

2011 Air Quality Progress Report and Air Quality Action Plan Review for London Borough of Hammersmith & Fulham

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

April 2011

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Report Reference number	
Date	30 th April 2011

Executive Summary

The Air Quality Progress Report has found that exceedences of the nitrogen dioxide annual mean and hourly mean objectives continued in 2010 at some locations in the borough, although as expected, breaches of the objectives seem to be more likely at busy roadside locations rather than at background sites. Breaches of the hourly nitrogen dioxide objective are also likely in busy locations alongside very busy 'A' roads and in the town centres. In terms of PM10, no monitoring took place in 2010, but monitoring will begin again in 2011.

The potential for air quality impacts from a range of specified local developments has been considered, concentrating on assessing any new transport, industrial, commercial or domestic sources that were not covered by previous assessments. No significant developments have taken place since the Updating and Screening Assessment in 2010. No further assessments are required at this stage.

The review of the Air Quality Action Plan for the 2010/11 period shows that progress has continued in most areas including the implementation of School Travel Plans, with significant modal shift away from car journeys; the continued popularity of the discount parking permit scheme for low emission vehicles; the installation and use of electric vehicle re-charging points and introduction of a pilot scheme providing on-street car club bays; further exploration of future improvements to public transport in the borough in relation to Old Oak Common HS2 interchange station; increasing membership of the airTEXT pollution alert service.

The next stage in terms of air quality review and assessment work is to prepare and submit the next Updating and Screening Assessment in April 2012.

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1 Introduction

1.1 Description of Local Authority Area

The Borough of Hammersmith & Fulham is located on the western edge of inner London in a strategic location on the transport routes between the City and Heathrow. It is the 4th smallest of the London Boroughs in geographical area (1,641 hectares or 6.34 square miles) and has the 3rd smallest population (estimated 2009 population: 169,729 (2010 Mid Year Estimate)). It also has the 4th highest population density of any London Borough or indeed Local Authority in England.

Much of Hammersmith & Fulham is residential in character and scale although the northern most part of the borough is more industrial, forming part of the Park Royal industrial estate and is also the location for a complex network of railway lines, depots and sidings, including 2 busy rail routes – the Great Western and the West Coast mainlines. There are also a small number of light industrial processes authorised by the council, although most of these are made up of dry cleaners and petrol stations. The borough is also home to Westfield London in Shepherd's Bush town centre, one of the largest shopping centres in the UK, to 3 Premiership football teams, 2 large exhibition centres at Earls Court and Olympia and is traversed by the A4 and A40, 2 of the busiest roads in west London.

Main sources of nitrogen oxides and small particle emissions in the borough are road traffic, domestic and commercial gas boilers, trains and small industrial processes.

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, 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 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, mg/m^3). Table 1.1 includes the number of permitted exceedances in any given year (where applicable).

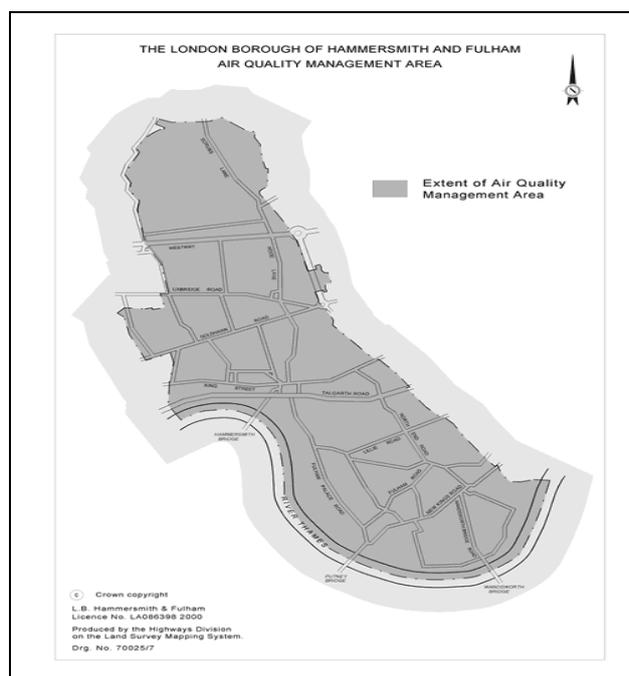
Table 1.1 Air Quality Objectives included in Regulations for the purpose of Local Air Quality Management in England.

Pollutant	Concentration	Measured as	Date to be achieved by
Benzene	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
1,3-Butadiene	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	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
Nitrogen dioxide	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
Particles (PM₁₀) (gravimetric)	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
Sulphur dioxide	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 whole of Hammersmith & Fulham was designated as an Air Quality Management Area (AQMA) in 2000 for two pollutants – nitrogen dioxide (NO₂) and particles (PM₁₀). This was because the first stage of the review and assessment process had shown that exceedences of the objectives for these pollutants were likely over large areas, particularly next to the busy road network that traverses the borough. There was no need to designate any area as an AQMA for any of the other pollutants as all of the targets for 1,3-butadiene, carbon monoxide, lead, sulphur dioxide and benzene were shown to be likely to be achieved.

Figure 1.1 Map showing the Hammersmith & Fulham AQMA



Having declared the AQMA, a more detailed assessment was carried out in the borough which confirmed the AQMA designation and then work started on drafting and implementing the Air Quality Action Plan (AQAP), which was adopted in April 2003. Progress with the Plan has been reviewed annually since 2004.

Updating and Screening Assessments (USAs) have also been completed (in 2004, 2006 and 2009), all 3 of which concluded that the original whole borough AQMA should remain. The 2004 USA showed that further investigations were necessary for 2 pollutants: (i) benzene (around a service station next to a busy road in Fulham) and (ii) PM₁₀ (in the industrialised part of the borough around Scrubs Lane). Results from these assessments have been reported previously and showed that no further actions were required. The 2006 USA concluded that exceedences of the NO₂ and PM₁₀ objectives were very likely to continue, requiring the AQMA to remain in place, but no Detailed Assessments were required. The 2009 USA concluded that it was appropriate to keep the AQMA in place, although it was recognised that there may be a more consistent level of compliance developing, particularly in relation to the PM₁₀ objectives.

For all other pollutants (1,3-butadiene, Carbon Monoxide, Lead, Sulphur Dioxide), the USAs have concluded that the Air Quality Strategy objectives were likely to be met by the required dates, so no further action was required to control emissions of these pollutants.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

During 2010/11, there were no automatic monitoring sites operating in the borough. The new site in Shepherds Bush town centre remained as a part-commissioned unit, following continuing difficulties in installing and connecting a new power supply. The station is now expected to be fully operational in the summer.

Figure 2.1 Map of Automatic Monitoring Site

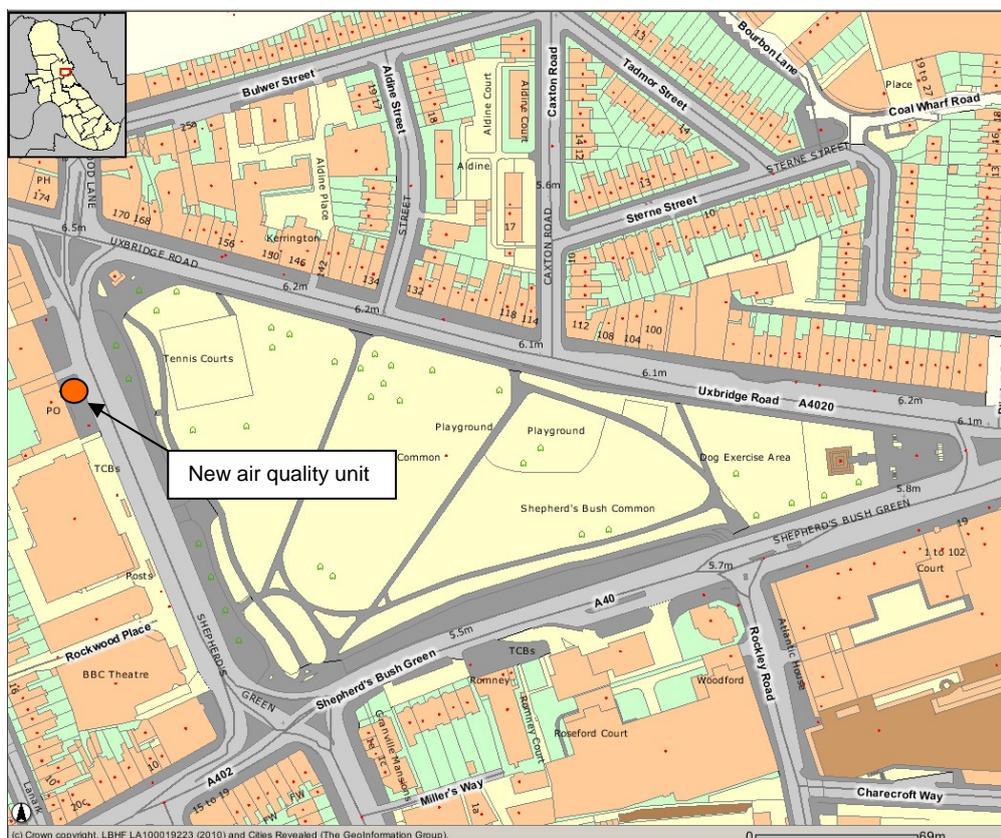


Table 2.1 Details of Automatic Monitoring Site

Site Name	Site Type	OS Grid Ref	Pollutants Monitored /Technique	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
Shepherds Bush	Urban Roadside	523313, 179900	NO2 (chemil.) PM10 (TEOM)	Y	Y (2m)	1m	Y

2.1.2 Non-Automatic Monitoring

During 2010, diffusion tubes were used at 10 sites to monitor NO₂ levels at 5 roadside sites and 5 background sites, as shown in the map and table below.

Figure 2.2 Map of Non-Automatic Monitoring Sites

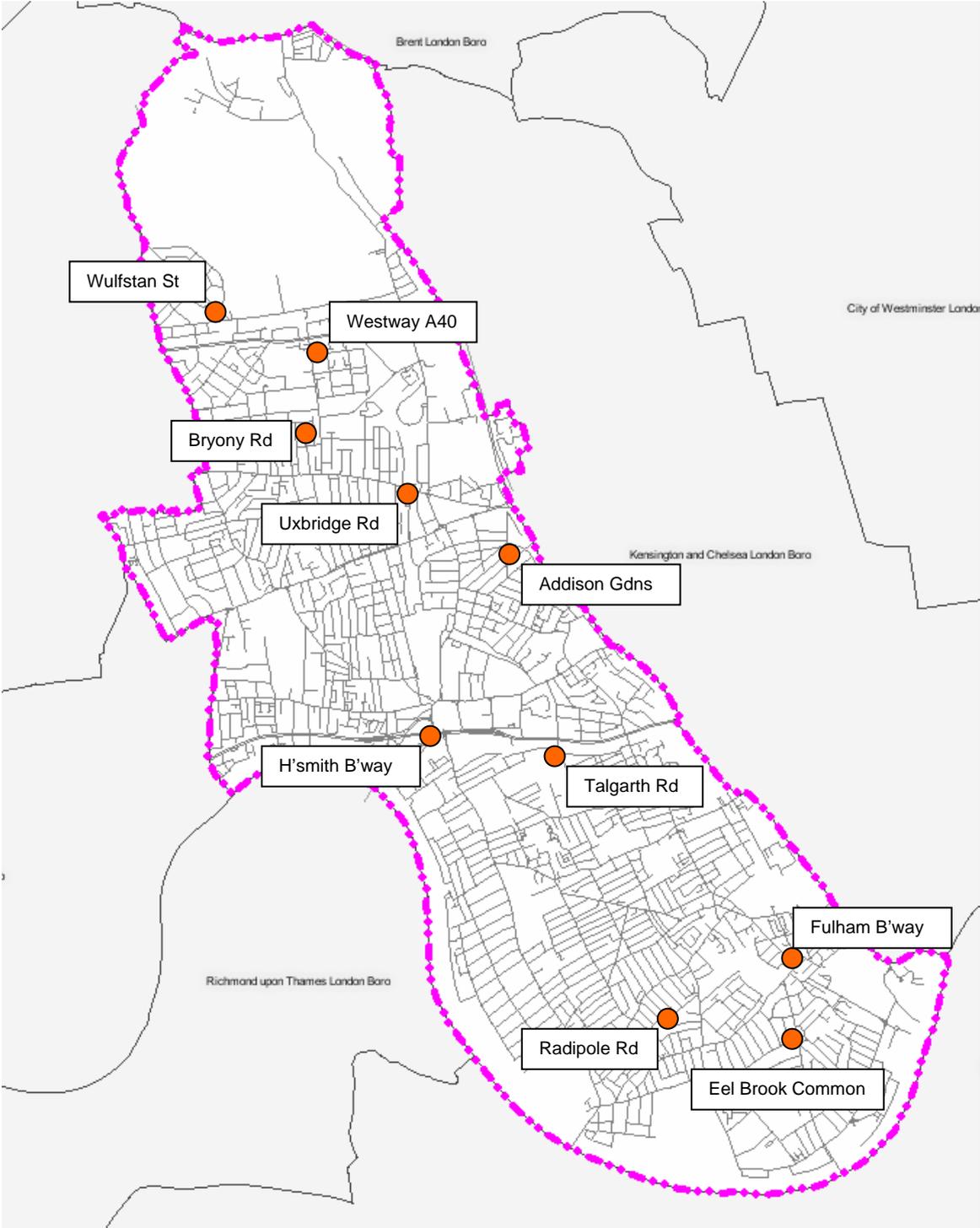


Table 2.2 Details of Non- Automatic Monitoring Sites

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 ?
Addison Gardens	Urban Background	523813, 179491	NO2	Y	Y (5m)	1m	N
Bryony Road	Urban Background	522479, 180656	NO2	Y	Y (6m)	1m	N
Eel Brook Common	Urban Background	525413, 176828	NO2	Y	N	50m	N
Fulham Broadway	Urban Roadside	525197, 177302	NO2	Y	Y (15m)	2m	N
H'smith Broadway	Urban Roadside	523327, 178484	NO2	Y	N	4m	Y
Radipole Road	Urban Background	524680, 176880	NO2	Y	Y (4m)	1m	N
Talgarth Road	Urban Roadside	524150, 178363	NO2	Y	Y (14m)	1m	Y
Uxbridge Road	Urban Roadside	522861, 180061	NO2	Y	Y (3m)	1m	N
Westway A40	Urban Roadside	522548, 180960	NO2	Y	Y (20m)	3m	Y
Wulfstan Street	Urban Background	521984, 181132	NO2	Y	Y (13m)	1m	N

The lab supplying and analysing the diffusion tubes is Gradko, who use a 50% TEA in acetone preparation method. Full details of QA/QC procedures are included in Appendix A.

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data

No automatic monitoring took place in 2010. Please refer to the 2010 Progress Report for a discussion of recent automatic monitoring data.

Diffusion Tube Monitoring Data

10 sites were monitored with NO2 diffusion tubes in 2010.

Figure 2.3 shows the annual mean NO2 concentration trends over the last 5 years at these sites. As expected, the lowest concentrations tend to be found each year at the background sites, most of which have met the 40 µg/m³ annual mean objective in recent years. The highest concentrations are found in the town centres (Hammersmith Broadway and Fulham Broadway) and alongside the busiest roads such as the Westway A40. As well as exceeding the annual mean objective, these sites are also likely to exceed the short-term hourly objective. All sites are representative of relevant public exposure, mostly being residential streets, town centre areas or public parks.

Figure 2.3 Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Diffusion Tube Monitoring Sites

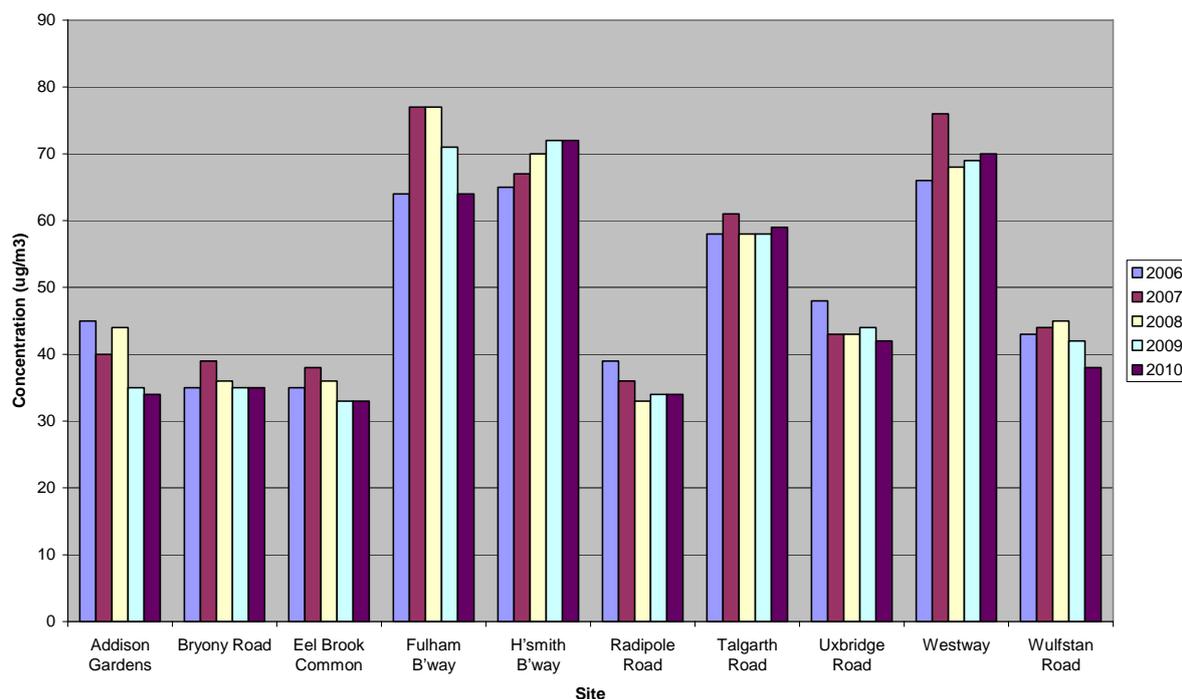


Table 2.3 Results of Nitrogen Dioxide Diffusion Tubes

Site ID	Location	Within AQMA?	Data Capture for monitoring period (2010) %	Data Capture for full calendar year (2010) %	Annual mean concentrations (µg/m ³)		
					2008	2009	2010
HF53	Addison Gardens	Y	100	100	44	35	34
HF45	Bryony Road	Y	100	100	36	35	35
HF44	Eel Brook Common	Y	100	100	36	33	33
HF50	Fulham B'way	Y	92	92	77*	71*	64*
HF32	H'smith B'way	Y	100	100	70*	72*	72*
HF66	Radipole Road	Y	100	100	33	34	34
HF63	Talgarth Road	Y	100	100	58	58	59
HF61	Uxbridge Road	Y	92	92	43	44	42
HF54	Westway	Y	100	100	68*	69*	70*
HF47	Wulfstan Road	Y	100	100	45	42	38

(bias adjustment factors used: 2008 – 0.93; 2009 – 0.92; 2010 – 0.93)

Concentrations highlighted in **bold** indicate an exceedence of the annual mean objective; those tagged with a star '*', highlight annual mean results above 60 µg/m³, indicating a risk that the 1-hour objective may also be exceeded.

2.2.2 PM10

No monitoring of PM10 took place in 2010. Please refer to the 2010 Progress Report for a discussion of recent automatic monitoring data.

2.2.3 Sulphur Dioxide

There was no sulphur dioxide monitoring in Hammersmith & Fulham in 2010.

2.2.4 Benzene

There was no benzene monitoring in Hammersmith & Fulham in 2010.

2.2.5 Other pollutants monitored

No other pollutants were monitored in Hammersmith & Fulham in 2010.

Summary of Compliance with AQS Objectives

Hammersmith & Fulham council has examined the results from monitoring in the borough.

Although no monitoring took place in 2010, in recent years, the PM10 annual mean objective has been met at both the background and roadside sites. The daily mean objective has occasionally been exceeded at the roadside site, but it has been met in most years since 2000.

For NO₂, exceedences of the annual mean objective continue at all roadside sites being monitored, with the hourly mean also likely to be exceeded at the very busiest locations. Background levels of NO₂ tend to be just below the objective level.

3 New Local Developments

3.1 Road Traffic Sources

Since the Updating and Screening Assessment report was published in 2009, there have been no new developments that have introduced any of the following:

- Narrow congested streets with residential properties close to the kerb
- Busy streets where people may spend one hour or more close to traffic
- Roads with a high flow of buses and/or HGVs
- Junctions
- New roads constructed or proposed since the last Updating and Screening Assessment
- Roads with significantly changed traffic flows
- Bus or coach stations

3.2 Other Transport Sources

Since the Updating and Screening Assessment report was published in 2009, there have been no new developments that have introduced any of the following:

- Airports
- Locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m
- Locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m
- Ports for shipping

3.3 Industrial Sources

Since the Updating and Screening Assessment report was published in 2009, there have been no new developments that have introduced any of the following:

- **Industrial installations:** new or proposed installations for which an air quality assessment has been carried out
- **Industrial installations:** existing installations where emissions have increased substantially or new relevant exposure has been introduced
- **Industrial installations:** new or significantly changed installations with no previous air quality assessment
- Major fuel storage depots storing petrol
- Petrol stations
- Poultry farms

3.4 Commercial and Domestic Sources

Since the Updating and Screening Assessment report was published in 2009, there have been no new developments that have introduced any of the following:

- Biomass combustion plant – individual installations
- Areas where the combined impact of several biomass combustion sources may be relevant
- Areas where domestic solid fuel burning may be relevant

3.5 New Developments with Fugitive or Uncontrolled Sources

Since the Updating and Screening Assessment report was published in 2009, there have been no new developments that have introduced any of the following:

- Landfill sites
- Quarries
- Unmade haulage roads on industrial sites
- Waste transfer stations etc
- Other potential sources of fugitive particulate emissions

Summary of New Local Developments

Hammersmith & Fulham council confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

4 Implementation of Action Plans

Progress has continued with the Air Quality Action Plan in most areas. Full details are presented in the following table.

Of particular note are the following:

- the implementation of School Travel Plans, with significant modal shift away from car journeys;
- the continued popularity of the discount parking permit scheme for low emission vehicles;
- the installation and use of electric vehicle re-charging points and introduction of a pilot scheme providing on-street car club bays;
- further exploration of future improvements to public transport in the borough in relation to Old Oak Common HS2 interchange station;
- increasing membership of the airTEXT pollution alert service.

Table 4.1 Action Plan Progress 2010/11

Action Plan Measure	Original Timescale	Previously reported Progress	Previously Reported Outcomes	New Progress, Outcomes and Additional Comments for 2010/11
REDUCING EMISSIONS AT SOURCE				
1. Encourage improved availability of alternative fuels	Summer 2003	<p>a) Originally the plan was to incorporate guidance on providing facilities for alternative fuels into a new Supplementary Planning Document (SPD) on Sustainable Design and Construction. However, when the document was finally published, the focus was on the construction process rather than development design features and availability of alternative fuels was not covered.</p> <p>b) H&F is part of a SWELTRAC project assessing the feasibility of providing charging points for electric vehicles. Provision of electric vehicle charging points on the public highway has been investigated in H&F, but was not regarded as feasible.</p> <p>c) All diesel vehicles in the council fleet switched to a 5% biodiesel mix in early 2006.</p>	<p>a) The SPD was adopted in November 2007, but no guidance was included on alternative fuel infrastructure.</p> <p>There continues to be 2 service stations in the borough where forecourt LPG is available – BP Connect on Talgarth Road by Hammersmith Flyover and BP Connect Shepherd’s Bush Green.</p> <p>b) 36 electric vehicle charging points are now in operation at 4 different sites, Hammersmith Hospital, Charing Cross Hospital, Kings Mall Shopping Centre and Westfield.</p> <p>c) Diesel vehicles continue to use 5% biodiesel fuel with fuel additive. Fleet MOT emissions tests have shown reduction in smoke emissions.</p>	<p>a) A policy has been included in the draft replacement London Plan that requires 1 in 5 parking spaces in new developments to provide an electrical charging point to encourage the uptake of electric vehicles.</p> <p>b) With the abolition of SWELTRAC in April 2011, ownership of the non-Westfield sites passed to the council, who have signed up to the Source London scheme, as have Westfield, so that the spaces will be available to any registered user in London.</p> <p>c) Biodiesel continues to be used, but the additive is no longer used due to engine warranty issues for newly acquired vehicles.</p>
2. Provide incentives for use of alternative fuels	From Summer 2003 onwards	<p>a) Continued to publicise information on the location of LPG refuelling stations in the borough and details of grant schemes.</p> <p>b) The council introduced a discount parking permit scheme for low emission vehicles in autumn 2007.</p>	<p>a) Impacts are difficult to assess – BP does not like to provide sales figures for LPG or any off their fuels due to commercial confidentiality.</p> <p>b) By 2009/10 almost 600 (572) parking permits had been issued for electric, gas or dual fuel cars in the borough. This represented about 1% of total permits issued.</p>	<p>a) As previously reported. No new activities for this measure.</p> <p>b) The number of ‘green’ parking permits issued is now 650. We intend to amend the system to make it compatible with the congestion charge criteria for cleaner vehicles.</p>
3. Promote travel plans to encourage a switch to low emission vehicles	Ongoing from 2002 for the duration of the AQAP	<p>a) Low-emission vehicles are promoted through the travel planning process, particularly with businesses. Emphasis so far has been on alternative modes of transport. The council uses its own rickshaw as an example of what kinds of alternative vehicles are available.</p>	<p>a) By 2009/10, 78 workplace travel plans were listed on iTrace for the borough. The first 4 voluntary workplace travel plans had also been completed.</p>	<p>a) 24 workplace travel plans were initiated or reviewed in 2010/11.</p>
4. Reduce emissions from the council fleet	Ongoing from 2002	<p>a) As mentioned above, biodiesel has been adopted for use by the council’s fleet. A fuel additive is also used to further improve efficiency and reduce emissions. The fleet has been reducing in size in recent years, with a proportional decrease in alternatively fuelled vehicles. All HGV classified vehicles meet the LEZ emission requirements.</p>	<p>a) Use of biodiesel and fuel additive continues to help emissions from the council’s diesel vehicles to be as low as possible. The number of vehicles in the council fleet continues to reduce as services are contracted out. The council has also signed up to TfL’s Freight Operators Recognition Scheme (Bronze level) which offers training and guidance in a number of areas relating to vehicle and fleet management.</p>	<p>a) 27 new mini-buses that utilise Mercedes’ ‘stop/start’ technology to reduce idling emissions have been added to the fleet. The council also remains a member of the FORS scheme. 1 vehicle has been earmarked for removal from the fleet due to non-compliance with the more stringent LEZ emissions standards due to be introduced in January 2012.</p>

Action Plan Measure	Original Timescale	Previously reported Progress	Previously Reported Outcomes	New Progress, Outcomes and Additional Comments for 2010/11
5. Seek a reduction in emissions from the bus fleet	To be agreed with TfL and bus operators	a) Council officers continue to liaise regularly with TfL representatives and bus operators.	a) TfL continues to trial buses running on alternative fuels such as electric-diesel, but none of the bus routes running in H&F are using hybrid buses, so there are no direct local emissions improvements from the trials. Bus companies are contacted when complaints are received about emissions at bus stands where engines are kept running unnecessarily.	a) As previously reported.
6. Encourage the use of vehicles with smaller, more efficient engines	From Summer 2003 onwards	a) Produced a public information leaflet (Drive Down Pollution) which included information on benefits of smaller vehicles. Information also appeared in HFM, the council web site and information poster. Also distributed at events such as the west London Green Festival etc. b) The Environment Services Department has use of a Smart car for council business which is used for site visits etc.	a) The information leaflet encourages people to consider smaller, more fuel efficient cars. b) The Smart car is a visual reminder to people that such small, efficient cars are ideal for city driving conditions.	a) As previously reported. See above (action 2) for update on discount parking permit scheme. b) As previously reported.
7. Seek to reduce emissions from larger vehicles (Low Emission Zone)	The report on the outcome of the LEZ study is due in mid 2003. Any scheme would need to be co-ordinated with other boroughs etc	a) The council submitted a full consultation response to TfL on their LEZ proposals. Concerns were raised about the potentially high costs that could be incurred in achieving relatively modest air quality benefits. The first phase of the LEZ was introduced in February 2008. Phase 2 of the LEZ was introduced in July 2008.	a) Most vehicles are complying with the LEZ requirements and emissions from HGVs (over 3.5t), buses and coaches are expected to be reducing in London as a result. All council vehicles comply with the LEZ emission standards as required.	a) The next phase of the LEZ is planned for early 2012 when larger vehicles will have to be Euro 4 compliant for PM10 and vans/mini-buses come into the scheme for the first time (Euro 3 compliant for PM10).
8. Seek to reduce emissions from badly maintained vehicles	Roadside testing is likely to start in 2003; to be co-ordinated with other participating boroughs	a) H&F carried out roadside tests as part of the London-wide vehicle emission testing scheme in 2003/04. However, the scheme was not funded to continue beyond that and no further testing has been carried out.	a) During 2003/04, 468 vehicles were tested, out of which 12 failed the emissions test. No test since then.	a) No further vehicle emission testing carried out.
9. Encourage more environmentally friendly driving behaviour	Implementation to be co-ordinated with other participating boroughs. Aim for summer 2003	a) Complaints about bus drivers unnecessarily running their vehicle's engine whilst parked are investigated as and when they are made by residents. Our public information leaflet includes information on reducing emissions through improved driving style such as switching the engine off to avoid unnecessary idling.	a) Opening of the extension to Hammersmith bus station in March 2008 has removed buses from an on-street bus stand where buses had on occasion been seen with engines running unnecessarily whilst parked.	a) No recent complaints received about emissions from buses stationary at bus stands. TfL are looking at running a London-wide awareness and enforcement campaign on idling vehicles.
10. Seek a reduction in	Ongoing from 2002 for the	a) Complaints of dust nuisance investigated as and when reported.	a) Complaints continue to be investigated as required. 18 complaints received in 09/10 about	a) Complaints continue to be investigated as required. 14 complaints received in 10/11 about construction /

Action Plan Measure	Original Timescale	Previously reported Progress	Previously Reported Outcomes	New Progress, Outcomes and Additional Comments for 2010/11
emissions of small particles from construction sites	duration of the AQAP	<p>b) Large scale developments are required to submit a construction code of practice, which will include measures on minimising dust emissions. SPD on Sustainable Construction adopted in November 2007 to provide advice on how to reduce dust and pollution impacts during construction /demolition works on large sites.</p>	<p>construction/demolition dust. Informal warning/ advice is usually effective in securing improvements. No notices served.</p> <p>b) Developers are advised to follow guidance in the council's SPD on Sustainable Construction and submit details on how dust/PM10 emissions will be minimised. The GLA/London Councils Best Practice Guidance on Control of Dust and Emissions from Construction and Demolition is also recommended.</p>	<p>demolition dust. Informal warning/advice usually effective in securing improvements. No notices served.</p> <p>b) We continue to require a construction management plan for major development sites, including measures to minimise dust emissions and advised to follow SPD/BPG guidance.</p>
11. Seek a reduction in emissions from domestic and commercial properties	Ongoing from 2002 for the duration of the AQAP	<p>a) Annual home composter promotions and the garden waste collection scheme continue to divert waste from landfill and prevent disposal by bonfire.</p> <p>b) Complaints about smoke from domestic /commercial properties are investigated as and when they are received.</p> <p>c) The council continues to use 'green electricity' contracts to reduce emissions from council buildings, particularly of CO₂. Took part in CIBSE awareness raising campaign on energy use and energy efficiency and plan to carry out energy audits at the 10 main council offices.</p>	<p>a) In 2009/10, 319 tonnes of household waste were composted – including 284 tonnes of other household green waste (leaf fall etc) and 35 tonnes of xmas trees. 395 tonnes of green waste from the council's parks were also sent for composting.</p> <p>b) Informal warning/advice usually effective in securing improvements. 24 complaints about smoke from bonfires in 2009/10. Advice was given and improvements secured. 4 notices were served. No complaints received about smoke from commercial chimney installations.</p> <p>c) The council's Carbon Management Plan was adopted in April 2010 and this outlines a number of energy efficiency saving projects which will reduce energy use and associated emissions, including local emissions as well as CO₂. For example, the council has implemented improved energy monitoring through an Energy Management System; Improved asset and</p>	<p>a) More than 4,600 home composters have been distributed in total since the composter promotions were first launched. In 2010/11 the following green waste was sent for composting:</p> <ul style="list-style-type: none"> - 55 tonnes of Christmas trees - 225 tonnes of leaf fall from public highways - 168 tonnes from the council's parks. <p>Some green waste from the council's parks and some of the Christmas trees were composted at Wormwood Scrubs. This makes further CO₂ savings as the green waste does not need to be transported to a composting facility outside of London.</p> <p>In 2010/11 we started to send some of our residual waste to an Energy from Waste plant rather than landfill -1,564 tonnes where sent for incineration during February and March (2011).</p> <p>b) In 2010/11 there were 43 complaints about smoke from commercial/domestic properties, including from bonfires. 2 abatement notices were served.</p> <p>c) The Carbon Management Plan is currently being reviewed to help improve the baseline data and provide a more accurate carbon emissions figure.</p> <p>£100k is now allocated to energy efficiency projects every year through the corporate planned maintenance budget. New projects that took place during 2010-11 including the introduction of LED lights for the town hall</p>

Action Plan Measure	Original Timescale	Previously reported Progress	Previously Reported Outcomes	New Progress, Outcomes and Additional Comments for 2010/11
		d) The council is part of the Carbon Trust Local Authority Carbon Management Programme, Phase 7.	facilities management which combined with Smart Working is rationalising and reducing the number of buildings used to deliver council services and improving energy management; Corporate Planned Maintenance Programme, which provides funds for energy initiatives; Carbon reduction initiatives in the council's IT strategy; The planned improvements as part of the Building Schools for the Future programme have not happened due to its cancellation. d) The baseline NI 185 data showed that the council's estates and operations were responsible for 24,443 tonnes of CO2 emissions in 2008/09. The Carbon Management Plan sets a target of reducing these emissions by an aspirational target of 40% by 2016.	and extension. d) NI185 has been replaced by DEFRA's Greenhouse Gas emissions reporting. ON the 29 th of July the council will report to DEFRA its scope 1,2 and 3 emissions for financial years 2009-10 and 2010-11. Details of emissions will be published on the council website.
12. Seek to control and minimise emissions from industrial premises	Ongoing from 2002 for the duration of the AQAP	a) Complaints of smoke emissions investigated when reported. Authorised processes inspected in line with DEFRA requirements.	a) Continued regulation and reduction of emissions to atmosphere through the LAPPC regime and clean air regulations. 5 complaints were received in 2009/10 regarding emissions from industrial sites regulated by the council. No evidence found of non-compliance – no action required.	a) Continued regulation duties. 2 complaints were received in 2010/11 regarding emissions from industrial sites regulated by the council. No evidence found of non-compliance.
REDUCING THE NEED TO TRAVEL				
13. Sustain and improve town & local centres, facilities and employment areas	UDP review to be complete in 2003	a) UDP alterations adopted in August 2003. The Mayor's altered London Plan was adopted in February 2008.	a) Work has started on the Local Development Framework which will replace the UDP. Over the past couple of years, the Council has been reviewing and refining its proposed LDF Core Strategy. Reducing traffic congestion and the need to travel remain strategic objectives.	a) The Submitted Core Strategy includes strategic policies supporting the regeneration of key parts of the borough. The Core Strategy and associated Planning Framework documents set strategic objectives of encouraging and promoting healthier lifestyles and reducing health inequalities.
14. Seek to reduce the air quality impact of new development	Ongoing from 2002 for the duration of the AQAP	a) UDP policies are applied as and when required to ensure developments to not have any adverse impacts on local air quality. Where necessary conditions have been attached to planning approvals or s.106 agreements made to require Travel Plans or improve public transport facilities. b) Air quality and land use guidance has been prepared for internal use by Development Control.	a) Air quality assessments are carried out for major developments and mitigation measures proposed if there is a need to reduce impacts. b) H&F guidance is in use by Development Control officers.	a) The council's submitted Core Strategy contains a policy on air quality and more detailed policies are being drafted for the Generic Development Management policies. An SPD is also likely to be drafted in 2011/12. b) As previously reported.
ENCOURAGING A SWITCH TO LESS POLLUTING FORMS OF TRANSPORT				
15. Promotion of bus services	Ongoing from 2002 for the	a) Continuing liaison with TfL on the provision of new bus services in the borough. The council	a) Bus service improvements during 2008/09: Route 316 (Cricklewood-Kilburn-Queens Park-	a) A full time bus stop for southbound traffic was constructed in North End Road, junction Racton Road.

Action Plan Measure	Original Timescale	Previously reported Progress	Previously Reported Outcomes	New Progress, Outcomes and Additional Comments for 2010/11
	duration of the AQAP	continues its involvement with the London Bus Priority Network and will further facilitate its continued success by preparing, or assisting in the preparation of bids for funding.	North Kensington) has been extended from North Kensington to White City, via the Edward Woods estate, from November 2008. New route 228 (Park Royal- Harlesden – White City – Notting Hill- Kensal rise was introduced January 2009. (Both in association with Westfield). A new Sunday service was introduced on route 607 from April 2010. All buses operating in the borough are now accessible.	Previously a bus stop at this location operated only in the evenings and on Sundays. The new facility provides an accessible facility within the main shopping and market area.
16. Promotion of other forms of public transport	Ongoing from 2002 for the duration of the AQAP	a) Continued to work in partnership with TfL on the development of the West London Tram scheme and with rail operators on new West London Line stations at Shepherd's Bush and Imperial Wharf.	a) Shepherds Bush rail station opened in September 2008 and a new tube station at Wood Lane opened in October 2008. Imperial Wharf station was opened in September 2009. The council is promoting a Crossrail interchange station with the West London Line in the Old Oak Common/Mitre Bridge area, linked to a possible High Speed Rail hub station. The Government has included the proposals for a High Speed Rail/Crossrail interchange at Old Oak Common in its Command Paper on HS2.	a) The council has commissioned work to show how the Old Oak Common interchange would provide a stimulus for regeneration of the brownfield sites in the Park Royal area.
17. Promotion of cycling	Ongoing from 2002 for the duration of the AQAP	a) The council has continued its involvement and co-operation with LCN+ and LCN, and will continue to consider the needs of cyclists with respect to any new development. In 2008/09, £765,000 was spent on LCN plus routes and £60,000 on cycle training for children and adults. Schools are encouraged through the Travel Plan programme to promote cycle training. Between September 2007 and March 2009, 568 pupils have received some level of cycle training. In 2007/08 training was provided for 32 schools, and so far in 2008/09 22 schools have been visited. 31 schools have been successful in receiving new cycle storage from the Mayor of London's Cycling Initiative between 2004/05 and 2008/09. A further 20 schools have been offered / invited to apply for cycle storage through the Mayors scheme in 2009/2010.	a) In 2009/10, £372,000 was spent on LCN plus routes and £60,000 on cycle training for children and adults. From April 2010, the London Cycle Network will no longer be promoted or funded. Cycling improvements on the highway will be introduced through the boroughs Corridor and Neighbourhoods budgets. The UDP has cycle parking standards to ensure new developments provide adequate provision for cycle parking /storage. In 2009/10, a total of 251 children were trained. 88 were trained to 'Bikeability' level 1 (38 of which achieved 2.7). 163 children were trained to level 2.8 and above. A total of 187 adults received individual training. The Sustrans Bike It project has been running in the borough since 2007. The project has tackled low bike ownership and improved the road worthiness of pupils' cycles, through the provision of Dr Bike Days and the organisation of bike pools. The UDP has cycle parking standards to ensure new developments provide adequate provision for	a) From 2010/11 TfL funding of transport work for London Boroughs changed to a holistic approach by way of "Neighbourhood" and "Corridor" funding. The approach taken by H&F has been to carry out "blank canvas" consultation with local people to understand their transport needs and problems. Proposals are then formulated and this is subjected to a further round of consultation. This has allowed local issues to be identified including identification of the need for additional cycle parking. In 2010/11 we carried out works in the Upper Mall which is part of the Thames Path to address local concerns regarding cycle / pedestrian conflict. The works included widening a path at the entrance to the Open Space, and the provision of specially designed pavements advising cyclists to give priority to pedestrians.

Action Plan Measure	Original Timescale	Previously reported Progress	Previously Reported Outcomes	New Progress, Outcomes and Additional Comments for 2010/11
			cycle parking/storage.	
18. Promotion of Walking	Ongoing from 2002 for the duration of the AQAP.	a) Walking Strategy now adopted and in the transport Local Implementation Plan. The council continues to promote walking as a viable means of travel through the provision of further improvements to facilities for pedestrians. This includes consideration of streetworks guidance, further traffic management measures i.e. Home Zones and a range of other measures aimed at providing an environment that is accessible, and highly conducive to the needs of all pedestrians.	a) The council promoted the 'Walking Works' activities, with again more than 1,000 individuals taking part. We also promoted walking at the Grand Union Canal Fest. Council Road Safety Officers visit infant, junior and secondary schools throughout the borough to raise awareness of road safety and provide training. 32 schools were visited between September 2008 and March 2009, with approx. 2,880 pupils benefiting from this work. 17,010 pupils have received road safety education from the team in the last 3 years. Road Safety Officers also organise school community awareness raising events to which the whole school community is invited, pupils, staff, parents and carers, and the general public/ local residents.	a) The new funding regime described above also allowed a focus to be provided on local accessibility issues. In the Wendell Park area we worked with volunteers from the Hammersmith and Fulham Action on Disability to identify barriers to movement across the area. In the adjoining Askew Road we repaved the footway in the whole of the main shopping area. We also completed the first stage of pedestrian signing in the Borough by erection of TfL's Legible London type signage in Shepherd's Bush town centre. Work commenced on the design of Legible London signage in Hammersmith town centre.
19. Encourage a reduction in car use for the journey to school	Ongoing from 2002 for the duration of the AQAP	a) Funding for the Travel Plan Co-ordinator post has been extended. Continued to promote school travel plans through the work of the Travel Plan Co-ordinator and encourage cycling/walking to school through highways improvements.	a) By 2009/10, a total of 77 schools (incl. nurseries) have school travel plans (STPs), with 53 of these currently being 'valid' (i.e. established and annually reviewed). One further school is engaged in the process and aiming for STP approval in 2010. Only one out of 79 schools in the borough total has not yet started work on its STP.	a) Not including independent nurseries (which do not have to do travel plans) a total of 72 schools (97%) have school travel plans (STPs), with 49 (66%) of these currently 'valid' (i.e. active and annually reviewed). One further school is engaged in the process and aiming for STP approval in 2011. Only one school in the borough never produced a STP. Over 20,000 pupils surveyed at 74 schools shows the following modal shift over the last 6 years: <ul style="list-style-type: none"> • Car use down from 21% to 16% • Cycling & scootering up from 5% to 10% • Walking level constant at 39% • Public transport constant at 32%
20. Encourage a reduction in car use for the journey to work and business trips	Ongoing from 2002 for the duration of the AQAP	a) As above: Funding for the Travel Plan Co-ordinator post has been extended.	a) By 2009/10, 78 workplace travel plans were listed on iTrace for the borough. The iTRACE system is used by the council, allowing more effective management of business travel plans that have been secured through the planning process. The first four voluntary workplace travel plans have been completed in the last financial year. A snap shot survey in November 2007 had the following modal split results: Motorcycle 2%; Car share 3%; Car 15%; Rail 12%; Tube 32%; Bus 14%; Bike 9%; Walk 13%. A Travel Plan business network is developing in Hammersmith Town Centre.	a) See measure 3.

Action Plan Measure	Original Timescale	Previously reported Progress	Previously Reported Outcomes	New Progress, Outcomes and Additional Comments for 2010/11
21. Control provision of on and off street parking to deter car commuting into and within the borough	Ongoing – parking best value review to be complete by mid 2003	<p>a) On street parking controls extended and now there are Controlled Parking Zones in all but the far north of the borough. The council monitored the effects of the congestion charge western extension on parking demand in the borough and subsequently made changes in November 2008 to deter commuter parking.</p> <p>b) Off street parking controlled by parking standards in the revised UDP.</p>	<p>a) Sunday controls were introduced in the areas near Westfield in December 2008 and further strengthening of controls was introduced in December 2010. Consultations have also been held on further match day parking controls around Chelsea and Fulham football grounds.</p> <p>b) Parking standards applied to new developments to ensure adequate provision without increasing 'parking stress'.</p>	<p>a) Chelsea and Fulham match day controls were rejected in the consultation. Work in the past year has concentrated on improving the enforceability of existing controls.</p> <p>b) Parking standards continue to be applied and new policies are being drafted for the council's LDF.</p>
22. Encourage freight to be transported in a sustainable manner	2004	<p>a) The council continues to work with the West London Freight Quality Partnership with a view to improving sustainability in the freight transport sector.</p> <p>b) Peter Brett Associates were commissioned to carry out a general freight study and a Home Delivery Scheme feasibility study.</p> <p>c) As part of the Clear Zone project, a survey is being carried out into demand for sustainable home deliveries in the Brook Green / Addison wards.</p>	<p>a) The council started planning a freight/delivery map for Hammersmith & Fulham together with the Metropolitan Police. A pilot map for North End Rd will be produced with the aim of reducing congestion and accidents.</p> <p>b) The home delivery scheme is included in the WLFQP three year programme; we will follow this up together with the partnership.</p> <p>c) 3 bicycle rickshaws have been purchased for potential use in such a scheme. Rickshaws have already been used by the council to transport mail/ goods and for local school deliveries.</p>	<p>a) The Council is now a member of FORS (Freight Operators Recognition Scheme) and we encourage the development of Servicing and Delivery Plans and the use of rail and water for freight via the planning process.</p> <p>b) No progress as yet on the home delivery scheme.</p> <p>c) As previously reported.</p>
MAKING MORE EFFICIENT USE OF ROAD TRANSPORT				
23. Encourage car sharing	From Summer 2003 onwards	a) Signed up to SWELTRAC and WLTS 'Share the Car' scheme. Car clubs are starting to set up in the borough with cars stationed at a number of locations – e.g. Fulham Broadway.	a) Share the car software installed Spring 2004. Car share scheme is up and running. We now have 3 Car Clubs operating in Hammersmith & Fulham: City Car Club, Zipcar and Streetcar. Transport officers have been working with the council's parking team to progress the introduction of on street car club bays, but with no results at the moment.	a) 4 on-street car club bays have been installed as a pilot scheme. Plans are being developed for further bays to be installed.
24. Discourage short journeys	From Summer 2003 onwards	a) See 21 above. Also participated in regular annual events such as the West London Green Festival and the Good Going week where information and advice on other forms of transport has been made available.	a) The "small zone" system mentioned under action 21 discourages intra-borough car journeys. Discouragement of short journeys is at the heart of the travel planning process. The school travel planning process has generated a positive modal shift with fewer short journeys being reported.	a) As previously reported. See also updates for measures 19, 20 and 21.
OTHER MEASURES TO REDUCE ROAD TRAFFIC AND EMISSIONS				
25. Reduce the amount of road	Ongoing from 2002 for the	a) Continued implementation of Home Zones and pedestrianisation schemes. A bid for funding from	a) There are now 16 20mph zones in the borough. The innovative "drive over chicane" in the North	a) An innovative 20mph zone without physical measures has been piloted in 2010/11 in the Wendell

Action Plan Measure	Original Timescale	Previously reported Progress	Previously Reported Outcomes	New Progress, Outcomes and Additional Comments for 2010/11
traffic in residential areas and town centres	duration of the AQAP	TfL has been made in the council's BSP to set up other Home Zone schemes in other parts of the borough. b) UDP has policies on car parking, plot ratio and density designed to limit the amount parking in new developments.	End Road East zone was Highly Commended at the London Transport Awards 2009. b) The UDP no longer has policies/standards on plot ratio and density – these expired in September 2007. We rely on London Plan for density and plot ratio. Policies being applied as and when appropriate.	Park area. b) The council's emerging generic Development Management policy document includes a policy on car parking standards aimed at reducing additional car travel and encouraging more sustainable travel methods.
26. Promote the use of trees to help improve local air quality	Work on the Biodiversity Action Plan will begin in early 2003	a) The Biodiversity Action Plan (BAP) was adopted in May 2004. The UDP also has a tree planting policy which seeks to ensure that the council will endeavour to plant new trees whenever possible and will expect developers to plant trees where appropriate.	a) 329 trees were planted in 2009/10. For some development sites, where planting etc is planned as part of the soft landscaping developers may be advised to investigate the use of vegetation/trees as a barrier helping to filter out pollution.	a) In 2010/11, a total of 371 trees were planted. Planting in new developments continues as previously reported.
27. Reduce the amount of traffic on the A4 and A40	From Summer 2003	a) Previously liaised with GLA/TfL on this issue to clarify if the A4 and A40 are regarded as priority roads for traffic reduction measures. TfL are concentrating on their 'network management duty' which relates more to keeping traffic moving rather than reducing traffic flows.	a) Partner in a bid for 'Greening the A4' project funding with Hounslow, Kensington & Chelsea and others. Bid includes travel demand management, alternative fuels, and road safety measures. TfL was due to consult the council on plans for the A4, but this has been delayed due to TfL reorganisations.	a) No funding for the A4 scheme.
MEASURES TO RAISE AWARENESS OF THE LINKS BETWEEN AIR QUALITY AND HEALTH				
28. Provide information to allow people to make informed choices about travel behaviour	From Summer 2003 onwards	a) Produced 'Drive Down Pollution' leaflet on cutting pollution from car use and other publicity material.	a) As previously reported. AirTEXT information distributed and presentations given to school nurses group and local breathe easy group. 102 people have now signed up for pollution alerts. No other new publicity produced in 10/11.	a) As previously reported. 135 Hammersmith & Fulham residents have now signed up for AirTEXT pollution alerts.
29. Provide information so people can make informed choices about reducing pollution from domestic activities	From Summer 2003 onwards	a) Originally intended to combine information on pollution from domestic activity with pollution from car use, but these 2 issues were separated.	a) A leaflet on cutting pollution from car use was produced, but production of domestic emissions information leaflet was delayed and not carried out.	a) No new publicity material produced.
30. Continue to monitor air quality and make info. available	Ongoing from 2002 for the duration of the AQAP	a) Monitoring continues to be carried out in the borough, with the focus on the 2 key pollutants of NO2 and PM10.	a) The annual NO2 objective continued to be exceeded in 09/10 at a number of sites across the borough. Both real-time air quality monitoring stations were closed in early 2009 with the intention to re- establish monitoring at a new site.	a) During 2010/11, the annual NO2 objective was exceeded at 5 sites out of 10, mainly at the roadside sites. No PM10 monitoring took place during 2010/11, but monitoring is expected to recommence during 2011/12.

5 Conclusions and Proposed Actions

5.1 Conclusions from New Monitoring Data

Hammersmith & Fulham council has examined the results from monitoring in the borough.

In recent years, exceedences of the NO₂ annual mean objective has continued at all main roadside sites being monitored, with the hourly mean also likely to be exceeded at the very busiest locations. Background levels of NO₂ tend to be just below the objective level.

Although no PM₁₀ monitoring took place in 2010, previous monitoring had shown that the annual mean objective was being met at both the background and roadside sites. The daily mean objective had occasionally been exceeded at the roadside site, but it had been met in most years since 2000.

5.2 Conclusions relating to New Local Developments

Hammersmith & Fulham council confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

5.3 Proposed Actions

The Progress Report has identified that there is currently no need to proceed to a Detailed Assessment for NO₂ or PM₁₀ and the whole borough Air Quality Management Area can remain in place.

The next stage in terms of air quality review and assessment work is to prepare and submit an Updating and Screening Assessment in 2012.

If the next round of assessments shows that the PM₁₀ 24-hour objective is consistently being met and that this is forecast to continue into the future, then a Detailed Assessment may also be required in order to support the variation of the AQMA order to apply only to NO₂.

6 References

Local Air Quality Management Technical Guidance (LAQM.TG(09)), DEFRA, 2009.

Air Quality Strategy, DEFRA, 2007.

Air Quality (England) Regulations 2000 (SI 928).

Air Quality (England) (Amendment) Regulations 2002 (SI 3043).

Air Quality Progress Report, LBHF, 2005, 2007, 2008, 2010.

Updating and Screening Assessment, LBHF, 2009.

Updating and Screening Assessment, LBHF, 2006.

Updating and Screening Assessment, LBHF, 2004.

Detailed Assessment, LBHF, 2006.

Air Quality Action Plan, 2003-05, LBHF, 2003.

London Air Quality Network, <http://www.londonair.org.uk>

Air Quality Management Area Order, LBHF, 2000.

Stage 1 Air Quality Review and Assessment, LBHF, 1998.

Stage 2 Air Quality Review and Assessment, LBHF, 1999.

Stage 3 Air Quality Review and Assessment, LBHF, 2000.

Stage 4 Air Quality Review and Assessment, LBHF, 2003.

Appendices

Appendix A: QA/QC of Monitoring Data

Appendix B: 2010 NO₂ Diffusion Tube Results

Appendix A: QA/QC Data

Diffusion Tube Bias Adjustment Factors

During 2010, the NO₂ diffusion tubes used for the passive monitoring work were supplied by Bureau Veritas and analysed by Gradko International Ltd. The preparation method used is 50% TEA v/v in Acetone. The bias adjustment factor for the 2010 data is 0.93; 2009 – 0.92; 2008 – 0.94; 2007 – 0.99.

Factor from Local Co-location Studies (if available)

There were no co-location studies carried out in 2010.

Discussion of Choice of Factor to Use

National bias adjustment factors have been used in this report as there are no local factors available.

PM Monitoring Adjustment

No PM₁₀ monitoring data is included in this report.

Short-term to Long-term Data adjustment

No data adjustment of this type is included in this report.

QA/QC of automatic monitoring

No automatic monitoring took place in 2010.

QA/QC of diffusion tube monitoring

Diffusion tube analysis is carried out in Gradko's UKAS accredited laboratory. Laboratory preparation and analysis of the tubes is strictly controlled and Gradko participate in 2 major independent schemes to assess their performance.

1) Workplace Analysis Scheme for Proficiency (WASP)

Gradko participates in the WASP NO₂ diffusion tube scheme on a monthly basis. This is a recognised performance-testing programme for labs undertaking NO₂ diffusion tube analysis as part of the UK NO₂ monitoring network. The scheme is designed to help laboratories meet the European Standard EN482. The lab performance for 2010 is shown below:

Nitrogen Dioxide WASP Results 2010

Analysis by UV/Vis spectrophotometry (GLM7) and continuous flow analysis (GLM9)

WASP Round No:-	R108A	R108B	R109A	R109B	R110A	R110B	R111A	R111B
Assigned Value	1.92	1.47	1.03	1.27	0.99	2.37	1.54	1.84
GLM7	1.862	1.443	1.074	1.022	0.891	2.245	1.57	1.851
GLM7	1.872	1.462	1.236	1.065	0.930	2.240	1.532	1.864
Average	1.867	1.453	1.155	1.044	0.911	2.243	1.551	1.858
Z Score	-0.3	-0.2	0.2	-1.2	-0.9	-0.7	0.1	0.1
GLM9	1.978	1.521	1.299	1.076	0.901	2.264	1.590	1.896
GLM9	2.028	1.536	1.252	1.075	0.934	2.243	1.599	1.9
Average	2.003	1.529	1.276	1.076	0.918	2.254	1.599	1.898
Z Score	0.6	0.5	0.6	0.1	-0.8	-0.6	0.5	0.4

All results show that the analysis performance levels are within the required levels to be regarded as satisfactory.

2) Network Field Inter-comparison Exercise

This exercise tests the performance of the diffusion tubes and lab analysis procedures and involves the regular exposure of a triplet of tubes at an Automatic Urban Network (AUN) site where real-time NO₂ levels are also measured using a chemiluminescent analyser. Gradko operates well within the required level of performance in terms of accuracy and precision, as shown by the results below. In 2010, the uncertainty of measurement for Gradko's analysis of diffusion tubes has been calculated at -3%, which is regarded as a good performance, signifying a high level of accuracy.

Table showing 2010 Network Field Inter-comparison results

Checking Precision and Accuracy of Triplicate Tubes



AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 $\mu\text{g m}^{-3}$	Tube 2 $\mu\text{g m}^{-3}$	Tube 3 $\mu\text{g m}^{-3}$	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	07/01/2010	03/02/2010	48.9	47.7	46.2	48	1.4	3	3.4	96	99.1	Good	Good
2	03/02/2010	03/03/2010								102	93.6		Good
3	03/03/2010	30/03/2010								107	99.4		Good
4	30/03/2010	28/04/2010								99	99.3		Good
5	28/04/2010	02/06/2010								88	99.3		Good
6	02/06/2010	01/07/2010	95.4	105.6	99.5	100	5.2	5	12.9	95	93	Good	Good
7	01/07/2010	04/08/2010	127.1	125.7	136.8	130	6.0	5	15.0	82	98.9	Good	Good
8	04/08/2010	01/09/2010	72.8	77.5	77.4	76	2.7	4	6.7	80*	94.7	Good	Good
9	01/09/2010	29/09/2010								86	99.6		Good
10	26/09/2010	03/11/2010	111.4	82.6	90.1	95	14.9	16	37.1	107	93	Good	Good
11	03/11/2010	01/12/2010	85.8	89.6	85.6	87	2.3	3	5.6	94.1	97.1	Good	Good
12	01/12/2010	05/01/2011	81.6	84.5	79.8	82	2.3	3	5.8	82.4	97.6	Good	Good
13													

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

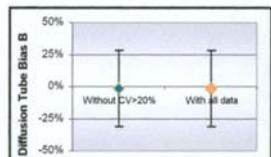
Site Name/ ID: Marylebone Road / NPL014B

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 7 periods of data	
Bias factor A	1.03 (0.79 - 1.48)
Bias B	-3% (-33% - 27%)
Diffusion Tubes Mean:	88 $\mu\text{g m}^{-3}$
Mean CV (Precision):	5
Automatic Mean:	91 $\mu\text{g m}^{-3}$
Data Capture for periods used:	96%
Adjusted Tubes Mean:	91 (70 - 130) $\mu\text{g m}^{-3}$

Precision: 7 out of 7 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 7 periods of data	
Bias factor A	1.03 (0.79 - 1.48)
Bias B	-3% (-33% - 27%)
Diffusion Tubes Mean:	88 $\mu\text{g m}^{-3}$
Mean CV (Precision):	5
Automatic Mean:	91 $\mu\text{g m}^{-3}$
Data Capture for periods used:	96%
Adjusted Tubes Mean:	91 (70 - 130) $\mu\text{g m}^{-3}$

Overall survey --> Good precision / Good Overall DC
(Check average CV & DC from Accuracy calculations)



Jaume Targa, for AEA
Version 04 - February 2011

Appendix B: 2010 NO2 Diffusion Tube Results

Table showing monthly NO2 results for all diffusion tubes sites in 2010 (unadjusted data)

Site ID	Location	Monthly concentrations ($\mu\text{g}/\text{m}^3$)											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HF53	Addison Gardens	50.6	47.29	33.86	33.33	33.69	31.3	22.84	24.52	33.81	39.13	46.52	48.09
HF45	Bryony Road	56.2	50.05	33.34	38.55	30.57	27.83	24.61	22.74	35.18	37.23	46.97	48.48
HF44	Eel Brook Common	50.02	51.12	30.71	36.32	28.99	26.07	20.09	23.54	29.88	34.5	43.16	46.27
HF50	Fulham Broadway	72.09	78.9	59.21	60.62	73.41	57.02	67.24	68.55	n/d	69.12	80.34	68.18
HF32	H'smith Broadway	79.53	82.57	71.62	68.39	88.84	74.91	64.07	77.87	93.25	77.64	80.26	68.99
HF66	Radipole Road	48.08	50.65	36.9	35.99	32.77	26.93	23.73	24.36	33.79	36.66	47.38	45.8
HF63	Talgarth Road	72.01	74.43	58.96	65.55	63.21	60.24	50.53	44.05	63.9	48.13	82.39	70.41
HF61	Uxbridge Road	n/d	55.73	45.19	43.21	40.51	38.68	35.35	38.11	47.49	46.1	48.36	50.95
HF54	Westway A40	88.38	80.81	56.65	84.13	78.25	77.3	56.47	60.48	72.9	73.25	87.06	82.85
HF47	Wulfstan Street	55.32	53.96	39.65	38.55	37.54	37.69	36.9	35.53	38.52	34.71	41.61	45.76

n/d – no data (tube missing)