



Watford Borough Council Air Quality Action Plan

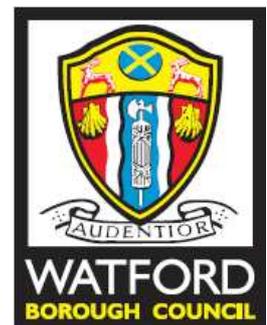
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Report to Watford Borough Council

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Watford Borough Council Air Quality Action Plan

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AEA group
Gemini Building
Didcot
Oxfordshire
OX11 0QJ

t: 0870 190 6440
f: 0870 190 6318

AEA is a business name of AEA Technology plc

AEA is certificated to ISO9001 and ISO14001

Author	Name	Beth Conlan
Approved by	Name	Scott Hamilton
	Signature	
	Date	28 April 2011

Executive summary

The Environment Act 1995 requires all Local authorities to review air quality within their boroughs. If it appears that any air quality “Objective” prescribed in the regulations and in the National Air Quality Strategy is not likely to be achieved then the local authority must designate the affected areas as Air Quality Management Areas (AQMAs). The Act then requires that an Action Plan be produced for any areas designated as AQMAs, setting out the actions that the Borough Council intend to take to achieve the National Air Quality Strategy.

In February 2006 Watford Council identified six areas where it was likely that the Air Quality objective for nitrogen dioxide (NO₂) would not be met due to traffic. Following this, in 2009 a Further Assessment was completed which recommended that the six AQMAs were reduced to four. The Borough Council works with the local highway authority, Hertfordshire County Council (hereafter referred to as the County Council) to help secure improvements to the network. This Action Plan is an update on the previous one produced in 2009 which aligns with the recently updated Local Transport Plan (LTP3)

The Action Plan confirms the likely source of nitrogen dioxide is from transport and in particular from congestion. Evidence suggests that a 34% reduction in traffic emissions of oxides of nitrogen (or NO_x which is a precursor to NO₂) is necessary (based on 2008 figures) to achieve the air quality standard. The Action Plan considers 21 options to improve air quality from the previous action plan and recommends 16 measures for implementation which are aimed at reducing levels of air pollution within the AQMAs in Watford. It also sets out the framework of partnership working with other organisations, within which the actions have been developed and will be progressed and monitored.

The core measure within the plan is the implementation of an intelligent transport system which aims to alleviate congestion and hence reduce transport emissions in the AQMAs. However, at this time the projected quantified emission reduction is not available. Nevertheless, it is anticipated that a reduction of this scale needed to the achievement of the annual mean NO₂ air quality standard (40µg/m³) throughout Watford will remain challenging and as implementation progresses additional measures may be required. It is acknowledged that the Action Plan is a continuously evolving document involving numerous groups and Authorities, which may require further revision in the future.

It is acknowledged that Watford is a diverse area and needs to balance the requirements of local businesses and community against improving local air quality. The actions and measures will provide other benefits for Watford and its surrounds, which are beyond the original scope of the Action Plan. The benefits include:

- Reduction of other pollutants such as particulate matter, benzene etc
- Reduction in emission of green house gasses
- Reduced noise from traffic
- Reduced congestion
- Environmental improvements when schemes are undertaken
- Assist with climate change polices
- Improvements to human health

In compiling this Action Plan, Government Guidance LAQM.PG (09) and the Review and Assessment reports produced by the Borough Council have been referred to. The Action Plan will be subject to statutory and public consultation and amended accordingly prior to formal adoption by the Borough Council.

For further information concerning this report, please contact:

Watford Borough Council Air Quality Action Plan

Environmental Protection, Watford Borough Council

Email: environmental.protection@watford.gov.uk

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1 Introduction

This local Air Quality Action Plan sets out an updated work programme for the improvement of air quality in the Borough of Watford. The work programme is led by the Borough Council but implemented in partnership with Hertfordshire County Council. The Borough Council is consulting the public and other statutory consultees on the content of this plan in advance of a final plan which is to be approved by the Borough Council, Central Government and then implemented.

Watford is a concentrated urban area situated to the North West of London, with a population of circa 81,000. It is a well established regional shopping centre with major rail and road communication links. It has both mainline and underground train stations, the M1 lies along the northern boundary of the borough and the M25 is situated to the west. The borough is also served by several major trunk roads, including the A41, A411, A412 and A405.

Watford Borough Council undertakes monitoring of the main local air pollutants associated with urban areas: nitrogen oxides (NO_x; consisting of nitrogen oxide (NO) and nitrogen dioxide (NO₂)). The results of the monitoring clearly indicate that health based national objectives are being exceeded in some areas. Predictive modelling studies have also been used to better understand the spatial extent of the problem, and to help determine likely pollutant concentrations in the future.

Based on the monitoring and modelling work undertaken by the Council, several areas have been identified as unlikely to be meeting national objectives, and hence the Council have declared AQMAs. The air quality problem in Watford is predominantly a result of emissions from road vehicles, as is the case elsewhere in the UK.

The aim of the Air Quality Action Plan is to describe the actions that Watford Borough Council will take to improve air quality in Watford, particularly in the four declared AQMAs.

1.1 The importance of air quality

There are few things as fundamental to human life as having clean air to breathe. Adult lungs have a huge surface area made up of delicate structures in intimate contact with the air that surrounds us. Air pollution has a well understood negative impact on human health and the surrounding environment. Tackling air pollution is about preventing ill health, improving health and life expectancies, and benefiting our environment and quality of life.

It is widely accepted that exposure to air pollutants, even to the historically low levels found in countries such as the UK, can damage health (Department of Health, 1995; Department of Health, 2006). Recent work has suggested that inflammatory processes triggered by inhalation of pollutants may play important roles: either directly, leading to effects on the respiratory system, or indirectly, leading to effects on the cardiovascular system. Such effects are manifested as increased hospital admissions and daily deaths. Long-term exposure to pollutants, in the main, particles, has been shown to contribute to the progression of cardiovascular disease and a reduction in life expectancy.

A recent report by the House of Commons Environmental Audit Commission compares the gains in life expectancy that could be realised by improving poor air quality (in particular reducing exposure to PM_{2.5}) within those arising from action on passive smoking and road accidents. Based on Department of Health data the Commission reported that gains in average life expectancy of 7-8 months could be achieved from reductions in air pollution, whereas eliminating passive smoking and road accidents only provides average gains of 1-3 months. Although the focus of this Air Quality Action Plan is NO₂, the measures contained will also reduce other pollutant concentrations with common sources including particle concentrations.

Air quality policy has synergies with many other environmental policy areas. For instance, persons living adjacent to busy, and hence noisy, roads are also more likely to suffer from cardiovascular disease and early death. The Royal Commission on Environmental Pollution refers to the interconnectedness of urban issues such as car ownership, obesity, traffic pollution, respiratory health, road noise etc as a 'wicked problem'. We cannot solve the problem by resolving one issue but must augment our efforts to maximise our gains. It is clear that tackling traffic related air pollution has

Watford Borough Council Air Quality Action Plan

synergies with tackling climate change, noise pollution and many other issues to make our Borough a more pleasant and healthier environment in which to live.

2 Air Quality in Watford

This chapter sets out local authority duties in relation to Local Air Quality Management. These are the tasks that the District Council must complete as a statutory duty.

There are various sources of air pollution in the UK. These can include transport (mainly road transport), energy – both use and production, commercial / industrial premises and natural sources. The Government has identified 8 key pollutants:

- Nitrogen Dioxide
- PM₁₀ particulates
- Benzene
- 1,3 – butadiene
- Lead
- Sulphur Dioxide
- Carbon Monoxide
- Ozone

Whilst this Action Plan is primarily aimed at reducing NO₂, the initiatives within it will have a positive affect on the reduction of other air pollutants, especially particulates. The health implications of the three main transport emissions types are as follows:

Nitrogen Oxides (NO_x) Road transport is responsible for approximately 50% of the emissions of NO₂ in Britain. NO₂ has been identified as having various adverse health effects particularly on the respiratory system and in both asthmatics and non-asthmatics. Short term exposure to this pollutant can increase the likelihood of reaction to allergens such as pollen and has been known to increase asthma in some people. Children exposed to this pollutant may have increased risk of respiratory infections.

Particulates (PM₁₀) Particulates can be produced directly from combustion and other processes, as well as from natural activities. They can also be caused by chemical reaction in the air. Particulates of less than 3 µm can pass deep into the lungs thus causing respiratory problems.

Carbon Monoxide (CO) Carbon monoxide is a colourless, tasteless gas, which is known to be poisonous when incomplete combustion occurs. Inhaling small doses of this gas can result in a person becoming confused and having reduced co-ordination. It can also increase the likelihood of angina.

Principal Sources of Air Pollution in the Borough Nitrogen dioxide (NO₂) and nitric oxide (NO) are collectively known as Nitrogen Oxides (NO_x). Nitrogen Oxides which are the main source of poor air quality, are produced during all combustion processes in air, usually in the form of NO which subsequently reacts with ozone (O₃) to form NO₂. The predominant source of NO_x in Britain is road transport and it is thought that half of emissions in Europe originate from this source; certainly the highest concentrations of NO₂ are generally found close to busy roads in urban areas. NO₂ pollution levels within the Borough follow a similar pattern with the majority of NO_x emissions being road transport related. Commercial, industrial and domestic sources also make a small contribution to background.

In the UK, air pollution is currently estimated to reduce the life expectancy of every person by an average of 7-8 months with estimated equivalent health costs of up to £20 billion each year. Air pollution also has a detrimental effect on our ecosystems and vegetation. Clearly there are significant benefits to be gained from further improvements.

To protect the health of the population, the Government have set out a national air quality strategy which includes statutory objectives (standards) for some key pollutants. The objectives are expressed as a maximum ambient concentration not to be exceeded, either without exception or with a permitted

number of exceedences within a specified timescale (see Appendix 1). The objectives have been set throughout the UK and European Union at levels that aim to protect the vulnerable in society from the harmful effects of breathing pollution.

In response, a number of measures have been introduced at an international level (including the UK) to reduce this impact. They include:

- Incremental reductions in emissions from vehicles and industry
- Climate change programme policies
- Local Air Quality Management (see following section)

The UK government recognises the important role that local authorities have and continue to play in helping deliver the air quality objectives. "Action taken at the local level can be an effective way of tackling localised air quality problems leading to an overall improvement of air quality."

2.1 The legislative framework for air quality

Local Air Quality Management

The Environment Act 1995 gives local authorities duties and responsibilities that are designed to secure improvements in air quality, particularly at the local level. These include the review and assessment of key pollutants in their area in a series of rounds every three years. If it appears that any of the air quality objectives set by government are not likely to be achieved and members of the public are being exposed to the pollution, the local authority must by order designate any part of its area so affected, as an Air Quality Management Area (AQMA). They must then prepare and implement a remedial Action Plan of measures to reduce air pollution levels in that AQMA. A Review and Assessment round consists of local authorities initially undertaking an Updating and Screening Assessment (USA) and then carrying out the following stages if any objectives are found to be exceeded:

- Detailed Assessment of those areas identified in the USA as potential AQMA's
- Designation of AQMA
- Further Assessment of air pollution in the AQMA
- Amendment if necessary of AQMA boundaries
- Action Plan
- Annual Action Plan Progress Reports

The fifth round of Review and Assessment will commence in 2012.

2.2 Conclusions of previous review and assessment of air quality in Watford

The Borough Council designated six AQMAs in 2006 as a result of exceeding the air quality objective for annual mean NO₂ across various areas of the Borough. The extent of the AQMAs are shown in Appendix 1. The 2009 Further Assessment of air quality recommended the redesignation of the six AQMAs to four revised areas. It is now the intention of Watford Borough Council to amalgamate AQMA 3 (Aldenham Road) and AQMA 4 (Chalk Hill) to form a single AQMA (AQMA 3A, Aldenham Road and Chalk Hill) due to their proximity and similarity in air quality issues affecting them.

The revised AQMAs are referred to hereafter as:

- Watford no 1: St Albans Road;
- Watford no 2: Vicarage Road;
- Watford no 3A: Aldenham Road and Chalk Hill; and
- Watford no 5: A405/Horseshoe.

A draft Action Plan for the four revised AQMAs was published and approved by Defra in 2009. This revised Action Plan provides an update to the earlier document, giving greater detail of the measures that will be put in place to help reduce levels of NO₂ in the AQMAs.

St Albans Road in AQMA 1



Vicarage Road AQMA 2



Chalk Hill AQMA 3A



Horseshoe Lane AQMA 5



2.3 Principal Sources of Air Pollution in the Borough

Road traffic was identified as the dominant source of NO_x (NO+NO₂) in all four of Watford Borough Council's AQMAs in the 2009 Further Assessment. Source apportionment studies identified that HGVs (freight and buses) contribute significantly to emissions from the locally-generated road traffic component, though the number of these vehicles passing through the area is relatively small. It is estimated that a reduction in traffic emissions of between 5 and 34% would be required to achieve the annual mean NO₂ objective (40 µg/m³) at all modelled receptor locations in 2010.

The source apportionment study indicates that road traffic is the dominant local source of emissions in the Borough, in the four remaining AQMAs, with the following conclusions drawn:

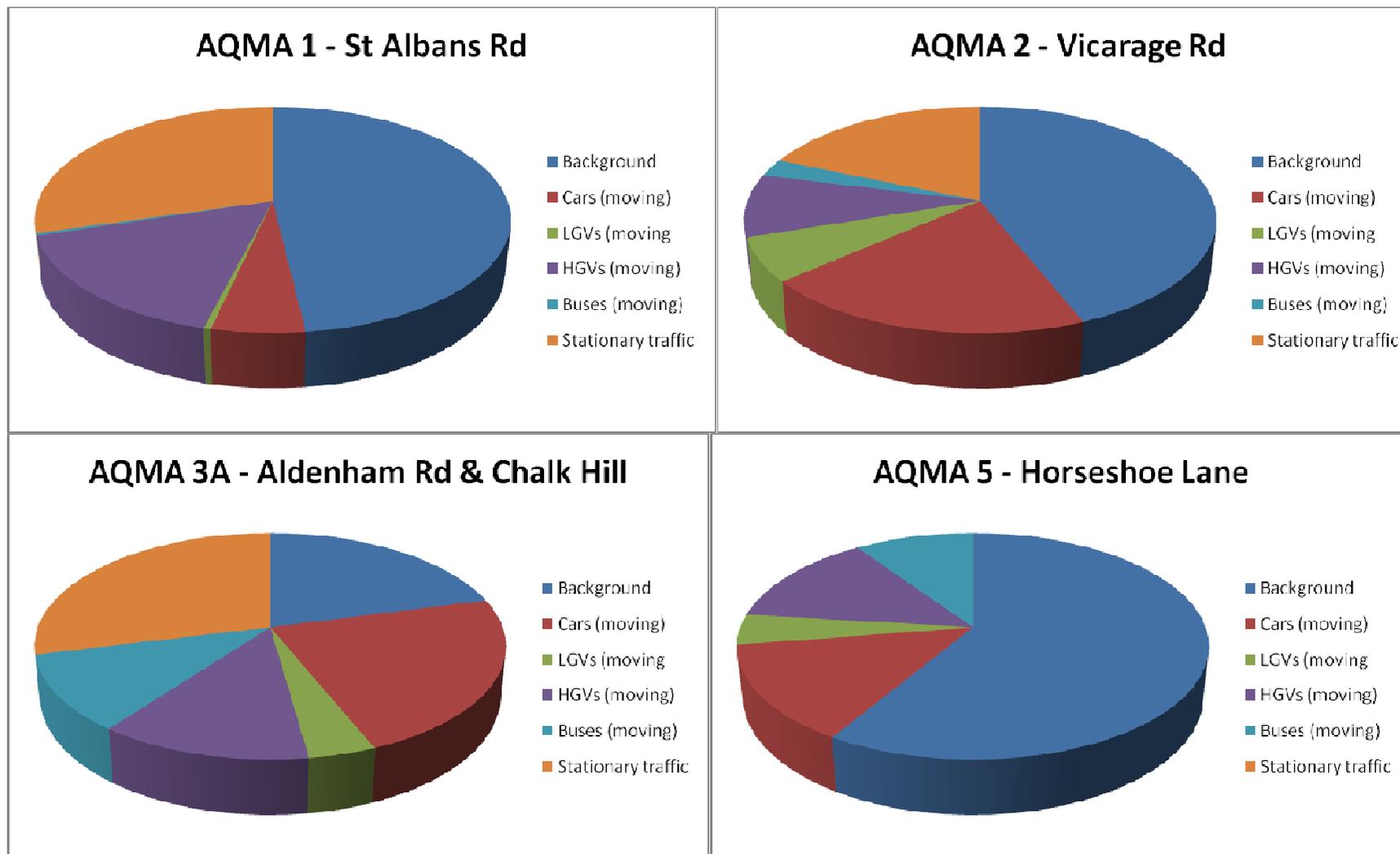
- Reductions of between 5% to 34% in local road transport emissions are required to achieve NO₂ objectives in 2010;
- Congestion contributes significantly to emissions in AQMAs 1, 2 and 3A (20-30%);
- HGVs, although small in number, contribute significantly to emissions in all AQMAs (10 to 15%);
- Buses are estimated to make small contributions (<3%) in AQMAs 1 and 2, but have more significant contributions (around 10%) in AQMAs 3A and 5;
- Cars contribute significantly to local NO_x emissions in AQMAs 2, 3A and 5 (15-23%), but do not contribute significantly in AQMA 1;
- The background concentration of NO_x is also significant across the Borough, and contributes between 21 to 58% in the 4 AQMAs. This is by far the largest source of NO_x in AQMA 5.

Table 1 and Figure 11 show the dominant sources of NO_x emissions from road traffic in the four AQMAs, which accounts for 40% to 79% of total NO_x concentrations. Table 1 also identifies the proposed focus of measures for the sources.

Table 1: Significant sources of NO_x emissions in each AQMA

NO _x Emission Source	AQMA				Proposed focus of measures
	1	2	3A	5	
Background	√	√	√	√	Coordinated action on a regional / national scale
Cars (moving)		√	√	√	Reduce car numbers e.g. Green Travel Plans, behavioural measures
LGVs (moving)		√			Improve freight quality and activity
HGVs (moving)	√	√	√	√	Improve freight quality and activity
Buses (moving)			√	√	Improve the quality of buses and timetabling
Stationary traffic		√	√	√	Reduce emissions from stationary traffic and improve traffic flow

Figure 1: Significant sources of NO_x emissions in each AQMA



2.4 Current levels of nitrogen dioxide in the Borough

Residential areas included in the AQMAs in Watford are given in Table 2 below.

Table 2 Summary of Watford AQMAs designated in February 2006

Watford AQMA no 1 St Albans Road	1B & 1C Wellington Road 155 – 157 St. Albans Road 211-215 St. Albans Road 164 – 454 St. Albans Road
Watford AQMA no 2 Vicarage Road	28A – 30A Vicarage Road (Flats above shops) 85A-87A Vicarage Road (Flats above shops)
Watford AQMA no 3 Aldenham Road	Residential Accommodation above The Railway Arms, Aldenham Road
Watford AQMA no 4 Chalk Hill	12 Chalk Hill
Watford AQMA no 5 A405 / Horseshoe Lane	3A – 5A Horseshoe Lane 887 St Albans Road 1026 St Albans Road
Watford AQMA no 6 M1 / Meriden	16, 17 & 18 Ravenscroft 1 – 5 The Gossamers 31 The Gossamers 63 – 65 The Gossamers 95 – 97 The Gossamers 62, 64, 69 Eastlea Avenue

Continuous monitoring of NO₂ and PM₁₀ is undertaken by King's College London Environmental Research Group (ERG) at Watford Town Hall. Real time data, as well as weekly month and annual reports are available from Herts & Beds Air Pollution Monitoring Network website; www.hertsbedsair.org.uk. Annual mean concentrations at these sites are shown in Table 3 for the period 2007-09. Concentrations of both PM₁₀ and NO₂ have been below the annual mean objectives of 40 µg/m³ at both of these sites during this period.

Photograph showing the automatic monitoring at Watford Town Hall.



Passive monitoring of NO₂ is undertaken using diffusion tubes around at 17 locations within the Borough shown in Figure 2. Annual mean concentrations recorded at these sites are shown in Figure

2: Location of Watford Borough Council NO₂ diffusion tube monitoring network

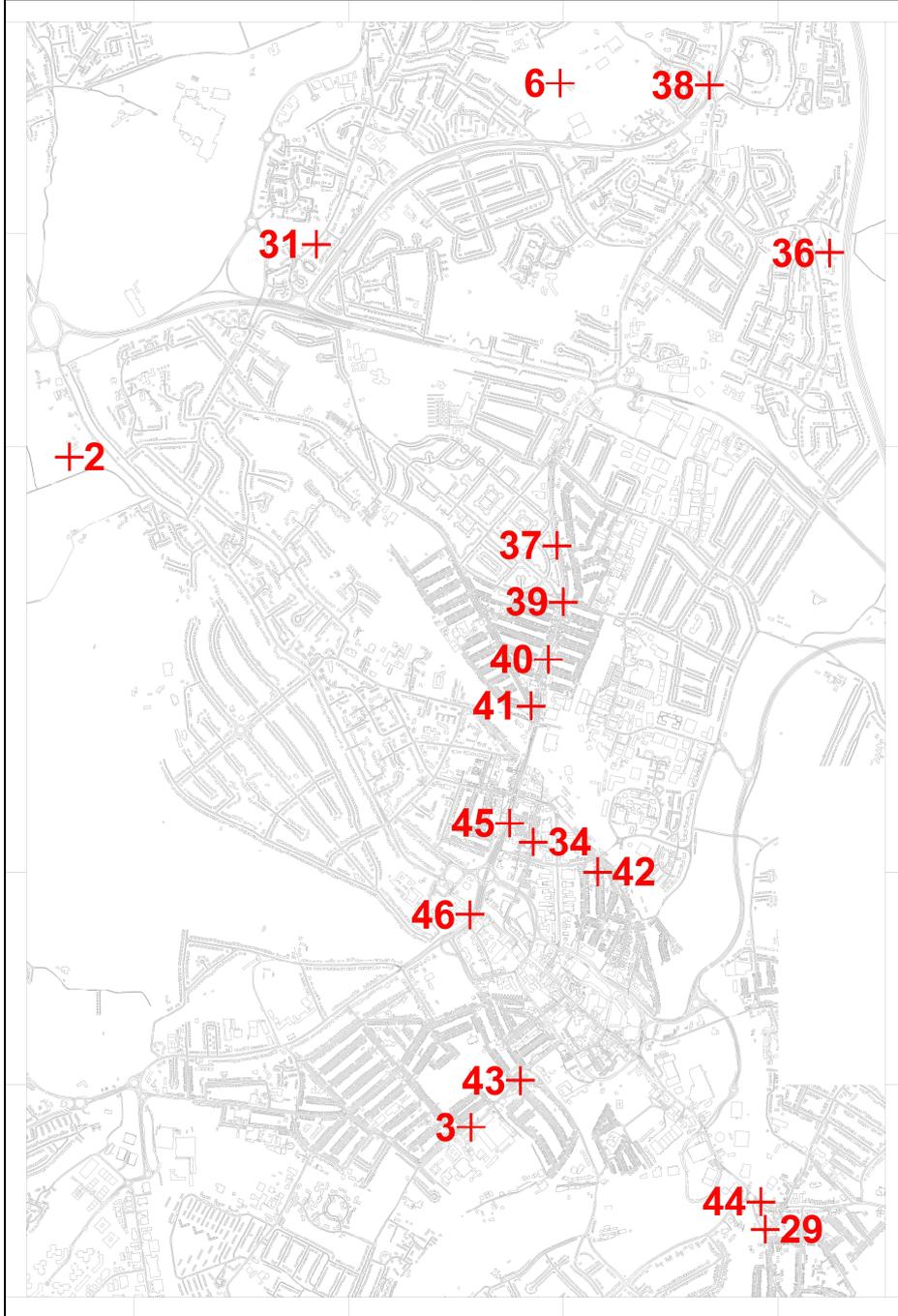


Figure 3 for 2007 to 2009. The data series is not long enough to determine a clear trend in annual mean concentrations in Watford, though concentrations in 2009 appear consistently higher than those recorded during 2008. In 2009, annual mean concentrations exceeded the objective of $40 \mu\text{g m}^{-3}$ at 11 sites, 3 of which are outside the redesignated AQMAs. However, these 3 sites are not representative of relevant exposure.

Table 3: Results of Automatic Monitoring at Watford Town Hall, Rickmansworth Road

Pollutant	Data Capture 2009%	Annual mean concentration ($\mu\text{g/m}^3$)		
		2007	2008	2009
NO ₂	98%	35 ^a	32 ^b	39
PM ₁₀ ^c	98%	23	21	22

Note: Data downloaded from <http://www.hertsbedsair.org.uk/hertsbeds/asp/AdvStats.asp>

^a 58% data capture; ^b 84% data capture; ^c Data was collected using a TEOM PM₁₀ instrument. Results have been converted to reference equivalence using the volatile correction method (VCM).

Figure 2: Location of Watford Borough Council NO₂ diffusion tube monitoring network

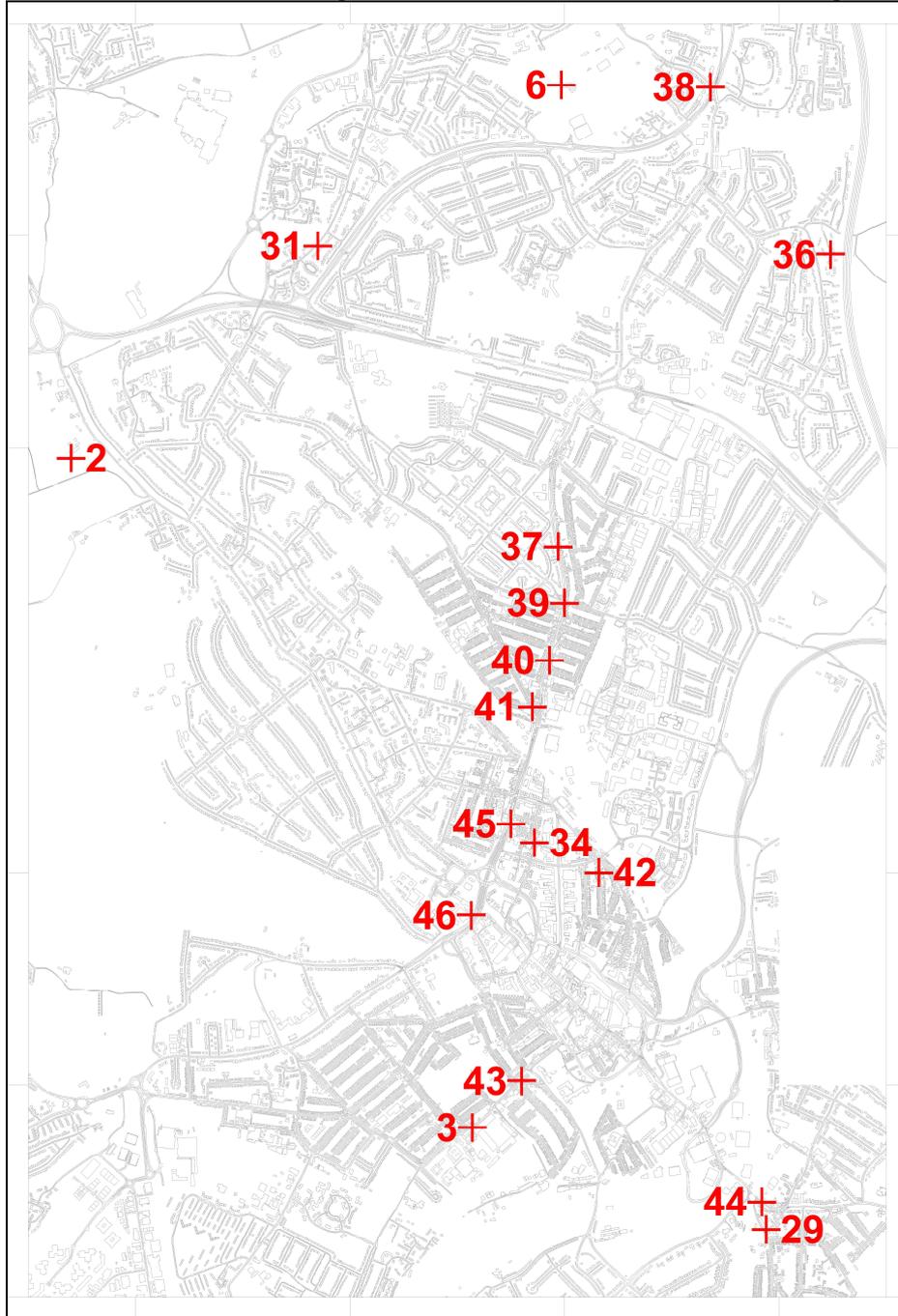
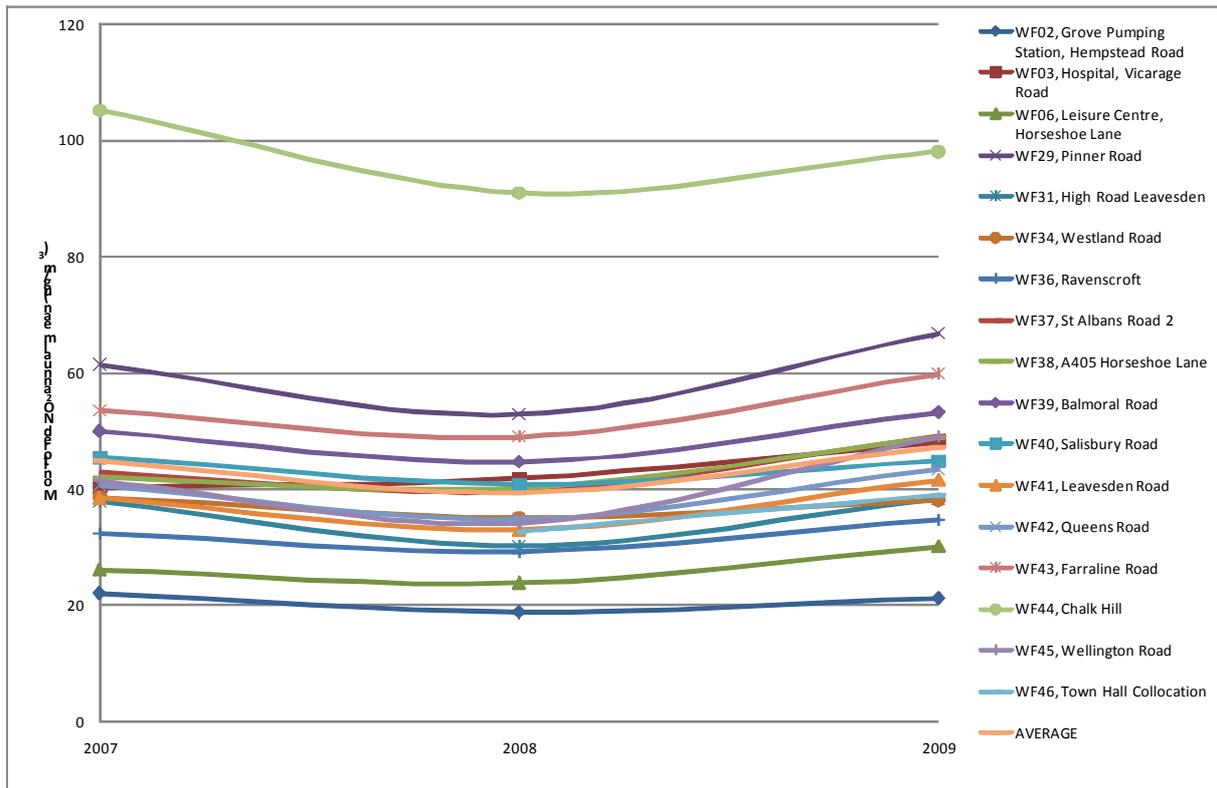


Figure 3 Diffusion tube annual mean NO₂ concentrations, 2007 - 2009



2.5 Scale and extent of the air quality problem in Watford

In general terms, there is a need to address congestion in Watford as this has been identified as a significant source in AQMAs 1, 2 and 3A so action plan measures for these would be best targeted at reducing overall vehicle numbers and achieving improved management of traffic control signals. Private cars are important in all AQMAs so a reduction in these could also provide a benefit across the borough. Moving HGVs contribute significantly to NO_x emissions in AQMAs 1, 3A and 5 though this is not the case for AQMA 2 where LGVs are more important pointing towards action on freight quality and activity being important in this plan. Buses are also important sources in AQMA 3A and 5 though are not thought to be so important in AQMA 1 or 2. This would indicate that measures to improve bus quality will have benefits specific to AQMA 3A and 5 with little impact on the others. A very substantial reduction in emissions is necessary to meet the air quality objective in AQMA 3A. Concentrations here in Chalk Hill were largely due to stationary traffic. Table 4 provides a summary of level of reduction necessary to meet the objectives.

Table 4: Level of reduction necessary to meet the air quality objectives for AQMAs

AQMA	Area	Annual average NO ₂ (µg m ⁻³) 2009	Level of reduction necessary (µg m ⁻³)	residential properties exposed to concentrations exceeding the objectives
1	St Albans Road	49	9	1B & 1C Wellington Road 155 – 157 St. Albans Road 211-215 St. Albans Road 164 – 454 St. Albans Road
2	Vicarage Road	48	8	28A – 30A Vicarage Road (Flats above shops) 85A-87A Vicarage Road (Flats above shops)
3A	Aldenham Road & Chalk Hill	98	58	Residential Accommodation above The Railway Arms, Aldenham Road. 12 Chalk Hill
5	Horseshoe Lane	49	9	3A – 5A Horseshoe Lane 887 St Albans Road 1026 St Albans Road

2.6 Conclusions

1. The Watford AQMAs have a problem with local NO_x emissions causing levels of NO₂ to be above the health-based annual mean standard of 40 µg/m³. Road transport in all of the AQMAs is the dominant local source of NO_x emissions. Therefore it is intended that this Action Plan will be integrated into the Hertfordshire Local Transport Plan (LTP).
2. Based on the source apportionment analysis, options to reduce traffic emissions should firstly focus on reducing traffic queuing times at junctions.
3. This may solve the air quality problem in some of the AQMAs but substantial reductions are required to solve it in Chalk Hill.
4. Based on 2009 values, these measures would need to reduce annual average concentrations by 60% to achieve the air quality standard.
5. Although this Action Plan will focus on making progress towards achieving the annual mean objective for NO₂, it will have additional value for the Watford Borough community if it also addresses other objectives relating to traffic emissions including: reducing exposure to fine particulate matter (PM₁₀ for human health benefits) and reducing emissions of carbon dioxide (CO₂) as part of efforts to mitigate human-influenced climate change.

These conclusions will be referred to throughout the process of developing the Action Plan.

3 Development of the Action Plan

Consideration was given to a full range of relevant options in the drafting of the 2009 Action Plan. These have been reviewed to ascertain if any additional measures are now appropriate in terms of air quality impact, feasible and cost-effective compared to others.

The Action Plan must include:

- Quantification of the source contributions to the predicted exceedences of the objectives; this will allow the Action Plan measures to be effectively targeted.
- Evidence that all available options have been considered on the grounds of cost-effectiveness and feasibility
- How the local authority will use its powers and also work in conjunction with other organisations in pursuit of the air quality objectives
- Clear timescales in which the Borough Council and other organisations and agencies propose to implement the measures within the plan
- Quantification of the expected impacts of the proposed measures and where possible an indication as to whether the measures will be sufficient to meet the air quality objectives and
- How the local authority intends to fund, monitor and evaluate the effectiveness of the plan.

Once the Action Plan is adopted, the Borough Council will also report progress on the implementation of the Action Plan annually and revise it from time to time depending on circumstances.

3.1 Partnership between the District Council and the Local Transport Authority (the County Council)

In Watford, the County Council is responsible for overall transport strategy. As the AQMAs in Watford are dominated by emissions from transport, a partnership arrangement between the Borough and County Councils for the development of this Action Plan has been used. The County Council has put forward proposed actions, which they themselves can implement in pursuit of the air quality objectives.

3.1.1 Integration with Local Transport Plan

Under the Local Transport Act 2008 each English local transport authority must prepare a document to be known as the Local Transport Plan, containing:

- Policies (a strategy); and
- Implementation plans, i.e. proposals for the implementation of those policies.

The existing Hertfordshire LTP2 was published in April 2006 for the period up to April 2011. Although air quality has remained at high levels in parts of the County, there have been successes with measures to reduce congestion which include:

- Number of schools with travel plans has exceeded LTP2 target of 83%
- Walking is the most popular form of travel to school at just over 50% of all journeys
- Continued success of the Travel Smart scheme in Watford with car trips being reduced by 12%
- Walk to School Weeks in Oct 2009 and May 2010 attracted 250 primary schools across the county
- 18 schools are now promoting cycling through 'Bike it' projects in Broxbourne and St Albans
- 10 schools are actively supported by a Sustrans Bike it officer and 8 are now self sustaining and are maintaining the project themselves
- The Council has developed with local partners a series of printed walking and cycle maps that are available for some areas of the County.

3.1.2 Local Transport Plan, from 2011 (LTP3)

Hertfordshire County Council (HCC) is preparing a new Local Transport Plan (LTP3) which is not limited to a 5 year period. As such, HCC propose a 20 year plan with a 3 year Implementation Plan, meaning that the LTP3 will cover the period April 2011 to 2031. The LTP3 will be finalised by April 2011.

The goals set out in LTP3 include

- Support economic development and the planned dwelling growth;
- Improve transport opportunities for all and achieve behavioural change in mode choice;
- Enhance quality of life, health and the natural environment for all Hertfordshire residents;
- Improve the safety and security of residents using the network; and
- Reduce transport's contribution to greenhouse gas emissions and improve its resilience.

To achieve these goals Hertfordshire County Council has identified 13 of challenges and has put forward proposals to address these. All of these challenges will have an impact on uptake of sustainable transport or transport in general and therefore will impact on air pollutant emissions.

Challenge 1 Keep the county moving through efficient management of the road network to improve journey time, reliability and resilience and manage congestion to minimise its impact on the economy.

Challenge 2 Support economic growth and new housing development through delivery of transport improvements and where necessary enhancement of the network capacity.

Challenge 3 Improve accessibility for all and particularly for non car users and the disadvantaged (disabled, elderly, low income etc).

Challenge 4 Achieve behavioural change as regards choice of transport mode increasing awareness of the advantages of walking, cycling and public transport, and of information on facilities and services available.

Challenge 5 Achieve further improvements in the provision of public transport (bus and rail services) to improve accessibility, punctuality, reliability and transport information in order to provide a viable alternative for car users

Challenge 6 Improve journey experience for transport users in terms of comfort, regularity and reliability of service, safety concerns, ability to park and other aspects to improve access.

Challenge 7 Improve the health of individuals by encouraging and enabling more physically active travel and access to recreational areas and through improving areas of poor air quality which can affect health.

Challenge 8 Maintain and enhance the natural, built and historic environment managing the streetscape and improving integration and connections of streets and neighbourhoods and minimising the adverse impacts of transport on the natural environment, heritage and landscape.

Challenge 9 Reduce the impact of transport noise especially in those areas where monitoring shows there to be specific problems for residents.

Challenge 10 Improve road safety in the county reducing the risk of death and injury due to traffic accidents.

Challenge 11 Reduce crime and the fear of crime on the network to enable users of the network to travel safely and with minimum concern over safety so that accessibility is not compromised.

Challenge 12 Reduce greenhouse gas emissions from transport in the county to meet government targets through the reduction in consumption of fossil fuels.

Challenge 13 Design new infrastructure and the maintenance of the existing network in the light of likely future constraints and threats from changing climate, including the increasing likelihood of periods of severe weather conditions.

LTP3 specifically sets out that the county council will seek to:

- Reduce the levels of emissions from road traffic which affect human health and local flora and fauna.
- Reduce the volume of traffic in areas and in time periods where emission levels are causing locally poor air quality.
- Encourage the through traffic to use the Primary Route Network which where possible to avoid major urban areas.
- Work with District / Borough councils to monitor and assess air pollution levels. Where a District / Borough council declares an Air Quality Management Area as a result of its' review and assessment process, the county council will work in partnership with the District / Borough councils to create and deliver action plans.

Congestion Study in Watford 2010

Congested hotspots in Watford give rise to higher pollutant emissions and poorer air quality. The Watford Congestion Task Group reviewed activities such as roadworks, development and implementation of transport schemes in order to minimise congestion and detect locations where congestion is a problem and identify potential mitigation schemes that affect the Watford area.

In locations such as Watford, there is equilibrium between the level of congestion found during the peak periods and the willingness of regular commuters to tolerate a maximum length of journey time. The result is a suppressed demand during the peak periods. Improved end-to-end journey will therefore encourage journeys that were not previously made. In the longer term, the network may accommodate more journeys but the overall level of congestion will revert to the previous level. Consequently physical measures alone will have only a temporary benefit therefore a package of measures aimed towards encouraging a modal shift is required in the longer term not only to improve congestion, but air quality as well.

For Watford it has been proposed that over the next 10 years the Council should aim to increase average journey speeds during the peak hours by 10% capped at 20mph. This in turn will go towards reducing overall journey times along corridors by up to 10%. This speed is commensurate with road safety benefits particularly in areas of high pedestrian movement. It is also likely to be less threatening to cyclists and will encourage cycling. Vehicle drivers adopting a 20mph constant speed will experience less queues and delays at junctions, reduced stress levels and will be more likely to be courteous to other drivers – particularly those emerging from side roads and crossovers.

Improvements to reduce the level of congestion fall into three broad categories – increase capacity, reduce or manage demand, and measures to avoid congested areas. All options have been reviewed by the Congestion Task Group and, in conjunction with educational and awareness measures, 12 'quick wins' have been identified which have the potential to improve known hotspots. Some of these are changes to junctions which have already been identified whilst others are signal timing reviews which may lead to further changes dependent on the findings. These are seen as quick wins as they have the benefit of reducing delay and increasing flow throughout without any significant disbenefit to other road users. All of these should be progressed as soon as funding is available. The air quality benefit of these measures have not to date been quantified, however their impact will be measured with a 'before and after' implementation survey.

In the medium to longer term the full roll-out of the ITS Strategy is recommended. It is anticipated that the deployment of the eight packages of the ITS Strategy will cover a seven year period. This will be subject to funding being available. In the longer term it is expected that large developments within Watford will generate additional network capacity and funding for improvements.

3.2 Partnership working with Development Planning

The Watford Borough Council Local Development Scheme (LDS) lists the planning documents the Council will be preparing over the next three years and the timetable for their preparation. The latest LDS to be agreed with the Government Office for the East of England was agreed in July 2007 and is currently under review. The timetable has slipped due to a combination of staff turnover and shortages, and advice on the need to expand and update the evidence base to ensure policies are sound.

The Council expects to begin formal pre-submission consultation on the Core Strategy early in 2011, as evidence studies are finalised. Site Allocations and Development Control Policies Development Plan Documents (DPD) will follow the Core Strategy. Work will begin shortly on a Town Centre Area Action Plan.

The LDS gives a detailed timetable and project plan showing all documents that are to be produced to make up the Local Development Framework (LDF). The LDF will consist of a set of documents that will gradually replace the existing Watford Borough Plan 2000. Using a range of shorter documents, rather than a single Plan should enable greater opportunity for community involvement in the process, and greater flexibility to update individual documents as required.

3.3 Partnership working towards air quality targets

Several discussion fora are available to Officers for the management of local air quality. These include the Herts and Beds Air Quality Network (previously the Hertfordshire and Bedfordshire Air Pollution Monitoring Network Group). At this forum officers from each of the fourteen local authorities discuss air quality issues and participate in data and information exchange. Action planning is an essential part of the air quality management process, and relies on the collaboration of District/Borough and County Councils. Also the Hertfordshire Technical Chief Officers Association (HTCOA) Group, which comprises officers from both the County and District/Borough is a useful mechanism for the discussion of air quality issues. The County Council, along with District/Borough Councils, also attends the Hertfordshire Environmental Forum (HEF – <http://www.hef.org.uk>).

3.1 Action Plan options and their assessment

Watford Council, in developing the updated Action Plan, has re-considered the 21 options which were set out in the draft action plan in March 2009. The process has been one of further refinement of the options to focus on those that are directed towards the problem, feasible, do not adversely impact on other locations or vulnerable highway users, and are cost-effective compared to others. This section summarises how this was done. Details of the 21 options are given in Appendix 2.

Essentially the stakeholders adopted the following procedure:

- Consideration was given to the full range of potential options.
- Initial decisions were made to determine whether any options were unfeasible or unacceptable and they were eliminated from the options list.
- Remaining options were defined further and underwent a detailed assessment.
- The results of the assessment identified those options to prioritise and to adopt as measures in the Action Plan.

There is a very wide range of options available to reduce the emissions from road transport. The Borough and County Councils do not necessarily have the power to implement them all directly but potentially they do have a role in attempting to influence those bodies or individuals who could implement them. Therefore, it is appropriate to initially consider all options. The Borough Council undertook consultation with local organisations and the public in order to assist with derivation of the list of options for consideration, the application of the assessment methodology, and the options that were chosen as probable measures.

3.2 Measures to improve air quality

Of the 21 options, 16 measures were identified via assessment for inclusion in this Action Plan as priorities for the improvement of air quality in Watford and the wider area. These measures have been grouped into Packages where they have similar characteristics or are alternative options to achieve the same end. Each Package of Measures has those recommended for implementation at this time. This provides 10 Packages of Measures in total which include:

1. Specific options aimed at promoting more sustainable travel choices and reducing queues in the Watford AQMAs
2. Strategic options aimed at integrating air quality into all relevant areas of decision making within the Borough and County Councils.

The measures in the Action Plan are detailed in the following section and a summary is presented in Table 5. This Plan is:

- o Focussed – road transport is the dominant source of emissions in the AQMAs and queuing vehicles and HDVs are particularly significant sources.
- o Proportionate – the plan puts most emphasis on reducing queuing from all vehicles and contains specific measures to attempt to address HDV emissions.
- o Realistic – the measures in the plan have been assessed as being the more feasible, acceptable and cost-effective among many options.
- o Strategic – key measures to be implemented include improving the Borough Council's capacity to manage air quality in order to avoid worsening air quality and to make progress towards the air quality standards.
- o Sustainable – we believe that the plan can contribute to the Borough Council community aims to reduce CO₂ emissions as outlined in the Council's Climate Change Policy, improve quality of life (by improved health) and not compromise the local economy or pedestrians and cyclists.

The 16 measures in this Action Plan are the ones that the Borough and County Councils have considered for adoption and implementation in pursuit of the air quality standards within the Watford AQMAs. Some of the identified measures require further study to facilitate which ones are most cost effective. After these studies are complete, the Councils will be able to decide which of the measures are fully warranted for implementation and if the air quality objective can be met.

In summary, measures within the plan aim to alleviate congestion and hence reduce transport emissions in the AQMAs. However, at this time the projected quantified emission reduction is not available. Nevertheless, it is anticipated that a reduction of this scale needed to the achievement of the annual mean NO₂ air quality standard (40µg/m³) throughout Watford will remain challenging and as implementation progresses additional measures may be required. The Borough Council will continue to review and assess air quality to monitor this situation.

Funding for the implementation of this Action Plan is through the Local Transport Plan where existing projects complement the Action Plan. Further funding will be sought through the Defra air quality grant annual award scheme for the implementation of specific tasks within measures.

Package of Measures 1: Altering Traffic Signal and Junction Configuration

Measure 1: Intelligent Transport Systems

Stationary vehicles give rise to a high proportion of emissions relative to moving traffic. Consequently, measures to reduce traffic queues are likely to reduce emissions. The measures within this package are focussed on reducing congestion within the AQMAs.

A key element to deliver the Local Transport Plan is 'intelligent transport systems'. Measures such as optimising traffic signals and providing real-time information will help network managers and drivers make the best use of our roads. The same systems will provide up-to-the-minute information on buses

and trains, encouraging motorists to consider using other forms of transport. This measure improves congestion but also effectively reduces idling emissions and improves overall air quality.

Work has commenced to develop a partnership to provide Automatic Vehicle Location (AVL) and Real Time Passenger Information (RTPI) systems. HCC will work with interested bus operators to install AVL on their buses, which is the first step to delivering a range of benefits to bus passengers and operators. It is anticipated that bus operators will contribute towards the costs of the AVL system through an annual membership scheme and HCC will seek contributions towards providing the initial system through the s106 agreement process.

Modern Urban Traffic Management and Control (UTMC) systems reduce congestion by optimising junction capacity and coordinating traffic lights over a wide area to keep traffic moving. UTMC can also prioritise particular types of vehicles and, for example, allow emergency vehicles to reach their destination quickly and safely or help late running buses to make up time. A key part of implementing ITS across the county will be the development of a Traffic Control Centre which brings together the necessary data to enable network managers to make co-ordinated and informed decisions to maximise efficiency and provide real-time information to all transport users.

Recommendation: Intelligent Transport System installation

Package of Measures 2: Road Infrastructure Improvements

Measure 2: Road Infrastructure Improvements

Two link roads are currently in the planning process:

1. Health Campus link road (<http://www.watfordhealthcampus.org/>). This link road would be expected to affect AQ at the Chalk Hill and Hornet's Gyratory/Wiggenhall Rd AQMAs.

The new link and access road is justified in the Health Campus Outline Planning Application and has been approved by the various planning authorities. It will link Wiggenhall Road and the Campus with Dalton Way. The link road is expected to help to alleviate the localised congestion and improve access to the hospital for emergency vehicles, for example in the Chalk Hill and Hornet's Gyratory/Wiggenhall Road AQMAs. In addition, transport improvements associated with the Watford Health Campus include:

- The introduction of pedestrian and cycle routes in new green spaces around the site;
 - Increased proportion of journeys made via public transport, with the hope of new bus services being attracted to the site;
 - Increased links to London through more direct road and rail provision;
 - More accessible car parking for visitors to the site;
 - Provision of new access and link roads to the site; and
 - Support for the introduction of the Croxley Rail Link for direct access to the site and beyond by train.
2. Watford Junction link road which is expected to significantly improve air quality on St Albans Rd in AQMA 1, by allowing HGVs to travel directly from the M1 to the industrial estate without using St Albans Road.

Small scale plans within Watford are set out in LTP3 to 2013.

Implementation Year	Location	Infrastructure plan
2012	Marlborough Road	Casualty Reduction Proposals
2011-2012	Clarendon Rd/Woodford Rd Junction	Casualty Reduction Proposals
2011-2012	Clarendon Road	Pedestrian Improvements
2011-2012	Watford	20mph Zone 4
2011-2012	Hempstead Road nr Ridge Lane	Signal Refurbishment
2011-2012	Tolpits Lane	Signage
2012-2013	St Albans Road A412	Casualty Reduction Proposals

Recommendation: Road Infrastructure Improvements

Package of Measures 2: On Street Car Parking

Measure 3: Enforcement of parking policy

On street car parking in Watford is strictly regulated, and is not believed to add significantly to congestion within the AQMAs. However, parking policy and how it impacts on the uptake of various modes of transport, particularly sustainable transport, is important.

There is a large number of Controlled Parking Zones (CPZ) around Watford (~18) where priority is given to residents who are able to purchase permits or vouchers for visitors. Many of the CPZ and increases in parking charges occurred in 1997 at the time when the Parking Strategy was amended. While there have been incremental increases in parking charges since 1997, there have been no increases in recent years due to the recession.

In the St Albans Road AQMA two small car parks were converted to pay and display to promote small businesses nearby. However, as this resulted in increased parking in surrounding side streets, charges have since decreased and the car park usage has increased.

The Council is committed to enforcing parking policy.

Recommendation: Enforcement of car parking policy

Package of Measures 3: Electric Vehicle Charging Points

Measure 4: Installation of Electric Vehicle Charging Points

In February 2010, the Department for Transport announced plans to roll-out the first tranche of a £30m fund for a network of electric vehicle hubs – called Plugged-In Places. London, Milton Keynes and the North East will have 11,000 vehicle recharging points installed during the next three years. A second

round of bids for funding was submitted in October 2010 for which Hertfordshire County Council was part of a regional East of England bid. An announcement will be made in early 2011 on whether or not this bid has been successful.

Recommendation: Electric Vehicle Charging Point Installation

Package of Measures 4: Encouragement of Public Transport Use

Generally in the UK, 25% of Britain's car journeys are less than 2 miles, which is a distance that can be covered by walking or cycling. Also, 17% of car journeys are travelling to and from work while school journeys are estimated at 17.5% of morning peak traffic in urban areas in term time. Indeed, if half of UK motorists received a lift one day a week, pollution would be reduced by 10% and traffic jams by 20%. It is therefore important to consider the promotion of public transport uptake, car sharing and travel planning within the Watford area and Hertfordshire in general.

Measure 5: Implement Bus Strategy

The County Council's Bus Strategy has been updated and is currently being consulted upon (March 2011). The following objectives are set:

- Support, promote and improve a network of efficient and attractive bus services which are responsive to existing and potential passenger needs, including the special accessibility requirements of the elderly and disabled.
- Procure a range of bus provision which provides maximum benefit to the travelling public in the most cost effective way.
- Develop a passenger transport network as a viable alternative to the use of the private car to contribute to the reduction of greenhouse gas emissions.
- Encourage parents and school aged children to make maximum use of the available public transport network
- Recognise that customers need attractive and affordable fares to use the system to its full potential and that car users need to be encouraged to choose sustainable modes.
- Continue to support and develop the bus transport provision that allows maximum accessibility - particularly for non car users and the disadvantaged (disabled, elderly etc).
- Promote and publicise the passenger transport network through the Intalink partnership using a variety of media.
- Provide and maintain all bus stops, and other bus related highway infrastructure, to consistent quality and standard across the county.
- Seek to give greater priority to buses on the road network to improve punctuality and minimise bus service disruption from road congestion and the effects of road works.
- Continue to develop partnerships with other parties to achieve improvements in service provision and other facilities for specific aspects, corridors or geographical areas.

Particular air quality and greenhouse gas emissions benefits are addressed by the following policies:

- The County Council will take account of the contribution that bus services make to reducing car use and emissions by supporting contract bus services and its policies to assist commercial provision.
- The County Council will encourage operators to invest in vehicles with lower emissions, systems that assist bus drivers to be more fuel efficient and adopt developing technologies, if this is suitable for Hertfordshire conditions.

The impact on air quality will be reviewed once the bus strategy implementation plan is finalised.

Measure 6: Implement the Intralink Project

The Transport Act 2000 placed a duty on Local Transport Authorities to stipulate required standards for passenger transport information, after consultation, and that these standards are met. In Hertfordshire this is largely delivered through the **Intalink** Partnership.

The **Intalink** Partnership is a unique quality partnership for information and marketing of the passenger transport network in Hertfordshire. Launched by the County Council in 1999, the partnership consists of the majority of local bus and train operators, all of the district councils and neighbouring local transport authorities.

As part of the Transport Act 2000 and the Bus Quality Partnership Act, Quality Contracts became an option for the County Council to introduce, should the commercial operator not be able to provide a service which meets the level of provision set out by the County Council. Further to that, extra powers were granted under the Transport Act 2008 which enable the partnership process to work on either statutory or a voluntary basis.

However, with the existence of the **Intalink** Partnership and the successful working relationships this currently provides, development of voluntary Quality Bus Partnerships have been achieved. The first of these voluntary partnerships was introduced with ARRIVA the Shires & Essex (between Stevenage and Chells) and using the experience gained, further partnerships were introduced for services 10, 308, 510 and 724.

With the criteria for Bus Quality Partnerships and corridors, set out within the County Council Bus Strategy and Bus Network Review, this provides the framework for introduction of further schemes. Indeed, the County Council has entered into a Quality Network Partnership with various stakeholders in St Albans using the new powers under the Transport Act 2008. The main aims are to achieve a simpler, easier-to-use network with enhanced publicity across all modes of transport. Other deliverables planned include improvements to infrastructure and highway design to ease congestion and yield greater reliability for bus services.

Details of the Arriva bus fleet currently operating in Watford, against which future changes to the fleet can be recorded, are presented in the table below:

Depot	Euro standard	No. vehicles	% of total
Watford / TFL Watford	2	20	16%
	3	77	61%
	4	27	21%
	5	2	2%
	2 – 5	126	100%

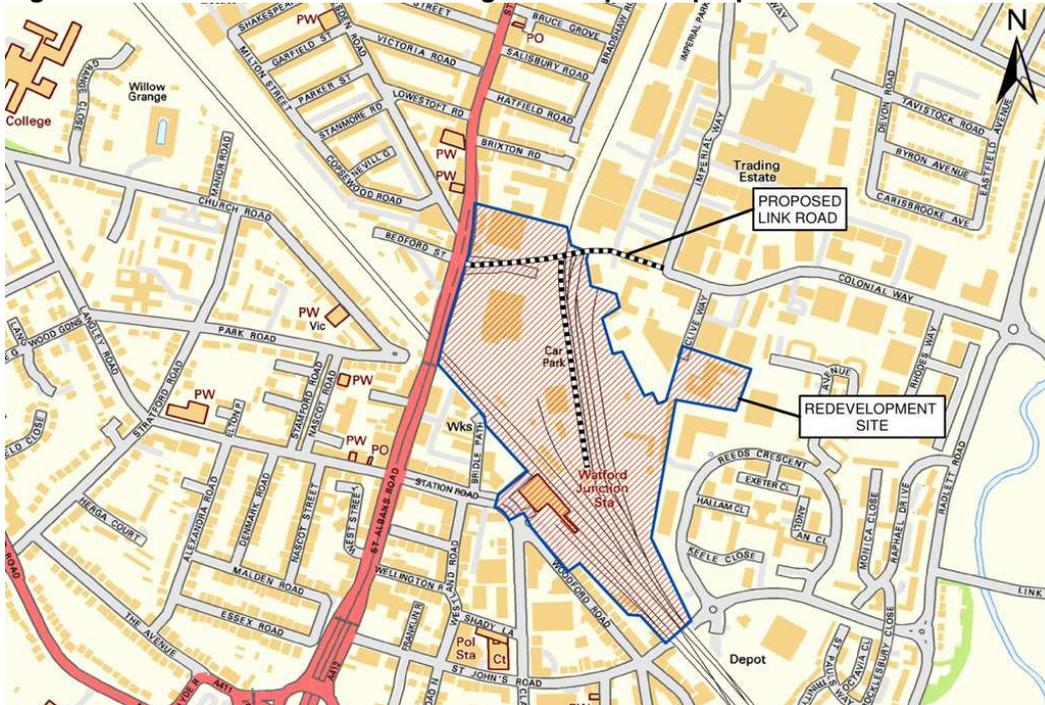
Measure 7: Watford Junction Interchange Improvements

The County Council, Watford Borough Council and a number of landowners have been developing a plan for the comprehensive regeneration of the wider Watford Junction area, to include the delivery of the interchange scheme. The interchange scheme itself will provide a new, high quality, passenger interchange at Watford Junction rail station, including additional car parking on the eastern side of the station accessed via a new link road connecting Colonial Way with St Albans Road.

By providing more direct access from the primary route network the scheme will alleviate existing traffic congestion in the immediate vicinity of Watford Junction and within the wider area, thereby benefiting bus operations at the station as well as on the approaches to it. The comprehensive regeneration emerged as a result of the initial development proposals which require the construction of a link road between Colonial Way and St Albans Road. In discussion with the landowners, a revised route has now been put forward which allows for the delivery of the link road and the comprehensive redevelopment of the wider site.

Public funding is still required to ensure delivery of the station access and interchange elements which also unlock the regeneration site. In turn, the mixed development elements will need to continue to generate funding for the land rehabilitation from old railway sidings and for the major station refurbishment. The major expenditure for the scheme is expected to occur in 2013/14 and 2014/15 with completion in 2016. This scheme is expected to improve air quality in the surrounding area as congestion improvements are realised.

Figure 4. Watford Junction Interchange development proposals



This plan shows the band of interest for Land Charge Search purposes only. The centre-line is notional and does not indicate a County Council approved route or commit the County Council to construct the scheme. © Crown Copyright. All rights reserved. Hertfordshire County Council. LA 100960 2010

Recommendation: Encouragement of Public Transport Use

Package of Measures 5: Car Sharing and Travel Planning

The encouragement of travellers to plan their journey and share transport, when possible is likely to lead to fewer vehicle trips and, therefore, lower emissions. Car sharing and travel planning are therefore important measures to improve air quality.

Measure 8: Promotion of Car Sharing Scheme

Car sharing schemes operate in urban areas around the UK, and have been reported to reduce driver days by up to 36% (Jones, 2009).

As part of Watford's commitment to reduce congestion and pollution, the Borough Council has already successfully established watfordjourneyshare.com a car and journey sharing partnership with eight other major employers in the town. This website aims to promote all forms of transport and integrate both public and private transport modes. It's about maximising people's travel options whilst also reducing the number of cars on the roads, cutting pollution, saving money and protecting the environment.

Watford.liftshare.com is free to use and has been built and designed for every possible user. To date the car sharing scheme, which operates throughout Watford, has over 428,000 registered members. The Borough Council will aim to promote this scheme.

Measure 9: Promotion of Travel Plans

A Travel Plan (sometimes referred to as a green travel plan) is a package of measures designed to influence the travel behaviour of individuals, businesses, schools or other organisations through promoting sustainable travel. The general aim is to reduce the negative effects of traffic by encouraging alternatives to single-occupancy car-use.

The Borough and County Council are working with businesses, schools, developers and individuals by promoting sustainable travel through travel planning. *Watford Commuter* is the town's Business Network Green Travel Plan to reduce congestion and act on climate change. It offers cheaper, easier, more sustainable ways to travel to work with information on local buses, the tube, train, walking, cycling and car sharing.

Within the Borough Council's Local Development Framework Infrastructure Delivery plan published in 2010, it is recognised that traffic congestion has an adverse impact on air quality and leads to increases in green house gas emissions that contributes to climate change. Therefore alleviating congestion on the roads and the promotion of sustainable transport measures, are considered important issues to be addressed by the Core Strategy.

Consideration should be given, within the production of the Development Plan Documents, to the option for proposed new development that would have significant transport implications, should have a Green Travel Plan. It is not necessarily the size of the development that would trigger the need but more the nature of the use. It should include:

- new employment sites employing over 10 people
- a use which is aimed at the public (eg retail, leisure activities)
- major residential development

The Travel Plans should seek to:

- (a) reduce the use of cars by encouraging car sharing;
- (b) provide links to enable the use of public transport;
- (c) improve road safety for pedestrians and cyclists; and
- (d) Identify any mitigation works to be funded by the developer in conjunction with the proposal.

Recommendation: Car sharing and travel planning

Package of Measures 6: Promotion of Cycling and Walking

Measures to encourage cycling and walking rather than using car especially for local journeys are important to reduce emissions and hence improve air quality.

Measure 10: Promotion of TravelSmart in Watford

A TravelSmart programme was undertaken in Watford during the period 2008-10.

<http://www.watford.gov.uk/ccm/content/planning-and-development/transport/travelSMART.en>

The project offers households information and support to enable people to walk, cycle and use public transport more often. It aims to reduce car use and encourage healthier lifestyles by increasing active travel in our daily routines. <http://www.sustrans.org.uk/what-we-do/travelSMART>

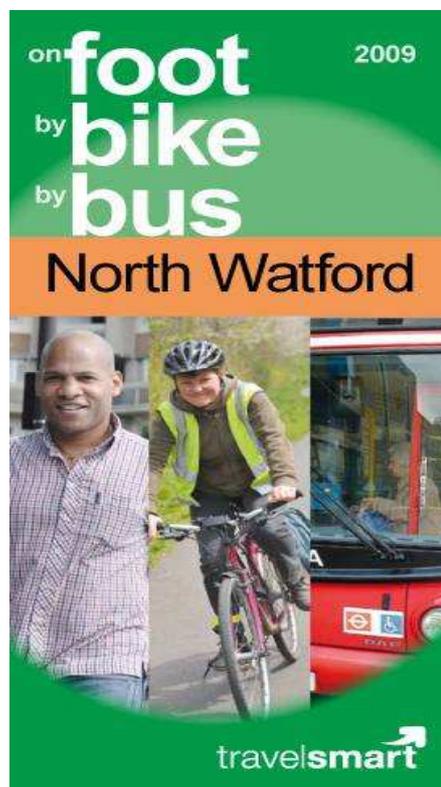
To supplement the TravelSmart project, detailed travel behaviour research was undertaken in Watford before the project started, with further research to be carried out at the end. The findings so far have shown that:

- Most of people's day-to-day trips are local
- A quarter of all car trips are under two miles
- Over half of all local car trips could be made by walking, cycling or public transport.
- Most people are concerned about traffic growth and support policies which favour walking, cycling and public transport.

- Lack of information, motivation, and the misperception of travel time are the main obstacles to changing travel behaviour.

TravelSmart will enable Watford residents to do their bit to tackle congestion and reduce their carbon footprint whilst keeping fit and healthy. The project achieved substantial increases in walking, cycling and use of public transport, leading to a relative reduction in car-as-driver trips of 13% and in car distance travelled for day-to-day trips of 16% (a net saving of 41.7 million car km per year among the target population). This level of behaviour change is in line with, or exceeds, other UK TravelSmart projects. The shift from car travel to walking, cycling and public transport also resulted in a 19% relative increase in average daily exposure to physically active forms of travel.

The focus on Watford has now ended – the programme lasted for 2 years, and the results were released in October 2009. A new programme is due to be launched in Croxley (immediately south west of Watford). This may still have an impact upon traffic in the Borough, particularly at the Bushey Arches and Hornet's Gyratory AQMAs.



Measure 11: Promotion of Cycling in Watford

A cycling strategy was published in 2007 committing the Council to

- Improving Cycling Infrastructure
- Cycle training (Bikeability)
- Marketing and promotion
- Stakeholder engagement
- Wider engagement (partnerships with other agencies)
- Planning (the integration of cycling into land use development)
- Targets and Monitoring

The Council has delivered 14.1 km of new cycle routes since 2004. Cycle route usage has increased at all monitored sites and the Council has introduced interest free cycle and season ticket loans, a new improved staff bike pool, staff showers and lockers and pool vehicles. The Strategy will be reviewed in 2011/12.

Recommendation: Promotion of Travel Smart, Cycling and Walking

Package of Measures 7: Development Planning

Measure 12 Consider air quality within the Local Development Framework for the future

The planning system plays a key role in protecting and improving the environment. Land use planning and development control can become an effective tool to improve air quality by first locating developments in such a way as to reduce emissions overall, and secondly reducing the direct impacts of those developments. In Watford the Development Core Strategy is currently underway with submission expected in early 2011. As air quality is a material planning consideration, it is proposed to produce a Supplementary Planning Document on air quality. This will help to understand the air quality impact of any proposed development by planners, environmental services officers and developers.

The Supplementary Planning Document will seek to ensure that developments in Watford are well served by public transport, pedestrian and cycle facilities in order to promote sustainable travel. It will enable the Borough Council to secure appropriate developer contributions and ensure resources are targeted towards schemes that promote long term sustainable travel. The inclusion of an indicator in the Local Development Framework that measures access by public transport to services from new residential developments, will also help us to monitor progress in incorporating sustainable travel into the planning process.

Recommendation: Develop a Supplementary Planning Document to improve air quality.

Package of Measures 8: Improvement of Council vehicle fleet

Measure 13: Improvement in Council vehicle fleet

The Council vehicle fleet are all a minimum of Euro standard IV, though recently the Council has purchased 12 new kerbside collection vehicles which are Euro V standard and, together with AdBlue technology give rise to significantly lower emissions.



All HGVs are inspected every 6 weeks as a legal requirement while other vehicles are serviced every 6 months or year. Vehicles in the Council fleet have emissions technologies e.g. Particle Trap, EMINOX BE12 <http://www.eminox.com/>. Road sweepers and refuse vehicles tend to go out early in the morning to avoid rush hour. This avoids contribution toward congestion or exacerbation of the air quality problems in the Borough.

As emission technology and fuel developments are made, the Council will consider how to access these to gain air quality benefits.

Recommendation: The Council undertakes an annual review of vehicle technology, their costs and accessibility to the Council.

Package of Measures 9: Promotion of air quality issues

To monitor the impact of this Action Plan on the improvement of ambient air quality it is important that the Borough Council measures the air pollutant concentration and reports this into the public domain. With effective communications the Borough Council can raise awareness about the air pollution problem to encourage more sustainable travel in Woodbridge.

Measure 14: Continue to improve and raise the level of knowledge and publicity relating to air pollution

The Borough Council will continue to raise the level of knowledge of air pollution in Watford and release press statements when appropriate to promote sustainable travel options. The Council will continue to make data and reports publicly available through the Hertfordshire & Bedfordshire Air Quality Network website is available at <http://www.hertsbedsair.org.uk/hertsbeds/asp/home.asp>

Measure 15: Continue to monitor air pollution

The Borough Council will continue to undertake routine monitoring of air pollution in existing AQMAs and locations around the Borough and increase the number of monitoring points as necessary. The Borough Council will continue to report progress on air pollution monitoring.

Recommendation: Promotion of air quality issues

Package of Measures 10: Feasibility Studies and Funding

In preparing this Action Plan the Borough Council and the County Council have not had all relevant traffic data available to undertake a detailed analysis of all measures. Target emission reductions for each measure are uncertain for most measures. It is therefore important that the Councils undertake some further feasibility studies for example to determine which junction alteration is most appropriate. Funding streams have to be identified to enable such feasibility studies.

Measure 16: Undertake identified feasibility studies

The Borough and County Councils will work together to undertake identified feasibility studies of measures to determine more robustly the effectiveness and cost of options. These feasibility studies will require traffic counts to be undertaken which will be used in transport modelling to investigate the impact of the measure on traffic flows and emission reduction.

Recommendation: Feasibility Studies and Funding

Table 5: Summary of the action plan measures

No.	Measure	Focus	Lead authority	Policy linkages	Timescale	Indicator	Target	Air Quality impact
1	Intelligent Transport Systems	To manage traffic movement more efficiently throughout the County	HCC	<ul style="list-style-type: none"> LTP3 	2011 onwards	NI167 congestion	2.87 mins/mile in 2008/09 to 2.80 mins/mile in 2015/15	Likely to be high in the AQMA congested junctions
2	Road Infrastructure Improvements	Ease congestion in St Albans Road AQMA. Further improvements are recommended in the Congestion study	HCC/WBC	<ul style="list-style-type: none"> LTP3 	2011 onwards	Schemes completed	2 link roads completed	Likely to be high
3	Enforcement of parking policy	Minimise emissions due to reduced traffic flow caused by obstructions	WBC	Council Enforcement Officers	2011 onwards	Number of warnings, fines and prosecutions for such offences	n/a	low
4	Installation of EV charging points	Encourage the uptake of electric vehicles	HCC	LTP3, Relies on success of bid to Plugged In Places government grant	2011 – medium term	Number of charging points installed	N/A depends on success of grant	low
5	Implement bus strategy	Encourage the increase of bus patronage	HCC/WBC	LTP3, Bus Strategy	2011 onwards	Bus patronage	Not set as yet	medium
6	Implement the intralink project	Increase the integration of public and sustainable transport movements	HCC/WBC	LTP3	2011 onwards	Bus and rail patronage, number of cyclists and pedestrians	Not set as yet	medium
7	Watford Junction interchange	Increase the accessibility of the rail station	HCC/WBC	LTP3	2011	Completed scheme	Completed scheme	High in the vicinity of the junction

Watford Borough Council Air Quality Action Plan

	improvement							
8	Promotion of car sharing scheme	Increase car sharing to ease congestion	WBC	LTP3, WBC green travel plan	2011 onwards	Registered members on liftshare Number of private schemes	2011 level is 480,000 8 schemes in 2011	low
9	Promotion of Travel Plans	Increase in sustainable transport	WBC	LTP3, WBC green travel plan	2011 onwards	Number of travel plans in schools and businesses	Increase from 2011	low
10	Promotion of TravelSmart	Personalised travel planning to reduce car use	WBC	LTP3, WBC green travel plan	2011 onwards	Progress on the Croxley programme	N/A	low
11	Promotion of cycling and walking	Increase sustainable transport	WBC/HCC	LTP3, WBC green travel plan	2011 onwards	Number of cyclists and pedestrians	N/A	low
12	Develop Supplementary Planning Document for Air Quality	Develop SPD on AQ for inclusion in the 2011 Development Plan Document	WBC	LDF	2011	<ul style="list-style-type: none"> • Publication of SPD; • Number of planning applications made using the guidance; 	n/a	low
13	Annual Council vehicle fleet review	Maintain clean Council vehicle fleet	WBC	Green Travel Plan	2011	Age and Euro standard of Council vehicle fleet	n/a	low
14	Promote air quality within the Borough	Increase awareness of AQ as a health issue and the	WBC	Air Quality SPD; Green Travel Plans	2011 onwards	"Hits" on Herts&Beds Air Quality website	Increase on 2011	low
15	Continue to monitor air quality	Maintenance of air quality monitors and data management	WBC	LTP3, Green travel plan, Community strategy	2011	Number of operational monitors	Same as in 2010	low
16	Undertake feasibility	To investigate the air quality impact of	WBC	LDF, LTP3	2011	N/A	N/A	N/A

Watford Borough Council Air Quality Action Plan

	studies	any potential future schemes						
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4 Implementation Plan

4.1 Feasibility Studies

To facilitate the implementation of the traffic management options, traffic surveys of the current levels need to be reassessed. Following implementation of any option, the impact on the traffic can then be reviewed and the success of the option measured. Traffic survey data will become available as the Intelligent Transport Systems are being fully considered. These traffic data can be compared to those undertaken in the past for the purposes of the detailed air quality assessments. Before and after traffic queue length surveys will be undertaken to ascertain the impact of measures. Targets will be set for other measures e.g. the number of travel plans to be implemented when base information is collected, e.g. number of eligible businesses within Watford.

4.2 Consultation

Consultees for the Action Plan

This draft Action Plan will be issued to the following consultees and as appropriate, the plan will be amended to reflect their views and comments.

All properties in the Air Quality Management Area
Hertfordshire County Council
Defra
Local Chambers of Commerce
Federation of Small Businesses
Bus Operators in Watford
All neighbouring borough and district Councils
All Watford Borough Council Departments
Highways Agency
Environment Agency
English Nature
Freight Transport Association

Watford Borough Council website for general public access

Monitoring the Action Plan: The Action Plan will be monitored annually and the results collated for the yearly progress report on the implementation of the plan.

5 Conclusions

This Action Plan describes the air quality assessment process that has taken place in Watford to date, identifies the role of traffic in the current problem and sets out a range of transport-focussed measures that could help improve air quality. In total, 21 options were considered. Some of these are based on measures already under consideration, and have been drawn from existing plans and policies. Additional options have been suggested to complement planned and ongoing activity. Of these options 16 have moved forward as measures for implementation or further feasibility study.

The objective of this Action Plan is to improve air quality at the Watford AQMAs to work towards meeting the national air quality objective for the protection of human health. To this end, where possible targets for the measures have been estimated and indicators to demonstrate progress have been identified. Prior to the implementation of this Action Plan a consultation process as described will be undertaken. Following the receipt of comments, a final plan will be produced followed by plan implementation.

Appendices

Appendix 1: Extent of Air Quality Management Areas

Appendix 2: Development of options and measures

Appendix 1

Extent of Air Quality Management Areas

Figure A-1: Watford AQMA no1 (St Albans Road) Map A

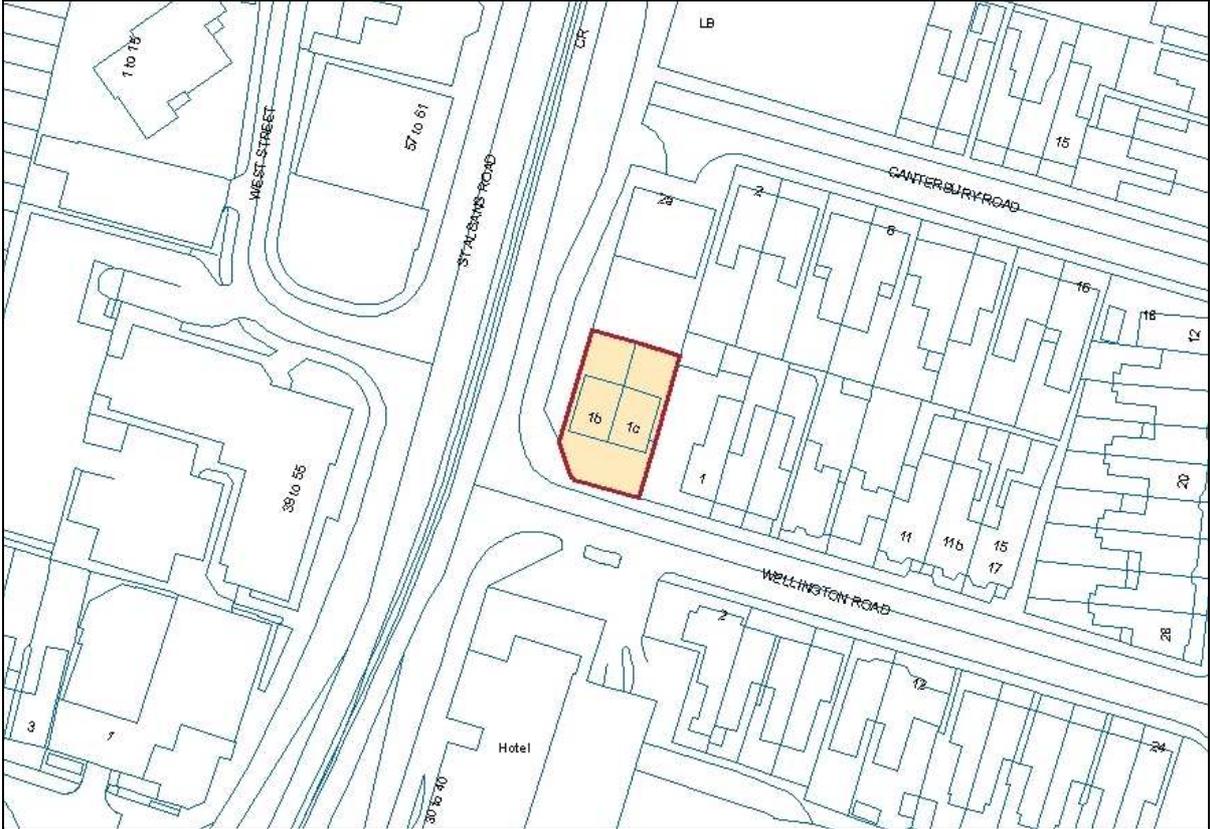


Figure A-2: Watford AQMA no1 (St Albans Road) Map B



Figure A-3: Watford AQMA no1 (St Albans Road) Map C

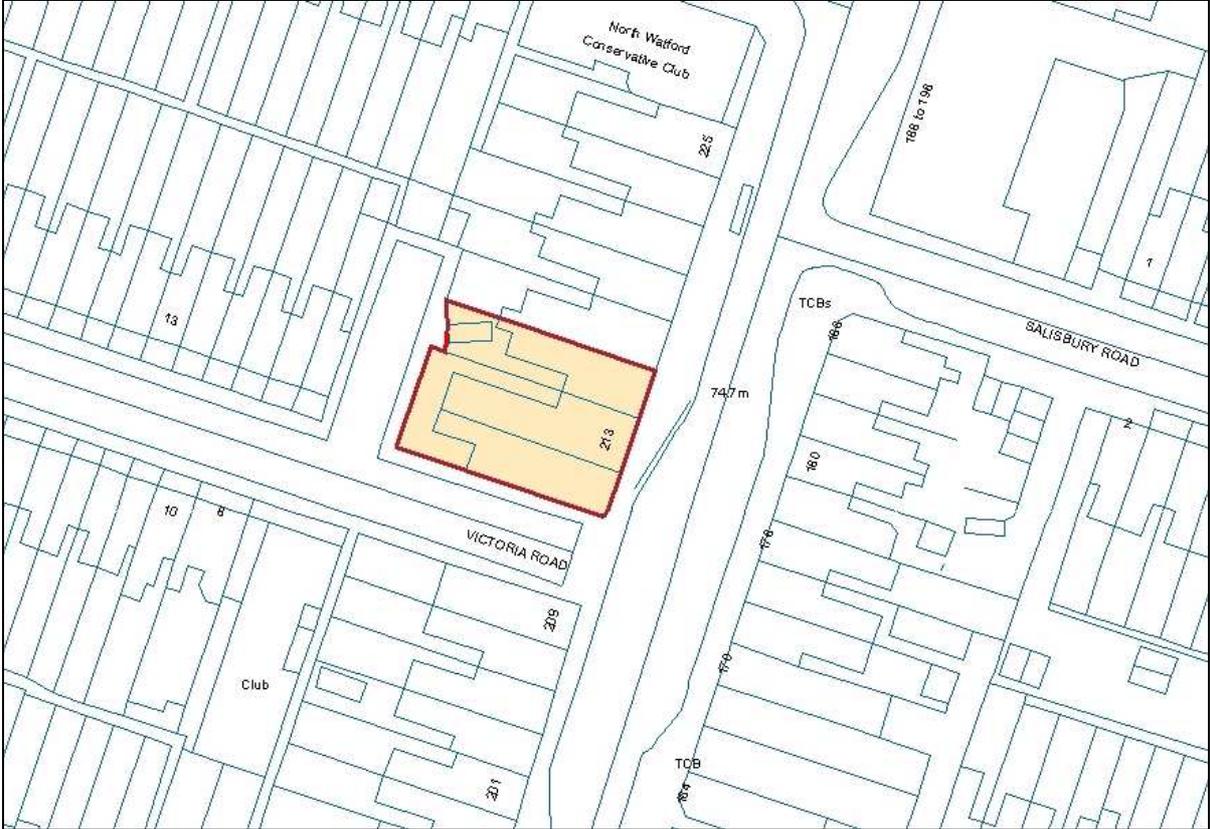


Figure A-4: Watford AQMA no1 (St Albans Road) Map D



Figure A-5: Watford AQMA no1 (St Albans Road) Map E



Figure A-6: Watford AQMA no1 (St Albans Road) Map F



Figure A-7: Watford AQMA no1 (St Albans Road) Map G

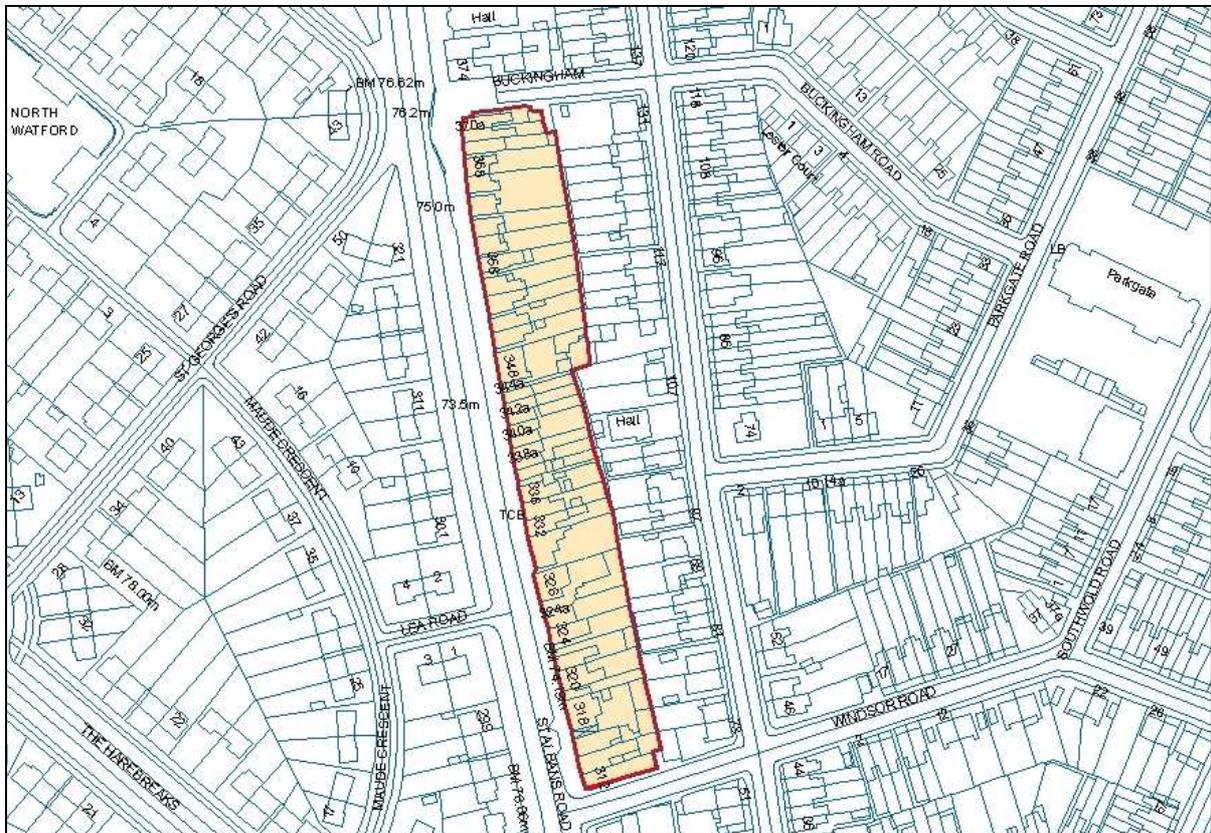


Figure A-8: Watford AQMA no1 (St Albans Road) Map H



Figure A-9: Watford AQMA no2 (Vicarage Road)



Figure A-10: Watford AQMA no3 (Aldenham Road)

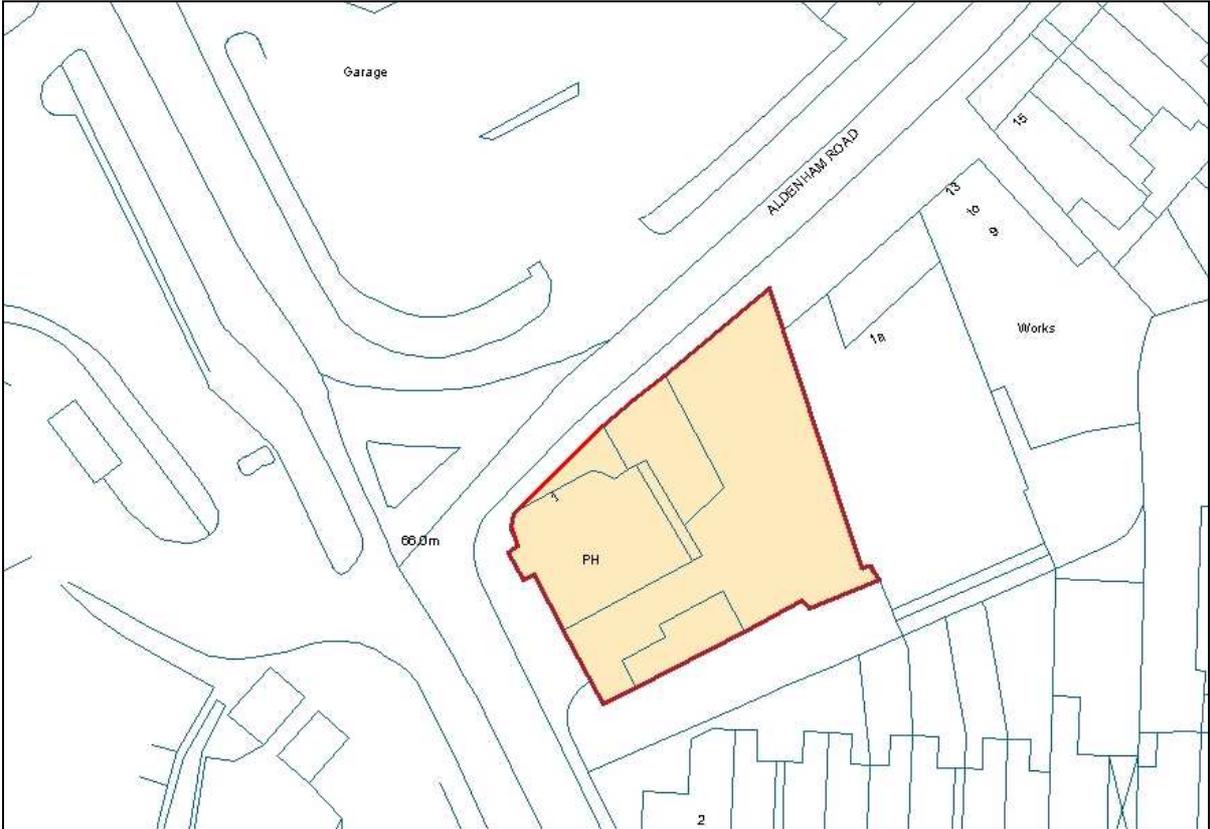


Figure A-11: Watford AQMA no4 (Chalk Hill)

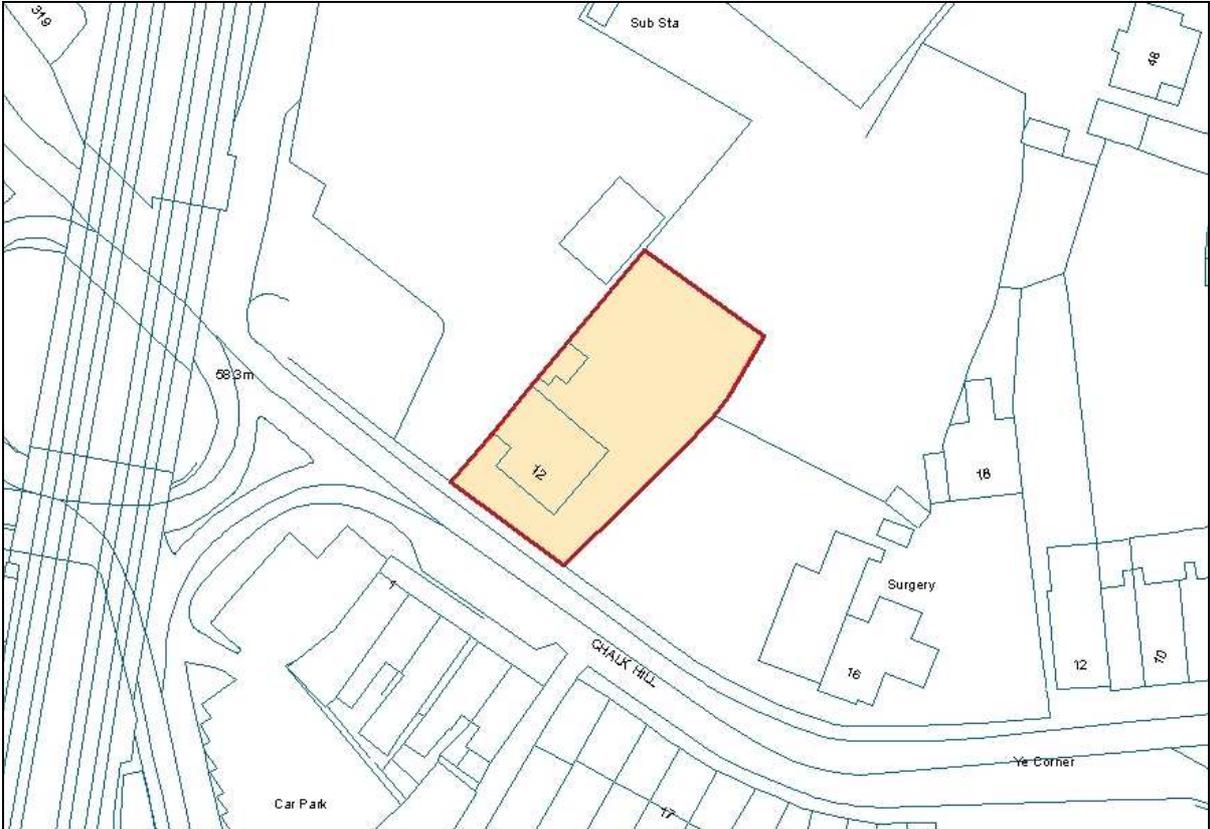


Figure A-12: Watford AQMA no5 (A405 / Horseshoe Lane)



Appendix 2

Development of options and measures

Methodology of option assessment from 2009 Action Plan

6 Development of the draft action plan, 2009

This section reports on how the Action Plan has been developed to date.

6.1 Formation of steering group

The development of the Action Plan began with a formal kick-off meeting, which was attended by a number of local authority officers. These officers will be informed and consulted throughout the development of the Action Plan. In this way the Action Plan should be influenced by their local knowledge and area of responsibility.

This steering group comprises:

- *Chair: Richard Brown, Environmental Health Manager (Commercial), Watford Borough Council*
- *Simone Smith, Assistant Environmental Health Officer, Watford Borough Council*
- *Matt Thomson, Planning Policy Manager, Watford Borough Council*
- *David Noble, Development Manager, Watford Borough Council*
- *Tina Gigg / Danielle Keogh, Transport Planning Officers, Hertfordshire County Council*

It was quickly evident that as the majority of issues were transport related, smaller subgroup could explore the options, as follows:

- *Chair: Richard Brown, Environmental Health Manager (Commercial), Watford Borough Council*
- *Simone Smith, Assistant Environmental Health Officer, Watford Borough Council*
- *Tina Gigg / Danielle Keogh, Transport Planning Officers, Hertfordshire County Council*

As a statutory duty, Watford Borough Council will consult widely outside of this group at an appropriate stage in the Action Plan process. Therefore other stakeholders will have the opportunity to influence the plan before it is adopted.

6.2 Actions to date

The steering group in developing the draft Action Plan has considered a full range of relevant options to reduce emissions from traffic within each of the 4 remaining AQMAs. The process has followed the available guidance and considered a wide range of measures before undertaking an initial assessment to eliminate measures that are not deemed feasible and thus will not be considered further at the present time.

Essentially the steering group adopted the following procedure:

- Consideration was given to the full range of potential options; and,
- Initial decisions were made on those options to eliminate from consideration at that stage.

There is a very wide range of options available to reduce the emissions from road transport. Watford Borough Council does not necessarily have the power to implement them all directly but potentially it does have a role in attempting to influence those bodies or individuals who could implement them. Therefore, it is appropriate for Watford Borough Council to initially consider all options.

Watford Borough Council's consultants have structured the options into a typology, which is presented in the table below.

Table 6 Typology of potential options to reduce emissions in AQMAs

Type	Description	Notes
1	Strategic actions	The underlying reason why AQMAs have been declared

Table 6 Typology of potential options to reduce emissions in AQMAs

Type	Description	Notes
		<p>is the massive increase in road transport activity over decades and the fact that this activity is very largely unregulated. The freedom to travel has created local environmental stress in urban areas and global stress due to its contribution to climate change.</p> <p>A local long-term strategy is required for an overall reduction in pollutant and greenhouse gas emissions. Such a strategy might include:</p> <ul style="list-style-type: none"> • Building the capacity to better assess and manage the environmental impacts from road transport • Specific commitments or targets within local development and transport planning policy to significantly reduce the impacts of new development
2	Move receptors away from the AQMA	Receptors are the people exposed to adverse pollutant levels in the AQMAs. If they were no longer resident in the AQMAs then there would be less pressure to do anything further to reduce pollution in the AQMAs. Note that this option therefore makes no effort to reduce emissions in any way. In this situation there is a danger that traffic activity will continue to increase and new locations will need to be declared as AQMAs.
3	Move sources away from the AQMA	The source is road transport. Construction of new roads could divert traffic away from the roads in the AQMAs. Less traffic on these roads results in lower pollution levels in the AQMAs. However, the opportunity to build such roads is frequently absent. In cases where such roads can be built, care needs to be exercised that the locations where the new roads are built do not become AQMAs in turn. Note that this option moves emissions from one location to another with no requirement to reduce them. Overall emissions may be increased by such actions.
4	Optimise how sources move through the AQMA	Changes in how the roads in the AQMAs are signed or otherwise managed could reduce emissions from road transport a) by diverting some traffic onto better routes for them or b) by reducing the amount of time that traffic is stationary with engines idling. Note that the opportunity to take such action is frequently limited.
5	Reduce emissions from sources by technical means	The majority of vehicles using roads in the AQMAs are conventional petrol or diesel powered vehicles with a range of ages. There are many technical options to convert such vehicles into ones using cleaner engine and fuel technology. By accelerating the uptake of these technologies the emissions in the AQMAs would be reduced. Note that technology does not always work in a positive sense for all emissions. They sometimes trade benefits for one pollutant against disbenefits for another one.
6	Reduce emissions from sources by reducing the demand for travel or achieving better travel choices	An important way to reduce emissions from transport is to reduce the number of journeys made through the AQMAs. This could be achieved either through avoiding making some journeys or by ensuring that these journeys are made via a less polluting form of transport. The success of such measures depends on policies that influence how people make travel choices. Note that there is increasing emphasis placed on such policies and that they work holistically by reducing emissions of all pollutants and greenhouse gases.

Table 6 Typology of potential options to reduce emissions in AQMAs

Type	Description	Notes
7	Other options	It may be that Watford Borough Council feels that it cannot implement measures or influence others to implement measures alone. In this case it may appeal to central government or its agencies (such as the Highways Agency) to take further steps to bring about the necessary improvements in air quality. Note that national measures take many years to be negotiated, implemented and finally to have a significant effect. They are also frequently a less cost-effective way to solve problems in an AQMA than local measures.

These options were considered worth further examination since they do address the relevant emission sources and it was felt that the approaches to implementing such options had some feasibility and it lay within the powers of local government to implement them.

As part of this process, Watford Borough Council has undertaken an initial assessment to identify some of the best options available for improving air quality in the AQMAs and the potential impact of the Local Transport Plan. The key measures could potentially include:

- Strategic measures to avoid worsening air quality;
- Efforts to reduce dependence on cars (e.g. the travel plan); and,
- Efforts to reduce HGV flow through the AQMAs.

These measures have been represented for modelling purposes within the Further Assessment as:

1. **Impacts of strategic measures to avoid worsening Air Quality:** To assess this Watford assumed Zero growth in traffic in the AQMAs from 2006 to 2010;
2. **Impacts of efforts to reduce dependence on cars (i.e. the travel plan, etc. measures):** To assess this Watford assumed a reduction of 10% in car flow rates from 2006 to 2010, with all other vehicle flow rates remaining at 2006 levels; Watford assumed that congestion may be unaffected by this approach although in reality short term improvements in congestion may result. Long term reductions in congestion may require parallel policies to 'lock in' benefits. Such policies may include access restrictions or a change in road-use priorities to promote more sustainable travel modes.
3. **Impacts of efforts to reduce HGV flow through the AQMAs:** To assess this Watford assumed A reduction of 10% in HGV flow rates from 2006 to 2010, with all other vehicle flow rates remaining at 2006 levels.

The measures taken forward within the 2009 draft Action plan are presented below.

Table 7 Summary of options included within the draft Action Plan, March 2009						
Measure	Focus	Lead	Planning phase	Implementation phase	Indicator	Target emission reduction
Develop Options into fully planned and costed measures.	Identify most appropriate options for improving air quality within each of the AQMAs – Consideration of Options listed below:	WBC	2009	2009	Provision of prioritised list of options.	N/A
Improving links with Local Transport Plan	Decide best options to reduce emissions in AQMAs	WBC and HCC	Ongoing	TBC	Adoption of LTP	AQ Target for each measure
Improving links with Local Planning and Development framework	Avoid deterioration of local AQ	WBC	Ongoing	TBC	Adoption of corporate strategy/Development and adoption of new planning policies	N/A
Bypasses	Assess potential to reduce traffic entering AQMAs	WBC and HCC	2009/10	Outcome following consultation and further assessment	Reduced traffic flows through AQMAs through diversion of traffic to alternate routes	TBC
Control access for freight	Assess potential to reduce traffic entering AQMAs	WBC and HCC	2009/10	Outcome following consultation and further assessment	Reduced HGV and LGV traffic flows through AQMAs	TBC
Control access for buses	Assess potential to reduce traffic entering AQMAs	WBC and HCC	2009/10	Outcome following consultation and further assessment	Reduced bus traffic flows through AQMAs	TBC
Traffic light phasing	Assess potential to reduce traffic congestion	WBC and HCC	2009/10	Outcome following consultation and further assessment	Emissions reduction/Reduction in queuing	TBC
Retain Speed controls	Vehicle emissions	WBC	2009/10	Outcome following consultation and further assessment	Emissions reduction	TBC
Other traffic management schemes	Reduce congestion and vehicle km	WBC	2009/10	Outcome following consultation and further assessment	Emissions reduction/Reduction in queuing	TBC
Explore introduction of Low Emission Zone	Assess potential to reduce unit emissions in the AQMA	WBC and HCC	2009/10	Outcome following consultation and further assessment	Reduction in unit emissions	TBC
Freight quality partnerships	Target reduction in emissions from freight	WBC and HCC	2009/10	Outcome following consultation and further	% uptake of scheme/emissions reduction	TBC

Table 7 Summary of options included within the draft Action Plan, March 2009

Measure	Focus	Lead	Planning phase	Implementation phase	Indicator	Target emission reduction
				assessment		
Education/Awareness Raising – Low emission vehicles	Target reduction in emissions	WBC	2009/10	Outcome following consultation and further assessment	% uptake of LEVs	TBC
Green procurement – Council/ Buses/ Local Business	Target reduction in emissions from Council, bus and local commercial fleet.	WBC	2009/10	Outcome following consultation and further assessment	% change/uptake of LEVs	TBC
Differentiate parking charges	Encourage consideration of alternative/ cleaner forms of transport	WBC and HCC	2009/10	Outcome following consultation and further assessment	% change/uptake of cleaner transport	TBC
Provide information relating to travel options/ public transport	Reduce reliance on car and reduce queuing time in AQMA	WBC	2009/10	Outcome following consultation and further assessment	Reduction in peak time flows and reduced queuing	TBC
Access to alternative modes (cycling + walking)	Reduce reliance on car and reduce queuing time in AQMA	WBC	2009/10	Outcome following consultation and further assessment	Reduction in peak time flows and reduced queuing	TBC
Green Travel Plans for large businesses and institutions	Reduce reliance on car and reduce queuing time in AQMA	WBC	2009/10	Outcome following consultation and further assessment	Reduction in peak time flows and reduced queuing	TBC
Parking provision, Park and Ride	Assess potential to reduce traffic entering AQMAs	WBC and HCC	2009/10	Outcome following consultation and further assessment	Adoption of scheme/Reduction in traffic flows through AQMAs	TBC
Commercial delivery strategy	Target reduction in emissions from local commercial fleet	WBC and HCC	2009/10	Outcome following consultation and further assessment	Reduction in HGV/LGV flows through AQMAs	TBC
Road use charging and workplace parking levy	Reduce reliance on car and reduce queuing time in AQMA	WBC and HCC	2009/10	Outcome following consultation and further assessment	Reduction in traffic flows in AQMAs	TBC
Vehicle idling regulations	Target reduction in emissions	WBC	2009/10	Outcome following consultation and	Emissions reductions	TBC

Table 7 Summary of options included within the draft Action Plan, March 2009

Measure	Focus	Lead	Planning phase	Implementation phase	Indicator	Target emission reduction
	from idling vehicles			further assessment		

AEA group
Gemini Building
Didcot
Oxfordshire
OX11 0QJ

Tel: 0870 190 6440
Fax: 0870 190 6318

