



2011 Air Quality Progress Report for *Cheltenham Borough Council*

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

Date (May 2011)

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Executive Summary

This Progress Report summarises the results from air quality monitoring that Cheltenham Borough Council has completed during 2010. It also provides details of further assessment that has occurred within Cheltenham's designated Air Quality Management Area (AQMA) where elevated nitrogen dioxide levels are still being observed.

This report also highlights further monitoring that has been carried out in several other areas within Cheltenham where elevated nitrogen dioxide levels have been observed. Real-time monitoring and detailed assessment of these areas is planned for 2011.

Since April 2009, Cheltenham Borough Council has monitored air quality for only one air pollutant - Nitrogen Dioxide (NO₂). All other air quality pollutants that can be assessed under our Local Air Quality Management obligations, such as sulphur dioxide and PM₁₀, have been assessed during previous monitoring periods and were found to be within national objective limits.

The main source of NO₂ is from vehicle emissions and seems to be a particular problem in narrow 'corridor' streets where stationary or slow moving traffic occurs. The AQMA in Cheltenham continued to be monitored during 2010 and 2011 and the results indicate that the designation remains justified. An Air Quality Action Plan for the current AQMA has been postponed as described in the Progress Report 2010. Further areas within Cheltenham where exceedance of the national objective is occurring have also been identified. These areas are likely to be included within a much wider AQMA covering most of Cheltenham town centre. An overarching Action Plan will therefore need to be produced to ensure that the levels of NO₂ are brought within National Objective limits. At present human health could be at risk at locations where the NO₂ limit is being breached.

The number of NO₂ monitoring tubes has been reduced within the existing AQMA but are sufficient to provide information on the efficacy of any control measures that may be implemented as part of any Action Plan.

Since January 2010 further NO₂ diffusion monitoring tubes have been installed at several other locations within Cheltenham where there is known traffic congestion and potential exposure to nearby residential property. Results indicate several locations in Cheltenham that are in breach of the annual mean national objective for NO₂. It is proposed to install real-time monitoring equipment at one location to confirm results. Detailed assessment of these areas will also occur during 2011 and it is proposed to declare a new Air Quality Management Area for Cheltenham which covers all the separate areas where elevated nitrogen dioxide levels have been identified.

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1 Introduction

1.1 Description of Local Authority Area

Cheltenham Borough Council is situated in central Gloucestershire. It is bordered by Tewkesbury Borough Council and Cotswold District Council (Figure 1). Cheltenham Borough Council has a population of approximately 111,700 and lies some five kilometres to the east of the M5 motorway mid-way between Bristol and Birmingham on the edge of the Cotswold Hills.

The Borough is based on the town of Cheltenham and is mainly urban with some areas of surrounding countryside. It covers an area of approximately 4,680 hectares of which 17 percent is designated as green belt and 22 percent as an area of outstanding natural beauty.

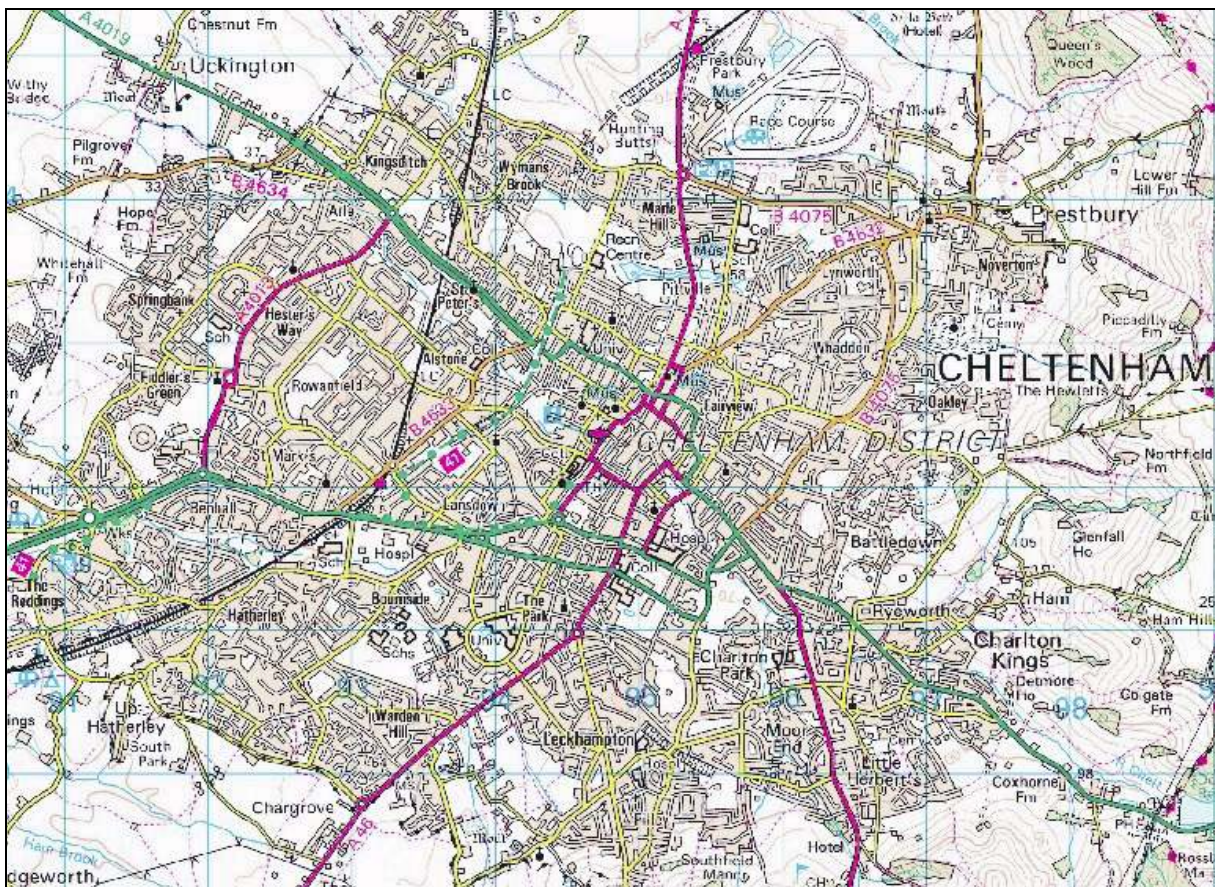


Figure 1.1 Map of Cheltenham Borough Council area

NW Cheltenham Extension: There is a proposal currently under consideration for the development of 5000 new houses to the north-west of Cheltenham (Appendix D). This development will primarily impact on Tewkesbury Road, Cheltenham and on Junction 10 of the M5. Cheltenham Borough Council and Tewkesbury Borough Council are working closely together to ensure that air quality is adequately considered for this development.

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 $\mu\text{g}/\text{m}^3$	Running 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

In recent years Cheltenham Borough Council has submitted the following reports:

- 2005: Progress Report
- 2006: Updating and Screening Assessment
- 2007: Progress Report
- 2007: Detailed Assessment of Bath Road for Nitrogen Dioxide
- 2008: Progress Report
- 2009: Updating and Screening Assessment
- 2010: Progress Report

In the 2004 Progress Report the authority identified the need to proceed to a Detailed Assessment for Nitrogen Dioxide at (lower) Bath Road. The Progress Report in 2005 again identified concerns for nitrogen dioxide at the same locations but also reported that there were no new locations of concern. Cheltenham Borough Council eventually undertook a Detailed Assessment for NO₂ at (lower) Bath Road in 2007.

A Detailed Assessment was completed for Bath Road and High Street in 2007 where an exceedance of the annual mean objective for NO₂ occurred with relevant exposure. In December 2008 an Air Quality Management Area (AQMA) was declared along a section of Bath Road and High Street in Cheltenham. The area is designated in relation to a likely breach of the nitrogen dioxide (annual mean) objective as specified in the Air Quality Regulations (England) 2000. The designated area incorporates High Street from the junction at Grosvenor Street through to the lower part of Bath Road where it meets the junction with Bath Street and Vernon Place. This includes the residential properties at 2A, 2B and 8A Bath Road, Flats 1-4 at 63A High Street, Flats 1-5 at 65 High Street and Flats 1 & 2 at 68 High Street.

A network of duplicate NO₂ monitoring tubes was installed in January 2009 which gave a total of thirteen monitoring locations with 26 tubes along the lower end of Bath Road including the designated AQMA. The number of tubes has now been reduced to seven locations which is still considered to be representative for measuring NO₂ levels within the AQMA. The updated locations are included in Figure 1.4.

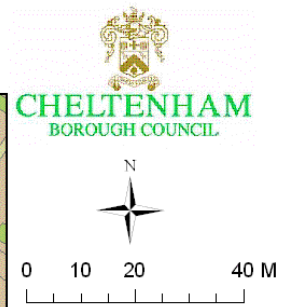
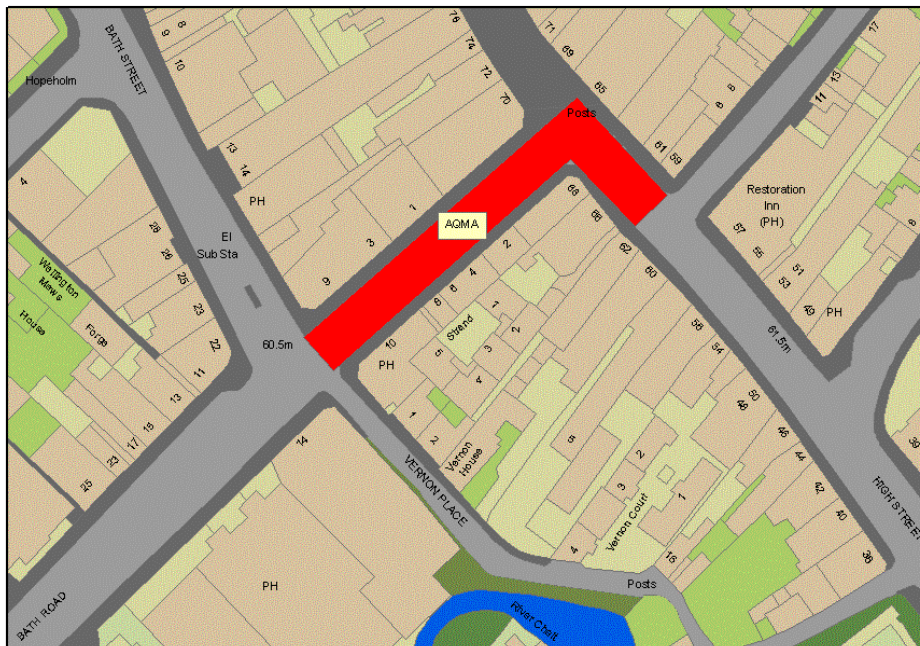
There have been no significant changes to the traffic flows in the Borough since the last round of Review and Assessment. One new industrial source was reported within the Borough in 2006. This is Kohler Mira (Kingsville Trading Estate, Cheltenham) a copper and alloy process established for the casting of gunmetal shower components. It is not considered that this process has a significant influence on local air quality within the Borough

The Updating and Screening Assessment for 2009 did not identify any new sources of pollution with the exception of a new biomass burner which was granted planning permission at the University of Gloucestershire. An air pollution screening assessment will be carried out if the system goes ahead to determine whether or not a detailed assessment may be necessary. At present the system has been shelved and no timescales have been submitted.

The 2010 Progress Report included details of further NO₂ monitoring at locations where there is known exposure and traffic congestion. Results are included within this report.

Figure 1.2 Map of AQMA Boundary

Location of AQMA in Cheltenham



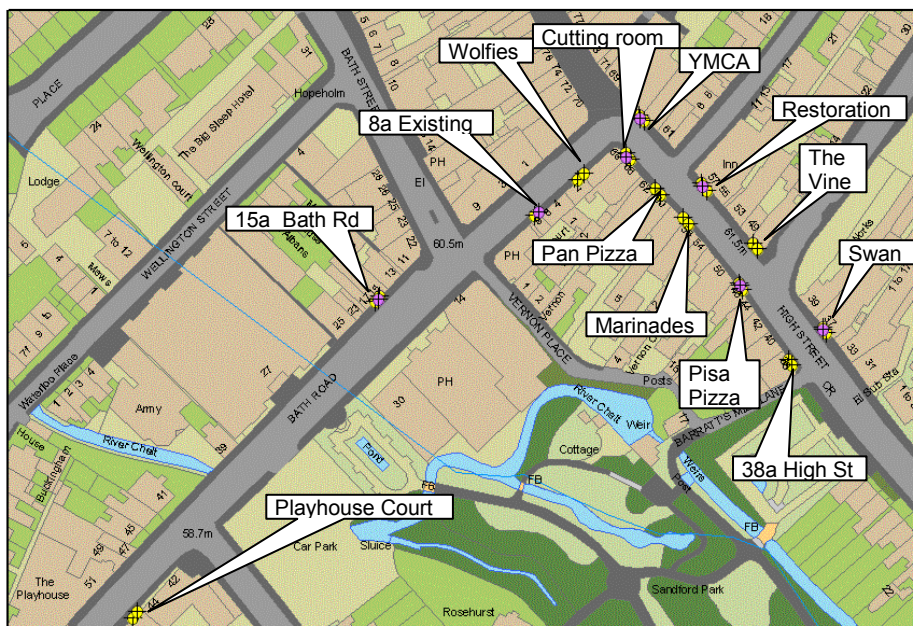
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 AQMA_Dec2008

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Figure 1.3 Monitoring locations near to the lower Bath Road AQMA

NO2 monitoring locations on Bath Road and High St in 2009(old) and 2010



Legend
 NO2_AQMA
 NO2_old_AQMA
 Surface_Water
 Main_river_10k

0 5 10 20 Meters

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2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Cheltenham Borough Council decided to cease operation of an automatic Air Quality Monitoring Station(AQMS) during 2009. Previous annual monitoring results from the AQMS did not indicate significant exceedance of any of the pollutants measured. Details are included in previous reports.

It is proposed to install a road-side enclosure to monitor for nitrogen dioxide in one of the new areas identified as exceeding the annual mean limit for nitrogen dioxide. This will give useful detailed information on pollutant levels and could lead to designation of a further AQMA in Cheltenham.

2.1.2 Non-Automatic Monitoring

Cheltenham Borough Council has been undertaking diffusion tube monitoring at a number of locations since 2003. Many of the monitoring locations have been consistently below the annual mean objective. Following a review at the beginning of 2010, several locations were replaced with new locations where there is relevant exposure and traffic congestion. Figure 2.1 illustrates the current monitoring sites within Cheltenham Borough (with the exception of the AQMA monitoring locations which can be seen in Figure 1.3). Table 2.2 provides details of these locations.

Figure 2.1 Map of Non-Automatic Monitoring Sites

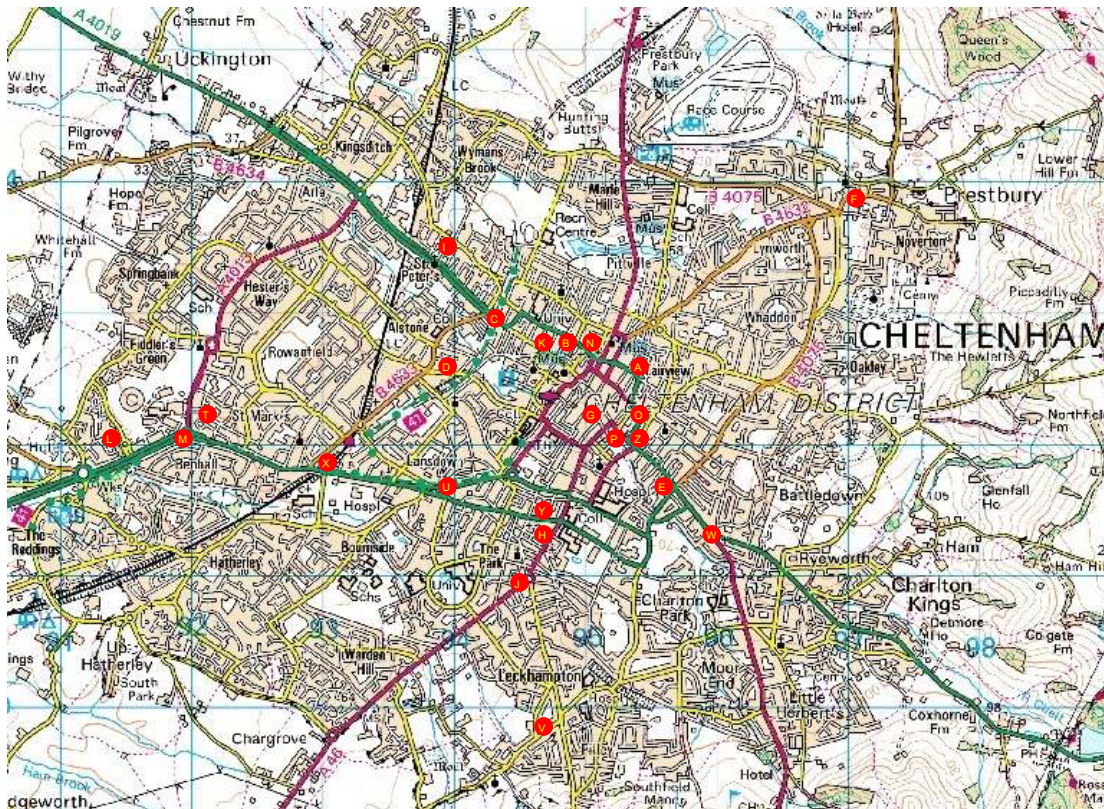


Table 2.1 Details of Non- Automatic Monitoring Sites

Map Ref.	Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA ?	Relevant Exposure with distance(m)	Distance to kerb of nearest road	Worst-case Location?
A	Portland Street/Fairview	Roadside	395110 - 222670	NO ₂	N	Y(2m)	2m	Y
B	2 Swindon Road	Kerbside	394830 - 222845	NO ₂	N	Y(2m)	1m	Y
C	443 High Street	Roadside	394330 - 222955	NO ₂	N	Y(3m)	3m	Y
D	124 Gloucester Road	Roadside	393802 - 222595	NO ₂	N	Y(1m)	10m	Y
E	81 London Road	Roadside	395660 - 221670	NO ₂	N	Y(1m)	5m	Y
F	Old Bakery Prestbury	Roadside	397009 - 223888	NO ₂	N	Y(2m)	2m	Y
G	Cambray	Urban centre	395064 - 222264	NO ₂	N	Y(20m)	5m	N
H	179 Bath Road	Roadside	394614 - 221153	NO ₂	N	Y(10m)	2m	Y
I	91 Tewkesbury Road	Roadside	393880 - 223390	NO ₂	N	Y(1m)	5m	Y
J	19 Shurdington Road	Roadside	394495 - 220960	NO ₂	N	Y(5m)	2m	Y
K	St Georges Street	Kerbside	394695 - 222733	NO ₂	N	Y(3m)	1m	Y
L	Telstar Road – GCHQ	Kerbside	391527 - 221930	NO ₂	N	Y(15m)	1m	Y
M	Miserden Road	Roadside	391997 - 222051	NO ₂	N	Y(20m)	5m	Y
N	Winchcombe St/Fairview Rd	Roadside	395210 - 222618	NO ₂	N	Y(1m)	2m	Y
O	132 Albion Street	Roadside	395400 - 222235	NO ₂	N	Y(1m)	2m	Y
P	7 Berkeley Place	Roadside	395340 - 222075	NO ₂	N	Y(5m)	2m	Y
T	P.E.Way roundabout	Roadside	391996 - 222133	NO ₂	N	Y(1m)	15m	Y
U	Westal Green	Roadside	393924 - 221608	NO ₂	N	Y(10m)	2m	Y
V	56 Church Road	Roadside	394577 - 219728	NO ₂	N	Y(5m)	2m	Y
W	212 London Road	Roadside	395969 - 221349	NO ₂	N	Y(2m)	2m	N
X	340 Gloucester Road	Roadside	392912 - 221862	NO ₂	N	Y(1m)	2m	Y
Y	7 Suffolk Road	Roadside	394640 - 221460	NO ₂	N	Y(1m)	2m	Y
Z	1 Hewlett Road	Roadside	395355 - 222055	NO ₂	N	Y(10m)	2m	Y

Details of Bias Adjustment

Nitrogen dioxide diffusion tubes used by Cheltenham Borough Council are 20% TEA in water supplied and analysed by Bristol Scientific Services. It can be confirmed that the lab follows the procedures set out in the Harmonisation Practical Guidance Procedures under the DEFRA practical guidance. The tubes at all 40 locations throughout the Cheltenham Borough Council area have a monthly exposure period. For 2010 the Bias Adjustment factor applied to the diffusion tube data was a National Bias Adjustment Factor obtained from the Bias Adjustment Factor Spreadsheet.

2.2 Comparison of Monitoring Results with Air Quality Objectives

During 2010, Cheltenham Borough Council monitored 23 nitrogen dioxide diffusion tube locations across the Borough and 7 diffusion tubes in the vicinity of the AQMA as part of the further assessment required for elevated nitrogen dioxide levels. Further monitoring tubes were added to the monitoring network at the beginning of 2011 to enable more detailed assessment of locations where elevated levels of nitrogen dioxide were identified during 2010. These will be the subject of detailed assessment and likely designation of a further AQMA for Cheltenham Borough.

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data

No automatic monitoring was carried out within Cheltenham Borough during 2010.

Diffusion Tube Monitoring Data

During 2010 Cheltenham Borough Council undertook NO₂ diffusion tube monitoring at 23 locations across their administrative area. The results are included in Table 2.5. There was exceedance of the annual mean objective with relevant exposure at several locations as identified with bold type, all of which are new monitoring locations for 2010. Detailed assessment will therefore be required in those areas of Cheltenham where exceedance and nearby relevant exposure has been observed.

Table 2.5 Results of Nitrogen Dioxide Diffusion Tubes

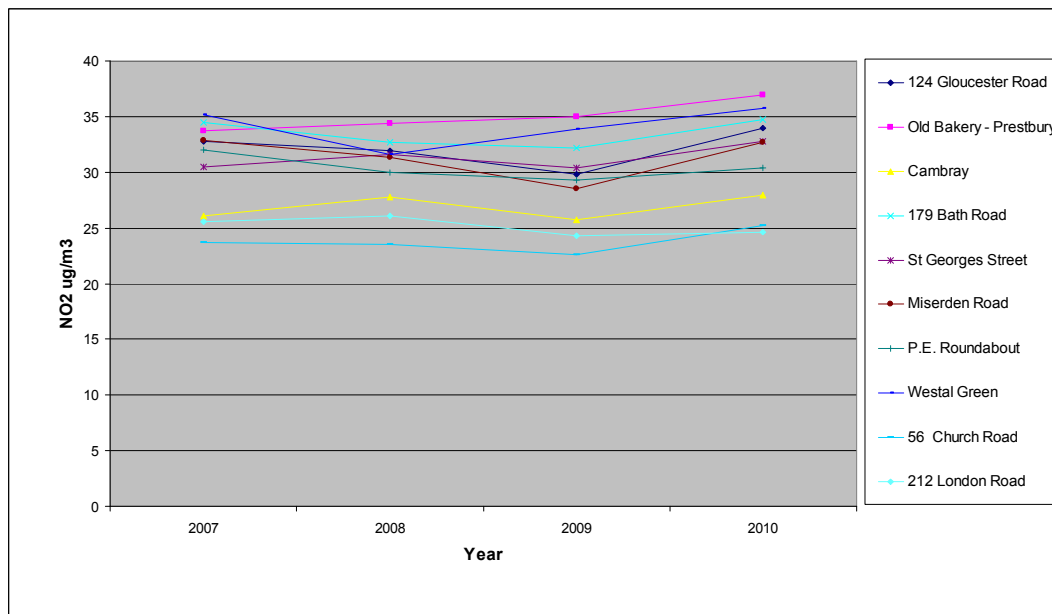
Site ID	Location	Within AQMA ?	Relevant public exposure Y/N?	Data Capture for monitoring period %	Data Capture for calendar year %	Annual mean concentrations (µg/m ³)		
						2008	2009	2010
A	Portland St / Fairview	N	Y	100	100			41.8
B	2 Swindon Road	N	Y	100	100			45.7
C	443 High Street	N	Y	100	100			41.4
D	124 Gloucester Road	N	Y	100	100	31.9	29.8	34.0
E	81 London Road	N	Y	100	100			45.5
F	Old Bakery -Prestbury	N	Y	100	100	34.4	35.0	37.0
G	Cambray	N	Y	100	100	27.8	25.7	28.0
H	179 Bath Road	N	Y	100	100	32.7	32.2	34.7
I	91 Tewkesbury Road	N	Y	100	100			31.9
J	19 Shurdington Road	N	Y	75	75			33.2
K	St Georges Street	N	Y	100	100	31.6	30.4	32.8
L	Telstar Road – GCHQ	N	Y	100	100			36.5
M	Miserden Road	N	Y	83.3	83.3	31.3	28.5	32.7
N	Winchcombe St/Fairview	N	Y	91.7	91.7			39.6
O	132 Albion Street	N	Y	91.7	91.7			30.6
P	7 Berkeley Place	N	Y	100	100			38.2
T	P.E.Way roundabout	N	Y	100	100	30.0	29.3	30.4
U	Westal Green	N	Y	100	100	31.6	33.9	35.8
V	56 Church Road	N	Y	100	100	23.5	26.9	25.2
W	212 London Road	N	Y	100	100	26.1	24.3	24.6
X	340 Gloucester Road	N	Y	100	100			44.5
Y	7 Suffolk Road	N	Y	100	100			40.1
Z	1 Hewlett Road	N	Y	100	100			47.9

New monitoring location results in bold type

A: Bias adjustment factor for 2008 was 0.87

B: Bias adjustment factor for 2009 was 0.84

C: Bias adjustment factor for 2010 was 0.85

Figure 2.2 Trends in Annual Mean Nitrogen Dioxide Concentration measured at Selected Diffusion Tube Monitoring Sites

Following a review of diffusion tube monitoring locations within the currently designated AQMA, further monitoring of NO₂ occurred during 2010 at a reduced number of locations within and surrounding the designated AQMA (see Fig 1.3). Annualised bias adjusted data indicates that the declared AQMA is justified due to continuing exceedance of the annual mean objective for NO₂. The highest readings within the AQMA correlate to the areas immediately adjacent to the two sets of traffic lights where traffic is sometimes stationary. It is likely that a revised AQMA will be declared for Cheltenham which will include the current AQMA together with the numerous other sites which have been identified as exceeding national objective limits for nitrogen dioxide within Cheltenham.

Table 2.6 Results of Nitrogen Dioxide Diffusion Tubes near AQMA

Site ID	Location	Within AQMA?	Relevant public exposure Y/N?	Data Capture for monitoring period %	Data Capture for full calendar year %	Annual mean concentrations (µg/m ³)		
						2008	2009	2010
1	The Swan	N	Y	100	100	n/a	32.4	35.8
2	Pisa Pizza	N	Y	100	100	n/a	34.6	36.2
3	The Restoration	N	Y	100	100	n/a	38.6	42.0
4	Cutting Room	Y	Y	100	100	n/a	45.6	47.3
5	YMCA Shop	Y	Y	100	100	n/a	40.3	45.1
6	8a Bath Road	Y	Y	100	100	n/a	45.3	46.3
7	15a Bath Road	N	Y	100	100	n/a	34.8	39.8

A: Bias adjustment factor for 2008 was 0.87

B: Bias adjustment factor for 2009 was 0.84

C: Bias adjustment factor for 2010 was 0.85

2.2.1 PM₁₀

No monitoring of PM₁₀ was carried out by Cheltenham Borough Council during 2010. Previous monitoring at an Automatic Air Quality Monitoring Station did not yield any significant exceedances. Roadside monitoring of PM₁₀ may be considered in future to supplement NO₂ monitoring, should funding be made available.

2.2.2 Sulphur Dioxide

No monitoring of Sulphur Dioxide was carried out by Cheltenham Borough Council during 2010.

2.2.3 Benzene

No benzene, carbon monoxide, 1,3-butadiene or lead monitoring was carried out by Cheltenham Borough Council during 2010.

2.2.4 Other pollutants monitored

No other air quality monitoring was carried out during the last round of review and assessment.

Summary of Compliance with AQS Objectives

Cheltenham Borough Council has measured concentrations of nitrogen dioxide above the annual mean objective at relevant locations outside of the AQMA, and **will need to proceed to a Detailed Assessment**, for those areas.

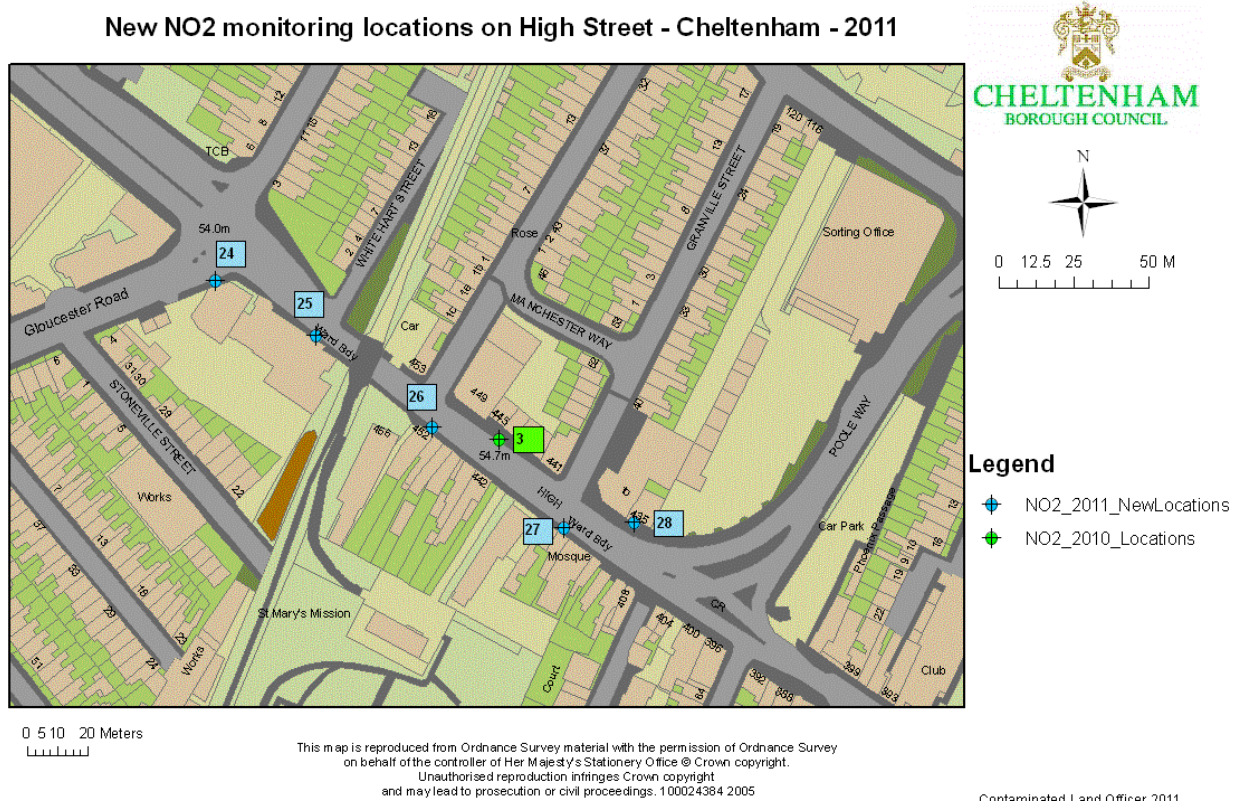
During 2011, Cheltenham Borough Council has installed further nitrogen dioxide monitoring tubes to provide more detailed information on the extent of the problem areas that were identified in 2010. This includes a number of new locations on High Street, Swindon road, Fairview road and Gloucester road. (See Section 3.1 for more details)

3 New Local Developments

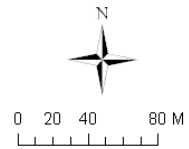
3.1 Road Traffic Sources

During late 2009, Cheltenham Borough Council identified a number of new locations within the Borough where there are congested roads and junctions with residential properties close to the kerb. These locations were monitored throughout 2010 and the results (see table 2.5) indicate a number of new locations where levels of NO₂ exceeded the annual mean national objective. It was therefore decided to conduct more detailed assessment at each of these locations and since January 2011, further NO₂ monitoring tubes have been installed near to each of these locations to gain a better understanding on the spatial extent of the problem. The plans below indicate the location of the new NO₂ monitoring tubes in relation to the monitoring tube locations which exceeded the national objective in 2010. The reference for each location is identified in Table 3.2.

Figure 3.1 Maps showing locations of new NO₂ diffusion tubes in Cheltenham to assist with detailed assessment

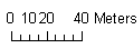


New NO2 monitoring locations on Swindon Rd/Fairview Rd - Cheltenham - 2011



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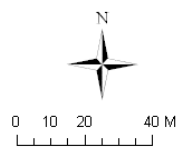
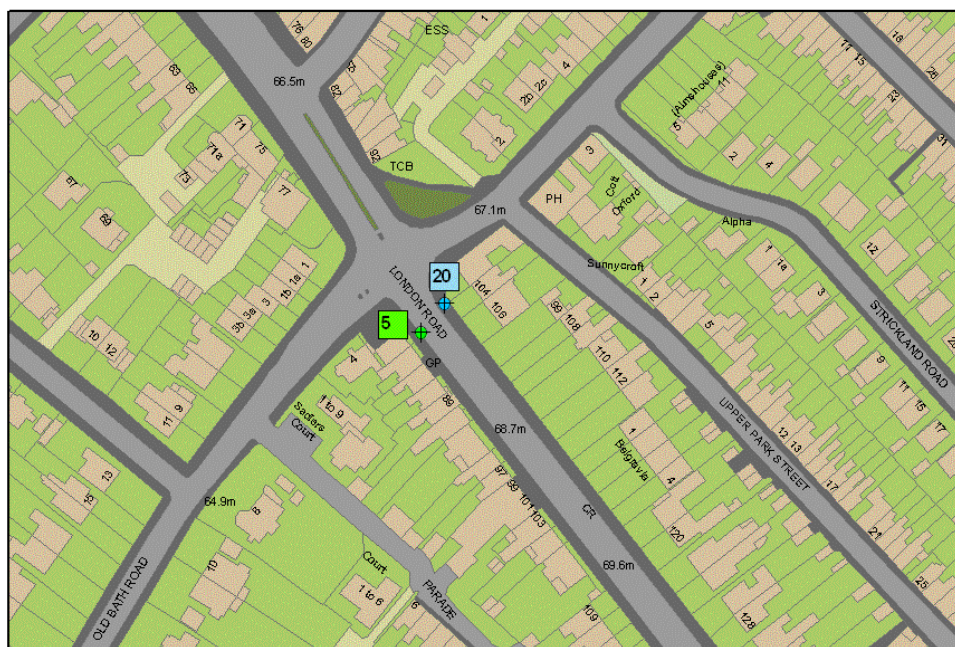
- NO2_2011_NewLocations
- NO2_2010_Locations



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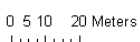
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New NO2 monitoring location on London Road - Cheltenham - 2011



Legend

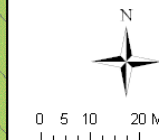
- NO2_2011_NewLocations
- NO2_2010_Locations



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New NO2 monitoring location on Gloucester Road - Cheltenham - 2011



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- + NO2_2010_Locations

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Table 3.2 Location of current NO2 diffusion tube network in Cheltenham

Ref	Site name	Monitor	Pollutants monitored	New location/ Existing/removed	OS Grid ref.
1	Portland Street/Fairview Rd	Diffusion tube	NO2	Existing	395110 - 222670
2	2 Swindon Road	Diffusion tube	NO2	Existing	394830 – 222845
3	443 High Street	Diffusion tube	NO2	Existing	394330 – 222955
4	124 Gloucester Road	Diffusion tube	NO2	Existing	393802 – 222595
5	81 London Road	Diffusion tube	NO2	Existing	395660 – 221670
6	Old Bakery Prestbury	Diffusion tube	NO2	Existing	397009 – 223888
7	338 Gloucester Road	Diffusion tube	NO2	NEW	392942 - 221885
8	179 Bath Road	Diffusion tube	NO2	Existing	394614 - 221153
9	91 Tewkesbury Road	Diffusion tube	NO2	Existing	393880 - 223390
10	19 Shurdington Road	Diffusion tube	NO2	Existing	394495 – 220960
11	St Georges Street	Diffusion tube	NO2	Existing	394695 - 222733
12	Telstar Road – GCHQ	Diffusion tube	NO2	Existing	391527 – 221930
13	Miserden Road	Diffusion tube	NO2	Existing	391997 – 222051
14	Winchcombe St/Fairview Rd	Diffusion tube	NO2	Existing	395210 – 222618
15	132 Albion Street	Diffusion tube	NO2	Existing	395400 – 222235
16	7 Berkeley Place	Diffusion tube	NO2	Existing	395340 – 222075
17	P.E.Way roundabout	Diffusion tube	NO2	Existing	391996 – 222133
18	Westal Green	Diffusion tube	NO2	Existing	393924 – 221608
19	56 Church Road	Diffusion tube	NO2	Existing	394577 – 219728
20	104 London Road	Diffusion tube	NO2	NEW	395673 - 221678
21	340 Gloucester Road	Diffusion tube	NO2	Existing	392912 – 221862
22	7 Suffolk Road	Diffusion tube	NO2	Existing	394640 - 221460
23	1 Hewlett Road	Diffusion tube	NO2	Existing	395355 – 222055
24	2 Gloucester Road	Diffusion tube	NO2	NEW	394236 – 223006

25	Opp. White Hart Street	Diffusion tube	NO2	NEW	394270 – 222988
26	452 High Street	Diffusion tube	NO2	NEW	394308 – 222958
27	422 High Street	Diffusion tube	NO2	NEW	394352 – 222924
28	Church Hill Court	Diffusion tube	NO2	NEW	394375 – 222927
29	New Rutland/Swindon Rd	Diffusion tube	NO2	NEW	394738 – 222890
30	Saracens Court	Diffusion tube	NO2	NEW	394771 – 222875
31	5 St Margarets Terrace	Diffusion tube	NO2	NEW	395041 – 222712
32	Millenium Plaza/Fairview Rd	Diffusion tube	NO2	NEW	395121 – 222659
33	Regency Hall/ Fairview Rd	Diffusion tube	NO2	NEW	395225 – 222610
	Cambray	Diffusion tube	NO2	REMOVED	395064 - 222264
	212 London Road	Diffusion tube	NO2	REMOVED	395969 - 221349

3.2 Other Transport Sources

There are no newly identified non-road traffic sources of air pollution in Cheltenham.

3.3 Industrial Sources

There are no newly identified industrial sources of air pollution in Cheltenham.

3.4 Commercial and Domestic Sources

In Cheltenham, there is a proposal to install a biomass heating system at the University of Gloucestershire's Hardwick campus. This facility is rated at 700KW. The Campus site and proposed boiler is in a Smoke Control Area and the boiler will need to be exempt under Section 21 of the Clean Air Act 1993. However the proposed development has been put on hold and there is currently insufficient information available to conduct an air quality assessment. Should the proposed development resume, then a screening assessment will be carried out at this time.

3.5 New Developments with Fugitive or Uncontrolled Sources

Cheltenham Borough 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 Local / Regional Air Quality Strategy

Cheltenham Borough Council does not currently have a local air quality strategy.

Cheltenham has contributed to the current revised Gloucestershire Air Quality Strategy published in 2010. This document can be accessed via Gloucestershire County Council's website or via Cheltenham Borough Council's website www.cheltenham.gov.uk

The revised strategy will be incorporated into the 3rd Local Transport Plan for the County (2011-2026).

5 Planning Applications

There is a proposal still under consideration for the development of 5000 new houses to the north-west of Cheltenham (termed the North-west extension area). This proposal is still in the early consultation phase. This development will primarily impact on Tewkesbury Road, Cheltenham and also on the M5 Junction 10. A map indicating the area of the proposed development is in Appendix C. To date there has been some consultation by the developer's agents with regards to the potential impact on air quality from this proposed development. Cheltenham Borough Council has agreed with the developer's agents for a number of NO₂ diffusion tubes to be placed in strategic positions in the vicinity of the proposed development to monitor current background NO₂ levels. These monitoring tubes should allow modelling of the likely increase in NO₂ as a result of the development and whether or not mitigation measures should be implemented. During forthcoming consultation periods it will be recommended that sufficient mitigation measures are adopted as part of the proposed development to ensure that traffic derived NO₂ levels do not exceed statutory limits.

6 Air Quality Planning Policies

Cheltenham Borough Council does not have any specific air quality planning policies. However as part of the Council's standard planning consultation procedures, all planning proposals are scrutinised by the relevant Environmental Health Officer and assessed for potential Air Quality implications. Recommendations are made as appropriate to ensure that sufficient information is submitted by the applicant to demonstrate that the development will not have a significant negative impact on local air quality and will not contribute to exceedances of any national air quality objectives. The Officer will consider various aspects of the development such as scale of the development, affect on traffic flow, local conditions – for example existing air quality and exposure – and whether the proposal incorporates any biomass boilers or PPC regulated processes. If it is considered that there is the potential for a significant impact on air quality from a proposed development then an Air Quality Impact Assessment will be requested from the developer which must define the magnitude of changes to air quality and the impacts at specific receptors.

Where required, a screening assessment will be carried by Cheltenham Borough Council on those proposed developments that could significantly impact air quality such as Biomass Boilers. This will progress to a detailed assessment where necessary.

7 Local Transport Plans and Strategies

Cheltenham Borough Council's transport strategy is derived from the Gloucestershire Local Transport Plan. The latest Local Transport Plan has been produced and covers the period from 2011 to 2026. It can be viewed on line at the following location;

<http://www.gloucestershire.gov.uk/index.cfm?articleid=102114>

The overall Local Transport Plan (LTP3) vision is: "Providing a safe and sustainable transport network within Gloucestershire" where safe means a transport network that people feel safe and secure using and sustainable means a transport network that is both environmentally and financially sustainable.

LTP3 has to address national transport priorities at the local level. These priorities are to;

- Tackle climate change;
- Support economic growth;
- Promote equality of opportunity;
- Contribute to better safety, security and health;
- Improve quality of life.

and it has aligned these to four main themes, which are:-

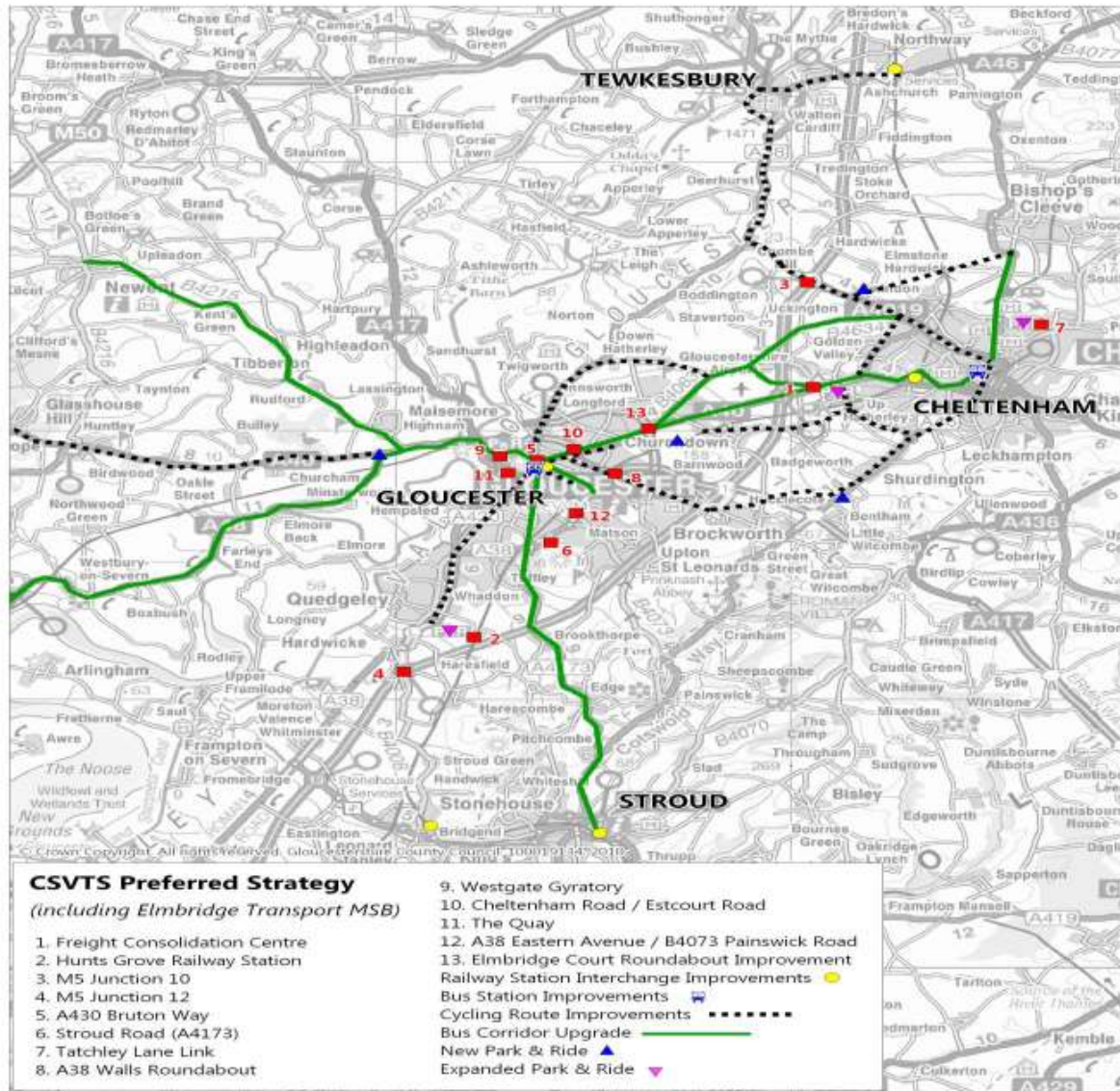
- A greener, healthier Gloucestershire;
- Sustainable economic growth;
- A safer, securer transport system;
- Good access to services.

The LTP3 sets out how the county council, working with its agents in Cheltenham and Gloucester and elsewhere in the county, aims to achieve the above themes and improvements through implementation of a number of specific schemes.

A summary of the preferred schemes identified within LTP3 for the Central Severn Vale area which covers Cheltenham are illustrated on the plan below.

Cheltenham Borough Council is also implementing a Smarter Travel Plan which will aim to support Government targets to reduce carbon emissions, and specifically to:

- reduce impact of travel on the environment
- create a healthier work force
- reduce unnecessary travel and encourage more sustainable modes of transport, by improving facilities/policies and providing information to raise awareness.
- reduce transport costs both for employees and the council
- create a positive public image with local residents, business, partners and other organisations
- reduce carbon emissions from road vehicles used for Government administrative operations by 15% between 2005/06 and 2010/11;
- reduce carbon emissions from Government offices 12.5% between 2005/6 and 2010/11 and by 30% by 2020.



It is hoped that the adoption of these schemes will assist in reducing traffic vehicle movements in Cheltenham which should result in a consequential improvement in air quality.

However many of these schemes rely on significant funding which, due to the uncertain economic climate, may not be guaranteed.

Additionally it is recognised that people may not respond to measures to encourage them to change to travel by cycle, on foot, car-sharing or by public transport. This may therefore result in increased congestion and CO2 emissions.

8 Climate Change Strategies

Cheltenham Borough Council produced a Climate Change Strategy in 2005 which can be found on the following link;

http://www.cheltenham.gov.uk/site/scripts/download_info.php?fileID=955

The OVERARCHING AIM of this strategy is to make Cheltenham a carbon neutral borough.

The MAIN OBJECTIVES of the strategy are to:

- raise awareness of the potential impact of climate change;
- establish accurate data of greenhouse gas emissions from activities in Cheltenham;
- propose measures to help prevent the causes of climate change, by aiming to reduce CO₂ emissions from activities in Cheltenham by 20% from 1990 levels by 2010 and by 60% by 2050;
- propose measures to help us adapt to the inevitable consequences of climate change;
- and engage with external agencies and other stakeholders to gain commitment to addressing climate change issues and delivering the climate change action plan.

Although it doesn't specifically detail improvements to Air Quality it does highlight the need to reduce the impact of road transport in terms of greenhouse gas emissions.

The Strategy accepts that the most effective tools to reduce CO₂ emissions from vehicles are likely to be EU and national legislation and taxes. Car manufacturers are reducing average CO₂ emissions from new cars by 25% from 1995 to 2008, and changes to vehicle tax bands and company car taxation are designed to encourage cleaner vehicles.

However there is minimal evidence to demonstrate a reduction in car usage in Cheltenham. Recent traffic count data suggests that car use and congestion has not decreased since Cheltenham adopted its Climate Change Strategy.

9 Implementation of Action Plans

Cheltenham Borough Council has not yet implemented an Action Plan for its AQMA. The data for 2009 justified the decision to declare the AQMA on lower Bath Road and High Street in Cheltenham. Data obtained during 2010 indicates that the air quality in the AQMA area continues to exceed National Air Quality Objectives for Nitrogen Dioxide(NO₂). Following exceedance of the national objective for NO₂ at other locations within Cheltenham, it is now proposed to declare a much larger AQMA for Cheltenham to include those new areas identified as well as the current AQMA. An Action Plan will then be developed for the new AMQA.

Detailed traffic data for the AQMA has been provided by Gloucestershire County Council which can be found in Appendix B. This data has been split into vehicle type and movements along each section of roadway within the AQMA. Source apportionment by vehicle type has been carried out and the information is summarised below. It is clear that the majority of vehicle movements and emissions are attributable to cars.

Entering the AQMA along High Street the proportion of each vehicle type is as follows;

Buses/coaches(PSV) = 1.0%

Heavy Goods Vehicles (OGV 1&2) = 1.6%

Light Goods Vehicles(LGV) = 12.0%

Cars = 84.8%

Motorcycles = 0.6%

Leaving the AQMA down Bath Road:

Buses/coaches(PSV) = 0.9%

Heavy Goods Vehicles (OGV 1&2) = 1.5%

Light Goods Vehicles(LGV) = 11.2%

Cars = 85.8%

Motorcycles = 0.6%

The proportion of emissions per vehicle is summarised below

Vehicle Type	% of flow	% of total emissions at 5km/h	% of total emissions at 15km/h
Cars	84.8	47.5	43.8
LGV	12.0	19.2	17.1
HGV	1.6	15.0	19.2
Buses	1.0	18.2	19.8
Motorcycles	0.6	0.1	0.1
TOTAL	100	100	100

Detailed assessment is occurring at several locations in Cheltenham following the installation of further nitrogen dioxide monitoring tubes in January 2011 at sites which were in excess of the national objective for NO₂ (annual mean). See Chapter 3.

10 Conclusions and Proposed Actions

10.1 Conclusions from New Monitoring Data

New monitoring data indicates that nitrogen dioxide levels remain above national objectives at several locations within the designated AQMA. In addition, data obtained during 2010 indicates that there are several other locations within Cheltenham that appear to be exceeding the national objective for nitrogen dioxide (annual mean). These locations are now the subject of detailed assessment during 2011 and it is likely that a new AQMA will be designated for a large area of Cheltenham to include all the areas identified together with the existing AQMA.

Development and implementation of an Action Plan to control these levels will therefore be required.

In tandem with the requirement to develop an Action Plan for Cheltenham, the Council, in partnership with Gloucestershire Highways, is currently progressing with its plans to close part of the inner ring road to through traffic, with the exception of buses. Preliminary traffic modelling has been carried out which suggests there could be a net reduction in traffic flow through the current AQMA should this scheme be implemented. This would obviously be welcomed as this may reduce nitrogen dioxide levels to below the national objective at the current AQMA location. However there is the risk that traffic may be diverted to other roads which could cause air quality problems. The overall air quality impact on those areas identified in this report as requiring detailed assessment is uncertain.

10.2 Conclusions relating to New Local Developments

There are no new local developments identified during the period covered by this report.

10.3 Other Conclusions

It is likely that Cheltenham will need to develop a new approach to traffic management if it intends to reduce traffic derived pollution levels to meet national objectives.

10.4 Proposed Actions

Assessment of Nitrogen Dioxide levels at several new locations within Cheltenham has demonstrated that exceedance of national objective is occurring. More detailed assessment of these areas commenced in 2011. A new AQMA will be declared to include all areas identified.

Appendices

Appendix A: QA:QC Data

Diffusion Tube Bias Adjustment Factors

The diffusion tubes (20% TEA in Water) are supplied and analysed by Bristol Scientific Services Ltd. The tubes at all locations throughout the area have a monthly exposure period. A triplicate co-location study at Cheltenham's Automatic monitoring station (AQMS) generated a 'local' bias adjustment factor which was applied to all nitrogen dioxide diffusion tube data for 2008. This data was assessed using the Precision and Accuracy Bias Tool available on the Air Quality Archive Website. For 2009 and 2010, due to closure of the council's air quality monitoring station, a local bias adjustment was not available. Instead a National Bias Adjustment factor was calculated using the Bias Adjustment Factor Spreadsheet available at <http://www.uwe.ac.uk/aqm/review/index.html> The bias adjustment factors utilised were:

- 2008 bias adjustment factor: 0.87
- 2009 bias adjustment factor: 0.84
- 2010 bias adjustment factor: 0.85

QA/QC of diffusion tube monitoring

The diffusion tube monitoring carried out within Cheltenham's AQMA during 2009 utilised duplicate tubes at each monitoring location. The precision of the tubes were assessed using the Precision and Accuracy Bias Tool available on the Air Quality Archive Website and were assessed as having 'good' precision. See below for an example of precision assessment for one of the locations within our AQMA.

Bristol Scientific Services participates in the WASP scheme, the latest results show them as 'good' on the basis of RPI old and new criteria.

Appendix B: Detailed Traffic Count data within AQMA

Section 1		High Street / Grosvenor Street junction, Cheltenham										Ref no: 550245					
Gazeteer Ref:		Grid ref: 395190222164										Wednesday, 24/3/2010					
All motor vehicles																	
		High St west					High St east					Grosvenor Street					Total In
		Left	Ahead	In	Out	2-Way	Ahead	Right	In	Out	2-Way	Left	Right	In	Out	2-Way	
06:00-07:00	-	-	-	-	-	-	-	-	-	-	-	-	9	9	-	9	883
07:00-08:00	-	-	-	883	883	-	874	-	874	-	874	-	9	9	-	9	883
08:00-09:00	-	-	-	1391	1391	-	1379	3	1382	-	1382	-	12	12	3	15	1394
09:00-10:00	-	-	-	1074	1074	-	1051	2	1053	-	1053	-	23	23	2	25	1076
10:00-11:00	-	-	-	945	945	-	923	6	929	-	929	-	22	22	6	28	951
11:00-12:00	-	-	-	942	942	-	923	6	929	-	929	-	19	19	6	25	948
12:00-13:00	-	-	-	961	961	-	937	6	943	-	943	-	24	24	6	30	967
13:00-14:00	-	-	-	980	980	-	958	7	965	-	965	-	22	22	7	29	987
14:00-15:00	-	-	-	1015	1015	-	987	4	991	-	991	-	28	28	4	32	1019
15:00-16:00	-	-	-	1035	1035	-	1010	6	1016	-	1016	-	25	25	6	31	1041
16:00-17:00	-	-	-	1163	1163	-	1141	11	1152	-	1152	-	22	22	11	33	1174
17:00-18:00	-	-	-	1122	1122	-	1098	6	1104	-	1104	-	24	24	6	30	1128
18:00-19:00	-	-	-	899	899	-	890	7	897	-	897	-	9	9	7	16	906
19:00-20:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20:00-21:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21:00-22:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12hr	-	-	-	12410	12410	-	12171	64	12235	-	12235	-	239	239	64	303	12474
Est AADT	-	-	-	13651	13651	-	13459	-	13459	-	13459	-	263	263	70	333	
Heavy goods 6 or more tyres (excluding PSVs & Coaches)																	
		High St west					High St east					Grosvenor Street					Total In
		Left	Ahead	In	Out	2-Way	Ahead	Right	In	Out	2-Way	Left	Right	In	Out	2-Way	
06:00-07:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07:00-08:00	-	-	-	14	14	-	14	-	14	-	14	-	-	-	-	-	14
08:00-09:00	-	-	-	18	18	-	18	-	18	-	18	-	-	-	-	-	18
09:00-10:00	-	-	-	32	32	-	31	-	31	-	31	-	1	1	-	1	32
10:00-11:00	-	-	-	25	25	-	24	-	24	-	24	-	1	1	-	1	25
11:00-12:00	-	-	-	25	25	-	24	-	24	-	24	-	1	1	-	1	25
12:00-13:00	-	-	-	16	16	-	16	-	16	-	16	-	-	-	-	-	16
13:00-14:00	-	-	-	18	18	-	18	-	18	-	18	-	-	-	-	-	18
14:00-15:00	-	-	-	16	16	-	16	-	16	-	16	-	-	-	-	-	16
15:00-16:00	-	-	-	21	21	-	21	-	21	-	21	-	-	-	-	-	21
16:00-17:00	-	-	-	6	6	-	6	-	6	-	6	-	-	-	-	-	6
17:00-18:00	-	-	-	5	5	-	5	-	5	-	5	-	-	-	-	-	5
18:00-19:00	-	-	-	2	2	-	2	-	2	-	2	-	-	-	-	-	2
19:00-20:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20:00-21:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21:00-22:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12hr	-	-	-	198	198	-	195	-	195	-	195	-	3	3	-	3	198
Est 16hr	-	-	-	216	216	-	213	-	213	-	213	-	3	3	-	3	
Percentage heavy goods																	
		High St west					High St east					Grosvenor Street					Total In
		Left	Ahead	In	Out	2-Way	Ahead	Right	In	Out	2-Way	Left	Right	In	Out	2-Way	
06:00-07:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07:00-08:00	-	-	-	2	2	-	2	-	2	-	2	-	-	-	-	-	2
08:00-09:00	-	-	-	1	1	-	1	-	1	-	1	-	-	-	-	-	1
09:00-10:00	-	-	-	3	3	-	3	-	3	-	3	-	4	4	-	4	3
10:00-11:00	-	-	-	3	3	-	3	-	3	-	3	-	5	5	-	4	3
11:00-12:00	-	-	-	3	3	-	3	-	3	-	3	-	5	5	-	4	3
12:00-13:00	-	-	-	2	2	-	2	-	2	-	2	-	-	-	-	-	2
13:00-14:00	-	-	-	2	2	-	2	-	2	-	2	-	-	-	-	-	2
14:00-15:00	-	-	-	2	2	-	2	-	2	-	2	-	-	-	-	-	2
15:00-16:00	-	-	-	2	2	-	2	-	2	-	2	-	-	-	-	-	2
16:00-17:00	-	-	-	1	1	-	1	-	1	-	1	-	-	-	-	-	1
17:00-18:00	-	-	-	0	0	-	0	-	0	-	0	-	-	-	-	-	0
18:00-19:00	-	-	-	0	0	-	0	-	0	-	0	-	-	-	-	-	0
19:00-20:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20:00-21:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21:00-22:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12hr	-	-	-	2	2	-	2	-	2	-	2	-	1	1	-	1	2
Est 16hr	-	-	-	2	2	-	2	-	2	-	2	-	1	1	-	1	
Data input 04/05/2010 00:00:00	Est AADT = 12hr all motor vehicles * 1.1 Est HGV 16hr = 12hr HGV * 1.09																

Appendix C: Plan of proposed North West Cheltenham Extension

