	KCC
Air Quality Impacts	Low. Moderate if combined with improvements in emissions standards.
Non Air Quality Impacts	Potential reductions in journey time for public transport users.
Perception	Likely to be perceived as positive as part of overall scheme of Gravesend Town Centre improvements.
Cost-effectiveness & Feasibility	Cost- Low.

➢ Action 8: Public Transport Service Improvements

The 2nd LTP includes proposals for the Fastrack priority bus network and improvements to Gravesend Train Station. The development of the Fastrack network with road prioritisation will help to increase public transport patronage. Work by KCC, GBC & Arriva has already begun to improve feeder bus services and increase patronage. The first stage of construction of Fastrack started in 2004/05 with progress ahead of schedule. New infrastructure (improved bus stops) and vehicles are in place for improved local services in Gravesham.

Objective	Improve public transport uptake. Reduce car use and congestion.
Responsibility	KCC/Public transport operators
Air Quality Impacts	Low to Moderate; dependant on scheme.
Non Air Quality Impacts	Potential reduction in noise; reduced congestion; safer roads
Perception	Likely to be perceived as positive.
Cost-effectiveness & Feasibility	Cost- High.

➢ Action 9: Car Parking Strategy (Including Park & Ride Schemes)

The potential for Park and Ride schemes for Gravesham will be explored as part of the Car Parking Strategy for Gravesend which is due to be jointly undertaken by KCC and GBC within the next 18 months. A number of options are under consideration, which includes Park and Ride, Commuter Coach Park & Ride and Controlled Parking Zones. All which have the potential to bring about air quality benefits. Park & Ride Schemes may not be feasible for Gravesend, due to the large proportion of through traffic through the town centre. Schemes such as Commuter Coach Park & Ride may therefore be more cost-effective.

In addition to the longer-term air quality benefits through the developing Car Parking Strategy, in the short-term Gravesham Borough Council will ensure adequate enforcement of illegal on-street parking in Gravesend Town Centre to help relieve congestion problems.

Objective	Improve public transport uptake. Reduce car use and congestion.
Responsibility	GBC
Air Quality Impacts	Low to Moderate; dependant on levels of traffic reduction.
Non Air Quality Impacts	Potential reduction in noise; reduced congestion; safer roads
Perception	Likely to be positive for Park & Ride schemes; less positive for parking restrictions.
Cost-effectiveness & Feasibility	Cost-effectiveness and feasibility to be investigated through the development of the Strategy in the next 12-18 months.

Direct Measures considered for inclusion in the draft Action Plan but dismissed on the grounds of cost-effectiveness and feasibility

- **Low Emission Zone (LEZ) or Clear Zone**

A Low Emission Zone (LEZ) is a geographic zone defined for an area where vehicles of an acceptable emissions standard (normally Euro III) can enter and move around. The concept is held widely as a way of achieving air quality objectives within large urban area where economies of scale can be achieved with respect to set-up and operating costs. Further consideration to the implementation of an LEZ within Gravesend is dismissed on the grounds of cost alone.

A Clear Zone is a defined urban area, usually a City, which exploits new technologies and operational approaches to improve quality of life and support economic growth, whilst minimising the adverse impacts of its transport systems. The implementation of a Clear Zone within Gravesend is dismissed on the grounds of cost-effectiveness.

- **Road User Charging or Workplace Parking Levy**

The Transport Act 2000 gave local authorities powers to introduce road user charging or workplace parking levy schemes. The revenue generated from such schemes would be used to improve local transport in the area.

The costs of introducing a road charging scheme can be offset by the revenue that is generated. Area wide charging is likely to be more costly than a designated route. The feasibility of area wide schemes is being considered in the regional Multi-modal Studies and it is unlikely that they will be introduced in the short term to achieve the air quality objective. Local schemes within Gravesend are likely to be controversial and unpopular with voters and have therefore been dismissed on the ground of feasibility.

Based on charging workers for parking at their place of work, the implementation of a workplace parking levy could reduce the number of private vehicles entering Gravesend. The traffic entering the Gravesend AQMAs is largely related to commuter through traffic and as such a work place parking levy would penalise businesses within Gravesend without tackling the main air quality issues. In addition, the proposal is likely to be controversial and unpopular with voters and has therefore been dismissed on the ground of feasibility.

- **Roadside Emissions Testing**

Under new powers of authority (Roadside Vehicle Emissions (Fixed Penalty) Regulations 2002 local authorities are able to undertake roadside emissions testing of vehicles. The aim is to identify those vehicles that make a disproportionate contribution to emissions through poor maintenance with on-the-spot fines for those that fail. The scheme of a formal roadside emissions testing programme is not considered viable for stand-alone authorities and has therefore been dismissed as a possibility for inclusion in the current action plan. The use of voluntary vehicle emissions testing as a promotional tool is being explored through the Kent and Medway Air Quality Partnership.

- **Idling Engine Emissions**

The Road Traffic (Vehicle Emissions)(Fixed Penalty) (England) Regulations 2002 permit all English local authorities to take action against drivers who leave their vehicle engines running unnecessarily when parked. The local authority can issue a

fixed penalty (£20) to any driver blatantly running their engine unnecessarily and who refuses all reasonable requests to switch off.

Tackling congestion and the volume of traffic passing through the town centre will be the main deliverer of air quality improvements in Gravesend. Idling emissions from parked vehicles are not considered a significant issue to warrant introducing specific measures with necessary resource implications. The proposal has therefore been dismissed on the ground of cost-effectiveness.

A Summary of the direct measures for the three AQMAs is shown in Table 5.

The ranking of options has been based on professional judgement through the assessment of a number of considerations; including the costs and benefits of all the options, feasibility and acceptability, and whether they will achieve the Air Quality Objective. It is likely that the NO_2 annual mean Objective will only be achieved through a combination of measures.

At this stage the impact assessment is qualitative. Quantitative air quality impact assessment of the principal 2nd LTP measures will be undertaken when relevant information on the detailed schemes becomes available.

The costs are provided as:

- **'Low' (up to £1 million);**
- **'Moderate' (between £1 million – £5 million); and,**
- **'High' (greater than £5 million).**

The benefits are provided as:

- **'Low' (<0.2µg/m^3);**
- **'Moderate' (between 0.2 – 1 µg/m^3); and,**
- **'High' (greater that 1 µg/m^3).**

7.2 General Borough-wide Measures to Improve Air Quality

These are general measures that can be implemented by GBC, or which GBC can feed into, aimed at improving the air quality throughout the Borough. They will reduce background pollution concentrations and indirectly will work towards achieving the Air Quality Objectives within the AQMAs.

Theme 1 Reduction of the need to travel by car

1. Transport measures

- **Sustainable Travel Plans**

A Travel Plan is a general term for a package of measures tailored to the needs of an organisation to introduce greener, cleaner and sustainable travel choices and reduce the reliance on the car. It involves the development of a set of mechanisms, initiatives and targets that together can enable an organisation to reduce the impact of travel and transport on the environment. This will include the consideration of alternative fuels.

School Travel Plans – The 2nd LTP Objective is for all schools in Kent to have a school travel plan and increase the number of children walking and cycling to school by 2010. Annual funding allocations are made to support the 'Safer routes to school' schemes and support School Travel Plans. A School Travel Plan Advisor has been appointed for West Kent to support schools with implementation of their Travel Plans.

Employer Travel Plans – The 2nd LTP Objective is to approach all major employers in Kent with more than 200 personnel and offer assistance to establish Green Travel Plans and assist in the implementation of 10 Green Travel Plan's per year.

Council Travel Plan - GBC have developed a Council Travel Plan to help manage and reduce the Council's impact on the environment and improve travel choices for staff. A staff survey was undertaken in 2001, which was used to assess the modes of business travel and commuting and gauge support for potential travel plan options. The Travel Plan is being reviewed in 2006 by Planning and Regeneration Services and new targets will be set at this time. Options provided within the travel plan include:

- Car Sharing
  This has been implemented as an informal scheme within the Council, but will be extended through the KCC Kent Car Share Scheme, which GBC has signed up to.
- Interest Free Season Ticket Loans
  As an incentive to encourage staff to use public transport, season ticket loans are available.
- Pool Bikes
  For those staff requiring transport for business use, a number of pool bikes are available.
- Home working
  A home working policy has been developed by the Council to enable improved scope for home working for staff.

Measure 1: GBC will implement the Council's Green Travel Plan measures and encourage uptake of sustainable modes of transport

Measure 2: GBC will continue to work together with KCC to encourage the uptake of Employer and School Travel Plans within the Borough.

- **Cycle and Walking Strategies**

Regional strategies are in place to improve cycling and walking facilities throughout Kent and increase uptake.

GBC has developed a Cycling Strategy to encourage greater uptake of cycling in the Borough and improve cycle facilities and routes in the Borough. GBC is working with KCC on progress with cycle routes in the area, including the National Cycle Millennium Route No. 1. GBC is also working with KCC and the Groundwork Trust to develop the Green Grid within Gravesham for further enhancement of walking and cycling.

Progress during 2004/5 included enhancement of a cycle route along the A227 from New House Lane to the A2. There are proposed cycling schemes within the 2nd LTP which included new routes along the A227 between Meopham and Gravesend, as well as new walking and cycling routes along the A2 once work has been completed on the A2 realignment.

Measure 3: GBC will continue to work with KCC to improve the facilities for cycling and walking within Gravesham and encourage greater uptake.

2. Land Use Planning

Section 4 .1 summarises the main Gravesham Local Plan 2nd Review (2000) policies which will contribute to improvements in air quality. Policies have been incorporated to ensure developments with the potential to cause environmental impacts are adequately assessed and to refuse development proposals where there are unacceptable impacts. However, current policies do not refer specifically to Air Quality Management Areas or the impact of building sensitive development adjacent to pollution sources. As a material planning consideration, it is important that air quality is taken fully into account in planning decisions and it is therefore recommended that the four provisional air quality policies are included in the emerging Gravesham Local Development Framework.

Measure 4: GBC Environmental and Public Health Services will continue to work closely with the Planning and Regeneration Services to ensure that air quality is taken into account in the planning process when located in or close to the AQMA or in areas marginally below air quality objectives.

Land use planning has a key role in delivering sustainable transport systems within the area by influencing the location, scale, density, design and mix of development and encouraging alternative modes of travel. Local Plan Policy T1 requires major development to provide Travel Assessments, including a Parking Strategy and Green Travel Plan. GBC is working in partnership with Dartford Borough Council and Kent County Council on the Fastrack network which will serve proposed large-scale developments, such as the Springhead Quarter of the Ebbsfleet development.

Measure 5: GBC will continue to work together with developers to improve sustainable transport links serving new developments.

To provide support to local plan policies, the development of supplementary planning guidance for air quality assessments of developments and, in particular, for development which may impact on an AQMA is recommended in the Policy Guidance LAQM.PG(03).

Measure 6: GBC will develop, through the Kent & Medway Air Quality Partnership, supplementary planning guidance to assist with air quality assessments of development proposals

Theme 2 Reduction of background concentrations

3. Local Air Quality Management and Pollution Control

- **Air quality strategy**

The development of a local air quality strategy, to provide a framework for ensuring the longer-term commitment and support for air quality issues, is recommended in the Policy Guidance LAQM.PG(03).

The Strategy would incorporate a wider remit than the Action Plan, allowing related policy areas to be incorporated, such as climate change, in addition to consideration of non-transport and transboundary sources. Links can be made to other strategies and policy areas such as the Community Strategy and KCC Environment Strategy. The aim would be to ensure that air quality is considered across all GBC activities and to encourage others to adopt positive actions to improving local air quality.

Measure 7: GBC will develop a local air quality strategy to provide a framework for ensuring long-term commitment and support for air quality issues

- **Air quality monitoring**

The air quality monitoring network in GBC provides more accurate information and understanding of air quality within the Borough. Continuous monitoring stations are installed at two sites within the Borough to monitor NO_2 and PM_{10} concentrations so that modelled predictions can be verified and the progression of action plan measures can be monitored and assessed. This is supplemented by NO_2 passive diffusion tubes at 70+ sites throughout the Borough, a large number of which are within the AQMAs. GBC is also part of the Kent and Medway Air Quality Monitoring Network, which was set up in 1997 and provides information on a wide range of pollutants through the County.

Measure 8: GBC will continue their commitment to local air quality monitoring within the Borough to ensure a high standard of data is achieved to assess against air quality objectives

- **Promotion and Education**

It is important that information on air quality is provided in a clear and accessible way. The Council web site http://www.gravesham.gov.uk and the Kent and Medway Air Quality Partnership web site http://www.kentair.org.uk provide details on air quality within the Borough and summaries of LAQM Review and Assessment Reports are available for viewing.

Measure 9: GBC will make details of the Action Plan measures and annual progress reports available on the Website to ensure broad access to the consultation and implementation process.

GBC is a member of the Kent and Medway Air Quality Partnership, which was formed in 1992. The members of the Partnership are shown below.

The major aims and objectives of the Partnership are:

- To facilitate a co-ordinated approach throughout Kent and Medway to the Local Air Quality Management (LAQM) obligations placed on local authorities under the Environment Act 1995.

- To compile, update and maintain an Emissions Inventory of air pollution sources in and around Kent, to assist with the LAQM process.

- To comment on and influence the economic, planning and transport policies within the county so that air quality issues are properly considered and dealt with.

- To gain an understanding of the health implications associated with poor air quality and the extent to which air quality threatens the health of Kent and Medway's communities.

- To work with national agencies, neighbouring authorities and European partners to promote an awareness of air quality issues and to participate in joint initiatives to further the knowledge and understanding of air quality issues.

- Liaise with DEFRA and government bodies to assist with the implementation of the National Air Quality Strategy.

Measure 10: GBC will continue to work together the Kent and Medway Air Quality Partnership on promotional activities to raise the profile of air quality in Gravesham

- **Pollution Control**

Prescribed Industrial Processes are regulated by GBC and the Environment Agency under the Environmental Protection Act 1990 Part I A & B and subsequent Pollution Prevention and Control Regulations 2000. There are 28 prescribed B Processes in Gravesham regulated by GBC and three A1 Processes regulated by the Environment Agency.

With regard to nuisance emissions from unregulated processes, Statutory Nuisance is enforced by Environmental and Public Health Services under the Environmental Protection Act 1990 Part III and this controls smoke, dust, fumes or gas emissions from commercial and domestic premises which are causing a nuisance or are prejudicial to health. Bonfire leaflets have been produced and these are distributed when nuisance smoke problems arise.

- **Smoke Control Areas**

The majority of GBC urban area north of the A2 Trunk Road is within a Smoke Control Area and therefore emissions from domestic chimneys are controlled by requiring people to burn only smokeless fuel. This is enforced by GBC Environmental and Public Health Services under the Clean Air Act 1993. Northfleet Industrial Area does not currently fall within this area and therefore consideration should be made of designation of the whole urban area north of the A2 to ensure consistency in the approach to enforcement and reduce potential smoke emissions from domestic sources in the Northfleet Area.

- **Energy Management**

o **Commercial Energy Use**

GBC has a Green Housekeeping Policy, which includes measures to reduce energy consumption in all its buildings, in addition to LA21 Action Plan measures to determine a practical energy efficiency target for the Council. A number of measures to increase energy efficiency in Council buildings have been undertaken, including an ongoing programme to replace light fittings with more energy efficient fittings and the purchase of 'green electricity' renewable energy. Staff are encouraged to adopt energy efficient practices at work by ensuring lighting and appliances are not left on necessarily and the installation of movement sensors is being considered in parts of the building less utilised so that lighting will be automatically be switched off.

o **Domestic energy use**

GBC are working in partnership with the Kent Energy Centre to promote increased energy efficiency in residential properties in the Borough. An annual Home Energy Survey is sent to residents; with advisory leaflets on help available e.g. grant schemes. The energy savings can be calculated on a 12 monthly basis and includes the likely costs of improvement works to residents. GBC also have a planned maintenance programme for Council housing stock to increase energy efficiency.

The Kent Energy Centre is co-ordinating the implementation of the Kent Health & Affordable Warmth Strategy (2001) on behalf of all Kent local

authorities including GBC, which aims to tackle fuel poverty and promote energy efficiency measures. There is a Comprehensive Energy savings Programme which includes projects such as distribution of energy efficient light bulbs, as well as promoting uptake of grants for improving energy efficiency and insulation. GBC has also launched the Coldbusters Scheme (2002) targeting grant assistance at the most vulnerable sectors of the community likely to suffer fuel poverty. All these measures will lead to improvements in domestic energy efficiency throughout the Borough.

o **Building Control**

Building Control can contribute to the development of policies for air quality improvement through the promotion of emission-reducing technologies in new developments and buildings. The Council's Building Control Service (Part of the Community Services Directorate) has policies in place to improve energy efficiency in buildings, as described below.

The Building Control Service has a statutory responsibility to ensure that new building works within the Borough meet minimum technical standards in relation to health, safety, welfare and energy conservation, as prescribed under the Building Regulations 1991. The Legislation sets out substantive requirements and technical guidance to achieve minimum standards. This technical guidance is contained in Approved Documents giving general guidance as well as practical guidance about some of the ways of meeting the requirements of the Regulations. Approved Document L, "Conservation of Fuel and Power" requires reasonable provision to be made for the conservation of fuel and power in buildings by:

- limiting the heat loss through the fabric of the building;
- controlling the operation of the space heating and hot water systems;
- limiting the heat loss from hot water vessels and hot water service pipe work;
- limiting the heat loss from hot water pipes and hot air ducts used for space heating; and
- installing in buildings artificial lighting systems, which are designed and constructed, to use no more fuel and power than is reasonable in the circumstances and making reasonable provision for controlling such systems.

Revisions to this document were introduced in April 2002. The key changes are:

- much more stringent requirements with regard to the thermal insulation of all building elements;
- new requirements in respect of controls, boilers and lighting;
- a separation of requirements in respect of domestic and commercial buildings; and with effect from October 2002, the testing of structures for air leakage.

Planning services request Ecohomes rating in new houses being built and encourage energy efficient development.

Measure 11: GBC will continue to work together with the Kent Energy Centre to promote and implement energy efficiency measures in Gravesham

- **Planting of Trees Beneficial to Air Quality**

Tree planting in urban areas can enhance air quality by absorbing gases and screening particles from the atmosphere, thus reducing the concentrations of pollutants in the air. Careful consideration must be given to location, type of tree density and growth rate. Tree planting schemes are required in new developments and information on planting trees beneficial to air quality is provided to developers.

Measure 12: GBC will encourage the planting of trees which benefit air quality within the Borough through the planning process, Gravesham's Open Space Strategy and Green Initiative Partnerships.

- **Advice and Advocacy Role**

Measure 13: GBC will provide advice and pursue an advocacy role to assist in minimising the effects of poor air quality in public buildings.

- **Parking Enforcement**

Unlawful on-street parking in Gravesend exacerbates the traffic flow constraints and resulting air quality problems in the Town Centre by obstructing the highway and causing congestion. Gravesham Borough Council, through Building and Town Services, will tackle illegal on-street parking and help reduce congestion problems in the Town Centre.

Measure 14: GBC will ensure adequate enforcement of unlawful on-street parking in Gravesend Town Centre.

A summary of the proposed general Borough-wide measures to improve air quality is provided in Table 6.

Table 5 Summary of direct measures proposed for the AQMAs

Action	Description	Organisation responsible	Date to be achieved by	Cost	Air quality improvement in AQMAs	Other potential impacts	Rank (based on cost-effectiveness)
1	Traffic rerouting using VMS	KCC/GBC	31/04/10	Low	Moderate	Improvements in journey time	2
2	HGV rerouting	KCC	31/04/11	Low	Moderate - High (Further Assessment impact assessment predicts a 9.2µg/m^3 reduction in NO_2 at the worst case receptor in the Town Centre AQMA)	Reduction in noise	1
3	New road infrastructure (Rathmore Link Road)	KCC	31/04/11	Medium	Low	Improvements in journey time	8
4	Traffic Management (UTMC and junction improvements)	KCC	31/04/10	Medium	Moderate (Further Assessment impact assessment predicts reductions of up to 1.1µg/m^3 in the A226 town centre one-way system AQMA; 0.8µg/m^3 in the Pelham Arms Junction AQMA; and 0.4µg/m^3 in the Wrotham Road/Old Street West Junction AQMA).	Reduction in travel time Public transport improvements	3
5	Pedestrianisation of King Street	KCC/GBC	31/04/10	Medium	Low (High locally. Further Assessment impact assessment predict localised reductions of up to 1.1µg/m^3 in the A226 town centre one-way system AQMA in King Street)	Reduction in noise	9
6	Improve emissions standards for Council Fleet and Public Service Vehicles	GBC/ Transport operators	To be confirmed	Dependant on scheme progressed	Low-moderate	Socio-economic impacts of increased costs	=5
7	Road prioritisation (Bus priority)	KCC	31/04/07	Low	Low (moderate if combined with improvements in emissions standards)	Improvements in journey time for public transport users	4
8	Public transport improvements	KCC/ Public transport operators	Ongoing to 31/12/07 for Fastrack	High	Low -moderate	Reduction in noise and congestion; safer roads.	=5
9	Car parking strategy	GBC	Feasibility study by 31/12/06	Dependant on scheme progressed	Low-moderate	Reduction in noise and congestion; safer roads.	=5

The costs are provided as: 'Low' (up to £1 million); 'Moderate' (between £1 million – £5 million); and, 'High' (greater than £5 million).

The air quality improvements are provided as: 'Low' (<0.2µg/m^3); 'Moderate' (between 0.2 – 1 µg/m^3); and, 'High' (greater that 1 µg/m^3).

Table 6 Summary of Proposed General Borough-wide Measures to Improve Air Quality

Proposed measure	Description	Organisation responsible	Indicator	Date to be achieved by
1	GBC will implement the Council's Travel Plan measures and encourage uptake of sustainable modes of transport	GBC	% modal shift to car share/public transport/walking/cycling	Ongoing
2	GBC will continue to work together with KCC to encourage the uptake of Employer and School Travel Plans within the Borough.	GBC	No. of travel plans in place	Ongoing
3	GBC will continue to work with KCC to improve the facilities for cycling and walking within Gravesham and encourage greater uptake.	GBC	%modal shift to cycling/walking No. miles new cycle lanes/routes	Ongoing
4	GBC Environmental and Public Health Services will continue to work closely with the Planning and Regeneration Services to ensure that air quality is taken into account in the planning process when located in or close to the AQMA or in areas marginally below air quality objectives.	GBC	No. planning applications with air quality conditions/assessments	Ongoing
5	GBC will continue to work together with developers to improve sustainable transport links serving new developments.	GBC	No. planning applications where improvements secured	Ongoing
6	GBC will develop, through the Kent and Medway Air Quality Partnership (K&MAQP), a Supplementary Planning Document to assist with air quality assessments of development proposals	GBC/ K&MAQP	Completion of a Supplementary Planning Document	Ongoing
7	GBC will develop a local air quality strategy to provide a framework for ensuring long-term commitment and support for air quality issues	GBC	Completion of air quality strategy	December 2006
8	GBC will continue their commitment to local air quality monitoring within the Borough to ensure a high standard of data is achieved to assess against air quality objectives	GBC	No. monitoring sites % data capture	Ongoing
9	GBC will make details of the Action Plan measures and annual progress reports available on the Website to ensure broad access to the consultation and implementation process.	GBC	Availability of recently published reports on the Website	Ongoing
10	GBC will continue to work together the Kent and Medway Air Quality Partnership on promotional activities to raise the profile of air quality in Gravesham	GBC	No. promotional activities undertaken with the Partnership	Ongoing
11	GBC will continue to work together with the Kent Energy Centre to promote and implement energy efficiency measures in Gravesham	GBC	% improvement in energy efficiency SAP rating	Ongoing
12	GBC will encourage the planting of trees which benefit air quality within the Borough through the planning process, Gravesham's Open Space Strategy and Green Initiative Partnerships.	GBC/KCC/ Groundwork	No. trees planted	Ongoing
13	GBC will provide advice and pursue an advocacy role to assist in minimising the effects of poor air quality in public buildings.	GBC/KCC	No. utilising the service	Ongoing
14	GBC will ensure adequate enforcement of unlawful on-street parking in Gravesend Town Centre.	GBC	No. on street parking offences	Ongoing

8 IMPLEMENTATION AND MONITORING

GBC will work jointly on the action plan measures with the relevant partners including Kent County Council, transport operators, schools and local businesses. To secure the necessary air quality improvements there must be involvement by all local stakeholders and GBC will actively work to encourage community participation in the process.

The implementation and effectiveness of the Action Plan will be carefully monitored through monitoring of NO_2 at relevant receptor locations within the AQMAs. In addition, traffic flow changes on the key roads will also be assessed through the review and assessment process, and the uptake of local measures such as Travel Plans will be monitored. Indicators have been provided for the general measures to be undertaken by the Council to monitor progress annually.

The Action Plan will be integrated into the LTP, to provide additional support to the proposed measures and allow the principal measures to be monitored annually through the LTP process. This will enable the success of proposed action plan measures to be assessed and additional measures proposed within the LTP bidding process as appropriate. Annual trajectories will be set within the LTP for the principal measures to enable progress to be monitored.

There will be regular review and assessment of the Action Plan proposals to evaluate progress and this will be reported annually.

9 GLOSSARY OF TERMS

Abbreviation	Full name
AQMA	Air Quality Management Area
AQS	Air Quality Strategy
BAT	Best Available Technology
CTRL	Channel Tunnel Rail Link
DEFRA	Department for Environment, Food and Rural Affairs
DETR	Department for Transport and Regions
DOE	Department of the Environment
GBC	Gravesham Borough Council
HGV	Heavy goods vehicles
KCC	Kent County Council
K&MAQN	Kent & Medway Air Quality Network
K&MAQP	Kent & Medway Air Quality Partnership
LA21	Local Agenda 21
LAQM	Local air quality management
LDD	Local Development Documents
LDF	Local Development Framework
LEZ	Low Emission Zone
LTP	Local Transport Plan
NAQS	National Air Quality Strategy
NO_2	Nitrogen dioxide
NOx	Oxides of nitrogen
NSCA	National Society for Clean Air
PM_{10}	Fine particle matter less than 10µm diameter
ppb	Parts per billion
SO_2	Sulphur dioxide
$\mu g/m^3$	Micrograms per cubic metre
UTMC	Urban Traffic Management Control
VMS	Variable Message Signage

10 REFERENCES

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