

# 2011 Air Quality Progress Report for

## *The Royal Borough of Windsor and Maidenhead*

In fulfilment of Part IV of the Environment Act 1995  
Local Air Quality Management

June 2011

*Royal Borough of Windsor and Maidenhead - England*

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<b>Report Reference number</b>	RBWM-PR11
<b>Date</b>	June 2011

## **Executive Summary**

The Report sets out the Progress Report 2011 (PR11) which forms part of the Review & Assessment process required under the Environment Act 1995 and subsequent Regulations.

The report builds on the information and the conclusions reached in the Progress Report 2010, the Detailed Assessment 2010 and the Updating & Screening Assessment 2009. It is an opportunity to report year on year on air pollution data as monitored across the Borough and provide updates on air quality measures and related plans.

Nitrogen dioxide (NO<sub>2</sub>) data within the AQMAs for 2010 showed annual average concentrations above the national annual mean objective of 40 µg/m<sup>3</sup> while the hourly objective for NO<sub>2</sub>, was not exceeded. Some sites outside of the AQMAs also showed exceedences of NO<sub>2</sub> annual mean objective. To improve monitoring within 'hot-spot' areas new diffusion tube monitoring sites were started in 2010 while others less relevant were discontinued. Four continuous monitors were installed for six months at sites of interest, the data collected is used to verify diffusion tubes and dispersion modeling results.

The report confirmed the need to declare new AQMAs near the M25, junction 13, in Wraysbury, site WM15 and near the junction between Winkfield Road and Imperial Road site WM0-3 and retain existing AQMAs. Data from continuous monitor in Windsor show a marginal decrease of annual mean concentration compared with 2009 and 2008.

There are a number of new developments in the Borough that link with the Air Quality Action Plan. In Windsor, the completion of works at Clarence Road Roundabout may bring improvements to traffic flow in the area, and a planned Park and Ride at Windsor racecourse may reduce road traffic. In Maidenhead the regeneration of the town centre, will take into account congestion and air quality issues. Other residential and commercial development will have to assess and mitigate possible air quality impacts.

Concentrations of NO<sub>2</sub> in Windsor areas show a downwards trend, in some case below the AQO. However the number and the geographical extend of AQMAs within the Borough has increased from two to four (including M25 area not yet declared) this is mainly due to the inclusion of areas near motorways.

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# **1 Introduction**

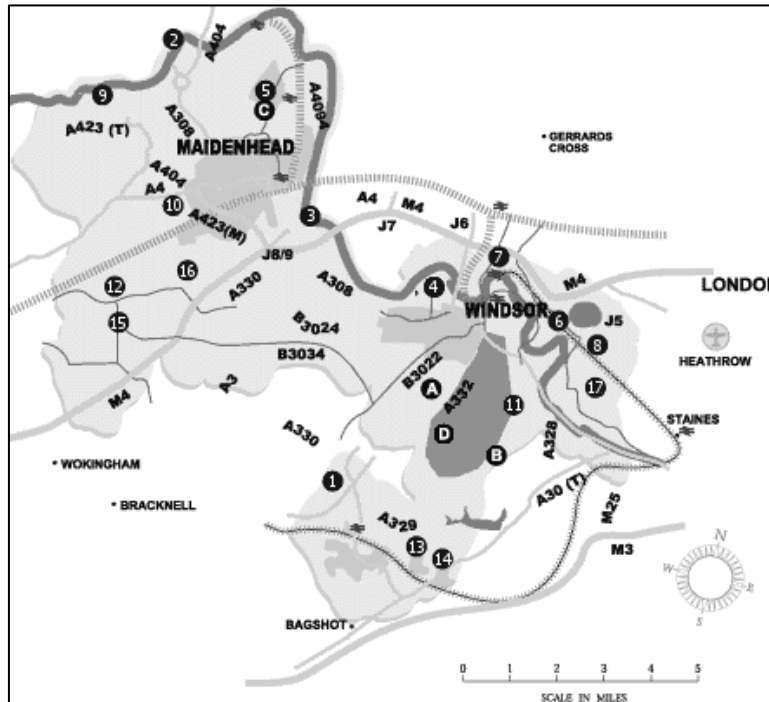
## **1.1 Description of Local Authority Area**

The Royal Borough of Windsor and Maidenhead is located towards the eastern end of the Thames Valley, just 25 miles to the west of London. It covers about 76 square miles and has a population of 133,626 people (2001 census). The bulk of the population is located in and around the main towns of Maidenhead, Windsor and Ascot. There are other 14 villages and 80% of its area is rural. The area is well served by strategic road and rail networks, with direct links into London and to the rest of the UK, Maidenhead will be Crossrail originating station in the west. The area is one of the most affluent in the South East with average incomes, house prices, and levels of car ownership amongst the highest in the country, 86% of households have at least one car. The jobs density as ratio of jobs to working-age population is 1.1, which means that there are more jobs than people, resulting in significant levels of inbound commuting. This is putting increasing pressure on both local and strategic transport infrastructure and services.

The Royal Borough is home to two of the country's top 10 visitor attractions – Windsor Castle and Legoland – and hosts the world famous Royal Ascot race meeting. Around 7 million domestic and foreign visitors come to Windsor & Maidenhead each year for business or pleasure, placing significant demands on local transport networks and parking facilities. Road traffic is the main sources of emissions in the Borough and although air quality across the Borough is generally good, in some areas concentrations of Nitrogen dioxide exceeds the national air quality objective. To date three areas have been declared as AQMAs and a fourth area is under assessment.

The busiest roads in the Borough are the A332 Relief Road, the A308 Windsor - Maidenhead and the A4. There is scope for economic growth and housing demand in the Borough, in particular in Maidenhead; this will place additional demands on local transport network and its capacity at peak time to control. Road traffic emissions and other sources from outside the Borough contribute to relatively high background concentration levels, these include motorways M3, M4, M25 and M40; the A4, A404(M), see map on page 7, the proximity of Heathrow Airport and the vicinity of London area are also important factors in determining high background concentrations, particularly during pollution episodes.

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### 1.2 Purpose of Progress Report

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the Local Air Quality Management process.

They are not intended to be as detailed as Updating and Screening Assessment Reports (USA), or to require as much effort. However, if the Progress Report identifies the risk of exceedance of an Air Quality Objective, the Local Authority (LA) should undertake a Detailed Assessment (DA) immediately, and not wait until the next round of Review and Assessment.

### 1.3 Air Quality Objectives

The air quality objectives applicable to Local Air Quality Management (LAQM) in England are set out in the Air Quality (England) Regulations 2000 (SI 928), and the Air Quality (England) (Amendment) Regulations 2002 (SI 3043). They are shown in Table 1.1. This table shows the objectives in units of microgrammes per cubic metre  $\mu\text{g}/\text{m}^3$  (for carbon monoxide the units used are milligrammes per cubic metre,  $\text{mg}/\text{m}^3$ ). Table 1.1. includes the number of permitted exceedances in any given year (where applicable).

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**Table 1.1 Air Quality Objectives included in Regulations for the purpose of Local Air Quality Management in England.**

<b>Pollutant</b>	<b>Concentration</b>	<b>Measured as</b>	<b>Date to be achieved by</b>
<b>Benzene</b>	16.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
	5.00 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2010
<b>1,3-Butadiene</b>	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
<b>Carbon monoxide</b>	10.0 $\text{mg}/\text{m}^3$	Running 8-hour mean	31.12.2003
<b>Lead</b>	0.5 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2008
<b>Nitrogen dioxide</b>	200 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2005
<b>Particles (PM<sub>10</sub>) (gravimetric)</b>	50 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
<b>Sulphur dioxide</b>	350 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

## 1.4 Summary of Previous Review and Assessments

The Borough has undertaken a Progress Report of local air quality for 2010, this is part of an on-going cyclical process of review and assessment and it fulfils the Borough's statutory duties surrounding Local Air Quality Management (LAQM). The Report included new monitored data and an update on measures and plans to work towards the Government's Air Quality Objectives (AQOs).

The PR11 builds on the information and conclusions reached in previous reports as submitted to DEFRA: the DA 2010 and the PR 2010. Also the,

- USA 09 submitted in June 2009
- Detailed Assessment accepted in November 2008
- Progress Report, submitted in July 2007
- USA submitted in October 2006
- Further Assessment, submitted in March 2006
- Detailed Assessment, submitted in 2004

In particular, the DA 2010 (Borough's third DA) identified two new areas where exceedences of the NO<sub>2</sub> objective occur and require AQMA status, the areas are in Wraysbury Road near the M25 (WM15) and the junction between Imperial/Winkfield Road in Windsor. The Progress Report in 2007 identified additional areas with potential exceedences of the NO<sub>2</sub> objective. A Detailed Assessment was carried out in 2008, it concluded that locations along Bridge Road (A4) in Maidenhead, along Windsor Road (A308 - near M4) in Maidenhead and along Arthur Road in Windsor need to be declared as AQMAs, two areas were the extension of the AQMAs declared in 2005 and the area near the M4 along Windsor Road was a new AQMA. The Borough is carrying out a FA for those areas.

<b>Chronological Summary</b>		
<b>Assessment</b>	<b>Date</b>	<b>Outcome</b>
Detailed Assessment	2004	To declare AQMAs in west Windsor and Maidenhead town centre
Further Assessment	2005/06	To retain AQMAs
Updating & Screening Assessment	2006	No Detailed Assessment required
Progress Report	2007	Detailed Assessment required
Detailed Assessment	2008	To declare new AQMA near M4, Windsor Rd and extended existing AQMAs.
Updating & Screening Assessment	2009	Detailed Assessment required
Progress Report	2010	As above
Detailed Assessment	2010	To declare new AQMA near M25, Wraysbury Rd and junction between Imperial/Winkfield Rd, Windsor.

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### **Phase 1 (2002 – 2003)**

The Borough completed Stages 1, 2 and 3 of the Phase 1 Review and Assessment process. The Stage 1 & 2 reports considered industrial sources, four Part A and twelve Part B installations in and around the Borough. The Part A installations located outside the Borough were not considered further in the process. The Part B installations and road traffic were investigated in the Stage 2 as sources of emissions. The A404, A404(M), A355, A322 (Eton), A308 (Braywick Road), A4, M4 (Junctions 7-8/9) and M25 were identified as potential sources of NO<sub>2</sub> and PM<sub>10</sub> emissions and required a further assessment at Stage 3.

The Stage 3 report concluded that the annual mean NO<sub>2</sub> and PM<sub>10</sub> AQOs may be exceeded at number of locations. However the Council concluded that there was no 'relevant exposure' at these locations and did not declare an AQMA.

### **Phase 2 (2003 – 2005)**

Since the publication of reports for the first round of review and assessment, there were a number of potential issues that needed to be addressed in terms of changes to the sources and emissions of pollutants that may affect ambient air quality in Borough. Furthermore, new policy developments and revisions to published guidance required consideration within the on-going assessment of air quality.

The USA 2004 concluded that the area including the roads, Broadway, Queen Street and Frascati Way in Maidenhead and the junction of the A332 and Clarence Road in Windsor should proceed to a Detailed Assessment for the potential exceedences of NO<sub>2</sub> objectives. Concentrations of NO<sub>2</sub> above the objective were identified at a number of locations. The Detailed Assessment concluded that on the basis of detailed dispersion modelling and passive diffusion tube monitoring, the annual mean NO<sub>2</sub> air quality objective was unlikely to be met by the required date at locations in Maidenhead town centre and at the junction of the A332 and Clarence Road in Windsor. In February 2005 the two areas were declared AQMAs. The areas near the M4 (Junctions 7-8) and M25 (Junctions 13) were assessed too but were not declared, however the M4 area was declared as AQMA in 2009 and the M25 area is in the process of becoming the forth AQMA.

The Progress Report 2005 included an update on the monitored data and other relevant information and reported on the progress made since the declaration of the AQMAs.

The Further Assessment in March 2006 based on better data allowed the Borough to review the conclusions from the Detailed Assessment 2004 in relation to the location and geographical extent of the AQMAs. It also contributed to the development of an Action Plan to reduce emissions of nitrogen oxides (NO<sub>x</sub>) from road traffic sources in the

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Borough. The Air Quality Action Plan (AQAP) was integrated into the Local Transport Plan 2006-2011, areas of the two plans with similar objectives were identified and linked in the outcomes.

The Progress Report in 2005 concluded that exceedences of the NO<sub>2</sub> annual mean AQO remained likely at the locations identified in the Detailed Assessment 2004, namely Maidenhead town centre and at the junction of the A332/Windsor Relief Road and Clarence Road in Windsor and to proceed with the preparation of and Air Quality Action Plans (AQAPs). The AQAP was submitted to DEFRA and Department for Transport (DfT) in March 2006 and accepted with a 'Good' score.

### **Phase 3 (2006 – 2008)**

The USA 2006 concluded that air quality standards for each pollutant included in national The Air Quality Strategy would not be exceeded at relevant sensitive receptor, except for NO<sub>2</sub> within the AQMAs.

No new developments with significant effects on local air quality were identified and no new industrial, domestic or mobile sources, or significant changes to these have occurred. The final conclusion of the USA was that, no location and pollutant requiring a Detailed Assessment was identified. However, early results from new additional monitoring, to be reported in the next Progress Report, showed some potential exceedences on NO<sub>2</sub> in areas outside the AQMAs.

The Progress Report 2007 highlighted several areas where NO<sub>2</sub> diffusion tube monitored concentration exceeded the annual mean AQO. In particular, Bridge Road in Maidenhead; Windsor Road in Maidenhead and Arthur Road, Alma Road, Osborne Road, Winkfield Road and Imperial Way in Windsor where identified as areas requiring DA. Following discussions with Defra about the findings of the Progress Report in 2007, it was decided that a DA for the mentioned areas will be carried out.

The DA 2008 undertaken by ENTEC, on behalf of the Borough, was initially rejected by Defra, it concluded that within the areas there were potential exceedences on NO<sub>2</sub> annual mean AQO, and the Borough needed to proceed with declaring those areas AQMAs. Defra accepted the assessment in November 2008 and its conclusions to declare the following areas:

- Area 1 - Arthur Road, Windsor;
- Area 2 - Bridge Road, Maidenhead; and
- Area 3 - Windsor Road, Maidenhead

and to continue monitoring at Alma Road, Osborne Road and Winkfield Road/Imperial Road junction in Windsor.

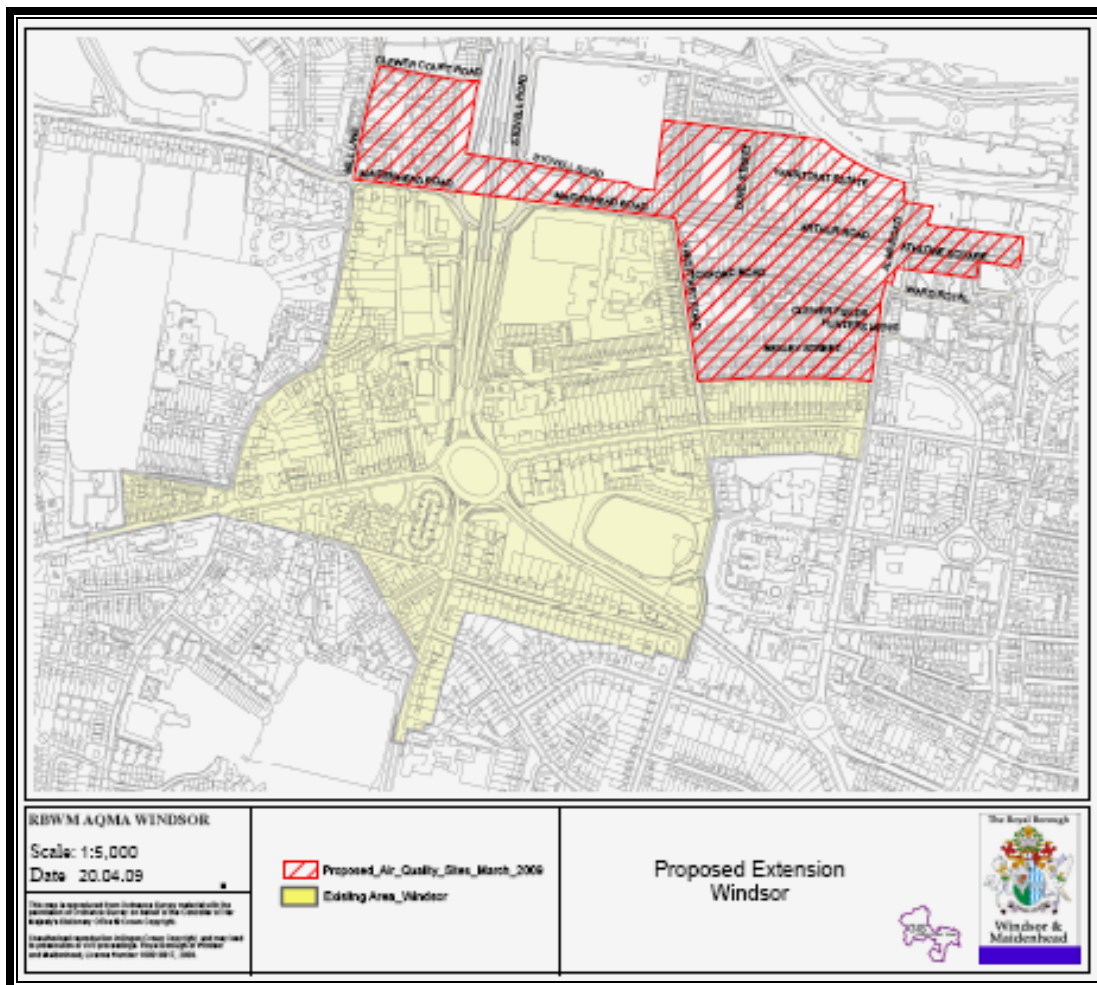
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The assessment considered relevant exposure criteria, whereby the annual mean objective is relevant only at locations where the public may regularly be exposed. This includes building façades of residential properties, schools and hospitals.

On the basis of the DA 08, the Borough declared AQMAs in relation to the exceedences of the NO<sub>2</sub> annual mean AQO for Windsor Road near the M4, Bray; Bridge Road along the A4 in Maidenhead; and Arthur Road in Windsor.

In Figures 1.1, 1.2 and 1.3 the new AQMAs as declared in July 2009, Windsor AQMA was extended to cover Arthur Road, Maidenhead AQMA was extended to cover Bridge Road along the A4 and the new AQMA area around the M4/A308/Braywick Road intersection.

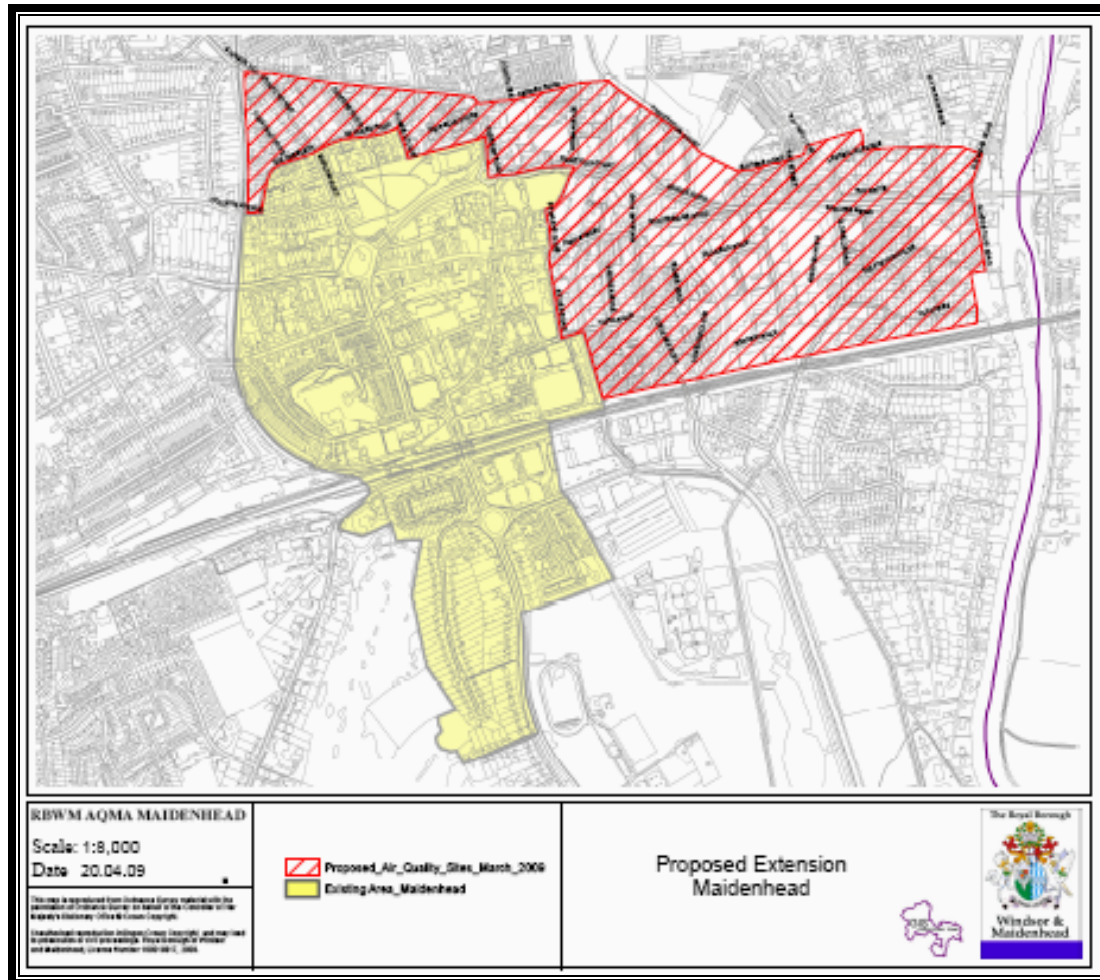
Figure 1.1 Windsor AQMA, Clarence Road Roundabout extended to cover Arthur Road



The red striped area is the extended AQMA in relation to that declared in 2005.

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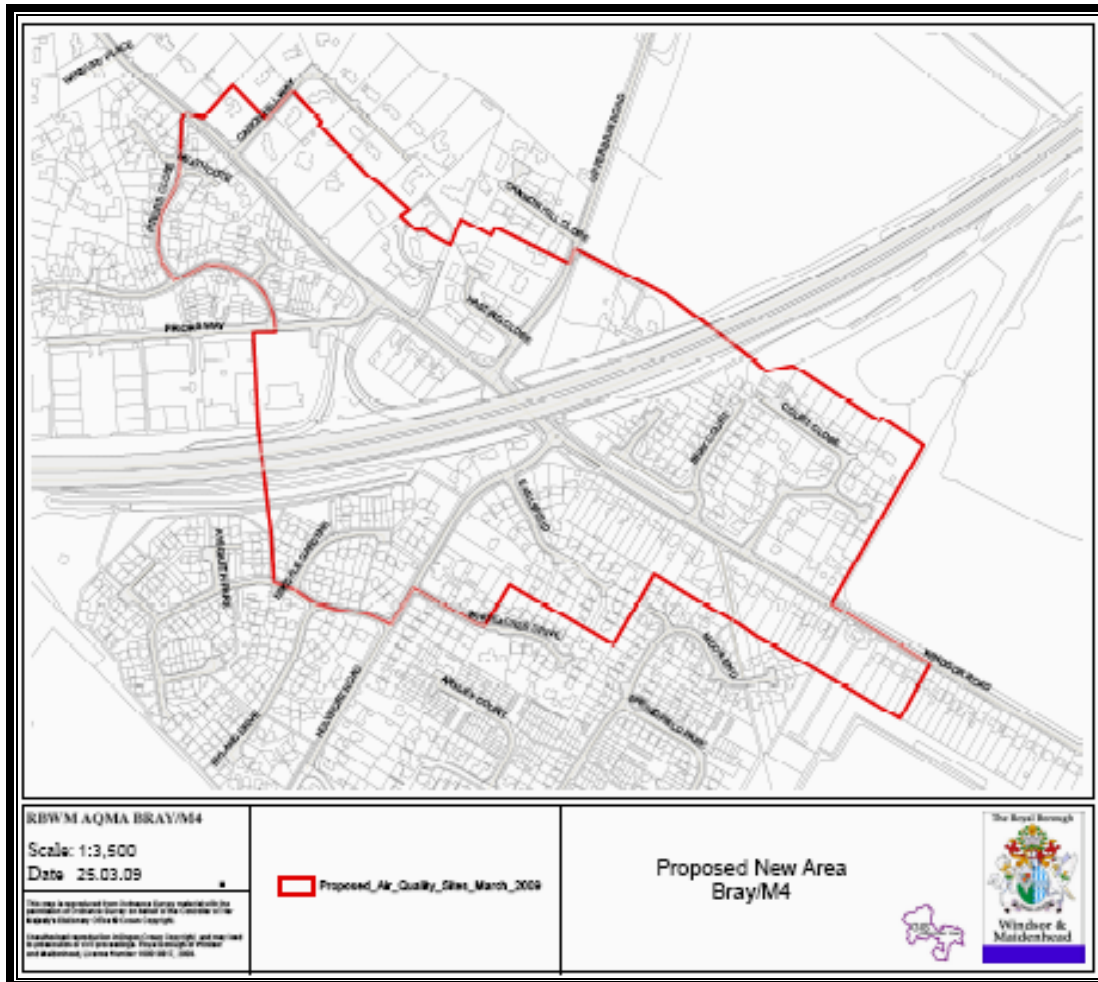
Figure 1. 2 Maidenhead AQMA extended to cover Bridge Road along the A4



The red striped area is the extended AQMA in relation to that declared in 2005.

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Figure 1.3 New AQMA, Windsor Road A308 – M4



### Phase 4 (2009 – 2011)

The USA 09 and subsequent discussion with DEFRA identified two new locations where a DA and additional monitoring was required: WM15 - Wraysbury Road near the M25 requiring a DA and WM0-3 (Winkfield Road/Imperial Road junction) requiring additional monitoring, new diffusion tubes sites were started in 2009 and 2010. New continuous monitoring was undertaken in Wraysbury Road, Arthur Road, Windsor Road and Bridge Road, the monitoring was carried out for 6 months from January 2010.

The PR10 included new monitored data for 2009, and an update on the potential exceedences for WM15 and WM0-3 sites. It concluded that a DA for both sites is needed and to be undertaken within 12 months.

The DA 2010, undertaken by the Borough was based on both monitored data and

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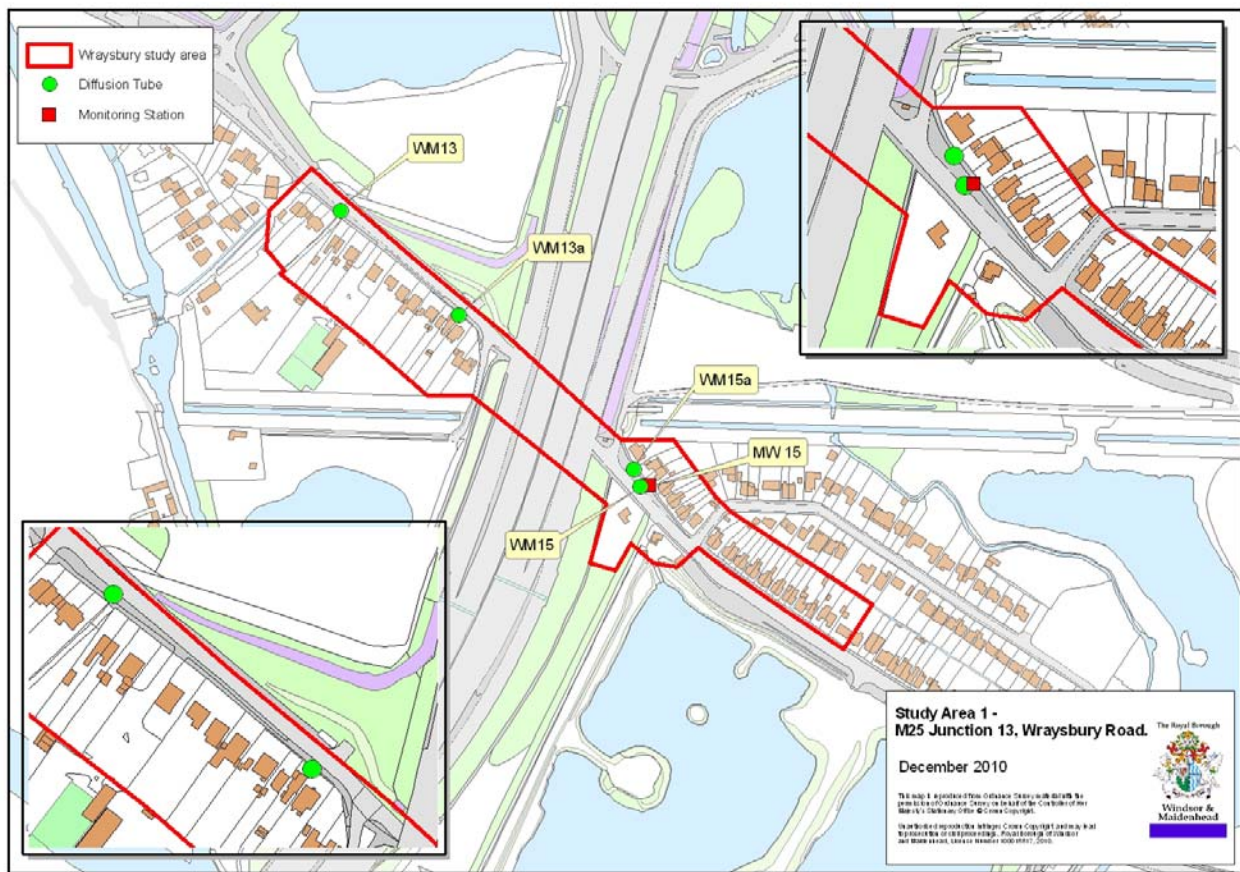
predicted concentrations modeled with ADMS Urban dispersion model. The DA concluded that, exceedences of the NO<sub>2</sub> annual mean AQO at sites WM15 and WM 0-3 are likely at locations with relevant exposure near residential façades. The DA concluded the Borough should consider declaring the two sites AQMAs.

More in details:

### Study area 1 to be declared AQMA - Wraysbury - M25 junction 13 area

The area runs along the B376 and intersects with the M25 near junction 13, in the vicinity of Heathrow Airport. There are residential buildings along the Wraysbury Road and those near the M25 tunnel portal are exposed to higher concentrations, figure 1.4. The area was assessed in a DA in 2004, however the predicted concentrations from the M25 and B376 at receptor points were predicted not to exceed the AQO.

Figure 1.4 M25 Junction 13, Wraysbury



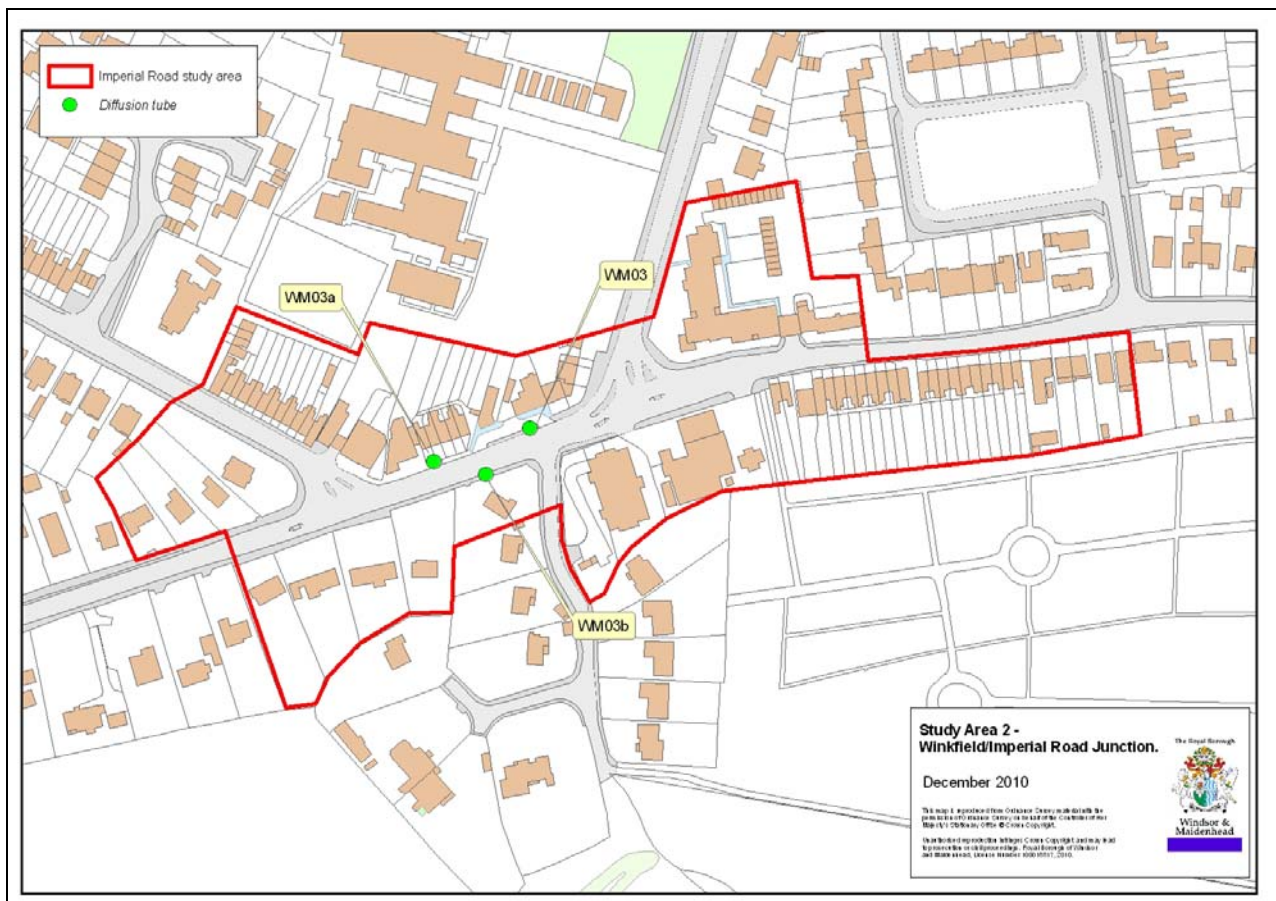
The MW15 site was a continuous monitor operated from Jan to Jul 2010, details of all four temporary stations are included in section 2.1.2.

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### Study area 2 to be declared AQMA - Imperial/Winkfield Road junction, Windsor

The area is linked with Clarence Road roundabout and Windsor AQMA by Imperial Road and is on the route to Legoland. It includes a double junction between B3022 (St Leonards Rd) and B3175 (Imperial Rd) there are residential buildings along the roads in particular along St Leonards Road and those near the junction are exposed to higher concentrations, figure 1.5. The area was assessed in DA in 2008, however the predicted concentrations at receptor points were found not to exceed the AQO.

**Figure 1.5 Winkfield/Imperial Road Junction, Windsor**



## **2 New Monitoring Data**

### **2.1 Summary of Monitoring Undertaken**

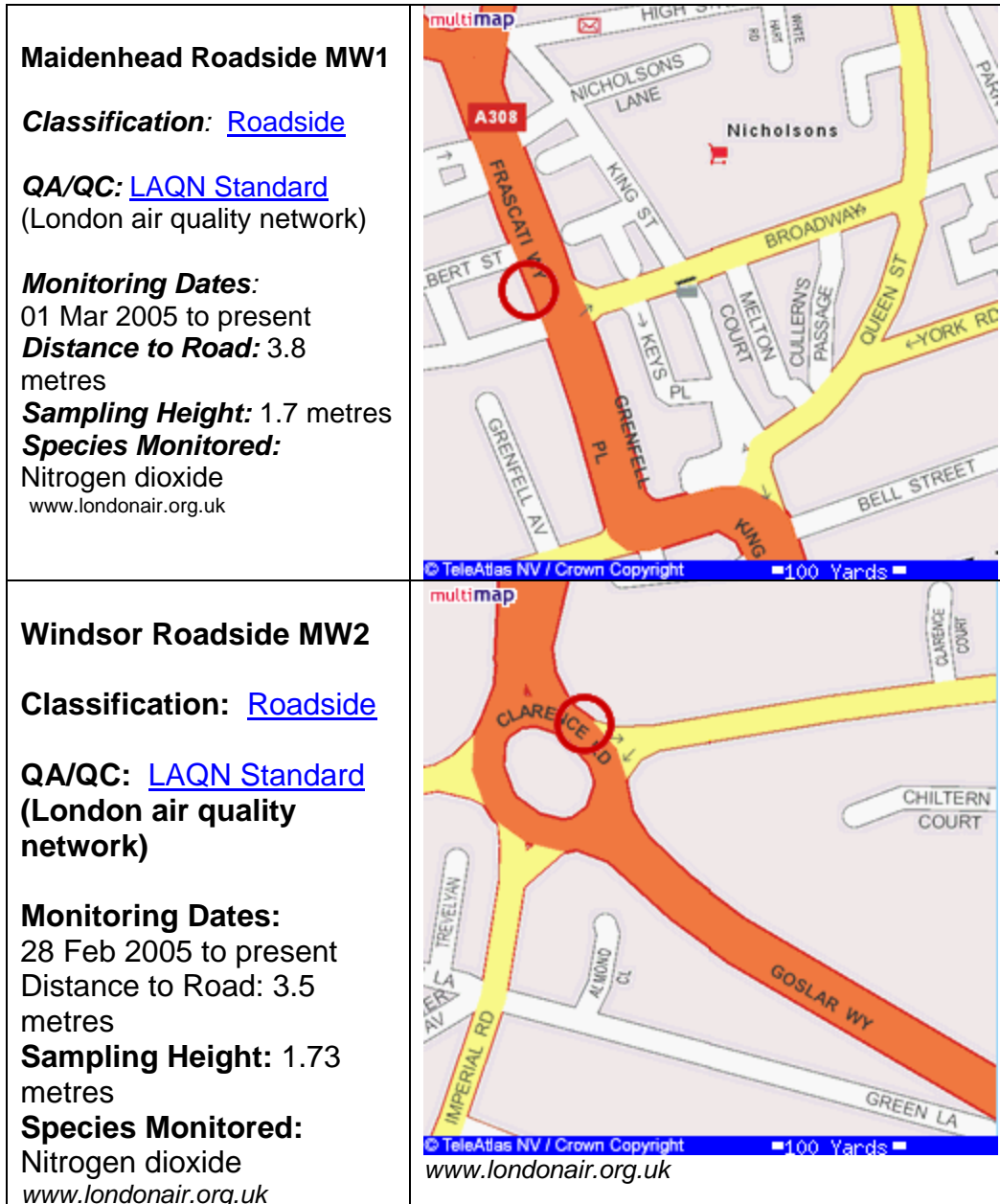
#### **2.1.1 Automatic Monitoring Sites**

Since March 2005 the Borough has monitored NO<sub>2</sub> concentrations by mean of two permanent continuous chemiluminescent monitors, one in Windsor and one in Maidenhead. Table 2.1 below provides site details. Four more continuous monitors have been used for the first six months of 2010 to monitor NO<sub>2</sub> concentrations within the new AQMA in Bray M4 and extended AQMAs in Arthur Road and Bridge Road also in Wraysbury Road to improve data for the undertaking of a DA, Figure 1.4. Transport Research Laboratory (TRL) on behalf of the Borough installed the stations and supplied data reports, section 2.1.2.

The Hourly mean is used to calculate monthly and annual averages. Monitoring stations are audited six monthly by the National Physics Laboratory. RBWM is part of the LAQN and its QA/QC standards. LSO services are carried out by SupportingU. The EPO is responsible for fortnightly calibrations and filter changes. The Environmental Research Group (ERG) at Kings College undertakes data validation and ratification, air quality data is publishes via the LAQN website through which air quality data is published. In Figure 2.1 details, description and location of monitoring stations in Maidenhead and Windsor.

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Figure 2.1 Maps of Automatic Monitoring Sites



Additional site information is included in Table 2.1. Ozone (O<sub>3</sub>) was also monitored at MW3 Ascot, the site was discontinued in 2009. RBWM sites are within AQMA and represent worse case locations, OS grid reference are included.

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**Table 2.1 Details of Automatic Monitoring Sites**

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA ?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location ?
MW1 Maidenhead	Roadside	488626 180994	NO <sub>2</sub>	Y	Y (5m)	3.8 m	Y
MW2 Windsor	Roadside	495664 176592	NO <sub>2</sub>	Y	Y (5m)	3.5m	Y
MW3 Discontinued	Rural	493810 169300	NO <sub>2</sub> O <sub>3</sub>	N	N	140 m	N/A

### 2.1.2 TRL Automatic Monitoring Sites

Four more continuous monitors, supplied by TRL were used for the first six months of 2010 (Jan-Jun) to monitor NO<sub>2</sub> concentrations within the new AQMA in Bray M4 and extended AQMAs in Arthur Road and Bridge Road also in Wraysbury Road for the undertaking of a DA, Table 2.2. The aim was to complement and verify data collected by mean of diffusion tubes.

**Table 2.2**

Site Name	Site Type	OS Grid Ref X Y	Pollutants Monitored	In AQMA ?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location ?
MW33 Arthur Road	Roadside	496288 176855	NO <sub>2</sub>	Y	Y (10m)	2 m	Y
MW15 Wraysbury Road	Roadside	502259 172322	NO <sub>2</sub>	N	Y (5m)	2.5m	Y
MW29 Windsor Road	Roadside	490001 178745	NO <sub>2</sub>	N	Y (10)	2 m	N
MW0-13 Bridge Road	Roadside	489556 181338	NO <sub>2</sub>	Y	Y (10)	2.5m	N

TRL was responsible for LSO services, data collection and ratification. The monitoring locations are shown in fig 2.2 to 2.4.

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**Figure 2.2 TRL monitoring station in Arthur Road**



The monitoring station in Arthur Road, Windsor was installed on 19<sup>th</sup> November 2009 and discontinued on 21<sup>st</sup> June 2010. The sampling height was 1.7 m and the distance from the road was 3.5 m.

**Figure 2.3 TRL monitoring station in Windsor Road**



The monitoring station in Windsor Road, Bray was installed on 16<sup>th</sup> November 2009 and discontinued on 19<sup>th</sup> May 2010. The sampling height was 1.7 m and the distance from the road was 1.5 m.

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**Figure 2.4 TRL monitoring station in Bridge Road**



The monitoring station in Bridge Road, Maidenhead was installed on 2<sup>nd</sup> December 2009 and discontinued on 26<sup>th</sup> July 2010. The sampling height was 1.7 m and the distance from the road was 2 m.

The monitoring station in Wraysbury Road, Wraysbury (Fig 1.4) was installed on 21<sup>st</sup> January 2010 and discontinued on 26<sup>th</sup> July 2010. The sampling height was 1.7 m and the distance from the road was 2 m.

### **2.1.3 Non-Automatic Monitoring**

The NO<sub>2</sub> diffusion tube monitoring network includes roadside, background and rural sites. Table 2.3 includes all relevant details and location of the sites.

The Borough has undertaken monitoring of NO<sub>2</sub> by mean of passive diffusion tubes since 1993. The network was extended in 1998 and in 2002 with a total of 11 sites. Following the declaration of AQMAs in Feb '05 the network was then extended again to 25 sites and two collocation study sites, one in Windsor and one in Maidenhead. In 2006 the Borough collaborated with Imperial College on a student's MSc research project, a review of the network was undertaken and additional monitoring was carried out. Sites such as WM0-3, WM0-13 were identified as hot-spots and are ongoing.

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**Table 2.3 Details of Non- Automatic Monitoring Sites**

Site Name <b>Discont.</b> <b>New</b>	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location?
<b>WM1</b>	Background	X 494067 Y 176764	NO <sub>2</sub>	N	Y (5m)	(2m)	
<b>WM2</b>	Background	X 489706 Y 178789	NO <sub>2</sub>	N	Y (10m)	(2m)	
<b>WM5</b>	Roadside	X 489706 Y 178789	NO <sub>2</sub>	Y	Y (1m)	(2m)	Y
<b>WM8</b>	Background	487982 182307	NO <sub>2</sub>	N	Y (5m)	(2m)	
<b>WM9</b>	Roadside	496179 176330	NO <sub>2</sub>	N	Y (10m)	(2m)	
<b>WM10</b>	Roadside	495613 176434	NO <sub>2</sub>	Y	Y (5m)	(2m)	
<b>WM13</b>	Roadside	502009 172544	NO <sub>2</sub>	N	Y (5m)	(2m)	Y
<b>WM13a</b>	Roadside	502108 172461	NO <sub>2</sub>	Y	Y (5m)	(2m)	Y
<b>WM15</b>	Roadside	502261 172318	NO <sub>2</sub>	N	Y (5m)	(2m)	Y
<b>WM15a</b>	Roadside	502257 172339	NO <sub>2</sub>	N	Y (2m)	(5m)	Y
<b>WM17</b>	Roadside	498877 177042	NO <sub>2</sub>	N	Y (5m)	(3m)	Y
<b>WM18</b>	Roadside	495664 176592	NO <sub>2</sub>	Y	Y (5m)	(3.8m)	Y
<b>WM19</b>	Roadside	//	NO <sub>2</sub>	Y	Y (5m)	(3.8m)	Y
<b>WM20</b>	Roadside	//	NO <sub>2</sub>	Y	Y (5m)	(3.8m)	Y
<b>WM21</b>	Roadside	488626 180994	NO <sub>2</sub>	Y	Y (5m)	(3.8m)	Y
<b>WM22</b>	Roadside	//	NO <sub>2</sub>	Y	Y (5m)	(3.8m)	Y
<b>WM23</b>	Roadside	//	NO <sub>2</sub>	Y	Y (5m)	(3.8m)	Y
<b>WM27</b>	Roadside	493626 166766	NO <sub>2</sub>	N	Y (10m)	(2m)	Y
<b>WM28</b>	Roadside	496604 177866	NO <sub>2</sub>	N	Y (5m)	(2m)	Y
<b>WM29</b>	Roadside	489975 178721	NO <sub>2</sub>	Y	Y (10m)	(2m)	Y
<b>WM29a</b>	Roadside	489928 178754	NO <sub>2</sub>	Y	Y (10m)	(2m)	Y
<b>WM29b</b>	Roadside	490012 178711	NO <sub>2</sub>	Y	Y (10m)	(2m)	Y
<b>WM29c</b>	Roadside	490108 178609	NO <sub>2</sub>	Y	Y (10m)	(2m)	Y
<b>WM31</b>	Roadside	495896 176939	NO <sub>2</sub>	Y	Y (3m)	(1m)	Y
<b>WM32</b>	Roadside	496082 176903	NO <sub>2</sub>	Y	Y (3m)	(1m)	Y
<b>WM33</b>	Roadside	496312 176886	NO <sub>2</sub>	Y	Y (3m)	(1m)	Y
<b>WM01</b>	Background	501366 172377	NO <sub>2</sub>	N	Y (15m)	(1m)	
<b>WM03</b>	Roadside	495331 175569	NO <sub>2</sub>	N	Y (10m)	(1m)	Y
<b>WM03a</b>	Roadside	495294 175556	NO <sub>2</sub>	N	Y (5m)	(1m)	Y

## Royal Borough of Windsor and Maidenhead - England

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location?
<b>Discont.</b> <b>New</b>							
<b>WM03b</b>	Roadside	495314 175551	NO <sub>2</sub>	N	Y (5m)	(1m)	Y
<b>WM04</b>	Roadside	496282 176091	NO <sub>2</sub>	N	Y (5m)	(1m)	
<b>WM012</b>	Roadside	488525 182471	NO <sub>2</sub>	N	Y (5m)	(1m)	Y
<b>WM013</b>	Roadside	489571 181334	NO <sub>2</sub>	Y new	Y (5m)	(1m)	Y
<b>WM013a</b>	Roadside	489652 181323	NO <sub>2</sub>	Y new	Y (5m)	(1m)	Y

In areas with relevant exposure where exceedences have been monitored additional diffusion tube sites were established in Jan 2011, data from those sites will be reported in the 2012 Review & Assessment. These include WM15b and WM0-3c.

Note:

NO<sub>2</sub> Diffusion Tubes: Technical Specification

Tubes are supplied by Gradko International Ltd, the preparation is a TEA 50% acetone.

RBWM Environmental Protection Officer undertakes the diffusion tubes monitoring, the tubes are analysed after 4 weeks exposure by U.V. Spectrophotometry.

### Bias correction factors 2010

Bias correction factors were calculated for the triplicate tubes positioned with the continuous monitors in Windsor, Maidenhead. The results show that

- Windsor: 1.009, based on good precision and 100% data capture over 12 months. Under-reading by 0.9 %
- Maidenhead: 1.1 based on good precision and 100% data capture over 12 months. Under-reading by 9.3 %

Average Windsor and Maidenhead factors = 1.06

Collocation studies from across the UK, which use the same laboratory and preparation method for the tubes for 2010 have an average bias factor of 0.99.

Windsor and Maidenhead monitors overall have the best data capture and the best precision, when compared with the other collocation studies and a **Bias Factor of 1.06** was used.

## ***Royal Borough of Windsor and Maidenhead - England***

### **Bias correction factors 2009**

Bias correction factors were calculated for the triplicate tubes positioned with the continuous monitors in Windsor and Maidenhead. The results show that

- Windsor: 1 (based on good precision and data capture with 12 months of data);
- Maidenhead: 1.05 (based on good precision and data capture with 12 months of data);

Average between the two is 1.02 and average under-reading is 1.9%.

Co-location studies from across the UK, which use the same laboratory and preparation method for the tubes, have a bias correction factor of 0.99. This is based on 15 monitoring locations.

Data and results from own collocation study have the best data capture and the best precision when compared with other studies. Therefore a **bias factor of 1.02** will be applied to all diffusion tube 2009 monitored data.

## 2.2 Comparison of Monitoring Results with Air Quality Objectives

The Borough has declared AQMAs for the exceedences of NO<sub>2</sub> annual mean objective, while the hourly objective is not exceeded. The exceedences are due to road traffic emissions and no other pollutants exceed the relative AQO. The annual mean concentration for NO<sub>2</sub> in 2010 was exceeded within the AQMAs and has identified in the DA 2011 in other areas outside the AQMAs.

### 2.2.1 Nitrogen Dioxide

The annual mean concentration for NO<sub>2</sub> in 2010 at MW2, Windsor was below the AQO. The objective was exceeded in Windsor: within AQMA along Arthur Road and outside in Winkfield Road/Imperial Road (WM0-3), in Wraysbury near M25 (WM15, WM13) and in Maidenhead: within AQMAs. The hourly average AQO for NO<sub>2</sub> was not exceeded during 2010.

### Automatic Monitoring Data

Table 2.3a compares 2010 NO<sub>2</sub> annual mean concentrations in Windsor and Maidenhead the annual mean objective. The table indicates that in 2010 the objective was exceeded in Maidenhead while in Windsor was not with concentration just below the 40 µg/m<sup>3</sup> limit value. The hourly average AQO for NO<sub>2</sub> was not exceeded, see Table 2.3b. Data after July 2010 is not fully ratified.

Table 2.3a Results of Automatic Monitoring for Nitrogen dioxide: Comparison with Annual Mean Objective

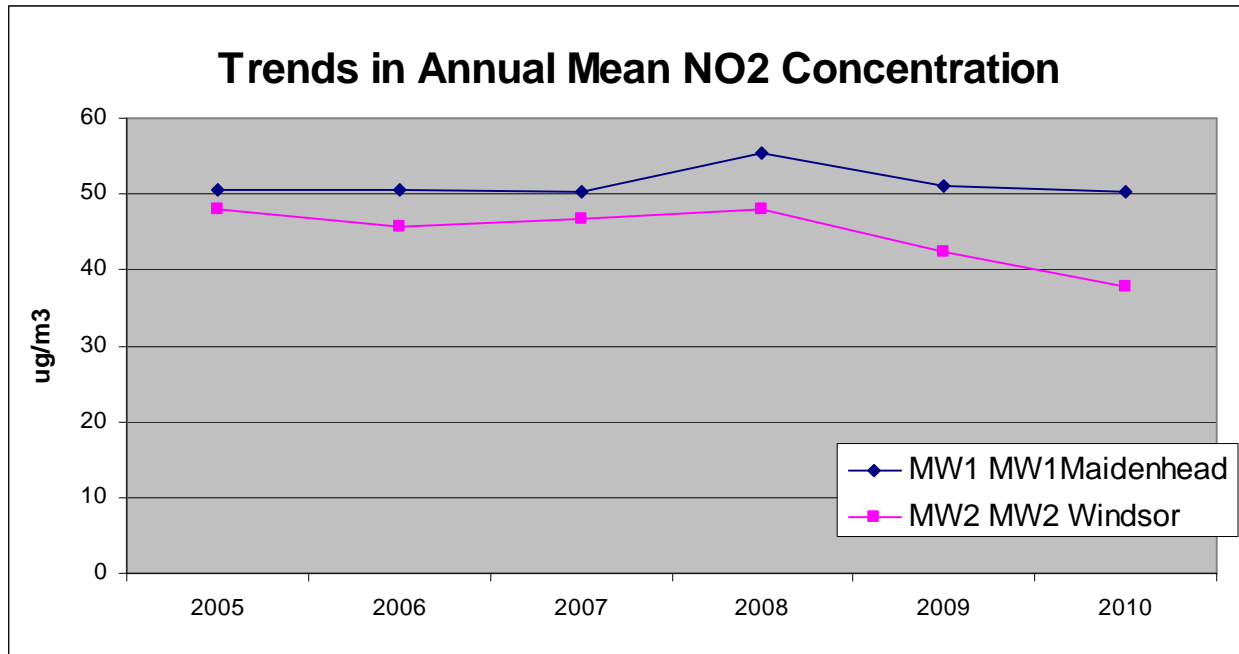
Site ID	Location	Within AQMA?	Proportion of year with valid data	Proportion of year with valid data	Annual mean concentrations (µg/m <sup>3</sup> )		
			2009 %	2010 %	2008 <sup>c, d</sup>	2009 <sup>c, d</sup>	2010 <sup>c</sup>
MW1	Maidenhead	Y	99	99	54.6	51	50
MW2	Windsor	Y	98	98	45.8	40.6	37.4

<sup>a</sup> i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.  
<sup>b</sup> i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)  
<sup>c</sup> Means should be "annualised" as in Box 3.2 of TG(09), if monitoring was not carried out for the full year.  
<sup>d</sup> Annual mean concentrations for previous years are optional.

## Royal Borough of Windsor and Maidenhead - England

Figure 2.3 Trends in Annual Mean Nitrogen dioxide Concentration Measured at Automatic Monitoring Sites.

Data after 30 July 2010 is not fully ratified\*



\*London Air Quality Network, ERG, KCL

## Royal Borough of Windsor and Maidenhead - England

**Table 2.3b Results of Automatic Monitoring for Nitrogen dioxide: Comparison with 1-hour Mean Objective**

Site ID	Location	Within AQMA?	Data Capture 2008 <sup>b</sup> %	Data Capture 2009 <sup>b</sup> %	Number of Exceedences of hourly mean (200 µg/m <sup>3</sup> )		
					2008 <sup>c</sup>	2009 <sup>c</sup>	2010
MW1	Maidenhead	Y	99	99	0	2	0
MW2	Windsor	Y	99	98	12	0	0

Data after 16<sup>th</sup> July 2009 is not fully ratified  
<sup>b</sup> i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%).  
<sup>c</sup> Numbers of exceedences for previous years are optional

**Table 2.3c Results of Six Month Automatic Monitoring for Nitrogen dioxide: Comparison with Annual Mean Objective**

Site ID	Location	Within AQMA?	Monitoring Period 2010	Proportion of period with valid data % <sup>a</sup> , full year (50%) <sup>b</sup>	Period Mean (µg/m <sup>3</sup> )	2010 Annualised Mean NO <sub>2</sub> (µg/m <sup>3</sup> ) <sup>c</sup>	Period Exceedences of hourly mean (200 µg/m <sup>3</sup> )
MW33	Arthur Road	Y	Jan - Jun	86	48.4	42.3	10
MW15	Wraysbury Road	N	Feb - Jul	97	42.6	41.1	0
MW29	Windsor Road	Y	Jan - May	99	49.6	45.2	0
MW0-13	Bridge Road	Y	Jan - Jul	96	36.4	35.2	8

<sup>a</sup> i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.  
<sup>b</sup> i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%).  
<sup>c</sup> Means should be "annualised" as in Box 3.2 of TG(09), if monitoring was not carried out for the full year.

Figure 2.4 to 2.8 Show Trends in Annual Mean Nitrogen dioxide Concentration (µg/m<sup>3</sup>) Measured at Diffusion Tube Monitoring Sites including data from background sites. The downward trends reported in 2009 continued in 2010 and some sites within AQMAs show concentration just below the AQO.

## Royal Borough of Windsor and Maidenhead - England

Figure 2.4 and 2.5 Trends in Annual Mean Nitrogen dioxide Concentration ( $\mu\text{g}/\text{m}^3$ ) Measured at Diffusion Tube Monitoring Sites in Windsor.

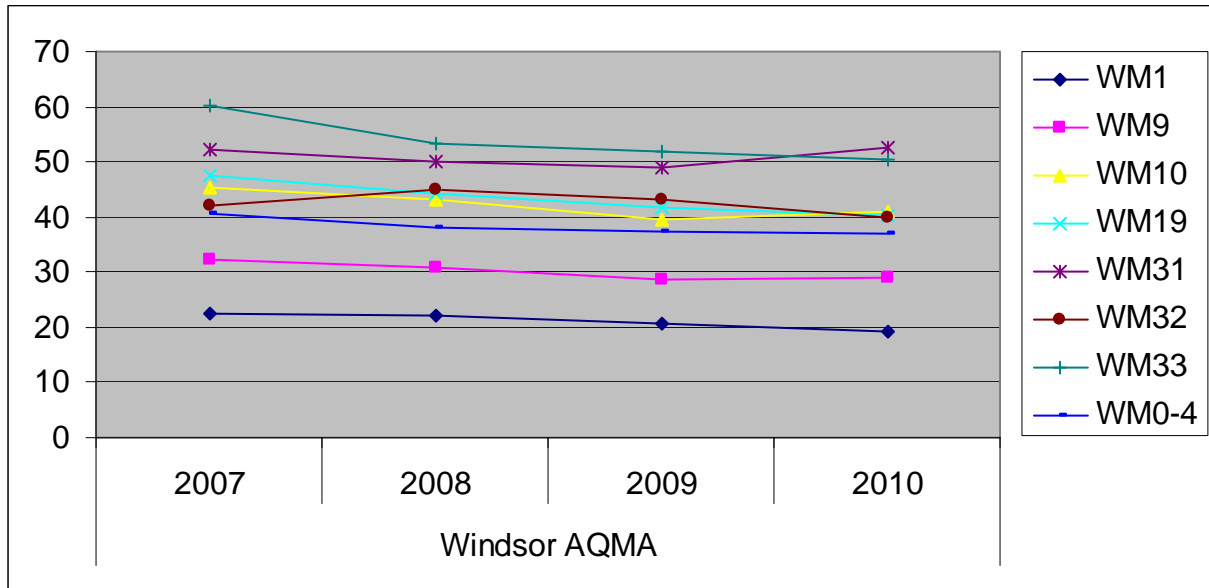
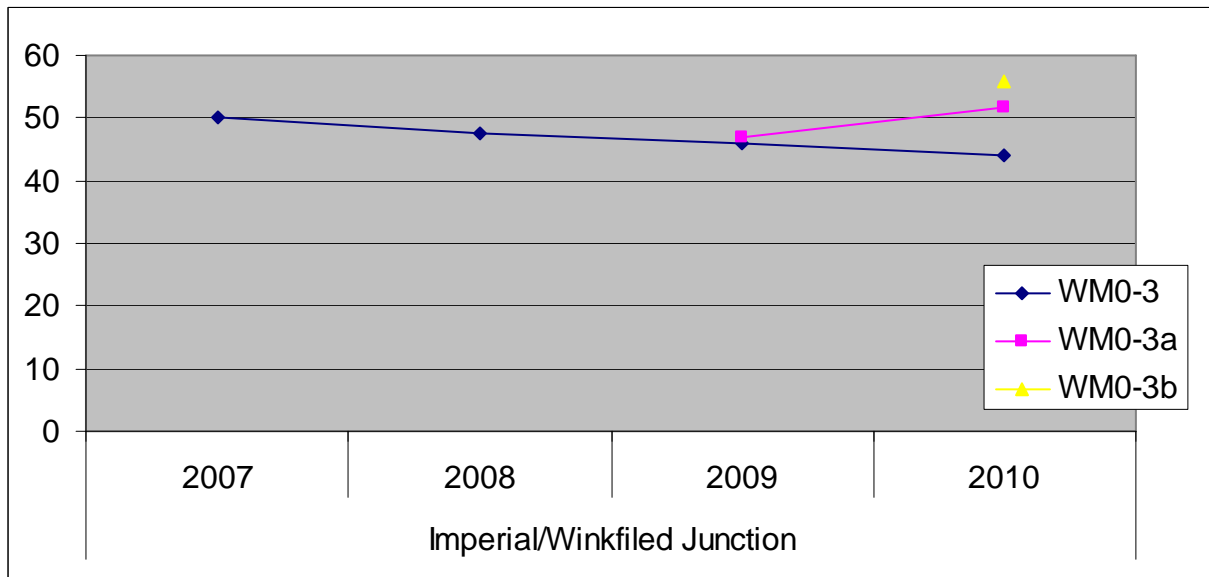


Figure 2.5



## Royal Borough of Windsor and Maidenhead - England

Figure 2.6 Trends in Annual Mean Nitrogen dioxide Concentration ( $\mu\text{g}/\text{m}^3$ ) Measured at Diffusion Tube Monitoring Sites in Wraysbury Road.

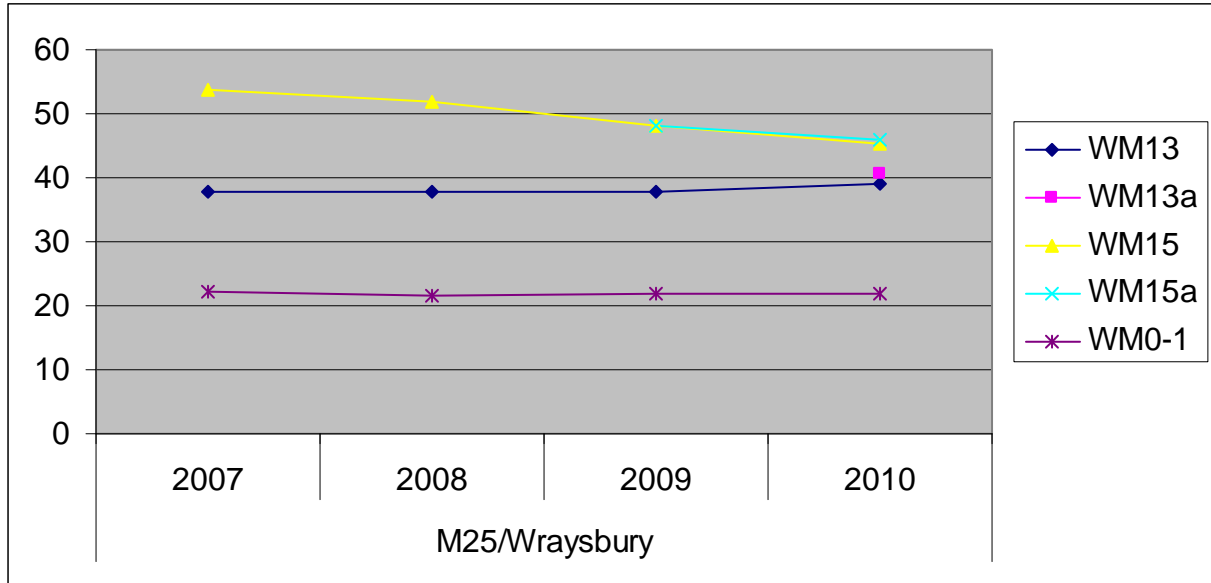
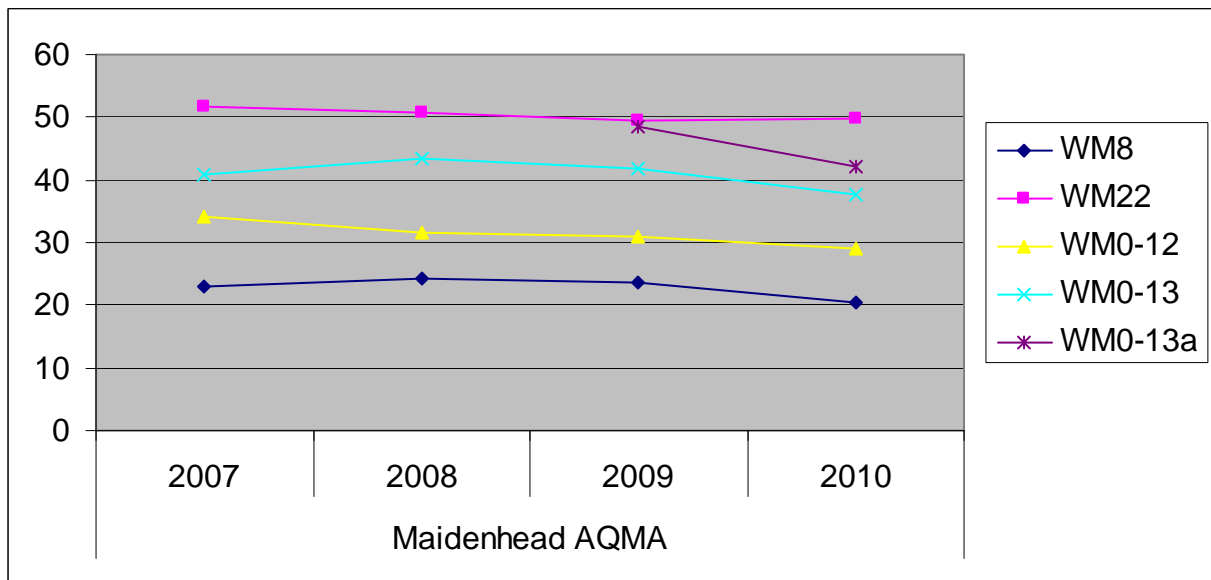
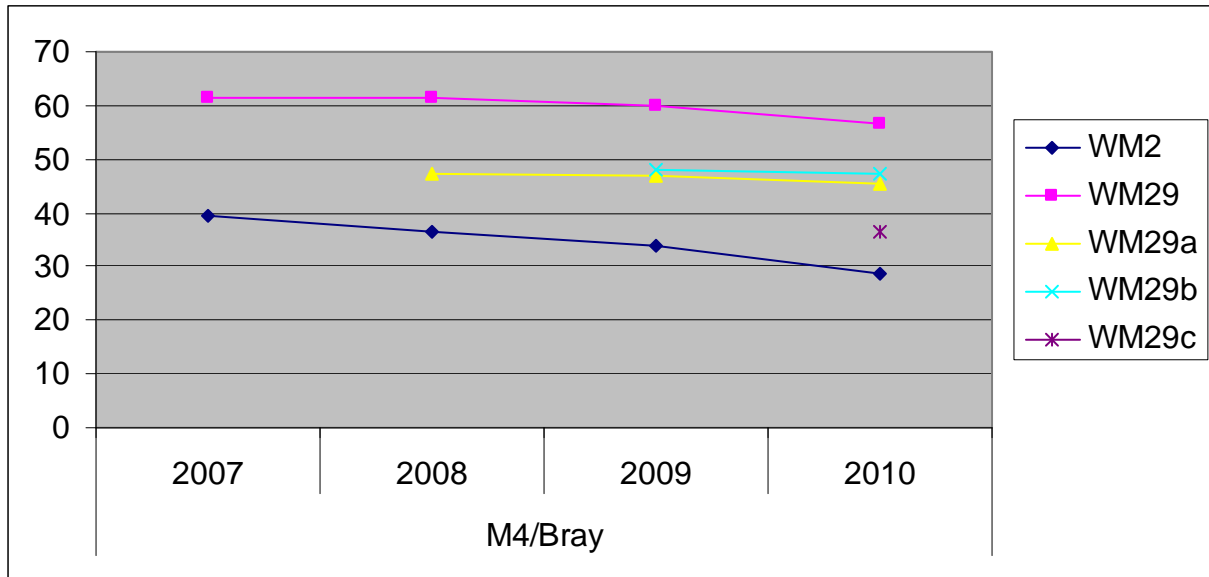


Figure 2.7 Trends in Annual Mean Nitrogen dioxide Concentration ( $\mu\text{g}/\text{m}^3$ ) Measured at Diffusion Tube Monitoring Sites in Maidenhead.



## Royal Borough of Windsor and Maidenhead - England

Figure 2.8 Trends in Annual Mean Nitrogen dioxide Concentration ( $\mu\text{g}/\text{m}^3$ ) Measured at Diffusion Tube Monitoring Sites in Windsor Road/M4 Bray.



### Diffusion Tube Monitoring Data

The marginal downward trends reported in 2009 continued in 2010. The annual mean from urban background sites i.e. residential areas away from main roads for 2010 is lower than that in 2009. Background sites WM1 in Dedworth, Windsor and WM8 Furze Platt, Maidenhead are the most representative of the decreasing concentrations for 2010 while WM0-1 in Hythe End remained flat over the four year period, figure 2.6. Similarly sites in and out the AQMA in Windsor also show marginal decrease of annual mean concentrations over the same period and in 2010 below the AQO. In Maidenhead trends are less consistent but it is clear that 2010 concentrations are lower than that in 2009.

The sites (WM15 and WM0-3) for which a DA was carried out in Dec 2010 show concentrations above the AQO no other sites outside the AQMAs show potential exceedences. More monitoring sites for WM15 and WM0-3 have been started and are ongoing. Sites WM15b and WM0-3c started in Jan 2011. Data for the sites started in 2011 will be reported in 2012. Data capture in Table 2.4 is given as a % of the calendar year, monitored data from Sep to Dec 09 for the above mentioned site hasn't been annualised because of the limited capture and results complement data from existing site in the same area. Data from other sites with a data capture of less than 100% mostly due to missing tubes haven't been annualised because they have no relevance in terms of exceedences.

## Royal Borough of Windsor and Maidenhead - England

**Table 2.4 Results of Nitrogen Dioxide Diffusion Tubes**

Site ID	Location (discontinued sites in bold)	Within AQMA?	Data	Data	Annual mean concentrations ( $\mu\text{g}/\text{m}^3$ )		
			Capture 2008 %	Capture 2010 %	2008	2009	2010
WM1	Longmead	N	100	100	22.16	20.66	19.29
WM2	Priors Way	N	92	75	36.43	33.76	28.61
WM5*	Broadway Road	Y	92	33	52.16	49.28	45.65
WM8	Mossey Vale	N	100	100	24.19	23.69	21.13
WM9	Alma Road	N	100	100	31	28.73	28.87
WM10	Imperial Road	Y	100	100	43.25	39.46	41.13
WM11	<b>St Lukes Road</b>	N	100		32.13	31.64	
WM13	Wraysbury Road	N	100	100	37.76	37.89	39.03
WM13a	Wraysbury Road	N		92			40.68
WM14	<b>Wrays High Street</b>	N	50		26.1	26.21	
WM15	M25 Wrays Road	N	92	100	51.91	48.26	45.34
WM15a	M25 Wrays Road	N	33	92		48.1	45.99
WM17	<b>Horton Road</b>	N	92		30.53	27.65	
WM18	AQMS Windsor 1	Y	100	100	44.56	40.83	39.04
WM19	AQMS Windsor 2	Y	100	100	44.19	41.64	40.20
WM20	AQMS Windsor 3	Y	100	100	43.89	41.45	39.54
WM21	AQMS Maidenhead 1	Y	100	100	50.55	47.55	46.77
WM22	AQMS Maidenhead 2	Y	100	100	50.68	49.58	49.66
WM23	AQMS Maidenhead 3	Y	100	100	51.45	50.75	48.72
WM25	<b>Sunninghill High St</b>	N	25		32.1	31.19	
WM28	Eton Wick	N	83	92	38.93	38.66	38.25
WM29	M4 Windsor Road	Y	92	100	61.27	59.78	56.70
WM29a	M4 Windsor Road	Y	75	92	47.39	46.73	45.36
WM29b	M4 Windsor Road	Y	8 (new)	92		48.16	47.23
WM29c	Holyport Road	Y		92			36.47
WM31	Arthur Road 1	Y	100	100	50.18	48.84	52.74
WM32	Arthur Road 2	Y	100	100	44.98	43.17	39.77
WM33	Arthur Road 3	Y	100	75	53.24	52.01	50.46
WM0-1	Hythe End Road	N	100	100	21.54	21.74	21.99
WM0-2	<b>Dedworth Rd</b>	N	50		33.19	29.7	
WM0-3	Winkfield Rd	N	58	100	47.69	45.81	43.97
WM0-3a	Winkfield Rd	N	25 (new)	83		47.02	51.59
WM0-3b	Winkfield Rd	N		83			55.80
WM0-4	Osborne Rd	N	100	92	38.2	37.25	37.00
WM0-9	<b>Ascot High St 1 A</b>	N	100		32.3	32.59	
WM0-12	Cookham Road M	N	100	67	31.69	30.8	29.15
WM0-13	Bridge Road M	Y	92	100	43.55	41.93	37.72
WM0-13a	Bridge Road M	Y	75	100		48.48	42.18

\* WM5 Period Mean 45.6, "annualised" as in Box 3.2 of TG(09)

**2.2.6 Summary of Compliance with AQS Objectives**

The Royal Borough of Windsor and Maidenhead has measured no concentrations of Nitrogen dioxide above the annual mean objective at relevant locations outside AQMAs for 2010. The Borough has submitted a Detailed Assessment, for junction between Imperial/Winkfield Road and Wraysbury Road M25. Exceedences of the AQO in those areas continued in 2010.

The 2010 annual mean from Windsor continuous monitor was just below the AQO, 37.4 ug/m<sup>3</sup>.

## **3 New Local Developments**

### **3.1 Road Traffic Sources**

There are two new developments in Windsor that link with the Air Quality Action Plan. The completion of works for a new layout of Clarence Road Roundabout this is expected to improve traffic flow and increase the distance from residential façade. The Park and Ride development in Windsor in preparation for the Olympics should help to reduce road traffic volume at peak times although no quantitative assessment was undertaken. In Maidenhead the Area Action Plan to regenerate the town centre should take into account congestion and air quality issues, consultation on a scoping report concluded in May 2011.

The Royal Borough of Windsor and Maidenhead confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area and likely to create new potential exceedences. .

## **4 Local / Regional Air Quality Strategy**

Two AQMAs in Windsor and Maidenhead were declared in February 2005, the areas were extended in July 2009 and third area was declared in Windsor Road near the M4.

The DA 2010 has identified the need to declare two more areas in Wraysbury Road near the M25 and Imperial/Winkfield junction linked to Windsor AQMA.

There is therefore a need to review AQ measures within the AQAP and to engage with the Highways Agency about the hot-spots areas near the M4 and M25.

The Borough would also need: a) to review and update intermediate AQ indicators, priorities measure and quantify costs and benefits; b) continue to review the plan integration with LTP within the next LTP3. There are plans to develop a local air quality strategy as a tool to promote AQ work at corporate level and to better involve businesses and new stakeholders.

The LTP2 was extended for a further year to allow more needed work on the emerging LPT3 and the integration within LDF. Possible inclusion of air quality measures in the form of a local air quality strategy is under consideration.

## **5 Planning Applications**

Where appropriate the Council is involved in discussions and negotiations with developers to ensure that air quality in the borough is not adversely affected by any new development and where possible off set marginal impacts.

### **Maidenhead**

1. The Maidenhead Town Centre Area Action Plan AAP will be formally adopted at a meeting of Council later this summer (programmed for September 2011). Upon adoption it will form part of the council's Local Development Framework, the folder of documents which forms the wider planning strategy for the Royal Borough. Policies in the AAP supersede those for Maidenhead Town Centre contained within the Local Plan.
2. The Maidenhead Waterway Project is an ambitious plan that aims to transform the waterway that flows from the Cliveden Reach of the River Thames at Cookham, through Maidenhead to Bray Marina, into a valuable amenity, for the benefit of all those who live, work and spend their leisure time in the area. The project is promoted by the Maidenhead Waterways Restoration Group and supported by the council.
3. 08/60087/REF St Marys Park (Former Badnells Pit And Jenkinsons Yard And Spoore Merry) Blackamoor Lane Maidenhead. Site remediation ongoing and planned to be completed by August 2011. Redevelopment to provide 402 residential units comprising 288 one and two bed flats and 114 no. two, three and four bed houses and a 46-unit "Extra Care" Housing Scheme, plus associated open space, car parking and landscaping, with a principal access off Blackamoor Lane, limited secondary access off Simpson Close, a footway link to Deerswood and a separate pedestrian/cycleway connection to Blackamoor Lane.

### **Windsor**

1. 10/60074/REF Imperial House Alma Road Windsor SL4 3ES  
Demolition of existing building and erection of five buildings of between 1 and 5 storeys and a 3-storey car park to provide 25,464 sqm of office floorspace, a cafe/restaurant, ancillary security and substation as well as associated car parking, delivery drop off, service bay, cycle and motorcycle parking, public accessible open space, improved access and landscaping
2. [10/02090](#) Windsor Racecourse Park and Ride  
Provision of a 400 car Park and Ride facility with associated infrastructure and landscaping.

## 6 Air Quality Planning Policies

Under Planning Policy Statement (PPS) 23 Air Quality (AQ) is a material consideration. New developments within and around the AQMAs shall undertake an assessment to consider and quantify the AQ impact (e.g. impact on AQ for non residential developments) and the impact of poor AQ on new residential developments. The Borough has not yet developed an Supplementary Planning Guidance (SPG) for AQ, application are reviewed on the base of national policies and guidance on a case by case base. The Environmental Protection Team gives advice to developers on AQ matters and may take part in pre-application discussions. Submitted applications are reviewed in terms of how AQ impacts and the relevant mitigation measures are identified and quantified.

In cases where mitigations measures are required and cannot be appropriately secured through planning conditions, a planning obligation will be sought. The Borough's Supplementary Planning Document (SPD) on planning obligation includes Air Quality.

### **Developers' Contributions SPD: AIR QUALITY**

<b>Development Type</b>	<b>Relevant Proposals</b>	<b>Sought</b>
All applications for Residential or Non-residential development (including but not limited to Business (BIDS), Retail, Leisure, Health, Education, hotel and other development)	Within the context of development proposals, wherever air quality amelioration measures are required, and these cannot be appropriately secured through planning conditions, a planning obligation will be sought.	A contribution per additional dwelling or increase in floorspace towards meeting the cost of measures identified by the Borough Council. Where justified in planning terms, this may include commuted sums for monitoring over a specified period, to be agreed with the developer. Particular emphasis will be made on the two Air Quality Management Areas for Windsor and Maidenhead to work towards the actions identified in the Air Quality Management Plan included in the Local Transport Plan 2006-2011 and subsequently modified.

**Planning Justification:** The Council intends that this will be negotiated on a case-by-case basis and will normally expect the developer to provide any physical mitigation measures on and off site (including highways works to reduce directly related congestion) directly required as a result of the development's expected impact on air quality. It is therefore expected that the measures required and the geographical and functional relationships with the impacts of the underlying development will be very clear. However, where air quality monitoring and/or other appropriate measures are also required the developer may be offered the option of making a contribution instead of

## ***Royal Borough of Windsor and Maidenhead - England***

carrying out this work particularly where the Council can provide these measures in a more efficient and integrated way.

### **CONTEXT WHEN CONTRIBUTIONS WILL BE REQUESTED**

The table makes clear that contributions will be assessed in the context of individual proposals for development.

### **DERIVATION OF CONTRIBUTION:**

The Council anticipates that in many cases necessary on-site mitigation in air quality terms may be provided via planning conditions or by carrying out physical works including air quality surveys, possibly under the terms of a planning obligation. Off site mitigation is likely to involve schemes to reduce traffic congestion, many of which are identified in the LTP. Further such schemes may become necessary if this is shown as a result of monitoring and if so (and particularly given that air quality impacts are highly related to traffic generation), these additional projects may be added to the highways list in due course. As such, separate financial contributions may not be the most appropriate means to address these issues. However, where they are appropriate contributions will normally reflect the costs of making the part of any necessary provision that is related to the proposal. As such, they will normally be negotiated on a case-by-case basis.

## **7 Local Transport Plans and Strategies**

Local Authorities are required to develop and maintain a Local Transport Plan (LTP) setting out strategies and targets to improve their local transport network. The Borough's LTP2 adopted in 2006 and covering a period of five years included the AQAP and integrated measures to reduce road traffic emissions. The LTP3 was due to come into effect in March 2011, however under new freedoms introduced by the current government Local Authorities may adopt a more flexible approach to allow for more public participation. Within that the Borough's plans for LTP3 have changed and the life of LTP2 has been extended by one year, until March 2012 to allow more work towards the new approach and to develop the LPT3 jointly with the Local Development Framework (LDF). The AQAP and a review of its measures within the LTP3 is part of this process and more consultation with local communities is underway.

## **8 Climate Change Strategies**

Since 2008 Climate Change issues are dealt within the Sustainable Environment Ambition Group of the Community Partnership, the drive is to reducing carbon emissions from own estate and operations.

A drafted Climate Change Strategy has not been adopted or approved yet. The most recent documents remain the Carbon Management Programme Strategy and the Implementation Plan as finalised in 2008, and from which an action plan is being developed.

## **9 Implementation of Action Plans**

**Royal Borough of Windsor and Maidenhead - England**

**Table 9.1 Action Plan Progress**

Appendix A1 - Air Quality Action Plan Progress Report 2010

No	Measure - Focus	Lead authority	Planning Phase	Implementation Phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in the last 12 month	Estimated date to complete	Comments relating to target emission reductions
MOBILITY MANAGEMENT – SUMMARY FROM ACTION PLAN							PROGRESS REPORT 2010			
1	<b>Awareness Campaigns</b> Organise public events to increase knowledge and understanding of AQ issues.	RBWM: Environmental Services	2006	2006 -2011	attendance	N/A	Two events per year. Exploring the possibility of involving pupils in AQ monitoring to raise awareness among parents	Last event held in Mar 08	No events in 2009/10	
2	<b>Education Programmes</b> 1. Road safety and cycle training with primary schools. 2. Deployment of Speed Indicator Device (SID) 3. Learning for Sustainability (LfS) programme	RBWM: Environmental Services / Learning and Care	2006	2006 -2011	The 15% reduction in car journeys Monitored via survey  500(year 6) pupils pa targeted	3%	a) 700 Bikeability places in 2010/11, all delivered b) 10 SIDS/SLRS units deployed at sites across the Borough each day. c) LfS programme discontinued June 11. Possible collaboration with the OPAL project.		ongoing	The 15% reduction in car journeys To deliver a 3% reduction within AQMAs  in combination with measure 3, 9, 11 and 13
3	<b>Travel information &amp; advice</b> - Providing information on available travel options.	RBWM, Highways Agency, Operators, Other service providers.	2006	2006-07	See measure 2  Number of local bus passenger journeys originating in the authority area undertaken each year	3%	a) 13 different Routes are aid with Real-Time Passenger Information (RTPI). RTPI includes web-based facility and SMS messaging service. b) Timetables put up at all stops where infrastructure exists. c) RBWM does all timetables for contracted borough bus services. d) RBWM produced a new cycle map and leaflet in 2010/11, grading all roads		ongoing	

**Royal Borough of Windsor and Maidenhead - England**

No	Measure - Focus	Lead authority	Planning Phase	Implementation Phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in the last 12 month	Estimated date to complete	Comments relating to target emission reductions
							according to traffic conditions and appropriate levels of cycling expertise.			
4	<b>Travel Plans</b> - Promote and monitor all other travel plans, workplace, hospital and schools. Proactively request Travel Plans through Planning process. Produce guidance for all Travel Plans on the web.	RBWM, Schools, Hospitals, Businesses.	2007-08	2009-10	Achieve 100% of Schools with Travel Plans by 2010.  No more than 70% of employees driving to work in year 1 falling to 60% by year 3	5%	a) 100% of state schools and 16% of independent schools had travel plans in place by end of March 2010. b) 4 new workplace travel plans secured through planning conditions / S106 Agreements in 2010/11 c) RBWM staff travel plan was adopted October 2009.	a) Target achieved  c) Driving to work fell from 77.6% in 2008 to 74.6% in 2010.	ongoing	15% reduction in car driver trips three years Combining all travel plans a 5% emission reduction within AQMAs should be achievable
5	<b>Lift sharing</b> - To develop an area-wide lift-sharing. Establishing self-contained lift-sharing schemes.	RBWM Neighbouring LA, Businesses, Schools					Include borough-wide scheme as part of Local Sustainable Transport Fund bid	Advice on lift-sharing scheme on the council's website.		
6	<b>E-services</b> - Providing on line services to reduce the need to travel	RBWM, Businesses	2006	2007-11	See measure 2		a) Applications: library membership, school admissions, planning applications, parking permits; b) Payments - Council invoices, Council tax, business rates, parking fines, housing benefit repayment. c) Reporting - Council	completed	ongoing	

**Royal Borough of Windsor and Maidenhead - England**

No	Measure - Focus	Lead authority	Planning Phase	Implementation Phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in the last 12 month	Estimated date to complete	Comments relating to target emission reductions	
							complaints, highway maintenance, pollution, abandoned vehicles, rights of way, benefit fraud.				
7	<b>Ticketing solutions</b> - Promoting public transport	RBWM, Operators, Tourist/leisure attractions	2006	2007-11			Working with First Great Western and South West Trains to extend and simplify combined ticketing solutions. Scheme already in place for Legoland		ongoing		
<b>NETWORK MANAGEMENT – SUMMARY FROM ACTION PLAN</b>							<b>PROGRESS REPORT 2010</b>				
8	<b>Urban traffic control</b> - Updating and extending the current UTC ♦, in conjunction with better traffic surveys.	RBWM	2008-09	2011	Average journey time	3 %	New UTC system and server with improved system capabilities.	Micro-simulation and strategic traffic model	Completed	Used to test scenarios and flows	
9	<b>Bus / cycle priority</b> - Introducing priority measures. Promote and prioritise schemes through capital programme and LTP objectives	RBWM	2006	2006-11	Seen measure 2  Bus and cycle trips	3%	New cycle parking in Maidenhead town centre & Rail Station	A4 cycle route: Oldfield Moorbridge - Forlease/ Moorbridge Advanced Stop Line	No bus / cycle priority measures implemented In 2010	In conjunction with measure 2, 11 and 13	
10	<b>Junction Improvements</b> - Modifying the layout of junctions experiencing chronic congestion	RBWM	2006	2007-08	Average journey time	See n 8	a) Redesign of the Clarence Road roundabout in Windsor, to improved traffic flow. b) Maidenhead town	a) completed June 2011 b) Scoping report.	ongoing	See n 8	

♦ Urban Traffic Control

**Royal Borough of Windsor and Maidenhead - England**

No	Measure - Focus	Lead authority	Planning Phase	Implementation Phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in the last 12 month	Estimated date to complete	Comments relating to target emission reductions
							centre road network was modelled to inform the Maidenhead Area Action Plan. A number of improvements are proposed for key junctions as well as the completion of the Stafferton Link Road, to reduce traffic around the town centre.	Right turning lane Upper Bray Rd/ A308		
11	<b>Safer routes to schools</b> - Identify priorities through School Travel Plans and prioritise through capital projects working group	RBWM:	2006	2006-11	Seen measure 2  Number of safer routes	3%	Currently working on 10 Safer Routes to School schemes across the Borough to address barriers to walking and cycling to school. Capital bid for doubling of expenditure in 2009/10	Completed: A4 Links to School, Newlands School cycle route.	ongoing	
12	<b>Parking enforcement</b> - Decriminalised parking enforcement	RBWM	2007-08	2008-09			DPE introduced January 2008. Compliance with the parking restrictions is currently running at approximately 90%. Recent surveys show a 27% increase in the number of compliant vehicles in the Maidenhead area.		ongoing	
IMPROVING SUSTAINABLE TRAVEL OPTIONS– SUMMARY FROM ACTION PLAN							PROGRESS REPORT 2010			
13	<b>Pedestrian / Cycling Facilities</b> - New/improved	RBWM	2006	2006-11	Seen measure 2		An additional £100k of funding was allocated to	Improve A308 cycle	2011	Borough wide scheme – %

**Royal Borough of Windsor and Maidenhead - England**

No	Measure - Focus	Lead authority	Planning Phase	Implementation Phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in the last 12 month	Estimated date to complete	Comments relating to target emission reductions
	routes & crossing facilities				Cycling surveys		from the Participatory Budgeting exercise – this was used to fund:	route and other		target reduction low
14	<b>Supported bus services</b> - Providing financial support to local bus services	RBWM Operators	2006	2006-11			RBWM invests £ 800k per annum to support a network of local bus services.	Bus patronage levels are up 37%	ongoing	See n 16
15	<b>Public transport infrastructure Improvements</b> - Enhance accessibility and attractiveness of public transport and priority bus routes	RBWM	2006	2006-11	Reduced traffic volume along A308		A capital investment of circa £75k per annum is delivered. More bus shelters Improved bus stops. Better public transport information.	More Info in both electronic and hard copy format	ongoing	Maidenhead scheme – – % target reduction low
16	<b>Quality bus partnership</b> - Develop high quality, cross boundary bus services	RBWM, Neighbouring LA, Operators	2006	2006-11	Bus users survey		Partnership between BAA Heathrow, First, Slough BC and RBWM. Bus service to Heathrow			Borough wide – % target reduction low
17	<b>Park &amp; Ride</b> - Exploring opportunities for park and ride	RBWM, Neighbouring LA, Highways Agency, DfT Rail, Operators					Secured funding for small-scale park and ride sites in Windsor. Weekend parking at Centrica and possible at Windsor Racecourse.			
18	<b>Inter-urban coach services</b> To reduce the number of inter-urban car trips	RBWM Neighbouring LA, Highways Agency Operators					The Berkshire Strategic Transport Forum completed its inter-urban bus and coach study, but this did not identify any commercially viable routes to / from RBWM.	None		
19	<b>Rail partnerships</b> -	RBWM:					Ongoing discussion with	Working		

**Royal Borough of Windsor and Maidenhead - England**

No	Measure - Focus	Lead authority	Planning Phase	Implementation Phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in the last 12 month	Estimated date to complete	Comments relating to target emission reductions
	Working in partnership with First Great Western (FGW) and South West Trains (SWT).	Environment & Planning Neighbouring local authorities  DfT Rail Operators					FGW and SWT. Meeting with councillors and Train Operating Companies held with regular future meetings proposed to address key issues.	with FGW and SWT, to improve services.		
<b>DEMAND MANAGEMENT – SUMMARY FROM ACTION PLAN</b>							<b>PROGRESS REPORT 2010</b>			
20	<b>Parking standards</b> - Imposing strict maximum parking standards for new development as identified in the Borough's Parking Strategy.	RBWM: Environment & Planning		2006-11			Windsor Racecourse Park & Ride now has a planning permission Travel Plans are required for all major developments	Zero residential parking provision, Windsor Town Centre	completed	
21	<b>Public parking regimes</b> - Setting parking charges and permitted length of stay.	RBWM: Environment & Planning	2006	2007-08			Stating parking charges and permitted length of stay in public car parks in town centre locations to favour short-stay parking for shoppers and visitors and encourage us of public transport.		completed	
<b>VEHICLES EMISSIONS TESTING – SUMMARY FROM ACTION PLAN</b>							<b>PROGRESS REPORT 2010</b>			
22	<b>Council own fleet and contractors</b> – To reduce NO2 and PM10 emission under NI195.				Low	Med	Reduce emissions under NI195.	RBWM fleet emissions in 2010 were 5.8% lower than in 2008	ongoing	L tar red
<b>NEW TECHNOLOGIES – SUMMARY FROM ACTION PLAN</b>										
23	<b>New schemes and trails</b> - Participating in/support	RBWM	2006/07		Reduction of NOx ambient	N/A	Use of an electric vehicle as a staff pool			

**Royal Borough of Windsor and Maidenhead - England**

No	Measure - Focus	Lead authority	Planning Phase	Implementation Phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in the last 12 month	Estimated date to complete	Comments relating to target emission reductions
	schemes to reduce vehicles emissions.				concentration		car.			
24	Hybrid vehicles and hydrogen fuelled - vehicles Promoting, where possible, the use of less and non polluting vehicles	RBWM: Environment & Planning			N/A	N/A	RBWM to secure funding for electric vehicle charging points as part of its Local Sustainable Transport Fund bid			
<b>AIR QUALITY AND ROAD TRAFFIC MONITORING – SUMMARY FROM ACTION PLAN</b>							<b>PROGRESS REPORT 2010</b>			
30	<b>NO<sub>2</sub> Maintaining - two monitoring stations</b> - EP calibrates the stations fortnightly, liaise with ERG and attends the stations when needed.	RBWM TRL	2005	ongoing	N/A	N/A	Use of AQ grant to install 3 new NO <sub>2</sub> monitoring stations within the new areas declared in July 09	completed	July 2010	
31	<b>Diffusion tubes Network</b> NO <sub>2</sub> - Network of 25 passive diffusion tubes.	RBWM	2005	ongoing	N/A	N/A	Network revised in 2006, new hotspots found, current number of sites 26	Identified new hotspot areas		
31	<b>Monitoring PM<sub>10</sub></b> – monitor of PM <sub>10</sub> in Maidenhead town centre.	RBWM			N/A	N/A	No progress made			
31	<b>Monitoring road traffic</b> - EP to advise Highway to undertake suitable counts and monitoring.	RBWM	2006	ongoing	Survey points in AQAMs	N/A	Since 2006 AADT surveys within AQMAs been carried out.	Traffic model completed		

## Royal Borough of Windsor and Maidenhead - England

### APPENDIX A2 – Funded and Proposed LTP measure to be integrated with the existing AQAP

DETAILS	Responsibility	Impact on AQ	Targets By Date	Cost **	Other Impacts
<b>NETWORK MANAGEMENT (NM)</b>					
<b>Urban traffic control</b> Details Updating and extending the current UTC system	RBWM	High	2011 onwards	£150,000	Improve traffic flow
<b>Junction Improvements (NM)</b> Details: Modifying the layout of junctions experiencing chronic congestion					
Ongoing feasibility in progress at key roundabouts and junctions in Maidenhead and Windsor.	RBWM	High	2010 and ongoing	£ 40,000	Reduced road traffic congestion
<b>Windsor &amp; Eton Relief Road/ Clarence Road Junction (WERR)</b> Comprehensive redesign of the Clarence Road roundabout in Windsor, completed June 2011. The new scheme will deliver greatly improved traffic flow, helping to tackle congestion and improve air quality.	RBWM	High	2010 - 2012	Secured £5 million of major scheme funding	Health and air quality benefits and reduced congestion at peak hours
Windsor Parking and Transport Strategy: Car parking includes - Proposals for a ring of small-scale park and ride sites; Home Park car park extension; East Berks. College (extended public use); weekend public use of King Edward VII Hospital car park; improved accessibility at Windsor Dials ; new park and ride schemes from Centrica and Windsor Racecourse;	RBWM	High	2009-2012	Secured £5 million of major scheme funding	Reduced road traffic congestion by reducing circulating traffic
Bus priority at traffic lights	RBWM	Low	2010 - 2011	£ 25,000	
<b>Bray/M4/A308 Junction Improvements:</b> To improve traffic flow, reduce congestion and improve air quality. Any remaining problems will result from M4 traffic – Highways Agency (HA). Dialogue to be enhanced with HA & SEERA re resolutions proposed.	RBWM	Med	2009	£ 30,000	Improved road safety for cyclists / motorcyclists.
<b>Annual programme of junction improvements to reduce congestion</b>	RBWM	Med	2009 - 2011	Circa. £ 40,000 per annum	Improved safety for road users
<b>Maidenhead Town Centre</b>					
Review of traffic in Maidenhead town centre with particular reference to Grenfell Road junctions and along A4 throughout the length to Castle Hill.	RBWM, Maidenhead Area Action Plan working group	Potentially high	Commencing Spring 2009	Costs to be determined as PROM project develops	reduced traffic and congestion

## **10 Conclusions and Proposed Actions**

### **10.1 Conclusions from New Monitoring Data**

The new monitored data showed some marginal improvement within Windsor AQMA near Clarence Road roundabout, although other areas have NO<sub>2</sub> annual mean concentrations above the limit. The report confirmed the need to declare AQMAs near M25, junction 13, in Wraysbury and at the junction Winkfield Road and Imperial Road.

### **10.2 Conclusions relating to New Local Developments**

There are a number of new developments in the Borough relevant to air quality and the AQAP. The redevelopment of Clarence Road Roundabout (WERR) completed in June 2011 should increase the distance between building façades and the traffic and bring improvements to the traffic flow in the area. The Park and Ride development in Windsor should reduce road traffic. Maidenhead regeneration plans will take into account existing congestion and air quality issues in and around the town centre. Where appropriate the Council is involved in discussions and negotiations with developers to ensure that air quality in the borough is not adversely affected by any new development and where possible off set marginal impacts.

The Royal Borough of Windsor and Maidenhead confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

### **10.3 Other Conclusions**

The report identified the need to continue to review and implement the AQAP, to develop intermediate AQ indicators and review integration with the emerging LTP3.

### **10.4 Proposed Actions**

The report has identified no areas for which the Borough would need to undertake a Detailed Assessment. It is recommended to retain the existing AQMAs and continue to monitor NO<sub>2</sub> concentration across the current network.

## 11 References

ENTEC (2008): LAQM Detailed Assessment for the Royal Borough of Windsor and Maidenhead, ENTEC Report, November 2008.

Part IV of the Environment Act 1995: Local Air Quality Management - Technical Guidance LAQM.TG(09), February 2009.

Planning Policy Statement 23: Planning and Pollution Control. November 2004

RBWM (2007): LAQM Progress Report, Royal Borough of Windsor and Maidenhead Report, July 2007.

RBWM: Local Transport Plans (LTPs) 2006-2011, [http://www.rbwm.gov.uk/web/ltp\\_index.htm](http://www.rbwm.gov.uk/web/ltp_index.htm)

RBWM: The Planning Obligations and Developer Contributions Supplementary Planning Document (SPD) [http://www.rbwm.gov.uk/web/pp\\_planning\\_obligations.htm](http://www.rbwm.gov.uk/web/pp_planning_obligations.htm)

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The Air Quality Regulations (2000) and The Air Quality (England) Amendment Regulations 2002.