



2011 Air Quality Progress Report for Cambridge City Council

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

April 2011

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Executive Summary

New monitoring results show a marked and unexpected rise in nitrogen dioxide levels in 2010 against a background of continuing overall flat trend in levels of nitrogen dioxide and falling levels of particulate matter in Cambridge.

- The continuously monitoring instruments show no overall trend for nitrogen dioxide; exceedences of the annual mean were observed in Gonville Place and Parker Street, but not in Regent Street, where the level just met the national objective for the first time (and contrary to the trend elsewhere).
- The continuously monitoring instruments show that levels of particulate matter are falling.
- Diffusion tubes show a sharp and surprising increase in nitrogen dioxide with exceedences across the city and including some locations outside the AQMA on roads with high traffic flow.
- Diffusion tube data do not, this year, broadly confirm the current boundary of the AQMA. However, Cambridge City Council is not currently considering re-drawing the boundaries of the AQMA; we have adopted a ‘wait and see’ approach and this decision will depend upon the results from 2011 and 2012.
- No new sources or significant changes in sources have been identified so a Detailed Assessment is not required for any pollutants.

This Annual Progress Report includes a chapter on the closely related Local Transport Plan (LTP) and the Air Quality Action Plan.

The Air Quality Action Plan targets bus emissions in the City centre as the largest single source and the City Council proposed a Bus Emissions Reduction Commitment to the Quality Bus Partnership. As reported in 2009, agreement to any commitment has yet to be obtained, although operators have made voluntary improvements to the fleet. The County Council has agreed that targets for bus emissions improvements will be integrated into LTP3, but these have not yet been set.

Against a background of increased growth in East Anglia, albeit at a slower pace than anticipated a few years ago, Cambridge City Council face a challenge in preventing deterioration in air quality resulting from new housing that will inevitably bring new residents and more vehicle movements. Significant transport infrastructure improvements are required but the funding for this is not in place. Modelling has shown that air quality will be a recalcitrant problem for some years to come.

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1 Introduction

1.1 Description of Local Authority Area

Cambridge City has an area of approximately 4,070 hectares and is located around 60 miles northeast of London. It is best known for its University, which is made up of 31 Colleges and the resulting historic environment that has been created. The City is constrained by a tight Green Belt; however, current regional and strategic policy has allowed the relaxation of Green Belt boundaries to allow for more growth in the Cambridge area. This development will provide more homes for key workers and other groups and will increase the population of the City.

Economic Setting

Cambridge is an important regional centre for employment, services, government, healthcare and shopping; it is nationally and internationally important for its higher education, knowledge-based industries and tourism. Located within an hour of London and 30 minutes from Stansted by rail, as well as adjacent to the M11 and the A14, it is centrally located on the main transport routes within the East of England Region. Cambridgeshire has one of the fastest growing economies and populations in Britain. In the past much of this growth has been directed to the villages beyond the Green Belt, resulting in a growth of commuting by car to Cambridge, congestion and pollution in the cramped road network of the City. The large employment catchment area extends out of the County and includes Newmarket, Saffron Walden and Royston. A lack of local housing that people can afford has reinforced these trends and forced people to live further away from Cambridge, a City which has almost twice as many jobs as residents in work.

Physical Geography

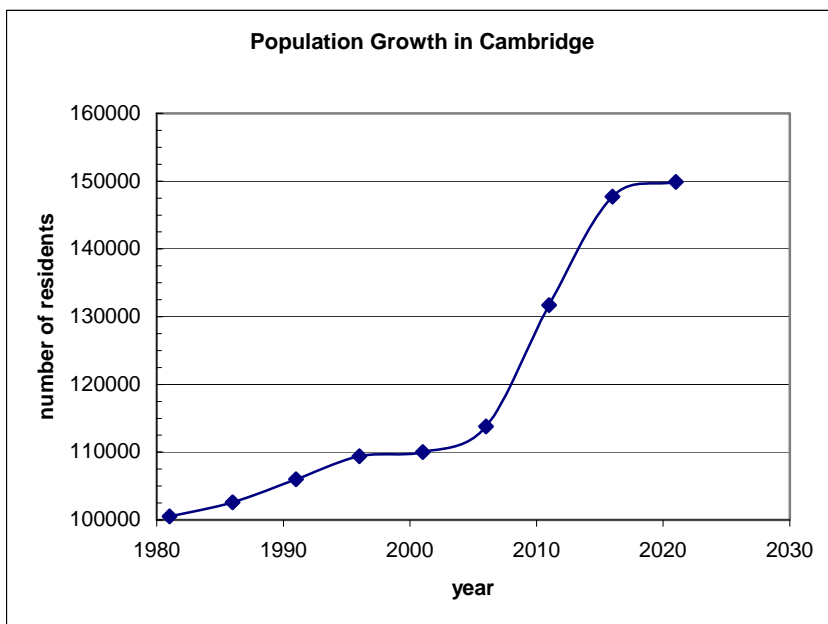
The County's low-lying relief, inland easterly position and southerly latitude within the British Isles contribute to its climate. Day to day weather conditions are governed largely by characteristics of the air masses which cover the County. Easterly continental airstreams can bring extreme conditions, which result in hot and dry spells in summer and very cold weather with severe frosts in winter. On average, Cambridgeshire receives between 530mm and 630mm of rainfall annually; it is one of the driest areas in Britain.

Population Growth

The latest population estimates put the population of the City at 117,700 (Cambridgeshire County Council, 2009). It is the main settlement within a rapidly growing sub-region, which encompasses over 471,700 people living in surrounding villages, new settlements and market towns. Cambridgeshire is one of the most rapidly growing areas of the United Kingdom. The population of Cambridge has risen significantly in recent years and is anticipated to continue to rise with an approximate increase of 50% over the 40 years from 1981 to 2021. Most of the increase was forecast to occur between 2006 and 2016, but the predicted rate of growth has slowed. The forecasts are based on housing trajectories that currently include Cambridge East, but as this development/settlement is not yet coming forward, the predictions may be high.

Figure 1.1a Population Growth in Cambridge – table and graph (reported in 2009)

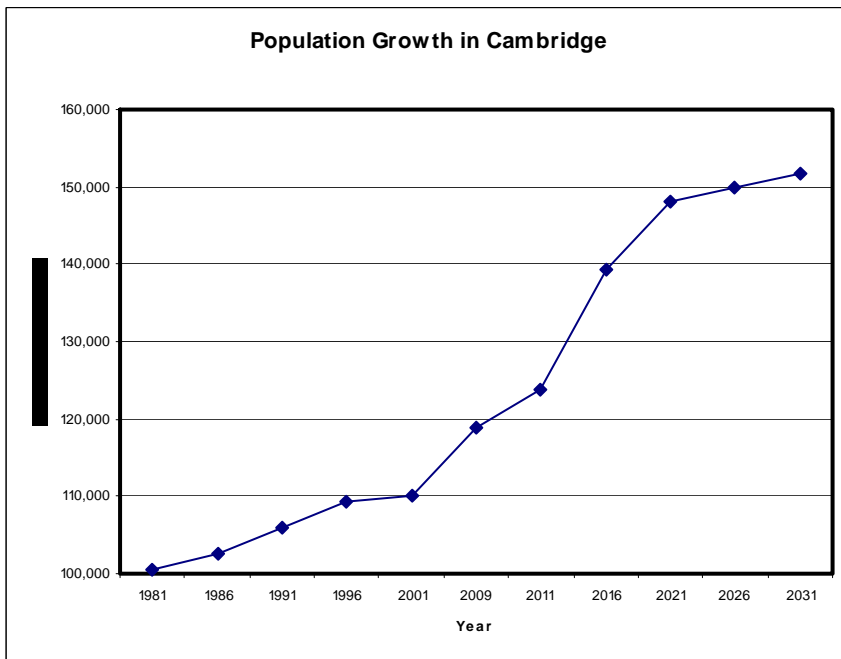
Year	Population
1981	100,500
1986	102,600
1991	106,000
1996	109,400
2001	110,000
2006	113,800
2011	131,700
2016	147,700
2021	149,900



Data Source: Cambridgeshire County Council Research Group

Figure 1.1b Population Growth in Cambridge – table and graph (latest predictions)

Year	Population
1981	100,500
1986	102,600
1991	106,000
1996	109,400
2001	110,000
2006	113,800
2011	123,700
2016	139,300
2021	148,200
2026	150,000
2031	151,800



Data Source: Cambridgeshire County Council Research Group
<http://www.cambridgeshire.gov.uk/business/research/populationresearch/population/forecasts/>

Major Sources of Air Pollution

Cambridge City has an air quality problem that is mostly related to emissions from traffic. Just over 183,000 motor vehicles crossed the Cambridge Radial Cordon between 7am and 7 pm each day in 2010, a decrease of 1% from 2009. There was no increase in traffic crossing the Cambridge Radial Cordon between 1999 and 2010. The number of motor-cycles, cars and heavy goods vehicles fell between 1999 and 2010 while the number of light goods and Public Service Vehicles (PSV) rose. Traffic crossing the River Cam and traffic entering the central area of the City, where air quality is worst, fell steadily from 1997 to 2007, levelled off in 2008 and fell again in 2009 and 2010. Traffic trends reported show that between 1999 and 2010 the number of motorcycles, cars and light and heavy goods vehicles crossing the River Cam screenline fell, while the number of PSV and cycles rose (Traffic Monitoring Report 2010, Cambridgeshire County Council).

An Air Quality Management Area (AQMA) was declared in 2004. Further development in the City has the potential to make air quality worse by nature of its size or its location.

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 exceedence 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 exceedences 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.

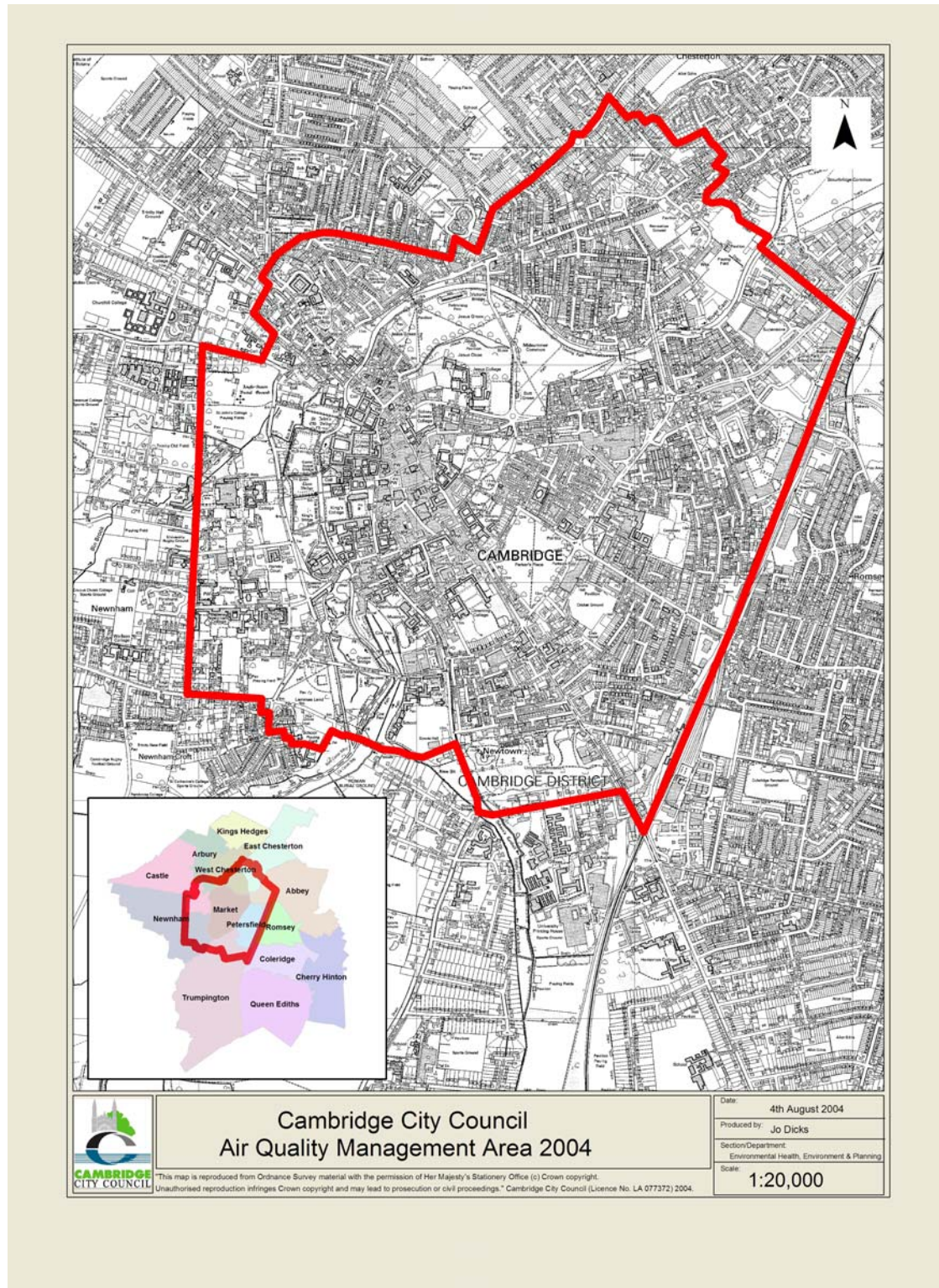
Pollutant	Concentration	Measured as	Date to be achieved by
Benzene	16.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
	5.00 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 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

The First Round of Review and Assessment indicated that ambient concentrations of pollutants of concern in Cambridge should meet the national objectives by their target dates, despite high levels of nitrogen dioxide and fairly high levels of particulate matter. The Second Round indicated that concentrations of nitrogen dioxide may not meet the target – the change in prediction was largely due to amended emission factors – and Cambridge City Council proceeded to a Detailed Assessment. The assessment predicted that concentrations of nitrogen dioxide would not meet the target; this was borne out by monitoring results in 2005. An Air Quality Action Plan was integrated into the Local Transport Plan 2. Further details of this process and its progress have been submitted to Defra in previous reports; the latest position is in Chapter 8 of this report. Current monitoring shows that no change to the AQMA boundary is required.

First Round of Review and Assessment	Ambient concentrations of pollutants of concern should meet national objectives by target date.	2000
Second Round of Review and Assessment	Concentrations of nitrogen dioxide may not meet national objectives by target date. Proceed to a Detailed Assessment. Other pollutants of concern should not pose a problem.	2003
Detailed Assessment of Nitrogen Dioxide	Concentrations of nitrogen dioxide in central Cambridge predicted not to meet national objectives by target date. AQMA declared.	2004
AQAP agreed	Air Quality Action Plan integrated into forthcoming LTP2 (2006-2011)	2005
Third Round of Review and Assessment	Concentrations of nitrogen dioxide in central Cambridge not meeting national objectives. Measured results were in line with those predicted in 2004. AQMA remains in place.	2006
Further Assessment of Nitrogen Dioxide	Heavy-duty vehicles (principally buses) are the largest single source of air pollution in the AQMA.	2006
Fourth Round of Review and Assessment	Concentrations of nitrogen dioxide in central Cambridge not meeting national objectives. Measured results were in line with those predicted in 2004. AQMA remains in place.	2009
Air Quality Action Plan	Joint AQAP prepared with Huntingdonshire and South Cambridgeshire District Councils.	2009

Figure 1.2. Map of the Air Quality Management Area



2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Cambridge City Council has five continuous monitors; all are at roadside sites. The monitoring station at Regent Street is situated at the offices of Cambridge City Council Environmental Services. It is part of the National Automatic and Rural Network (AURN) on behalf of DEFRA and has been in place since 1993. Monitors for Gonville Place and Parker Street were commissioned in 1998. The monitoring station at Newmarket Road was commissioned in 2001 in response to perceived data shortfalls for urban feeder roads following the first review. The monitoring station at Montague Road was commissioned in April 2007, replacing the station that was formerly located in Silver Street. Details of these changes were reported in the Annual Progress Report 2008.

Each of the sites is calibrated and maintained every 2-3 weeks by the Local Site Operator (LSO), serviced every 6 months by the supplier and audited by AEA NETCEN either as part of the AURN or through the 'Calibration Club'. All data is collated and ratified externally by AEA Technology. The results are ratified and returned as hourly sequential data.

Levels of nitrogen dioxide are continuously monitored at all five city centre locations in Cambridge. There are three ML9841B NO-NO₂-NO_x chemiluminescence analysers, at Montague Road, Parker Street and Gonville Place, serviced by Casella Stanger. Air Monitors (the company that took over the contract from Thermo Fisher Scientific) service two Model 42c NO-NO₂-NO_x chemiluminescence analysers, at Regent Street and Newmarket Road.

Levels of PM₁₀ are continuously monitored at three city centre locations in Cambridge. The particulate monitors at Montague Road, Parker Street and Gonville Place are Rupprecht & Patashnick TEOM[®] series 1400a ambient particulate (PM₁₀) monitors. Service, repair and calibration of these monitors are carried out under an annual contract with Casella Stanger. The data are corrected by a factor of 1.3 to compensate for volatile loss to provide continuity with previous results as well as with a calculated Volatile Correction Factor (VCF), in line with guidance.

The particulate monitor (PM_{2.5}) at Newmarket Road was installed in 2008. The SHARP 5030 is a hybrid nephelometric/ radiometric particulate mass monitor capable of providing precise, one-minute, real-time measurement of ambient particulate aerosol. It incorporates an intelligent moisture reduction system designed to maintain the relative humidity of the air passing through the filter tape and ensure negligible loss of semi-volatiles. Comparison with the reference method has been carried out in Germany; the data show that no correction factor is required for the SHARP (TÜV report 936/21203481/B, December 2006). Service, repair and calibration of the particulate monitor at Newmarket Road are carried out under an annual contract with Air Monitors.

Figure 2.1 Map of Automatic Monitoring Sites

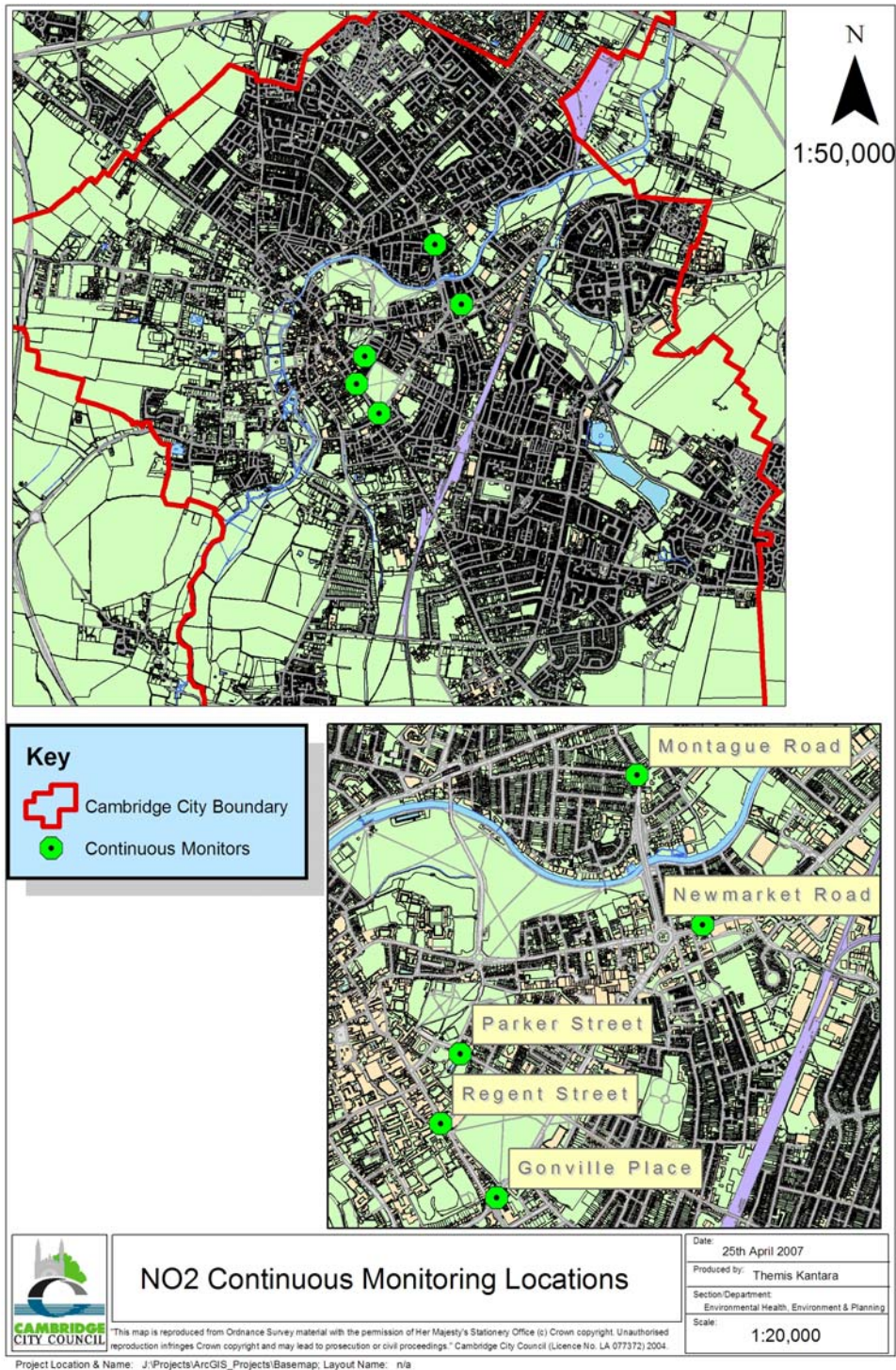


Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref		Pollutants Monitored	Monitoring Technique	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road	Does this location represent worst-case exposure?
Gonville Place	Roadside	545 508	257 828	NO ₂ , PM ₁₀	Chemiluminescence TEOM	Y	Y (1.8m)	3.3m	Yes
Montague Road	Roadside	546 057	259 118	NO ₂ , PM ₁₀	Chemiluminescence TEOM	Y	Y (1m)	4.0m	No
Newmarket Rd	Roadside	546 317	258 900	NO ₂ , PM _{2.5}	Chemiluminescence Nephelometer/BAM hybrid – SHARP 5030	Y	Y (1.4m)	3.9m	No
Parker Street	Roadside	545 366	258 391	NO ₂ , PM ₁₀	Chemiluminescence TEOM	Y	Y (0.5m)	3.3m	Yes
Regent Street	Roadside	545 289	258 118	NO ₂	Chemiluminescence	Y	Y (0.5m)	2.3m	Yes

2.1.2 Non-Automatic Monitoring

There are 47 nitrogen dioxide diffusion tube sites in Cambridge City, most of which are located at the roadside or kerbside, as well as 3 urban background sites. Three of these sites are temporary, located at the request of the County Council to monitor the effect of infrastructure changes in the City Centre.

The Environmental Scientifics Group (formerly Harwell Scientifics) supply and analyse the nitrogen dioxide tubes for Cambridge City Council. The tubes are prepared by spiking acetone: triethanolamine (50:50) onto the grids prior to being assembled. The tubes are desorbed with distilled water and the extract is analysed using a segmented flow autoanalyser with ultraviolet detection. Environmental Scientifics Group is one of the laboratories that follows the procedures set out in the Harmonisation Protocol and is rated as 'Good' under the WASP scheme.

Exposure periods for the diffusion tubes are those of the UK Nitrogen Dioxide Diffusion Tube Network run by Netcen, with the tubes being changed every four or five weeks.

QA/QC procedures are as detailed in the UK NO₂ Diffusion Tube Network Instruction Manual. Some diffusion tube data were rejected from the dataset in line with Netcen guidance. Low concentrations are rare at urban background or roadside sites and are likely to result from an analytical problem or a faulty tube and therefore are rejected, particularly if they are an isolated occurrence. High concentrations are included unless there is a reason to reject them.

The results are bias-adjusted using a locally derived co-location factor. The average of the triplicate tubes are compared with the results from the continuous monitor at Gonville Place. The factor for 2010 is 1.0 – results reported below have been bias-adjusted. This factor is higher than in previous years. (The Overall National Figure for Harwell is 0.85, with a range of 0.68 – 1.21.)

Cambridge City Council has measured benzene at Cambridge Roadside on behalf of the national monitoring network since February 2008. Tubes are changed fortnightly. Data was collected and ratified by the National Physical Laboratory until the end of June 2010; AEA collected the data from the beginning of July. The annual mean for 2010 is 0.8 ug/m³ and the annual maximum is 1.9 ug/m³. The national objective of 5 µg/m³ is not approached.

Figure 2.2 Map of Non-Automatic Monitoring Sites – Nitrogen Dioxide diffusion tubes

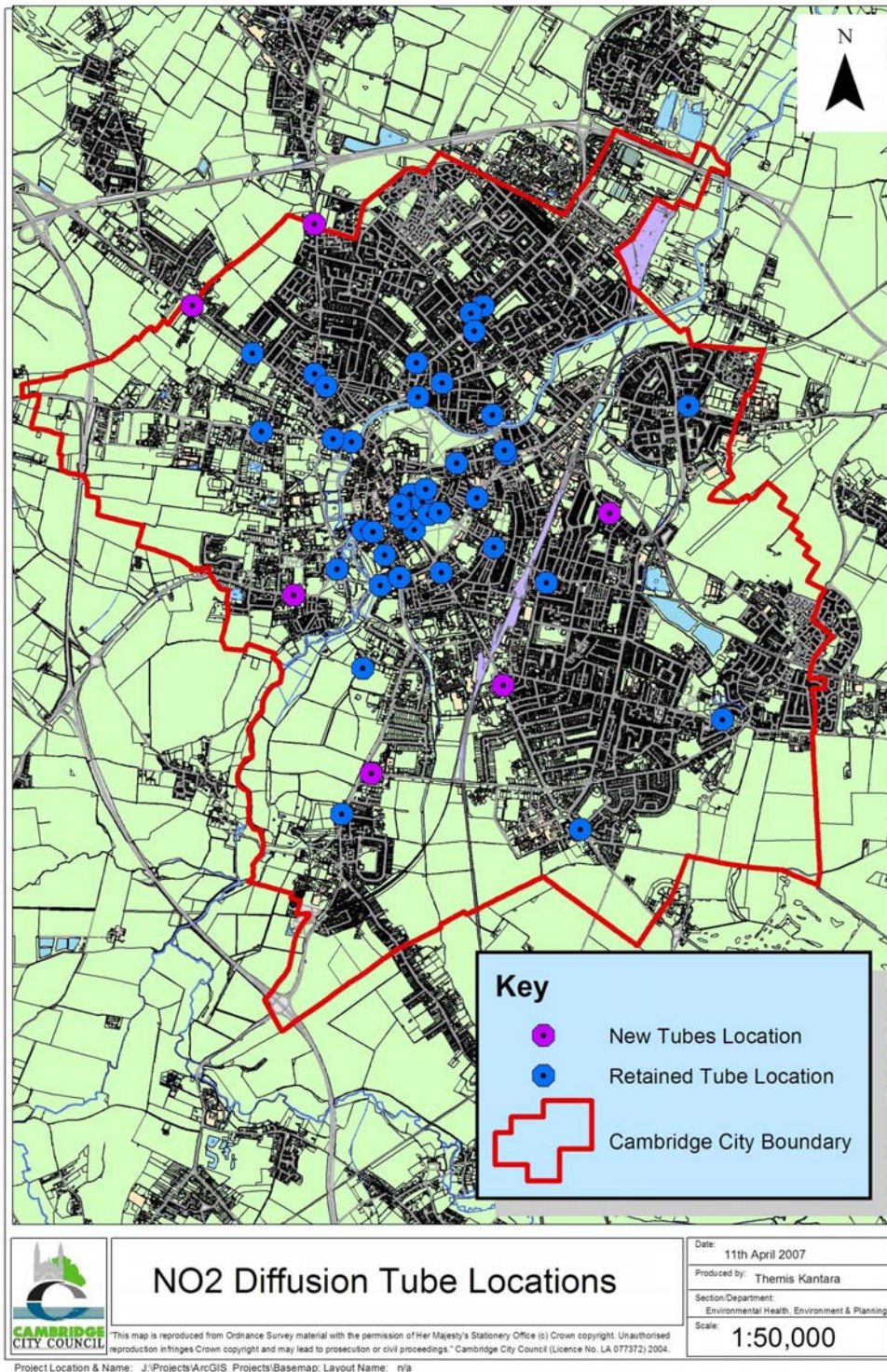


Table 2.2 Details of Non- Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref		Pollutants monitored	in AQMA?	Relevant exposure?	Distance to kerb?	Worst case Location?
Emmanuel Street	Roadside	545,293	258,418	NO ₂	Y	Y (0m)	2.4m	Y
Magdalene Street	Roadside	544,674	258,992	NO ₂	Y	Y (0m)	2.0m	Y
Northampton Street	Roadside	544,492	259,021	NO ₂	Y	Y (0m)	2.0m	Y
Silver Street	Roadside	544,783	258,116	NO ₂	Y	Y (0m)	1.0m	Y
Newmarket Road 1	Roadside	546,195	258,867	NO ₂	Y	Y (2m)	1.7m	Y
Milton Road	Roadside	545,977	260,352	NO ₂	N	Y (3m)	8.0m	N
Drummer Street	Roadside	545,247	258,472	NO ₂	Y	Y (0m)	2.1m	Y
Gilbert Road	Kerbside	545,314	259,777	NO ₂	N	Y (>3m)	1.0m	Y
Latham Road	Background	544,784	256,746	NO ₂	N	N	N/A	
Newmarket Road 2	Roadside	547,998	259,349	NO ₂	Y	N	3.7m	N
East Road	Roadside	545,908	258,439	NO ₂	Y	Y (1m)	4.0m	Y
Mill Road	Roadside	546,080	257,944	NO ₂	Y	Y (0m)	2.0m	Y
Hills Road	Roadside	545,557	257,695	NO ₂	Y	Y(2m)	0.4m	Y
Regent Street	Roadside	545,289	258,118	NO ₂ Benzene	Y	Y(0.5m)	2.3m	Y
Pembroke Street	Roadside	544,884	258,098	NO ₂	Y	Y (0m)	1.2m	Y
Elizabeth Way	Roadside	546,062	259,260	NO ₂	Y	N	1.6m	N
Victoria Road	Roadside	544,422	259,544	NO ₂	Y	Y (0m)	1.8m	Y
Madingley Road	Kerbside	543,784	259,093	NO ₂	N	Y(>3m)	0.8m	Y
Huntingdon Road	Roadside	543,694	259,867	NO ₂	N	Y(>3m)	2.0m	N
Histon Road	Kerbside	544,308	259,664	NO ₂	N	Y (1m)	0.5m	Y
Fen Causeway	Roadside	544,957	257,569	NO ₂	Y	Y(>3m)	2.1m	Y
Trumpington High St	Roadside	544,575	255,307	NO ₂	N	Y(0m)	2.7m	Y
Babraham Road	Roadside	546,948	255,169	NO ₂	N	Y(>3m)	1.2m	Y

Site Name	Site Type	OS Grid Ref		Pollutants monitored	in AQMA?	Relevant exposure?	Distance to kerb?	Worst case Location?
Cherry Hinton Road	Roadside	548,331	256,242	NO ₂	N	Y(>3m)	0.8m	Y
Arbury Road	Roadside	545,693	260,473	NO ₂	N	Y(1m)	1.9m	N
Newnham Road	Roadside	544,529	257,730	NO ₂	Y	Y (0m)	1.6m	Y
Victoria Avenue	Roadside	545,331	259,438	NO ₂	Y	Y (0m)	1.4m	Y
Parker Street	Roadside	545,370	258,399	NO ₂	Y	Y (0m)	1.4m	Y
Abbey Road	Roadside	546,163	258,983	NO ₂	Y	Y (1m)	1.7m	N
Cockburn Street	Urban Background	546,596	257,594	NO ₂	Y	Y (0m)	1.5m	Y
Oaktree Avenue	Urban Background	545,885	260,088	NO ₂	Y	Y (2m)	1.0m	Y
Chesterton Road	Roadside	545,566	259,578	NO ₂	Y	Y (2m)	2.7m	Y
Maids Causeway	Kerbside	545,710	258,782	NO ₂	Y	Y (3m)	0.8m	Y
Emmanuel Road	Roadside	545,405	258,521	NO ₂	Y	Y (0m)	1.5m	Y
Downing Street	Roadside	545,162	258,240	NO ₂	Y	Y (0m)	1.3m	Y
Trumpington Street	Roadside	544,999	257,871	NO ₂	Y	Y(2m)	1.4m	Y
Lensfield Road	Roadside	545,271	257,675	NO ₂	Y	Y(>3m)	1.8m	Y
Park Terrace	Roadside	545,429	258,271	NO ₂	Y	Y (>3m)	1.9m	Y
St Andrew's St	Urban Centre	545,147	258,367	NO ₂	Y	Y(0m)	0.8m	Y
Parkside	Roadside	545,539	258,295	NO ₂	Y	Y (2m)	0.5m	Y
Barton Road	Roadside	544,100	257,473	NO ₂	N	Y (>3m)	2.2m	Y
Coldhams Lane	Roadside	547,216	258,286	NO ₂	N	Y (>3m)	3.5m	Y
Hills Road 2	Roadside	546,166	256,580	NO ₂	N	Y (0m)	3.6m	Y
Histon Road 2	Roadside	544,284	261,273	NO ₂	N	Y (>3m)	2.0m	Y
Huntingdon Road 2	Roadside	543,101	260,344	NO ₂	N	Y (>3m)	2.5m	Y
Gonville Place	Roadside	545,050	257,828	NO ₂	Y	Y (0m)	3.3m	Y
Long Road	Kerbside	544,867	255,709	NO ₂	N	Y (>3m)	0.6m	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data

The AQ objective for the annual mean concentration was exceeded at Gonville Place, Parker Street and, for the first time, Montague Road in 2010. The level of nitrogen dioxide recorded at Gonville Place is significantly higher than in previous years, whereas at Parker Street the level is consistent with the previous three years. The level of nitrogen dioxide recorded at Montague Road is significantly higher than in previous years. However, for the first time since records began in Cambridge, the annual mean concentration was met at Regent Street, where the overall trend is downwards. Hourly exceedences were reported at Gonville Place (9) and Montague Road (2). We are currently unable to provide an explanation for the variation in data for 2010.

All sites are representative of relevant public exposure and all sites are within the AQMA for nitrogen dioxide.

There are targets for levels of nitrogen dioxide in the LTP2 for 2010 for Gonville Place, Parker Street and Regent Street – none have been met, although Regent Street appears to be approaching its target.

The diffusion tube data is quite different – see below.

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

Location	Within AQMA?	Data Capture for monitoring period %	Data Capture for full calendar year 2010 %	Annual mean concentrations ($\mu\text{g}/\text{m}^3$)			
				2007	2008	2009	2010
Gonville Place	Y	93.1	93.1	41	42	42	52
Montague Road/ Elizabeth Way	Y	80.7	80.7	28	29	30	43
Newmarket Rd	Y	97.7	97.7	33	34	33	30
Parker Street	Y	98.1	98.1	54	49	52	49
Regent Street	Y	96.2	96.2	42	44	41	40

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

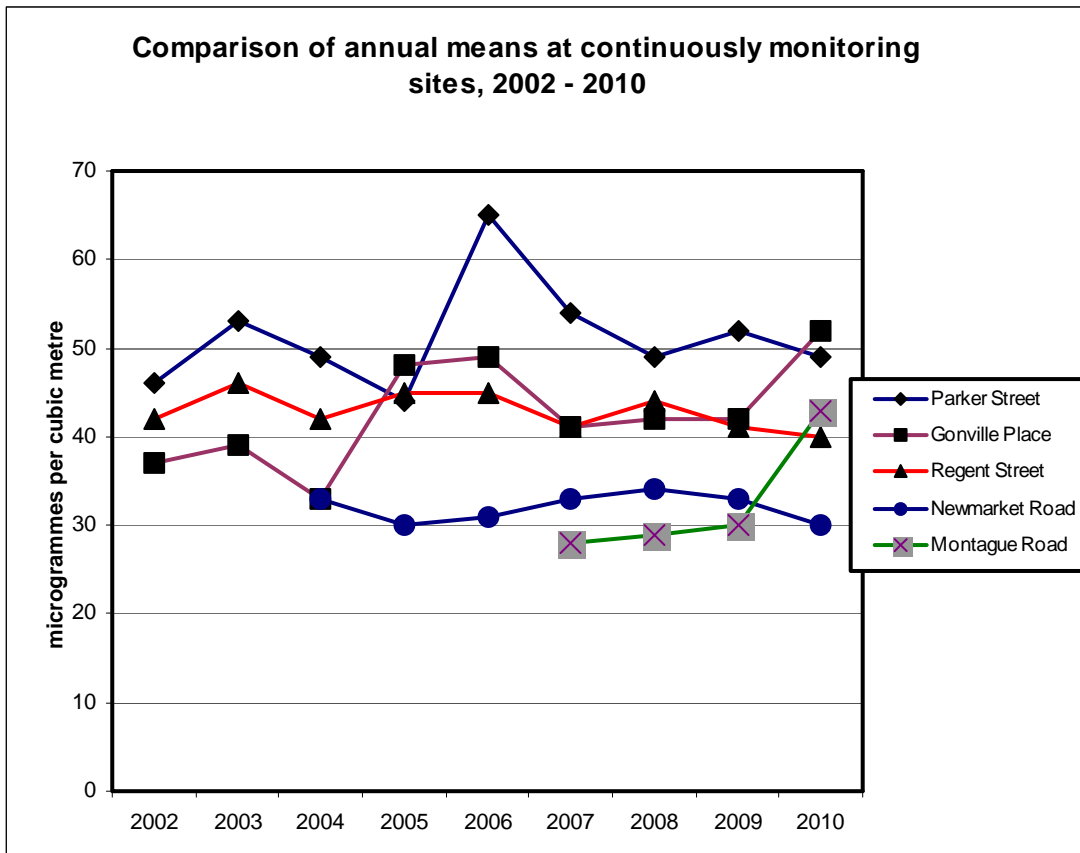


Figure 2.3b Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Automatic Monitoring Sites compared with LTP2 targets.

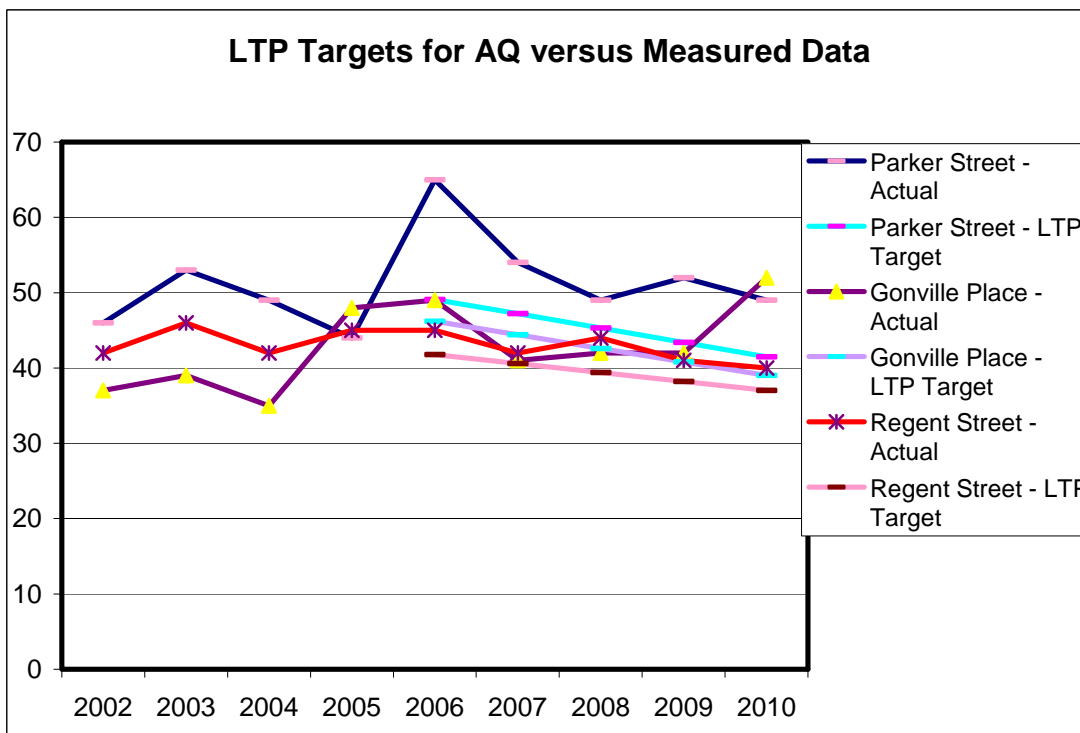


Table 2.3b Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour Mean Objective

Location	Within AQMA?	Data Capture for monitoring period %	Data Capture for full calendar year 2010 %	Number of Exceedences of hourly mean ($200 \mu\text{g}/\text{m}^3$)			
				2007	2008	2009	2010
Gonville Place	Y	93.1	93.1	0	0	0	9
Montague Road/Elizabeth Way	Y	80.7	80.7	0	1	1	2
Newmarket Rd	Y	97.7	97.7	0	0	0	0
Parker Street	Y	98.1	98.1	0	0	0	0
Regent Street	Y	96.2	96.2	0	0	0	0

Diffusion Tube Monitoring Data

The diffusion tube data show significant increases in nitrogen dioxide levels across the city in 2010. A co-location bias adjustment factor was calculated using data from the triplicate tubes and the fully ratified and scaled chemiluminescence monitor at Gonville Place. This year the BAF calculated is 1.0, which is significantly higher than in the past three years, which has been 0.8 – 0.83. We are confident that this BAF is correct because we also have a single tube co-located with the chemiluminescence monitor at Regent Street and have had a single tube co-located with the chemiluminescence monitor at Montague Road for six months of 2010. The bias-adjustment factors calculated here are 0.9 and 1.0, respectively for 2010.

This means that some locations outside the AQMA have recorded levels of nitrogen dioxide above the national objectives. These are Histon Road 1 and Histon Road 2, Madingley Road, Long Road (no relevant receptors – tube located here to monitor traffic changes), Trumpington High Street, Newmarket Road 2, Coldhams Lane and Hills Road 2; these are all roads with a high traffic flow. We do not plan to extend the AQMA based on a single year's diffusion tube results, but will look at the data for 2011 with interest and revisit.

Out of interest, we compared the diffusion tube data with that from 2003, the most recent year with anomalously high data. The data is broadly very similar, but we note that, relatively, the levels are lower at Drummer Street, Emmanuel Road, Emmanuel Street, Northampton Street and Silver Street – and higher at Madingley Road, Magdalene Street and Maids Causeway. Drummer Street, Emmanuel Road and Emmanuel Street are in the bus station area.

Table 2.4 Results of Nitrogen Dioxide Diffusion Tubes

Location	Within AQMA?	Data Capture for full calendar year 2010 %	Annual mean concentrations ($\mu\text{g}/\text{m}^3$)			
			2007	2008	2009	2010
Parker Street	Y	100	47	45	48	57
Cockburn Street	Y	92	26	22	24	29
Oaktree Avenue	Y	100	25	27	25	29
Histon Road 1	N	83	36	37	37	43
Newmarket Road 1	Y	100	45	48	49	52
Milton Road	N	100	26	29	27	33
Drummer Street	Y	92	45	43	40	46
Gilbert Road	N	100	27	26	28	32
Latham Road	N	92	16	15	15	21
Newmarket Road 2	N	100	35	33	34	40
East Road	Y	92	38	35	36	46
Mill Road	Y	83	35	37	37	40
Hills Road 1	Y	100	41	38	37	49
Regent Street	Y	100	35	38	42	45
Pembroke Street	Y	92	42	44	49	59
Elizabeth Way	Y	100	38	39	39	50
Victoria Road	Y	100	42	44	43	49
Madingley Road	N	83	39	44	41	53
Huntingdon Road	N	100	29	29	31	36
Fen Causeway	Y	100	31	29	31	39
Trumpington High Str	N	92	32	34	32	41
Babraham Road	N	100	26	35	28	30
Cherry Hinton Road	N	100	34	37	34	37
Arbury Road	N	100	23	23	26	29
Newnham Road	Y	100	44	48	47	58
Victoria Avenue	Y	100	46	48	47	55
Abbey Road	Y	100	27	24	34	35
Chesterton Road	Y	100	35	32	32	42
Maids Causeway	Y	83	46	49	43	55
Emmanuel Road	Y	92	55	54	53	60
Downing Street	Y	100	44	47	46	53
Trumpington Street	Y	100	34	34	35	42
Lensfield Road	Y	100	43	42	47	56
Park Terrace	Y	100	35	37	37	46
Barton Road	N	100	25	27	27	32
Coldham's Lane	N	100	32	33	34	41
Hills Road 2	N	100	34	30	35	45
Histon Road 2	N	92	33	34	33	40
Huntingdon Road 2	N	92	28	30	29	38
Long Road	N	92	45	51	52	61
Emmanuel Street	Y	92	57	56	52	56
Magdalene Street	Y	100	37	37	35	48
Northampton Street	Y	100	44	48	50	54
Silver Street	Y	67	42	46	44	53
Gonville Place	Y	100	35	42	41	52

The bias adjustment factor calculated for 2010 is 1.0; therefore no bias adjustment is required.

2.2.2 PM₁₀

Levels of PM₁₀ do not exceed the annual mean objective concentration of 40µg/m³, nor are there more than 35, 24-hour exceedences of 50 µg/m³. The monitoring site locations are representative of relevant public exposure.

Table 2.5a Results of PM₁₀ Automatic Monitoring: Comparison with Annual Mean Objective

Location	Within AQMA?	Data Capture for monitoring period %	Data Capture 2010 %	Annual mean concentrations (µg/m ³)			
				2007	2008	2009	2010
Gonville Place	Y	96.1	96.1	20	21	20.5 (22)	(20)
Montague Road/Elizabeth Way	Y	98.1	98.1	20	20	20.4 (22)	(20)
Parker Street	Y	98.3	98.3	29	28	24.5 (27)	(24)

The data for 2009 and 2010 (tbc) have had the Volatile Correction Method applied (figures supplied by Netcen). The figures in bracket have had the TEOM correction factor of 1.3 applied for a comparison with previous years' results and for this reason TEOM corrected data are used in Figure 2.5 below.

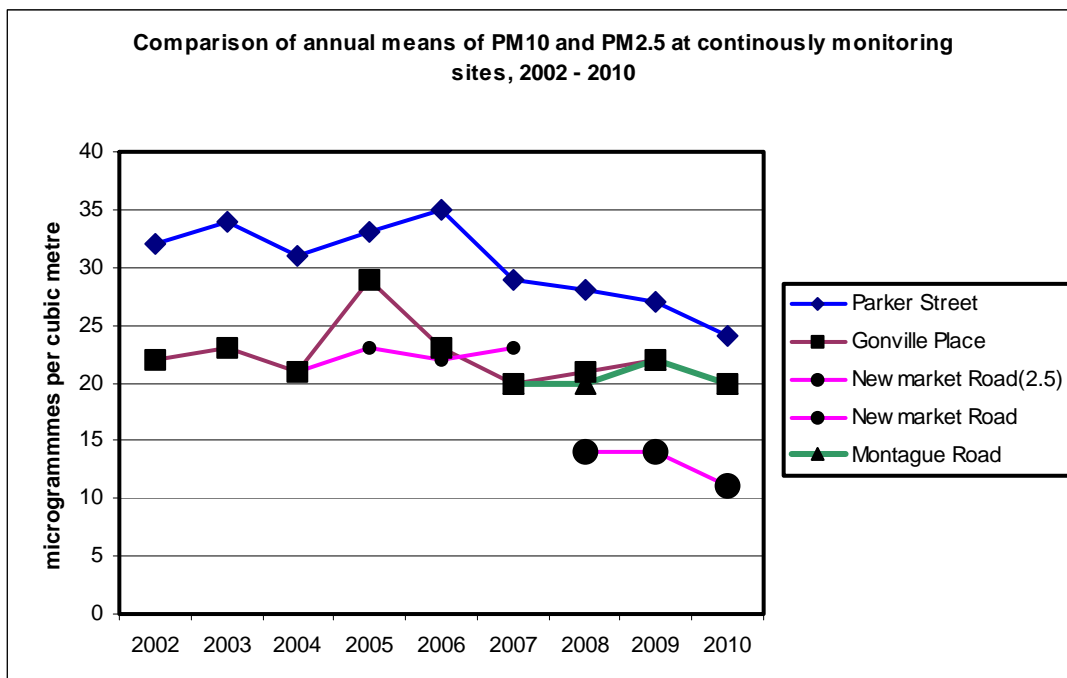
Table 2.5b Results of PM₁₀ Automatic Monitoring: Comparison with 24-hour Mean Objective

Location	Within AQMA?	Data Capture for monitoring period %	Data Capture 2010 %	Number of Exceedences of daily mean objective (50 µg/m ³)			
				2007	2008	2009	2010
Gonville Place	Y	96.1	96.1	4	5	0	2
Montague Road/Elizabeth Way	Y	98.1	98.1	0	6	3	2
Parker Street	Y	98.3	98.3	8	9	3	0

Table 2.5c Results of PM_{2.5} Automatic Monitoring

Location	Within AQMA?	Data Capture for monitoring period %	Data Capture 2010 %	Annual mean concentrations (µg/m ³)			
				2007	2008	2009	2010
Newmarket Rd	Y	98.0	98.0	N/A	14	14	11

Figure 2.5 Trends in Annual Mean PM10 Concentration Measured at Automatic Monitoring Sites



Data from Defra (2011) show that the long-term decrease in urban background particulate concentrations has levelled off in the last two years and that roadside levels increased slightly in 2010, although with an overall decreasing trend. In Cambridge there are two overall trends – level at Gonville Place and Montague Road (since 2007) as well as downwards at Parker Street and Newmarket Road. This report has already noted that nitrogen dioxide levels recorded at Gonville Place and Montague Road in 2010 were higher than in previous years.

2.2.3 Sulphur Dioxide

Cambridge City Council does not measure sulphur dioxide.

2.2.4 Benzene

Cambridge City Council has measured benzene at Cambridge Roadside on behalf of the national monitoring network since February 2008. Tubes are changed fortnightly. Data was collected and ratified by the National Physical Laboratory until the end of June 2010; AEA collected the data from the beginning of July.

The annual mean for 2010 is 0.8 ug/m³ and the annual maximum is 1.9 ug/m³. The monitoring site is representative of public exposure.

2.2.5 Summary of Compliance with AQS Objectives

Cambridge City Council has examined the results from monitoring in the district. Concentrations outside of the AQMA are all below the objectives at relevant locations, therefore there is no need to proceed to a Detailed Assessment.

3 New Local Developments

There are no new:

- 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.
- Roads with significantly changed traffic flows.
- Bus or coach stations.
- 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.
- 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.
- Areas where the combined impact of several biomass combustion sources may be relevant.
- Areas where domestic solid fuel burning may be relevant.
- Landfill sites.
- Quarries.
- Unmade haulage roads on industrial sites.
- Waste transfer stations etc.
- Other potential sources of fugitive particulate emissions.

There is one:

- New roads constructed or proposed since the last Updating and Screening Assessment, the Addenbrookes Access Road, which connects to the hospital in the south of the City.

Cambridge City Council has identified the following new or previously unidentified local developments, which may impact on air quality in the Local Authority area.

New Commercial/domestic sources

- Biomass boiler installed at Manor Care Home, 33 Milton Road, 300kW biomass boiler, details to be confirmed.
- Biomass boiler to be installed at Simon's House, Histon Road, 150kW biomass boiler, KWB TDS 150.

These will be taken into consideration in the next Updating and Screening Assessment, scheduled for 2012.

4 Planning Applications

Official government targets expect Cambridge to grow by at least 19,000 new homes by 2021 (that is, an increase of more than 40%) compared with housing numbers in 2001, presenting major opportunities and challenges for Cambridge. Most of the new homes to be built in Cambridge will form part of major developments on the city's southern, north west and eastern fringes – these are known as the Urban Extensions. The area around Cambridge station will be regenerated, featuring an improved public transport interchange (bus and rail links). The additional residents in and around Cambridge will undoubtedly have a negative impact on air quality without adequate public transport provision and infrastructure.

Air Quality Assessments are required for those developments which are likely to have an impact on air quality. This is a major part of our Air Quality Action Plan and therefore discussed further in that section.

The list of planning applications below consists of both the new urban extensions and replacements of areas with a previous industrial/commercial use. Planning applications for less than 50 residential units are not included.

Planning Applications for Annual Progress Report			
<u>Name</u>	<u>Location</u>	<u>Type</u>	<u>Status</u>
Applications approved			
CB1	Station Area	331 residential units, 1,250 student units, public square, transport interchange, offices	Permission granted and S106 agreed March 2010. Construction underway on student block. Development will be phased.
Glebe Farm	Southern Fringe	Up to 300 dwellings	Outline Planning permission granted 2008, RM approved 2009. Due to start build mid 2011.
Clay Farm	Southern Fringe	Up to 2,300 dwellings	Outline Planning permission granted 2008. Reserved Matters application for 308 dwellings received Feb 2011 pending.
Bell School	Southern Fringe	347 dwellings and 100 student rooms	Outline Planning permission granted 2006.
Trumpington Meadows	Southern Fringe	Approx 1,200 dwellings	Outline planning permission granted 2008, S106 agreed 2009, RM approved in 2009. Due to start build mid 2011.
Frontage site - NIAB	North West Cambridge	187 dwellings (3-bed and 2-bed homes)	RM approved May 2008 Construction began end 2009 and is ongoing.
CUP site - now Kaleidoscope	Clarendon Road - northern end of Hills Road	408 residential units	Planning permission granted, construction commenced 2008, nearing completion. New application in for additional units, but with no additional parking.

Milton Road Junior School - now Manor Care Home	Milton Road	Care Home and sheltered accommodation.	Completed and occupied 2009. Application in 2010 for final phase.
Fire Station and Police Station	Parkside (city centre)	131 residential units	Planning permission granted, construction not commenced
Shell petrol station/garage and other commercial	Cherry Hinton Road/Hills Road junction	133 residential units	Planning permission granted, buildings demolished but construction not commenced, due mid-2011.
British Telecom	Cromwell Road	140 residential units	Outline planning permission granted, RM not yet submitted.
Betjeman House, Broadcasting House, Botanic House	106 –108 Hills Road (near Station Road)	156 residential units /office	Planning permission granted, existing buildings demolished 2010.
Brunswick Site	Newmarket Road	97 residential units	Construction began 2010.
Applications pending			
9-15 Harvest Way, now Travelodge, Newmarket Road	Newmarket Road	Hotel	Extant planning permission for offices, new application for Hotel refused March 2010 and withdrawn from appeal.
9-15 Harvest Way, now housing, Newmarket Road	Newmarket Road	75 residential units plus office space	Extant planning permission for offices, new application for housing refused 2009, appeal launched 2010 and dismissed June 2010. New application March 2011.
Red House - now O'Callaghans Hotel	Station Road	Hotel	First application approved but new application refused in 2010.
Cambridge City FC Former Texaco garage	Milton Road Huntingdon/Histon Road	148 residential units 94 student units and retail on ground floor	Not yet submitted Submitted 2010 and refused.
Applications at pre-App/discussion stage			
Cambridge East	Marshalls Airport	Mixed use including up to 12,000 homes	Marshalls have not yet found a new site
Northern Fringe East	Sewage Works and Chesterton Sidings	Mixed use including up to 2,300 homes and new railway station	Sewage Works not yet found a new site.
NW Cambridge	University Land	Mixed-use including research, commercial and residential (90+ Ha), OPP due in late 2011.	Master-planning in progress
Travis Perkins	Devonshire Road	76 residential units	In discussion phase.
British Telecom	Long Road	76 residential units	Not yet submitted
Paddocks	Cherry Hinton Road	93 residential units	Not yet submitted
EMG Ford, 379-381	Milton Road	83 residential units	Not yet submitted
Mitchams Corner	Milton Road	tbc residential units	Not yet submitted

5 Air Quality Planning Policies

Policy 4/14 Cambridge Local Plan (2006) states that “Development within or adjacent to an Air Quality Management Area (AQMA) will only be permitted if

- a) it would have no adverse effect upon air quality within the AQMA or
- b) air quality levels within the AQMA would not have a significant adverse effect on the proposed use/users.”

Section 4.51 states that:

“Development proposals within or adjacent to an AQMA will be controlled so as to prevent a further deterioration of air quality within the AQMA, and to protect the occupiers of development proposals from the potential adverse effects of poor air quality. Development proposals outside and not directly adjacent to an AQMA, but which may have an impact on the AQMA by generating significant pollution within this area, will also be considered in relation to this policy. All applications will need to be supported by such information as is necessary to allow a full consideration of the impact of the proposal on the air quality of the area and developers may be required to provide appropriate pollution prevention or mitigation measures.”

A Developers Guide was published in 2008, which provides detailed information on the way in which air quality and air pollution issues will be dealt with through the development control system in Cambridge City. It complements the Sustainable Design and Construction Supplementary Planning Document published in 2007.

Proposals for biomass boilers in two locations have passed through the development control process. Neither is in the Air Quality Management Area. The first was described in the Sustainability Documentation, which was not passed to the Environmental Health team. It was not mentioned in the Air Quality Assessment. As a result we have discussed the issues around biomass with senior development control officers and reached a better understanding on the issues. The second biomass boiler was agreed, despite our recommendation for refusal, as the development is a flagship Code 5 (low carbon) residential development, which was considered by the case officer to over-ride the potential impact on air quality.

A guidance note on the impact of biomass in an urban area is being finalised.

6 Local Transport Plans and Strategies

Cambridge City Council air quality action planning was integrated into the Cambridgeshire Local Transport Plan 2 (LPT2) 2006-2011. There were two air quality related targets.

The first indicator is based on the principle of no increase in traffic in the centre of Cambridge. If levels of traffic do not increase, despite growth, then general air quality should improve as newer, cleaner vehicles penetrate the fleet. The Core Schemes have delivered no increase in traffic in central Cambridge, however, since this target was adopted for air quality purposes, it has become apparent that the anticipated fall in emissions and thus improvement in air quality with time has not yet occurred.

Figure 6.1 Travel trend indicator from LTP2 Delivery Report 2008

Indicator	Cambridgeshire LTP Targets	Latest position 2007
Trends in travel in Cambridge	CON6b Less than 191,700 motor vehicles per day crossing the Cambridge radial cordon in 2010/11 .	189,000

Figure 6.2 Travel trend indicator – latest position 2010

Indicator	Cambridgeshire LTP Targets	Latest position 2010
Trends in travel in Cambridge	CON6b Less than 191,700 motor vehicles per day crossing the Cambridge radial cordon in 2010/11 .	183,000

Just over 183,000 motor vehicles entered and left Cambridge between 7am and 7pm each day, which is 1% less than in 2009. The overall trend is flat, against a national background of annually increasing traffic.

The second indicator is air quality specific and based on the required improvements in bus emissions in the areas of worst air quality in Cambridge.

Figure 6.3 Air quality indicators from LTP2 Delivery Report 2008

Indicator	Cambridgeshire LTP Targets	Latest position 2008
Cambridge Air Quality	AQ2b 90% of all Public Service Vehicles entering the Cambridge Low Emission Zone (LEZ) to meet a minimum of Euro II emission standards by the end of January 2009.	86.9% (August 2008)
	AQ2c To be set in 2009 informed by consideration of progress towards AQ2b.	To be set

The original target (AQ2b) criteria set out in LTP2 is for 90% of PSVs entering the Cambridge Low Emission Zone to meet a minimum of Euro II emission standards with Reduced Pollution Certification (RPC) by the end of January 2009. The requirement for the RPC was dropped during negotiations with the bus companies, and as of August 2008, 86.9% of the PSVs entering the LEZ met the Euro II standard and 45.4% met the Euro III standard.

A further target (AQ2c), for 90% of PSV entering the Cambridge LEZ to meet a minimum of Euro III emission standards by January 2011 has not been agreed, although it was reported in the LTP2 Delivery Report (2008) that it had been.

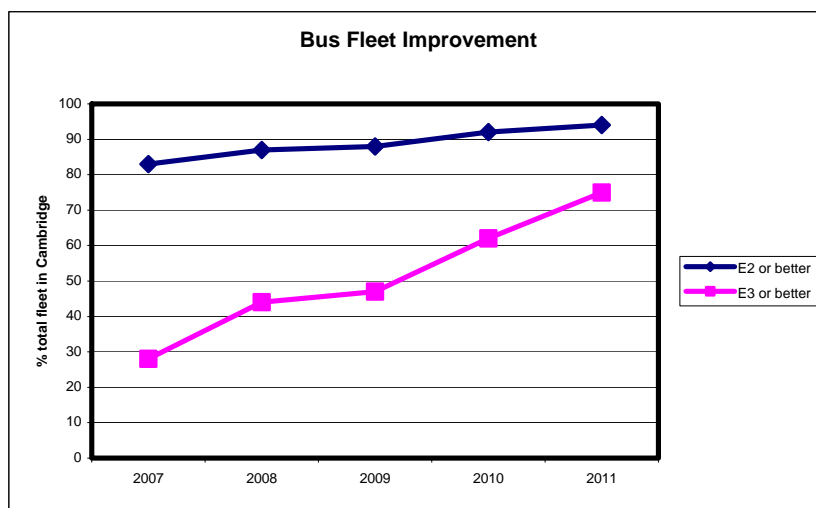
Figure 6.4 Air quality indicators – latest position

Indicator	Cambridgeshire LTP Targets	Latest position 2009
Cambridge Air Quality	AQ2b 90% of all Public Service Vehicles entering the Cambridge Low Emission Zone (LEZ) to meet a minimum of Euro II emission standards by the end of January 2009.	88% (January 2009)
	AQ2c To be set in 2009 informed by consideration of progress towards AQ2b.	Not agreed

The position in January 2010 for the second indicator is 92% Euro II or better; 62% of these are Euro III or better. The latest position in January 2011 for the second indicator is 94% Euro II or better in January 2010; 75% of these are Euro III or better. Slow but steady voluntary improvements in the bus fleet continue without a formal agreement.

Figure 6.5 Bus Fleet Improvement in Cambridge

	%E2 or better	%E3 or better
2007	83	28
2008	87	44
2009	88	47
2010	92	62
2011	94	75



Quality Bus Partnership

No further agreements have been made between the bus operators and the County Council. The proposed further target (AQ2c), for 90% of PSV entering the Cambridge LEZ to meet a minimum of Euro III emission standards by January 2011 was not agreed. Instead, the Quality Bus Partnership board agreed that the number of actual Journey Kilometres of each Euro standard PSV in the Cambridge Core Area were more important than which buses were used. For example, a Euro 2 bus on a

daily schedule and a Euro 4 bus on an hourly schedule will result in lower emissions than vice versa (a Euro 4 bus on a daily schedule and a Euro 2 bus on an hourly schedule).

A baseline was calculated for 2008 and new fleet targets were calculated based on the 50% emissions reduction required. The new proposal was presented to the Quality Bus Partnership in November 2009, but proved less popular than the simpler 90% of buses to be at a certain Euro standard. This draft proposal was appended to the Progress Report 2009. The County Council have been unable to come to any further agreement with the bus operators but have decided that targets should be integrated into the Local Transport Plan (LTP3 remains in preparation). Thus, formal agreement has not yet been achieved.

The Growth Agenda in Cambridge has slowed – 8,100 new dwellings are planned over the 10 years to 2021 instead of 18,200 and no new bus services are planned.

Indeed, cuts have been made to services as subsidies are withdrawn from the less commercially viable routes. Some services have been cancelled; the frequency on other routes has been reduced (Appendix A).

Whilst this may improve air quality in the short term (fewer buses travelling through the city centre will emit fewer emissions), we are concerned that they will be replaced by more private vehicle journeys in the long term as people are discouraged or unable to use public transport, leading to more traffic (and congestion) and poorer air quality in the long term.

Local Transport Plan 3

A new LTP (LTP3) covering the period from 2011 to 2026 was adopted at a meeting of the full Cambridgeshire County Council on March 29th 2011. Two indicators for air quality improvements are included.

Indicator LTP 12 is a composite indicator measuring levels of these pollutants in the declared AQMAs across the county. Indicator LTP 13 measures emissions of NO_x and PM₁₀ from the bus fleet in the core area of Cambridge, as calculated from bus mileage and routing information, and from the emissions standards of all of the buses that operate in the city centre.

A reduction in vehicle emissions will be required to meet these targets. This will be achieved by encouraging more people to use sustainable modes of travel, reducing the need to travel working with bus operators to improve the emissions of the bus fleet and by managing demand for private car use. The main risks to meeting these targets include higher than forecast traffic growth, not enough people transferring to sustainable modes of transport, and a limited take up of cleaner and greener vehicles.

A Working Group has been set up to develop the Cambridge Area Transport Strategy (CATS). Officers and elected Members from both the City Council and the County Council are involved in developing a strategy to resolve Cambridge's transport issues. The Strategy will set out transport measures needed to improve the quality of life and quality of environment of the area and will also detail those measures needed to support new communities in Cambridge and the surrounding area. Once in place, the Strategy will provide an up to date policy basis for the negotiation and securing of developer contributions which will be used to mitigate the impacts of new development and provide environmentally sustainable transport in and around the city.

7 Climate Change Strategies

Cambridge City Council adopted its Cambridge Climate Change Strategy & Action Plan in September 2008. Its' purpose is to establish the framework for action in Cambridge to tackle the causes and consequences of climate change. It describes the present situation, rationale, future intentions and actions for Cambridge City Council to take in order to achieve them. The aims of the Cambridge Climate Change Strategy & Action Plan are twofold.

1. To contribute towards national and international efforts to avert dangerous climate change by limiting temperature increases to 2 degrees centigrade.
2. To ensure that the climate change risks to Cambridge are appropriately identified, assessed, communicated and managed.

In order to achieve these aims, action that can be taken within Cambridge will be designed to achieve reductions in the city's carbon dioxide emissions from 6.2 tonnes per person in 2005 to:

- 5.5 tonnes per person by 2010 (11% cut),
- 4.8 tonnes per person by 2020 (23% cut),
- 2.2 tonnes by 2030 (65% cut), and
- 0.7 tonnes by 2050 (89% cut).

To contribute towards a reduction in the city's carbon footprint, Cambridge City Council will aim to reduce carbon dioxide emissions from its activities from 60.9 kilos per resident in 2005-06 to:

- 54.2 kilos per resident by 2010-11 (11% cut),
- 50.7 kilos per resident by 2015-16 (17% cut),
- 47.2 kilos per resident by 2020-21 (23% cut),
- 21.6 kilos per resident by 2030-31 (65% cut), and
- 6.9 kilos per resident by 2050-51 (89% cut).

Progress will be reported annually through the Cambridge Environmental Framework. The following details were reported in June 2010.

Target achieved or exceeded

- Planning to adapt to climate change (NI 188)
- Flood and coastal erosion risk management (NI 189)

Data unavailable

- Carbon dioxide reduction from local authority operations (NI 185) (waiting for fleet data)

Per capita reduction in CO₂ emissions in the local authority area (NI 186) (expected Sept 2011)

- Air Quality percentage reduction in NO_x & primary PM₁₀ emissions through local authority's estate and operations (NI 194) (waiting for fleet data)

8 Implementation of Action Plans

This is the second year that Cambridge City Council is reporting on the updated Air Quality Action Plan. Most of our efforts in the last year have focussed on continuing with actions that are known to improve air quality. In Cambridge this has involved keeping a close eye on planning applications and attempting to reach an agreement for PSV emissions improvements in Cambridge, via LTP3.

This Progress Report 2011 provides an update on the hierarchy of indicators, the progress based on monitoring results and an update on the principal actions in the Action Plan.

8.1 Hierarchy of Indicators: 1 Air Pollutant concentrations

As discussed above (Chapter Two) progress towards obtaining levels of nitrogen dioxide below the National Objectives remains elusive. Table 8.1 shows that 5 year rolling means at the continuously monitoring sites are level at 2 sites (Regent Street and Parker Street) and rising at one site (Gonville Place) over the past 5 years. Table 8.2 shows that 5 year rolling means are falling around the bus station and on some radial roads, but stable or rising in other areas.

8.2 Hierarchy of Indicators: 2 Direct Effect Indicators

8.2.1 Own Estate

The reduction in NO_x and primary PM₁₀ emissions through the local authorities' estates has not yet been confirmed.

8.2.2 Buses

The calculated reduction in emissions of NO_x and PM₁₀ from buses in the Cambridge Central Area, based on bus information provided to the City Council was 11% and 26% respectively in 2009 compared with 2008. This was largely the result of some fleet replacement in anticipation of the Cambridgeshire Guided Busway opening, which was due in 2009. Further improvements have been made with reductions of 26% (NO_x) and 44% (PM₁₀) on the baseline in 2008.

The target for number of journey kilometres in the AQMA made by different Euro standard public service vehicles has not yet been agreed, so the latest calculated 'kilometres in the core area' is reported. A reduction in Euro 2 journey kilometres and increase in Euro 3 journey kilometres are welcomed, but a substantial number of pre-Euro and Euro 1 PSV remain in service and contribute a significant proportion of emissions.

8.2.3 Taxis

The reduction in emissions of NO_x and PM₁₀ from taxis in the Cambridge Central Area has not yet been calculated. Cambridge City Council licenses around 50% of

the Hackney cab and private hire vehicles operating in Cambridge; South Cambridgeshire District Council licenses the remaining 50%.

There has been a big increase in the number of taxis licensed by both councils in recent years and our understanding, from discussions with taxi licensing officers, is that this is mostly driven by the substantial increase in the night-time economy of Cambridge.

We note that this increase in vehicle movements would not be noted by the Annual Traffic Counts carried out for the County Council, which count 12-hour periods and peak-time periods. It is possible that 24-hour taxi traffic movements are increasing.

There is also a knock-on effect in the day-time as the increase in the number of Hackney carriages has led to pressure on the preferred taxi ranks, with cabs either over-ranking and narrowing the roads, waiting on double yellow lines or driving around the centre of Cambridge looking for a rank.

8.2.4 Modal Shift

Bus patronage and cycle journeys are increasing (figures reported below in the Hierarchy of Indicators section).

8.2.5 Traffic levels

Traffic levels are level (Cambridge Radial Cordon) or falling (River Cam screenline), as indicated by the annual 12-hour traffic counts.

8.3 Hierarchy of Indicators: 3 Indirect Effect Indicators

8.3.1 Congestion

The morning journey time showed a small improvement in 2008/9 from 2007/8 but considerable improvement is required to meet the target set for 2010/11.

8.3.2 Buses

Both Frequent and Non-frequent buses are not yet meeting the punctuality targets (NI178); this is mostly related to congestion at peak times in Cambridge.

8.3.3 Walking

The baseline data for 2009 is presented. Further indicators may be adopted if included in LTP3.

HIERARCHY OF INDICATORS		
1 Air pollutant concentrations (District Councils to measure)		
INDICATOR	TARGET	PROGRESS
Annual average concentrations of NO ₂ in 2015 at monitoring sites in Cambridge	<40 µg/m ³	<u>2010</u>
· Parker		49
· Gonville		52
· Regent		40
2a Direct effect indicators (District Councils to measure)		
INDICATOR	TARGET	PROGRESS
Reduction in NO _x and primary PM ₁₀ emissions through local authority's estate and operations (NI 194) - Cambridge	To be confirmed	Waiting for fleet data.
Reduction in emissions of NO _x from buses in Cambridge Central Area from baseline 2008 - 287,160 grams per week	50% by 2015	2009 - 11% 255,205 g/wk 2010 - 26% 211,632 g/wk
Reduction in emissions of PM ₁₀ from buses in Cambridge Central Area from baseline 2008 – 6,847 grams per week	50% by 2015	2009 – 26% 5,076 g/wk 2010 – 44% 3,863 g/wk
Reduction in emissions of NO _x from taxis in Cambridge Central Area from Taxis from baseline 2008	50% by 2015	Base line to be calculated
Reduction in emissions of PM ₁₀ from taxis in Cambridge Central Area from Taxis from baseline 2008	50% by 2015	Base line to be calculated
2b Direct effect indicators (Cambridgeshire County Council to measure)		
INDICATOR	TARGET	PROGRESS

Reduction in NO _x and primary PM ₁₀ emissions through local authority's estate and operations (NI 194)	To be confirmed	Waiting for fleet data.
Bus patronage (NI 177)	22.5m boardings minimum 2010/11	22.1m (2009/10)***
Modal share of journeys to school by private car (NI 198) – reduction from 23.7% in 2007	20% by 2010/11	21.04% (count 2010)***
Number of cycle journeys (LTP target)	Up by 10.6% by 2010/11	16.9 to end March 2010; 19.6 to end March 2011***
Number of journey kilometres in Cambridge Core Area made by pre-Euro and Euro 1 PSV	NONE	2,254 km (2008); 1,727 km (2009)
Number of journey kilometres in Cambridge Core Area made by Euro 2 PSV	To be confirmed	10,428 km (2008) 9,112 km (2009)
Number of journey kilometres in Cambridge Core Area made by Euro 3 PSV	To be confirmed	2,503 km (2008) 2,835 km (2009)
Number of vehicles crossing the Cambridge Outer Cordon (baseline 184,800, 2004)	No increase	185,000 – 2009 183,000 – 2010***
Number of vehicles crossing the Cam screenline	No increase	61,000 – 2009 59,400 – 2010***
3a Indirect effect indicators (District Councils to measure)		
INDICATOR	Number	PROGRESS
Number of developments with less than the permitted parking spaces agreed in Cambridge	No target, report amount	Data not collated
Number of workplace/commercial travel plans established in Cambridge	No target, report amount	54 members of Travel for Work Partnership in Cambridge City district (45 in 2009)***

Number of personal travel plans established in Cambridge	No target, report amount	100 PTP in Kings Hedges; RTP guidance in draft will integrate PTP into RPT.***
How many sites with S106 funding for air quality projects in Cambridge	No target, report number	CB1 Trumpington Meadows
Number of cars in car clubs in Cambridge	Year on year increase	6 cars in 5 locations, March 2010 15 cars and 1 van in 15 locations, March 2011
Number of Low Emissions Strategies agreed for new development	No target report amount	None
3b Indirect effect indicators (County Councils to measure)		
INDICATOR	TARGET	PROGRESS
Bus punctuality (NI 178) - % of non-frequent buses on time	76% by 2010/11	71%***
Bus punctuality (NI 178) - the average excess waiting time for frequent services	53s by 2010/11	35s***
Journey time in the morning peak hour (NI 167)	3 min 25 seconds per mile by 2010/11	3 min 59 seconds (2009/10) from 4 min 6 seconds (2008/09) and baseline of 4 min 8 seconds in 2007/08***
Condition of surface footway (LTP target) – percentage with notional residual life of less than 0 years by 2010/11	Less than 19.2%	30%*** (2009) 23.7%*** (2010)
Number of routes generated on Walk-It	Year on year increase	16,124 (2009) 33,061 (2010)

** Figures from LTP2 Progress Report 2008

*** Figures from County Council colleague March 2010 and 2011

Table 8.1 Progress based on continuous monitoring site results: 5-year rolling means

	2006 base	2007	2008	2009	2010	2011	2012	2013	2014	Target 2015	On Target
Gonville Place	41	42	43	44	45					40 µg/m ³	No
Parker Street	51	54	54	54	54					40 µg/m ³	No
Regent Street	44	44	43	44	43					40 µg/m ³	No

Table 8.2 Progress based on NO₂ diffusion tube results: 5-year rolling means

	2006 base	2007	2008	2009	2010	2011	2012	2013	2014	Target 2015	On Target
Emmanuel Street	64	61	59	58	57					40 µg/m ³	No
Emmanuel Road	58	57	56	55	55					40 µg/m ³	No
Victoria Avenue	52	50	49	48	49					40 µg/m ³	No
Victoria Road	45	44	43	43	44					40 µg/m ³	No
Downing Street	47	47	47	47	47					40 µg/m ³	No
Maids Causeway	46	47	47	47	49					40 µg/m ³	No

Table 8.3 Action Plan Progress

	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
1	Implementation of Air Quality policies in the Local Plan	Development must not adversely impact on AQMA	City	Ongoing	Ongoing	None	0% increase in emissions			Ongoing	Must continue to be maintained and enforced.
2	Implementation of the Quality Bus Partnership	Reduce emissions in the AQMA by agreement	County	Ongoing	Ongoing	50% emissions cut by 2015	10%	Agreement has not been made, but there has been action.	26% cut from 2008 to 2010	Depends upon rate of fleet renewal and number of services	Most operators have considerably improved their fleet.
3	Maintain 8 year limit on taxis entering Core Area	Ensure that taxi fleet is continuously improving	City	Ongoing	Ongoing	100% compliance	Continually improving fleet, not quantified	100% compliance	100% compliance	Complete	Must continue to be maintained and enforced.
4	Creation of a Low Emission Zone	Restrict access to the central part of Cambridge to low emission vehicles	County	Ongoing	Ongoing	None	0% increase in emissions. No targets set for improvement although some anticipated	Some reduction in air pollution around bus station area	No progress in 2010.	Core 5 indefinitely deferred until need proven.	Formal LEZ has not been adopted. Most traffic not allowed into central area. Only taxis are lower emission.
5	LTP2 policies	Modal shift and maintain current levels of traffic	County	Ongoing	2006-11	% cycling or walking or using public transport Traffic count	0% increase in emissions arising from transport growth	Increases in cycling and public transport; traffic steady or falling	Continuing increases in cycling and public transport; traffic steady or falling	2011	Now working towards LTP3
6	Long term transport strategy	Forward planning to ensure that development is sustainable	County	Ongoing	Ongoing	None	0% increase in emissions arising from growth		No progress during time of uncertain funding - infrastructure projects on hold	Ongoing	TIF bid unsuccessful, bid to be prepared for Urban Challenge Fund – no details from County yet

9 Conclusions and Proposed Actions

9.1 Conclusions from New Monitoring Data

The new monitoring data confirm that the exceedences are still identified within the existing AQMA. Monitoring has identified some potential or actual exceedences at relevant locations outside the existing AQMA. Monitoring results within AQMA are not below the air quality objective, so it is not appropriate to revoke the AQMA.

9.2 Conclusions relating to New Local Developments

New local developments, Commercial/domestic sources, that will require more detailed consideration in the next Updating and Screening Assessment.

- Biomass boiler installed at Manor Care Home, 33 Milton Road
- Biomass boiler to be installed at Simon's House, Histon Road

9.3 Other Conclusions

A key action in the Air Quality Action Plan is to reduce emissions from one of the major sources in Cambridge, the buses, improving the fleet by introducing newer buses to the fleet. There have been some successes in emissions reduction during the last two years. New targets for operators are expected to be set in the next Local Transport Plan (3), which is currently being prepared.

Cambridge continues to expand and the population continues to grow. Planning policies are in place and are mostly being used to control the impact of growth on air quality. There are many major developments approved, pending and at the discussion stage. A guidance note on biomass boilers is being finalised.

9.4 Proposed Actions

New monitoring data has identified the potential need to proceed to a Detailed Assessment for any nitrogen dioxide.

New monitoring data has not identified any need for additional monitoring, or changes to the existing monitoring programme.

No changes are currently required to the AQMA.

There are no other outstanding LAQM Tasks such as outstanding Detailed or Further Assessments and/or AQMA declarations.

The next course of action is to submit a 2012 Updating and Screening Assessment.

Work on the Air Quality Action Plan is ongoing.

10 References

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Appendix A Cuts in Bus Services

Bus operator Stagecoach has announced it will axe 22 bus routes – and reduce the frequency of a further 15.

Among the casualties was the free Cambridge city centre shuttle, and routes from Cambridge to Orchard Park and St Ives.

Evening and weekend journeys will be scrapped on several routes serving the city, and rural Huntingdonshire will lose a number of services.

The changes will come into force on April 17 and Philip Norwell, Stagecoach Cambridgeshire's commercial director, said the withdrawal of public subsidies for some routes was a factor.

He told the News the cut in the amount of cash it would receive for carrying passengers with concessionary passes made other services "less commercially viable".

Mr Norwell said: "We are looking to provide a good level of service across the operating area but we must do that on a commercially viable basis and the company has had to respond to these changes.

"We are being careful to ensure the service that remains is adequate and will attract people to use public transport."

The county council's cabinet yesterday approved plans to reduce the amount of cash provided to operators for concessionary passes after funding from central Government was reduced.

There has been no decision on four St Neots town services.

Last week the authority approved phasing out £2.7 million of annual subsidies over four years, leading Liberal Democrat spokesman Cllr Kilian Bourke to claim the administration had created a "perfect storm for bus users".

He said: "By announcing out of the blue their intention to cut bus subsidies by 100 per cent, the Tories have precipitated a crisis in operator confidence."

The council could choose to ask other operators to run subsidised services which still have funding but are no longer wanted by Stagecoach, and has launched a consultation with district, city and parish councils.

Highways and access chief Cllr Mac McGuire said: "It is always difficult to make the decision to cut a service, but with limited funding from Government it is a decision we have had to make.

"Where there is no other transport option for communities we will be trying to continue to provide a service, even if it is at a reduced frequency, but no final decisions will be made until we have finished consulting local councils."

:: Cancellations

Cambridge city centre shuttles

31A – Trumpington to Netherhall Schools

33 – March to Peterborough

B – Orchard Park to Cambridge

32 – Peterborough to Chatteris

431 – Great Raveley to St Ives

95/15/91/96 – St Ives to Cambridge

139 – Foxton to Royston

409 – Huntingdon to Great Gidding

408 – Huntingdon to St Neots

407 – Huntingdon to Peterborough

402 – Huntingdon to St Ives

401 – Huntingdon to Grafham

406 – Huntingdon to Kettering

405 – Huntingdon to Peterborough
404 – Huntingdon to Bedford
403 – Huntingdon to Thrapston
400 – Keyston to Huntingdon
414 – Graveley to St Neots
66/65 – St Neots to St Ives
67 – St Neots to Southoe
32 – Chatteris to Ramsey/ Whittlesey

Service reductions

2 – Addenbrooke’s to Science Park, amend route and timetable
6 – Oakington to Cambridge, amend timetable
7 – Cambridge to Saffron Walden, amend route and timetable
12 – Cambridge to Ely, amend timetable
11 – Cambridge to Bury St Edmunds, amend timetable
9 – Cambridge to Littleport, amend timetable, no services after 8pm or on Sundays
4 / Uni4 – Addenbrooke’s to St Neots, amend route
14 – Caldecote to Cambridge, amend timetable
X7 – Cambridge to March, cancelled and replaced with the X8, making one journey each way Monday to Friday
X9 – Cambridge to March, cancelled and replaced with 9 between Ely and March, providing hourly service Monday to Saturday, infrequent service Sundays and public holidays
15 – Cambridge to Fenstanton, no services after 8pm or on Sundays
18 – Cambridge to Longstowe, no services after 8pm or on Sundays
30 – Huntingdon to Ramsey, no services after 8pm or on Sundays
45 – Huntingdon to St Ives, no services after 8pm
Citi 7 – Sawston to Duxford and Whittlesford, no services after 8pm or on Sundays

<http://www.cambridge-news.co.uk/Home/Axe-falls-on-22-bus-routes-as-cuts-bite.htm>

Services in bold directly affect Cambridge.