Annex C:

The Royal Borough of Windsor & Maidenhead

Air Quality Action Plan

(Draft Version - March 2006)

The Royal Borough
Windsor & Maidenhead
planning & environment

INTRODUCTION

Part IV of the Environment Act 1995 place a statutory duty for local authorities to periodically review and assess air quality. This process, known as Local Air Quality Management (LAQM) involves the monitoring and the assessment of current and future air quality. Where any potential exceedences of the National Air Quality Objectives (AQO) are identified then the LA has a statutory duty to prepare an AQAP and work towards meeting the objectives as set in the Air Quality Regulation 2000 and (amendment) Regulation 2002).

LAs are assisted with their LAQM work by a number of policy guidance produced by DEFRA. Those include, the LAQM PG 03 and its addendum LAQM PGA 05 and the technical guidance LAQM TG 03 provides. The PGA(05) recommends that, where road traffic is the main contributor to the exceedences of the objectives then LA should integrate the AQAPs within the LTPs.

The RBWM has undertaken the following assessments.

Air Quality Review & Assessment	**Exceedences of AQO**
Stage 3 Review and Assessment 2000	Potential exceedences of NO_2 and PM_{10} – no relevant exposure
Update Screening and Assessment 2003	Potential exceedences of NO_2 annual mean – with relevant exposure
Detailed Assessment (August 2004)	Exceedences of NO_2 annual mean, declaration of two AQMAs
Annual Progress Report (April 2005)	NO_2 annual mean – Reporting to DEFRA: monitoring results and assessment
Further Assessment (December 2005)	Exceedences of NO_2 annual mean confirmed findings of Detailed Assessment
Update and Screening Assessment (Due by April 2006)	Assessing any changes that would have an impact on air quality, e.g. traffic flows, new developments

The aim of the Detailed Assessment (DA) for NO_2 was to determine whether the potential exceedences would be realised and if there was any relevant exposure. Importantly if exceedences and relevant exposure were to be identified the Borough would be required to declare an Air Quality Management Area (AQMA) for each identified locations. The DA was completed in August 2004 and reported to DEFRA for scrutiny. The assessment identified two areas where the annual mean objective for NO_2 was likely to be exceeded and therefore, following DEFRA's approval of its findings, the RBWM formally declared two AQMAs.

The areas were declared by way of order in February 2005 and include:

- Maidenhead Town Centre,
- The roundabout junction of the A322 Eton & Windsor Relief Road & Clarence Road.

Following the completion of the DA the Borough undertook a Further Assessment (FA) of existing and future air quality within each management area. The aim of the FA was to confirm the findings of the DA and updated the NO2 contour maps derived from the dispersion model used initially in the DA. The FA concluded that the zone of exceedence may be wider in Maidenhead, while in Windsor may be narrower than those identified in 2004 and recommended the Borough to maintain the two AQMAs.

IMPACT OF TRANSPORT AND EMISSION REDUCTION

In urban areas and along busy roads vehicle emissions are responsible for poor air quality. In the RBWM road traffic emissions of NO_2 within the AQMAs account for almost 40% of its total ambient concentration, the other 60% is attributable to background concentrations and other local emissions. High road traffic volumes and road congestion in and around the Borough are among the most important issues that the RBWM is focusing on in preparing the action plan.

The Borough's latest assessment, named 'Further Assessment' based on air quality monitoring data and traffic counts data has modelled the ambient air concentration of NO_2 within the AQMAs. The FA provides an indication of road traffic emission reductions required the meet the NO_2 annual mean objective.

The reduction required in both areas expressed as annual mean is of approximately of 12 µg/m^3.

Total NO_2 monitored concentration	NO_2 annual mean objective	NO_2 required emission reduction
52 µg/m^3	40 µg/m^3	12 µg/m^3

Assuming that the contribution of road traffic to total ambient concentrations is of 20 µg/m^3 then a 12 µg/m^3 reduction equates to a 60% reduction of current road traffic.

PROPOSED MEASURES

In preparing and implementing the AQAP the RBWM seeks to manage short-term episodes of high pollution deriving from high traffic volume at peak hours, during the week and at weekends. This is the most important factor within the AQMAs that dictates the exceedence of the annual mean for NO_2.

The Local Transport Plan is the main tool locally for ensuring air quality. Improving air quality is one of the shared priorities for transport agreed by Government and the Local Government Association, and has been integrated into co-ordinated local objectives for transport within the LTP.

The LTP aims to improve air quality across the Borough by: improving sustainable travel options; improving management of the highway network; introducing mobility management measures (such as real-time information); and introducing limited demand management measures such as parking controls in congested areas.

Following appraisal of a various strategy options, a preferred strategy option was then identified (Table 5.5, Chapter 5), and most of the measures listed in the action plan have been identified from the preferred strategy option.

The LTP identifies the baseline situation with regard to air quality within the two AQMAs, sets future targets, identifies measures to address transport related pollution and sets out the quantified impacts of these proposed measures. The LTP aims to integrate the Action Plan measures that deal with transport related issues.

Action	Details	Responsibility	Impact on AQ	Cost	Other Impacts
MOBILITY MANAGEMENT					
Awareness campaigns	o Undertaking activities designed to highlight the adverse impacts of unsustainable car use, and draw attention to the existence and benefits of alternative travel modes and fuels, e.g. printed materials, web site information, promotional events, etc. This will encourage a change in travel behaviour and fuel use, leading to a reduction in emissions.	RBWM: Environment & Planning	High	Low	Wider environmental benefits
Education programmes	o Delivering training to give people the necessary skills to be able to travel safely and independently using sustainable travel modes rather than the private car. o Providing educational material designed to increase knowledge and understanding of air quality and environmental issues, encouraging sustainable behaviour.	RBWM: Environment & Planning / Education	Med	Low	Promotion of sustainable living
Travel information & advice	o Providing information on available travel options, both pre-trip and in-trip, to enable individuals to make informed decisions about where, when and how to travel. This includes printed material (e.g. public transport timetables), as well as real-time information (e.g. bus arrival times, car parking data, congestion information, air quality statistics, etc).	RBWM: Environment & Planning Highways Agency Operators Other service providers	Med	Low	Will Improve communication technologies.
Travel plans	o Delivering measures tailored to the needs of individual organisations, such as schools, hospitals and businesses, aimed at promoting sustainable travel choices and reducing reliance on the private car, e.g. changes to corporate policies, working practices, pay and benefits, on-site facilities, etc.	RBWM: Environment & Planning / Education Schools Hospitals Businesses	High	Low	Will Improve environmental performance

Action	Details	Responsibility	Impact on AQ	Cost	Other Impacts
	o These will be secured through voluntary take-up and as legal requirements associated with planning consents, and will include construction travel plans where appropriate. o The Council will progress its own travel plan to act as an exemplar.				
Lift sharing	o Working in conjunction with neighbouring authorities to develop an area-wide lift-sharing database, encouraging individuals and organisations to make use of the scheme in order to reduce the number of single-occupancy car journeys, particularly for commuting & business purposes. o Establishing self-contained lift-sharing schemes for both LEA and independent schools to reduce the number of car trips to and from schools, particularly where alternative modes of travel are unavailable or impractical.	RBWM: Environment & Planning Neighbouring authorities Businesses Schools	Med	Low	Will reduce road congestion
E-services	o Providing on-line services to enable everyday activities to be completed electronically, thereby reducing the need to travel, e.g. on-line applications and payments for Council services, shopping, banking, home working, etc.	RBWM: all departments Businesses	Med	Med	Will improve communication technologies
Ticketing solutions	o Establishing electronic payment systems to facilitate use of public transport, making these services more attractive, and providing operators with detailed usage information, informing service development. o Promoting combined travel/entry tickets for major events and tourist attractions to encourage access by public transport.	RBWM: Environment & Planning, Leisure Cultural & Property Operators Tourist/leisure attractions	Low	Med	

Action	Details	Responsibility	Impact on AQ	Cost	Other Impacts
NETWORK MANAGEMENT					
Urban traffic control	o Extending the current UTC♦ system in Maidenhead and Windsor to allow central management and control of signal-controlled junctions, enabling signal phasing to be optimised to respond to changing traffic flows and co-ordination of signals across an area in order to reduce congestion and exhaust emissions.	RBWM: Environment & Planning	Med	Med	Reduced road traffic congestion
Bus / cycle priority	o Introducing priority measures will help reduce journey times, improve journey reliability and improve safety for cyclists / motorcyclists, making these modes more attractive for everyday travel.	RBWM: Environment & Planning	Med	Med	Increased promotion of sustainable travelling
Junction improvements	o Modifying the layout of junctions experiencing chronic congestion in order to optimise traffic movements and reduce emissions.	RBWM: Environment & Planning	Low	Low	Reduced road traffic congestion
Safer routes to schools	o Creating an appropriate environment for children to walk and cycle to school, addressing safety and security concerns identified through consultation for School Travel Plans. Schools prioritised by number of road traffic accident casualties and car mode share	RBWM: Environment & Planning	Med	Med	Health benefits and reduced congestion at peak hours
Parking enforcement	o Improving enforcement of parking restrictions and off-street parking to reduce congestion, and increase turnover and reduce the number of vehicles circulating in town centres to look for parking.	RBWM: Environment & Planning	Med	High	Improved road safety for cyclists / motorcyclists.
IMPROVING SUSTAINABLE TRAVEL OPTIONS					
Pedestrian / Cycling Facilities	o Providing new / improved routes and crossing facilities along desire lines to increase walking / cycling activity and reduce unnecessary car use for short trips	RBWM: Environment & Planning	Med	Med	Health and environmental benefits
Supported bus services	o Providing financial support to local bus services with the aim of achieving commercially sustainable levels of patronage, encouraging a shift away from car use.	RBWM: Environment & Planning	High	Med	Will promote public Transport

♦ Urban Traffic Control

Action	Details	Responsibility	Impact on AQ	Cost	Other Impacts
	o Low emission vehicles will be specified for contracted services.	Operators			
Public transport infrastructure improvements	o Introducing a range of improvements to enhance the accessibility and attractiveness of public transport, e.g. raised kerbs, shelters, lighting, etc.	RBWM: Environment & Planning	Low	Med	Will promote public Transport
Quality bus partnership	o Working with operators and neighbouring local authorities to develop high-quality, cross-boundary bus services, incorporating criteria relating to vehicle emission standards where appropriate.	RBWM: Environment & Planning Neighbouring local authorities Operators	Low	Med	Will promote public Transport
Park & Ride	o Exploring opportunities for park and ride to the north of Windsor to intercept M4 traffic, and tackle air quality problems along the Windsor & Eton Relief Road. Options under consideration include a possible link with the centre of Windsor via the Windsor/Slough rail line.	RBWM: Environment & Planning Neighbouring local authorities Highways Agency DfT Rail Operators	High	High	Wider environmental benefits Land taking
Inter-urban coach services	o Working with neighbouring authorities and the Highways Agency to progress a north-south route linking High Wycombe, Marlow, Maidenhead, Bracknell, Blackwater and Farnborough, reducing the number of inter-urban car trips.	RBWM: Environment & Planning Neighbouring local authorities Highways Agency Operators	Med	Med	Will promote public Transport

Action	Details	Responsibility	Impact on AQ	Cost	Other Impacts
Rail partnerships	o Working in partnership with DfT Rail and train operating companies to develop better and more attractive services, tackling peak hour congestion, improve interchange, enhance accessibility and facilitate integration with other modes, making rail travel a realistic alternative to the car for commuting, shopping and leisure trips.	RBWM: Environment & Planning Neighbouring local authorities DfT Rail Operators	High	High	Will promote public Transport
DEMAND MANAGEMENT					
Parking standards	o Imposing strict maximum parking standards for new development as identified in the Borough's Parking Strategy will help to mitigate the traffic and air quality impacts of new development	RBWM: Environment & Planning	Med	Low	Wider environmental benefits
Public parking regimes	o Setting parking charges and permitted length of stay in public car parks in town centre locations to favour short-stay parking for shoppers and visitors will encourage use of park and ride / sustainable modes for long-stay visits / commuting trips.	RBWM: Environment & Planning	Med	Low	Health and environmental benefits
VEHICLES EMISSIONS TESTING					
Council own fleet and contractors	o Ensuring compliance with emission standards and ensuring that vehicles are used sensibly and are well maintained and that routes and tasks are co-ordinated to be as efficient as possible.	RBWM: Environment & Planning	Low	Med	Improved environmental performance
VOSA and other Testing	o Carbon monoxide (CO) and hydrocarbons (HC) are normally tested, RBWM will look into the possibility of testing NOx emissions	RBWM: Environment & Planning VOSA	Low	Med	Increased motorist awareness
NEW TECHNOLOGIES					
New schemes and trails	o Participating in and supporting schemes that involve the use of alternative fuels and trials of new materials that will adsorb reduce or eliminate NOx emissions.	RBWM: Environment & Planning	N/A	N/A	Wider environmental / health benfits

Action	Details	Responsibility	Impact on AQ	Cost	Other Impacts
Hybrid vehicles and hydrogen fuelled vehicles	o Promoting, where possible, the use of less and non polluting vehicles	RBWM: Environment & Planning	N/A	N/A	Wider environmental / health benfits
WASTE MANAGEMENT					
Increase composting facilities	o Reducing the need for bonfires and shredding services	RBWM: Environment & Planning	Low	Med	Wider environmental benefits
Home composting scheme	o Reducing the amount of household waste.	RBWM: Environment & Planning	Low	Med	Reduced pressure on landfill
STATUTORY DUTIES: CONTROL AIR POLLUTION FROM INDUSTRIAL / COMMERCIAL AND RESIDENTIAL SOURCES					
Use powers under the Environmental Protection Act, 1990	o Permitting and inspecting Part B processes. Working with construction companies to reduce air pollution from construction sites.	RBWM: Environment & Planning	Low	N/A	Wider environmental benefits
Investigate AQ related complaints	o Environmental Protection (EP) will liaise with Environment Agency regarding smoke from illegal burning of waste and dust complaints.	RBWM: Environment & Planning	Low	N/A	
AIR QUALITY MONITORING					
Maintaining two air quality monitoring stations	o EP calibrates the stations fortnightly, liaise with ERG and attends the stations when needed.	RBWM: Environment & Planning	N/A	Low	none
Sampling diffusion tubes to monitor NO_2	o RBWM has a network of 25 passive diffusion tubes, the network will be revised in 2006.	RBWM: Environment & Planning	N/A	Low	none
Monitoring PM_{10}	o RBWM wishes to carry out some real monitoring of PM_{10} in Maidenhead town centre.	RBWM: Environment & Planning	N/A	Low	none
AADT	o EP will liaise with Highway to undertake additional traffic flow monitoring.	RBWM: Environment & Planning	N/A	Low	none

TARGETS AND OUTC0ME

LTP authorities are required to report on up to 17 mandatory indictors, although the LTP8 indicator for air quality is required only where an Air Quality Management Area has been declared, except where this is not related to road transport, or is solely related to trunk roads. These mandatory targets assist the measurement of progress on the shared priorities for transport.

When considering the setting of targets for pollutants concentrations for Mandatory Indicator LTP8, the authority should undertake an impact assessment of those LTP measures likely to have an impact within the AQMA .

The LTP should quantify, where possible, the expected air quality impacts of all proposed measures being undertaken within the Air Quality Management Area (AQMA). This should not only relate to specific air quality measures, but should as far as possible, also establish the likely air quality impacts of other proposed measures relating to the other shared priority areas, such as congestion, which might also have an beneficial impact on the air quality within the relevant AQMA.

Chapter 5 of the LTP presents the preferred strategy options and the corresponding benefits and associated costs of each option. In terms of air quality, Travel Plans and Park & Ride have been identified as the two interventions that will have the most significant impact on air quality. These will be assessed further in terms of their relative impacts on air quality within the two declared AQMAs. This does not however rule out the consideration of any combination of other options.

The LTP is required to set out a 2004/05 baseline and a 2010/11 target relating to concentrations of the pollutant that triggered the AQMA designation. There is however no suitable method for the annual assessment of NO_2 concentrations, and when considering the influence of meteorology in the dispersal of pollutants, it is possible that elevated concentrations may be observed, despite progress with reducing NO_X emissions within the AQMA. The LTP therefore measures progress against intermediate outcomes linked to the preferred strategy options, which are based on the numbers of road traffic vehicles and the emissions associated with the movement of these vehicles through the AQMAs.

The table below presents the air quality targets and trajectories for 2004/5 to 2010/11.

Area	**Intermediate outcome option**	**Baseline (2005/6)**	**Intermediate Outcomes**				**Target (2010/11)**
			2006/7	**2007/8**	**2008/9**	**2009/10**	
Windsor AQMA		49 μg/m³ A	-	-	-	-	40 μg/m³
	Traffic (all vehicles) within AQMA (NOx tonnes/annum)	12.5					-
	Total Traffic (AADT) entering AQMA	-					-

	Total Traffic (AADT) entering Park and Ride	-					-
	Total Traffic (AADT): Windsor	56,839	57,293	56,721	58,422	59,928	59,773
	Cycling Trips (Annualised): Windsor	106	109	104	106	109	112
Maidenhead AQMA		51 $\mu g/m^3$ [A]	-	-	-	-	40 $\mu g/m^3$
	Traffic (all vehicles) within AQMA (NOx tonnes/annum)	19.9					-
	Total Traffic (AADT) entering AQMA	-					-
	Total Traffic (AADT): Maidenhead	87,234	88,107	88,900	91,567	92,940	93,869
	Cycling Trips (Annualised): Maidenhead	106	109	112	115	118	120
Borough Wide	Percentage of people who usually travel to work by car or van	66 [B]					
	Percentage bus patronage for work travel	1.76 [B]					
	No. school travel plans	7	12	15	18	21	-
	Car mode share (%) of journeys to school (Primary Schools)	58	57	55	53	51	49
	Car mode share (%) of journeys to school (Secondary Schools)	35	35	34	33	32	31
	No. work travel plans	-	-	-	-	-	-
	Cycling Trips (Annualised)	106	109	112	115	118	120

[A] Based on concentrations monitored at roadside continuous monitoring stations. Concentrations at receptor locations will be lower.

[B] Based on 2001 Census data.

TRAFFIC DATA REQUIREMENTS

At this stage it is not possible to undertake a full impact assessment as traffic data is not available. Data is required for each intervention option so that an assessment of the overall effect of each option towards the achievement of the 2010/11 target can be identified.

Essentially, the LTP should identify the number of vehicles entering the AQMA on each route, and assess how this will change following the introduction of each of the identified options.

The tables overleaf detail the information that will be required for the assessment of each option. Therefore, the tables should be populated for the baseline and then recalculated for each option that will then be compared against the business as usual baseline. These forecast data will then be used to identify the intermediate outcomes, which then serve as annual objectives. On an annual basis, road traffic monitoring data will be compiled and reviewed in the context these intermediate outcomes to ensure overall progress towards meeting the 2010/11 target is maintained.

NO_X EMISSIONS and NO_2 CONCENTRATIONS

The traffic flow figures will be used to calculate the tonnes of NO_X emitted per annum within the AQMAs. This is undertaken on the basis of traffic flow, fleet mix, average vehicle speed and distance travelled on each road, and will provide a means for assessment against the intermediate outcomes.

The setting of the 2010/11 target will be supported through the application of atmospheric dispersion modelling, by assessing the relative contribution of each of the measures towards reducing ground level NO_2 concentrations.

This approach will use the modelling undertaken in the 2005 Further Assessment as the 2004/05 baseline. On the basis of the projected 2010 baseline and the traffic reduction achieved through the options by this date, it is possible to identify whether the target will be met, and which of the options deliver the most effective reduction in NO_2 concentrations. The required reduction in NO_2 concentrations can be related back to the required NO_X emission reductions and then the reduction in traffic flow required to meet the Air Quality Objective.

If the modelling shows that the target is not met then additional measures will require consideration.

Traffic data requirements for Windsor AQMA (Baseline)

Road	Traffic Flow (AADT24) and corresponding HGV %											
	2005		2006		2007		2008		2009		2010	
	AADT	%	AADT	%	AADT	%	AADT	%	AADT	%	AADT	%
B3024 Clarence Road (west)	5,936	3										
B3173 Imperial Road	5,936	3										
A308 Goslar Way	23,479	3										
Clarence Road (east)	5,207	3										
A332 relief (slip on from Maidenhead Arthur Road)	5,962	3										
A332 W&E relief south	32,144	3										
A332 W&E relief north	30,754	3										
A332 W&E relief (slip off to A308)	5,962	3										
Clarence Road roundabout	30,754	3										

Traffic data requirements for Maidenhead AQMA (Baseline)

Road	Traffic Flow (AADT24) and corresponding HGV %											
	2004/05		2006		2007		2008		2009		2010	
	AADT	%	AADT	%	AADT	%	AADT	%	AADT	%	AADT	%
A308 Crauford Road	13,997	3										
A4 Saint Cloud Way	25,266	3										
A4 Bath Road	21,270	3										
Roundabout (A4) / 2	12,072	2										
A308 Frascati. Way	17,171	3										
Grenfell Road	17,980	3										
Grenfell Road (A308)	36,134	3										
Broadway	10,340	3										
Queen Street	10,340	3										
High Street	10,340	3										
A308 King Street	36,134	3										
A308 Roundabout	19,772	3										
A308 Roundabout / 2	9,886	3										
A308 Braywick Road (N) / 2	17,440	3										
A308 Braywick Road (S) / 2	18,694	3										
A308 Braywick Road	36,134	3										