



# 2014 Air Quality Progress Report for Cambridge City Council

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

April 2014

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## Executive Summary

Levels of nitrogen dioxide have shown a slight reduction in 2013 compared with previous years. Levels above the national objective were recorded at the Parker Street and at 5 of the 54 diffusion tube sites. Four of the 5 were inside the AQMA; the other is at Long Road, where there are no relevant receptors.

The continuously monitoring instruments show that levels of particulate matter, although below national objectives, have remained constant or shown a slight increase; significantly, the number of daily mean exceedences has increased again.

The City Council is not considering redrawing the boundary of the AQMA at this time, as the downward trend is only slight with many of the levels recorded still being fairly close to the national objective. Should this trend continue over the next couple of years the City Council will consider amending the AQMA boundary, but this will depend upon how well the growth in the area is managed.

No new sources or significant changes in sources have been identified so a Detailed Assessment is not required for any pollutants.

The Air Quality Action Plan will be updated in 2014/5 following the results from the Cambridge Real Emissions Project. The new plan will have evidence-based and targeted actions to make a real improvement in air quality in Cambridge.

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# 1 Introduction

## 1.1 Description of Local Authority Area

### Economic Setting

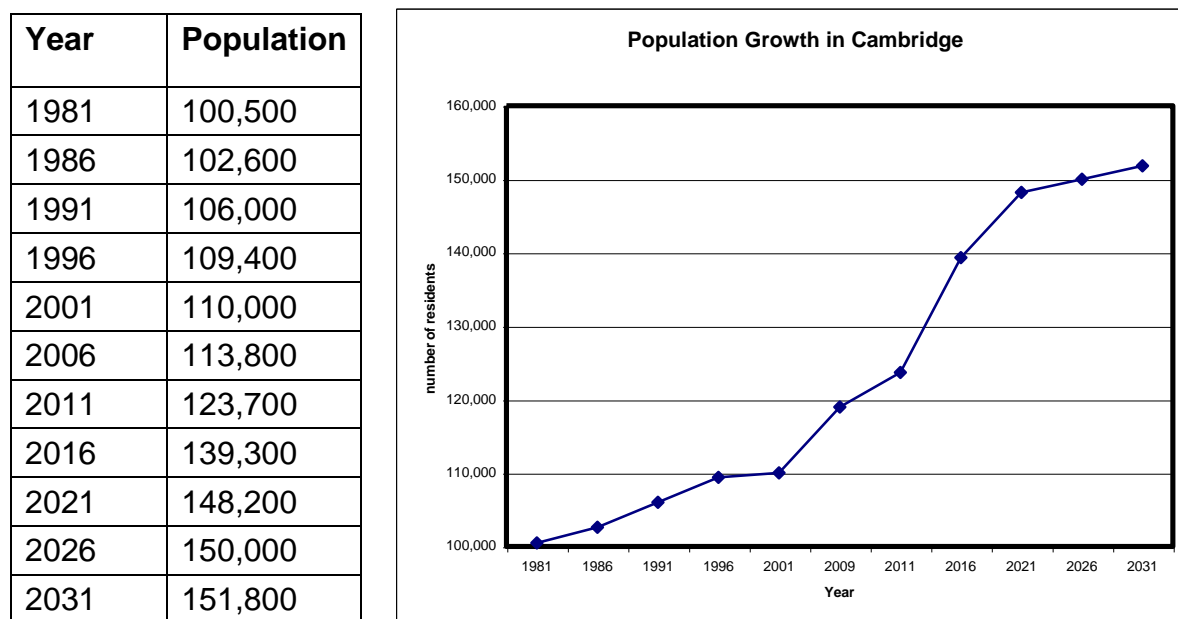
Cambridge is an important regional centre for employment, services, government, healthcare and shopping; it is nationally and internationally important for its higher education, knowledge-based industries and tourism. Located within an hour of London and 30 minutes of Stansted by rail, as well as adjacent 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 and is one of the driest areas in Britain.

### Population

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 is forecast to occur between 2006 and 2016.

**Figure 1.1 Population Growth in Cambridge – table and graph**

*Data Source: Cambridgeshire County Council Research Group*

### Major Sources

Cambridge City has an air quality problem that is mostly related to emissions from traffic. 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 although City Council policy aims to minimise this impact.

Cambridgeshire County Council monitors traffic across the county and produces an annual traffic report. Traffic has been monitored in the City of Cambridge since 1978 using two screenlines; the Radial Cordon and River Cam screenlines.

Traffic trends over the last 10 years show an increase in cycles, bus and coaches and a small decline in cars, motorcycles and light and heavy goods vehicles (although the decline in heavy goods vehicles is more marked).

### *Cambridge Radial Cordon*

Traffic counts recorded that there was a very small increase in motor vehicles crossing the Cambridge Radial Cordon per 12-hour day (7am and 7 pm) in 2013 at 190,578 (1.2% increase compared with 2012) although the long-term trend remains relatively flat.



This increase can be accounted for by a 2% increase in cars and a 10% increase in motorcycles. The number of buses decreased by 4% although remains 11% higher than 2004. There was a small decrease in both heavy and light good vehicles. The data for 2013 is outlined in Table 1.1 below:

**Table 1.1 Vehicle numbers crossing the Cambridge Radial Cordon**

Vehicle Type	Vehicles – 12 hour flow	Change 2012-2013
Motorcycles	1,870	10%
Cars	160,478	2%
Light Goods	22,436	-0.4%
Heavy Goods	3,628	-4%
Bus & Coach	2,166	-4%
All Motor Vehicles	190,578	1%

There was an 11% increase in pedal cycles compared with 2012 and an overall growth of 78% over the past 10 years.

#### *River Cam screenline*

There was a total of 60,151 motor vehicles crossing the River Cam screenline and entering the central area of the City in 2013, which is a 3% increase compared with 2012, but 14% less than ten years ago.

This increase can be accounted for by a 5% increase in cars, which shows a move away from the recent historical trend of decreasing cars in the city centre. By contrast to 2012 all other motorised vehicles show a decrease in numbers as compared with 2012 which saw an increase in all motorised vehicles with the exception of cars and heavy goods vehicles. The number of buses was 5% less than in 2012 although the total is similar to ten years ago. A 3% decrease was also seen in the number of cycles crossing the River Cam Screenline.

The data for 2013 is outlined in Table 1.2 below:

**Table 1.2: Vehicle numbers crossing River Cam**

<b>Vehicle Type</b>	<b>Vehicles – 12 hour flow</b>	<b>Change 2012-2013</b>
Motorcycles	670	-32%
Cars	50,159	5%
Light Goods	6,756	-4%
Heavy Goods	881	-9%
Bus & Coach	1,685	-5%
All Motor Vehicles	60,151	3%

Year to year variation in both cycles and pedestrians are expected as numbers are influenced significantly by prevailing weather conditions on the day of the survey. The number of cyclists in 2013 was 43% higher compared with 10 years ago. The decrease in numbers compared with 2012 figures is likely to be due to the extremely cold weather experienced in March when the surveys were undertaken. (Data from Traffic Management Report 2013, Cambridgeshire County Council).

## **1.2 Purpose of Progress Report**

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedences are considered likely, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

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 LAQM 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 LAQM **in England** are set out in the Air Quality (England) Regulations 2000 (SI 928), The Air Quality (England) (Amendment) Regulations 2002 (SI 3043), and are shown in Table 1.3. This table shows the objectives in units of microgrammes per cubic metre  $\mu\text{g}/\text{m}^3$  (milligrammes per cubic metre,  $\text{mg}/\text{m}^3$  for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

**Table 1.3 Air Quality Objectives included in Regulations for the purpose of LAQM in England**

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
	5.00 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
Carbon monoxide	10 $\text{mg}/\text{m}^3$	Running 8-hour mean	31.12.2003
Lead	0.50 $\mu\text{g}/\text{m}^3$	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
Particulate Matter (PM <sub>10</sub> ) (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

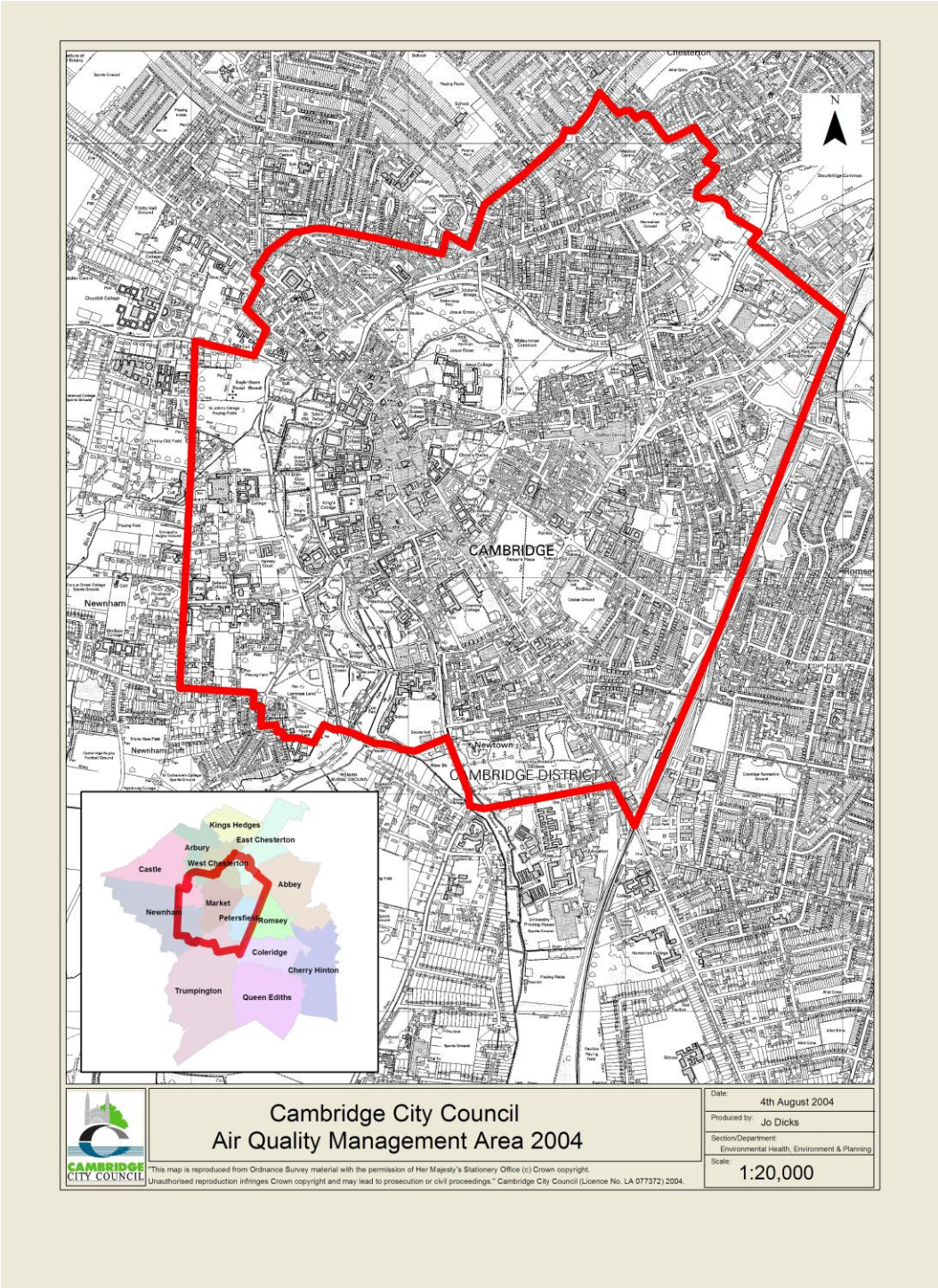
The First Round of Review and Assessment was carried out in Cambridge in 2000 and indicated that ambient concentrations of pollutants of concern should meet the national objectives by their target dates, despite high levels of nitrogen dioxide and fairly high levels of particulate matter. The Second Round in 2003 indicated that

concentrations of nitrogen dioxide may not meet the target – the change in prediction was largely due to amended emission factors. Cambridge City Council proceeded to a Detailed Assessment, which predicted that concentrations of nitrogen dioxide would not meet the target; an AQMA was declared in 2004. Monitoring since has shown that no change to the AQMA boundary is required.

**Table 1.4 Summary of Previous Review and Assessments**

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
Fifth 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.	2012

Figure 1.2 Map of AQMA Boundary



## **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.

Figure 2.1 shows the locations of these across the city. 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 monitor 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 monitors formerly located in Silver Street.

Each of the sites is calibrated and maintained every 2-3 weeks by the Local Site Operator (LSO), serviced every 6 months by Enviro Technology Services plc (ET) 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 five city centre locations in Cambridge. There are three Teledyne API M200E NO-NO<sub>2</sub>-NO<sub>x</sub> chemiluminescence analysers, at Montague Road, Parker Street and Gonville Place, supplied and serviced by ET. ET also has the contract to service and repair the Thermo Model 42c NO-NO<sub>2</sub>-NO<sub>x</sub> chemiluminescence analyser at Newmarket Road and the Casella Monitor ML2041 chemiluminescence analyser at Regent Street.

Levels of PM<sub>10</sub> are continuously monitored with BAM-1020 instruments at three city centre locations in Cambridge, Montague Road, Parker Street and Gonville Place. PM<sub>2.5</sub> levels are monitored at Gonville Place using a BAM-1020 with a PM<sub>2.5</sub> head and at Newmarket Road using a SHARP 5030, a hybrid nephelometric/ radiometric particulate mass monitor. Comparison with the reference method has shown that no correction factor is required for the SHARP (TÜV report 936/21203481/B, December 2006). Service, repair and calibration of all particulate matter monitors are carried out under contract with ET. This information is summarised in table 2.1.



Figure 2.1 Maps of Automatic Monitoring Sites

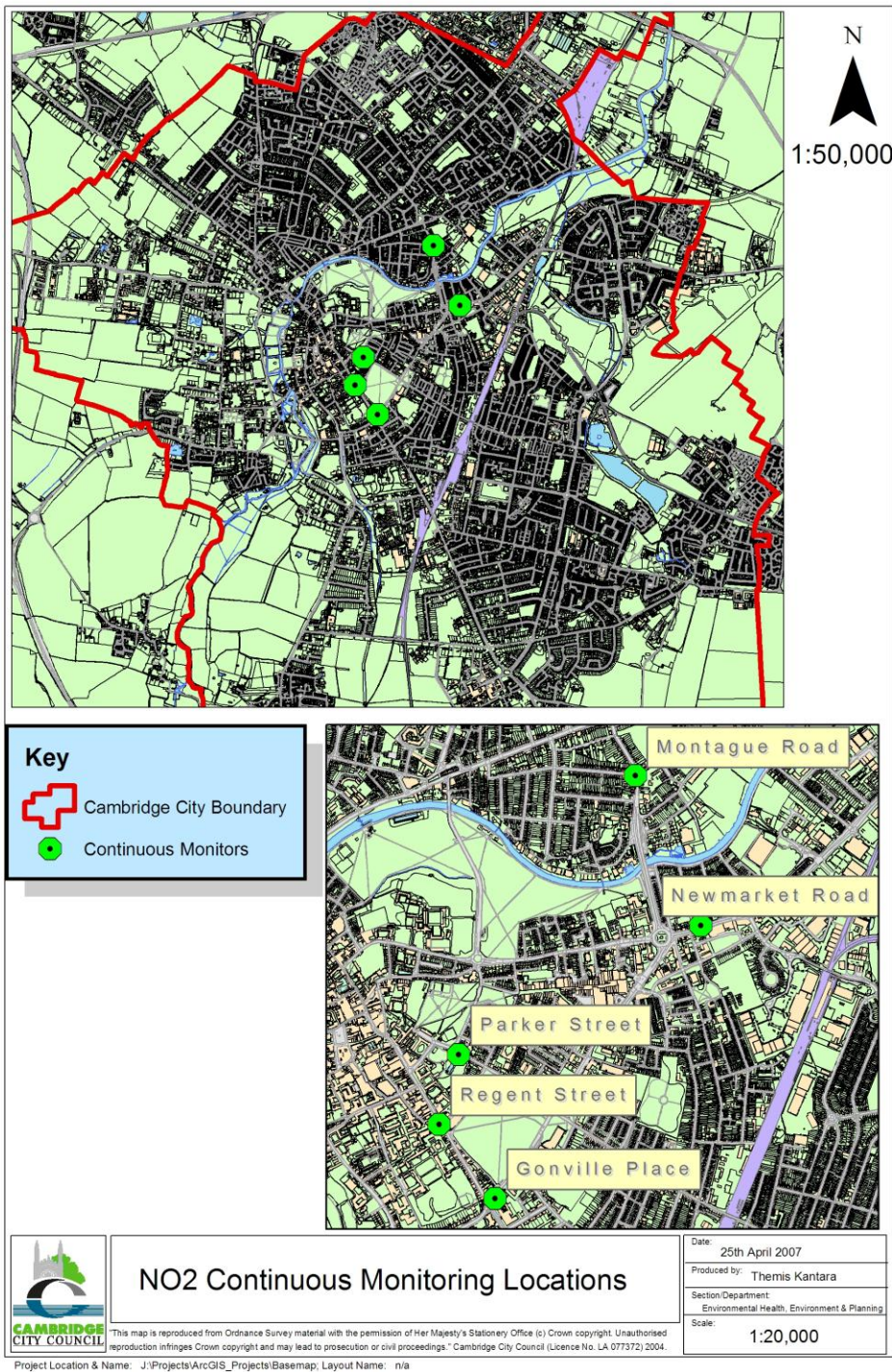




Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Inlet Height (m)	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
Gonville Place	Roadside	545 508	257 828	2.0	NO <sub>2</sub> , PM <sub>10</sub> , PM <sub>2.5</sub>	Y	Chemiluminescence, M200E 2 x BAM-1020	Y (1.8m)	3.3m	Yes
Montague Road	Roadside	546 057	259 118	2.0	NO <sub>2</sub> , PM <sub>10</sub>	Y	Chemiluminescence, M200E BAM-1020	Y (1.4m)	3.9m	No
Newmarket Rd	Roadside	546 317	258 900	2.0	NO <sub>2</sub> , PM <sub>2.5</sub>	Y	Chemiluminescence, 42c SHARP-5030	Y (0.5m)	3.3m	Yes
Parker Street	Roadside	545 366	258 391	2.5	NO <sub>2</sub> , PM <sub>10</sub>	Y	Chemiluminescence, M200E BAM-1020	Y (0.5m)	3.3m	Yes
Regent Street	Roadside	545 289	258 118	5	NO <sub>2</sub>	Y	Chemiluminescence, ML2041	Y (0.5m)	2.3m	Yes

## **2.1.2 Non-Automatic Monitoring Sites**

### **a. Nitrogen Dioxide**

There are 56 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. The location of these across the city can be seen in Figure 2.2 and Table 2.2 summarises the details of each.

During 2013 one of the Histon Road tubes had to be relocated due to the loss of lamp posts as part of a city wide lamppost replacement scheme. In most cases the location could be retained but for Histon Road 1 (S24) a new location needed to be found due to the loss of the lamppost in the original location. The new location is shown in Table 2.2.

The Environmental Scientifics Group 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. Harwell Scientifics 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 NO<sub>2</sub> 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.

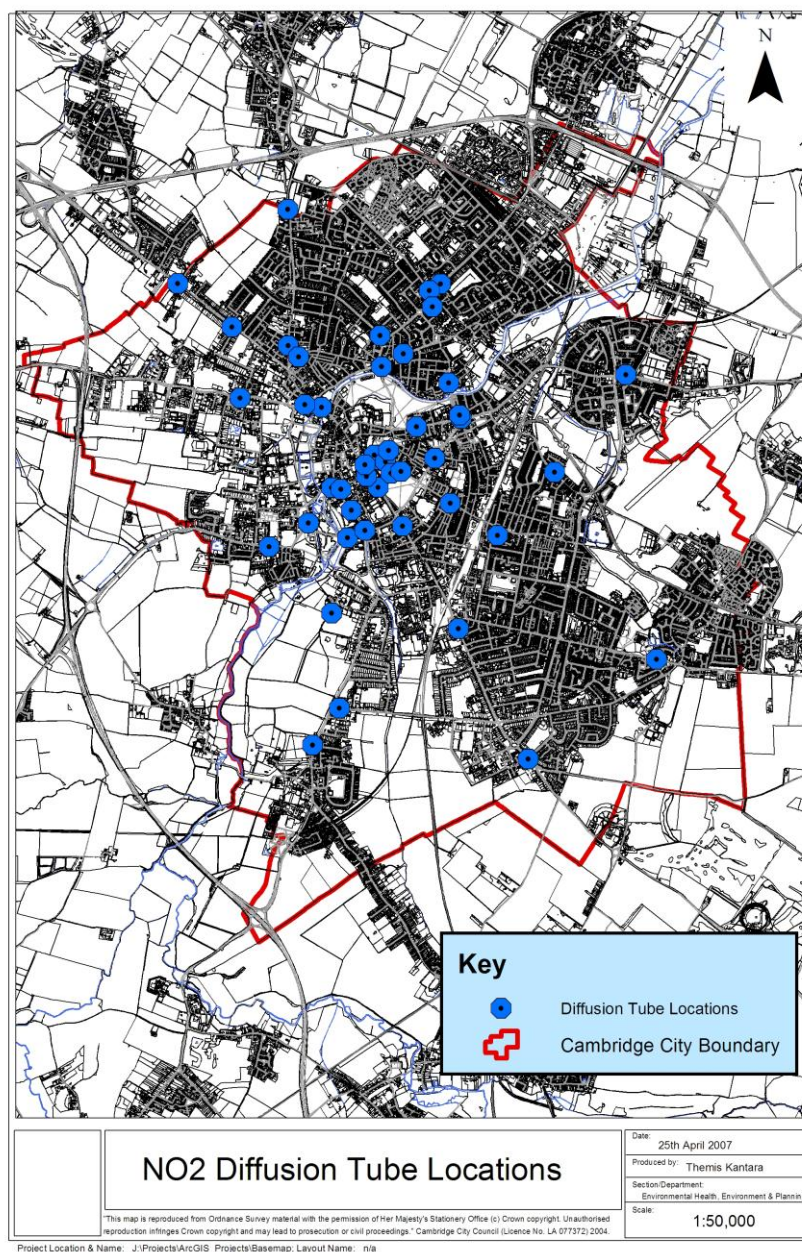
The results are bias-adjusted using a locally derived co-location factor. For 2013 this is 0.74 as compared with a nationally derived factor of 0.80. This locally derived factor compares the results from the continuous monitor with the average from the triplicate tubes all located at Gonville Place, Cambridge. The locally derived factor

has been used as it is felt to be more representative of the local situation as compared with the national factor. Results reported below have been bias-adjusted.

## b. 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 is collected by Ricardo AEA.

**Figure 2.2 Map of Non-Automatic Monitoring Sites**



**Table 2.2 Details of Non- Automatic Monitoring Sites**

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is monitoring co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (m) (N/A if not applicable)	Does this location represent worst-case exposure?
S1	Emmanuel Street	Roadside	545,293	258,418	2.5	NO <sub>2</sub>	Y	N	Y (0m)	2.4m	Y
S2	Histon Road 2	Roadside	544,284	261,273	2.5	NO <sub>2</sub>	N	N	Y (20m)	1.7m	N
S3	Magdalene Street	Roadside	544,674	258,992	2.5	NO <sub>2</sub>	Y	N	Y (0m)	2.0m	Y
S4	Northampton Street	Roadside	544,492	259,021	2.5	NO <sub>2</sub>	Y	N	Y (0m)	2.0m	Y
S5	Silver Street	Roadside	544,783	258,116	2.5	NO <sub>2</sub>	Y	N	Y (0m)	1.0m	Y
S6	Long Road	Kerbside	544,867	255,709	2.0	NO <sub>2</sub>	N	N	Y (20m)	0.6m	N
S7	Newmarket Road 1	Roadside	546,195	258,867	2.0	NO <sub>2</sub>	Y	N	Y (2m)	1.7m	Y
S8	Milton Road	Roadside	545,977	260,352	2.0	NO <sub>2</sub>	N	N	Y (3m)	8.0m	N
S9	Drummer Street	Roadside	545,247	258,472	2.5	NO <sub>2</sub>	Y	N	Y (0m)	2.1m	Y
S10	Gilbert Road	Kerbside	545,314	259,777	2.0	NO <sub>2</sub>	N	N	Y (10m)	1.0m	Y
S11	Latham Road	Background	544,784	256,746	2.0	NO <sub>2</sub>	N	N	N	N/A	N/A
S12	Newmarket Road 2	Roadside	547,998	259,349	2.0	NO <sub>2</sub>	Y	N	N	3.7m	N
S13	East Road	Roadside	545,908	258,439	2.0	NO <sub>2</sub>	Y	N	Y (1m)	4.0m	Y
S14	Mill Road	Roadside	546,080	257,944	2.0	NO <sub>2</sub>	Y	N	Y (0m)	2.0m	Y
S15	Hills Road	Roadside	545,557	257,695	2.0	NO <sub>2</sub>	Y	N	Y (2m)	0.4m	Y
S16	Regent Street	Roadside	545,289	258,118	5.5	NO <sub>2</sub>	Y	N	Y (0.5m)	2.3m	Y
S17	Coldhams Lane	Roadside	547,216	258,286	2.0	NO <sub>2</sub>	N	N	Y (10m)	3.5m	Y
S18	Pembroke Street	Roadside	544,884	258,098	2.0	NO <sub>2</sub>	Y	N	Y (0m)	1.2m	Y
S19	Huntingdon Road 2	Roadside	543,101	260,344	2.5	NO <sub>2</sub>	N	N	Y (25m)	2.5m	N

## Cambridge City Council

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is monitoring co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (m) (N/A if not applicable)	Does this location represent worst-case exposure?
S20	Elizabeth Way	Roadside	546,062	259,260	2.0	NO <sub>2</sub>	Y	N	N	1.6m	N
<b>S21</b>	Victoria Road	Roadside	544,425	259,560	2.0	NO <sub>2</sub>	Y	N	Y (0m)	1.8m	Y
S22	Madingley Road	Kerbside	543,784	259,093	2.5	NO <sub>2</sub>	N	N	Y(20m)	0.8m	N
S23	Huntingdon Road 1	Roadside	543,761	259,813	2.0	NO <sub>2</sub>	N	N	Y(15m)	1m	N
S24	Histon Road 1	Kerbside	544,308	259,664	2.0	NO <sub>2</sub>	N	N	Y (2m)	0.5m	Y
<b>S24</b>	Histon Road 1 <b>NEW</b>	Kerbside	544,305	259,580	2.0	NO <sub>2</sub>	N	N	Y (2m)	0.5m	Y
S25	Barton Road	Roadside	544,100	257,473	2.5	NO <sub>2</sub>	N	N	Y (20m)	2.2m	Y
S26	Fen Causeway	Roadside	544,943	257,567	2.0	NO <sub>2</sub>	Y	N	Y(50m)	2.1m	Y
S27	Trumpington High St	Roadside	544,575	255,307	2.5	NO <sub>2</sub>	N	N	Y(0m)	2.7m	Y
S28	Babraham Road	Roadside	546,948	255,169	2.5	NO <sub>2</sub>	N	N	Y(20m)	1.2m	Y
S29	Cherry Hinton Road	Roadside	548,331	256,242	2.5	NO <sub>2</sub>	N	N	Y(10m)	0.8m	Y
S30	Arbury Road	Roadside	545,693	260,473	2.0	NO <sub>2</sub>	N	N	Y(5m)	0.8m	N
S31	Newnham Road	Roadside	544,529	257,730	2.5	NO <sub>2</sub>	Y	N	Y (0m)	1.6m	Y
S32	Hills Road 2	Roadside	546,186	256,530	2.0	NO <sub>2</sub>	N	N	Y (0m)	3.6m	Y
S33	Victoria Avenue	Roadside	545,331	259,438	2.5	NO <sub>2</sub>	Y	N	Y (0m)	1.4m	Y
S34	Parker Street	Roadside	545,370	258,399	2.5	NO <sub>2</sub>	Y	N	Y (0m)	1.4m	Y
S35	Abbey Road*	Roadside	546,163	258,983	2.0	NO <sub>2</sub>	Y	N	Y (1m)	1.7m	N
S36	Cockburn Street	Urban Background	546,596	257,594	2.0	NO <sub>2</sub>	Y	N	Y (0m)	1.5m	Y
S37	Oaktree Avenue	Urban Background	545,885	260,088	2.0	NO <sub>2</sub>	Y	N	Y (20m)	1.0m	Y
S38	Chesterton Road	Roadside	545,566	259,578	2.0	NO <sub>2</sub>	Y	N	Y (2m)	2.7m	Y
S39	Maids Causeway	Kerbside	545,710	258,782	2.0	NO <sub>2</sub>	Y	N	Y (3m)	0.8m	Y
S40	Emmanuel Road	Roadside	545,405	258,521	2.5	NO <sub>2</sub>	Y	N	Y (0m)	1.5m	Y

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<b>Site ID</b>	<b>Site Name</b>	<b>Site Type</b>	<b>X OS Grid Reference</b>	<b>Y OS Grid Reference</b>	<b>Site Height (m)</b>	<b>Pollutants Monitored</b>	<b>In AQMA?</b>	<b>Is monitoring co-located with a Continuous Analyser (Y/N)</b>	<b>Relevant Exposure? (Y/N with distance (m) to relevant exposure)</b>	<b>Distance to kerb of nearest road (m) (N/A if not applicable)</b>	<b>Does this location represent worst-case exposure?</b>
S41	Downing Street	Roadside	545,162	258,240	2.0	NO <sub>2</sub>	Y	N	Y (0m)	1.3m	Y
S42	Trumpington Street	Roadside	544,999	257,871	2.0	NO <sub>2</sub>	Y	N	Y(2m)	1.4m	Y
S43	Lensfield Road	Roadside	545,271	257,675	2.5	NO <sub>2</sub>	Y	N	Y(>3m)	1.8m	Y
S44	Park Terrace	Roadside	545,429	258,271	2.5	NO <sub>2</sub>	Y	N	Y (>3m)	1.9m	Y
S45	St Andrew's St	Urban Centre	545,147	258,367	2.5	NO <sub>2</sub>	Y	N	Y(0m)	0.8m	Y
S46	Parkside	Roadside	545,539	258,295	2.5	NO <sub>2</sub>	Y	N	Y (2m)	0.5m	Y
S47/ S48/ S49	Gonville Place (triplicate)	Roadside	545,508	257,828	2.0	NO <sub>2</sub>	Y	Y	Y (0m)	3.3m	Y
S50	Hills Road 3	Roadside	545,893	257,152	2.5	NO <sub>2</sub>	N	N	Y(3m)	3m	Y
S51	Shelford Road	Roadside	544,960	254,220	2.0	NO <sub>2</sub>	N	N	Y(5m)	2m	Y
S52	Station Road 2 east	Kerbside/Roadside	546,019	257,300	2.0	NO <sub>2</sub>	Y	N	Y(10m)	0.4	Y
S53	Station Road 1 West	Kerbside/Roadside	545,897	257,325	2.0	NO <sub>2</sub>	Y	N	Y(10m)	0.4	Y
S54	Tenison Road	Roadside	546,027	257,663	2.5	NO <sub>2</sub>	Y	N	Y(4m)	0.2	Y
S55	Tenison Road 2	Roadside	546,005	257,405	2.5	NO <sub>2</sub>	Y	N	Y(4m)	0.3	Y
S56	Coldhams Lane 2	Roadside or urban background	546,602	258,796	2.0	NO <sub>2</sub>	Y	N	Y(8m)	1.7	Y

## 2.2 Comparison of Monitoring Results with Air Quality Objectives

### 2.2.1 Nitrogen Dioxide (NO<sub>2</sub>)

#### a. Automatic Monitoring Data

Newmarket Road was the only site in 2013 to not achieve the target of 90% data capture. This issue was carried over from 2012 when the electricity supply was lost; the site was not up and running again until May 2013 reducing data capture for the site to 62.3%. Data for Newmarket Road has therefore been annualised. The calculations relating to this can be found in Appendix 1.

The AQ objective for the annual mean concentration was only exceeded at one Automatic Data Monitoring Site in 2013 compared with two sites in 2012. Parker Street remains above the target of 40µg/m<sup>3</sup> at 46µg/m<sup>3</sup>; although a small decrease in levels was seen compared with 2012. As in previous years the overall trends vary from site to site. The small decrease was also seen at both Regent Street (bringing it just below the AQ objective level for the first time) and Montague Street. Gonville Place remained the same compared with 2012 levels. Newmarket Road was the only site to show a small increase although it remains well below the AQ objective level; in addition, the use of annualised data may have increased the level of error of the results.

Table 2.3 shows the results for 2013 alongside results for the previous 4 years. Figure 2.3 shows trends in levels since 2007.

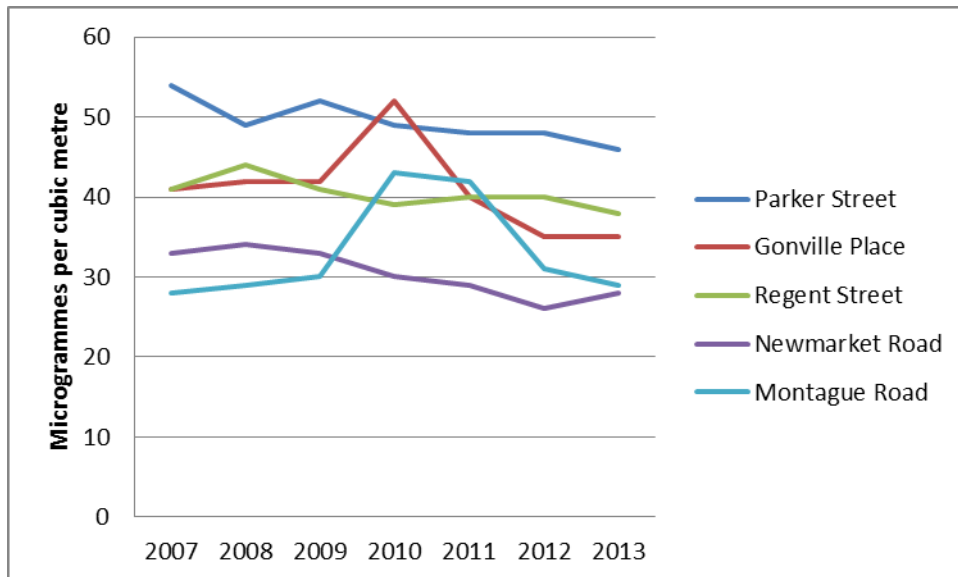
Parker Street continues to show a slight decreasing trend although it continues to remain above the AQ Objective Level of 40µg/m<sup>3</sup>. This decreasing trend is further supported at Regent Street where levels have remained constant or shown a slight decrease over the past 5 years; although 2013 is the first year where levels have fallen below the AQ Objective level.

Gonville Place and Montague Road have maintained the reduced levels below the AQ Objective as seen in 2012 following exceedences of this level in 2010 and 2011.

Newmarket Road is the only Automatic Monitoring Site in Cambridge to show an increase in levels as compared with 2012. This marks the end to the downward trend seen over the past 5 years. However the annualised data for both 2012 and

2013 may not be representative of the site as this increases a greater potential error for the data.

**Figure 2.3 Trends in Annual Mean NO<sub>2</sub> Concentrations Measured at Automatic Monitoring Sites**



Only one hourly exceedence was reported in 2013 at Newmarket Road as seen in Table 2.4. As this data set was below 90% data capture the 99.8<sup>th</sup> Percentile has been calculated. This falls well below 200µg/m<sup>3</sup> at 97µg/m<sup>3</sup>.

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

Traffic count data supplied by the County Council (Traffic Monitoring Report 2013) shows that the total number of motor vehicles recorded on the Cambridge Radial Cordon has remained fairly constant in 2013 compared with 2012 (1% increase); with a 5% increase in vehicles crossing the river Cam Screenline into the central area compared with 2012. In both cases this increase in vehicle numbers is due to increased numbers of cars, whilst all other types of motor vehicles have seen a decrease. Despite increased vehicle numbers the continued trend reducing NO<sub>2</sub> levels may be explained by the fall in larger, typically more polluting vehicles or the poor weather conditions on the day of the count.



**Table 2.3 Results of Automatic Monitoring for NO<sub>2</sub>: Comparison with Annual Mean Objective**

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period %	Valid Data Capture 2013 %	Annual Mean Concentration (µg/m <sup>3</sup> )				
					2009	2010	2011	2012	2013
Gonville Place	Roadside	Y	98.9	98.9	42	52	40	35	35
Montague Road/Elizabeth Way	Roadside	Y	98.9	98.9	30	43	42	31	29
Newmarket Road	Roadside	Y	96.5	62.3	33	30	29	26*	28*
Parker Street	Roadside	Y	98.8	98.9	52	49	48	48	46
Regent Street	Roadside	Y	99.2	99.2	41	40	40	40	38

\*Figures annualised

**Table 2.4 Results of Automatic Monitoring for NO<sub>2</sub>: Comparison with 1-hour Mean Objective**

Site ID	Site Type	Within AQMA ?	Valid Data Capture for Monitoring Period %	Valid Data Capture 2013 %	Number of Hourly Means > 200µg/m <sup>3</sup>				
					2009	2010	2011	2012	2013
Gonville Place	Roadside	Y	98.9	98.9	0	9	0	1	0
Montague Road/Elizabeth Way	Roadside	Y	98.9	98.9	1	2	0	0	0
Newmarket Road	Roadside	Y	96.5	62.3	0	0	0	0 (82)*	1 (97)*
Parker Street	Roadside	Y	98.8	98.8	0	0	0	0	0
Regent Street	Roadside	Y	99.2	99.2	0	0	0	0 (98)*	0

\*Less than 90% annual data capture therefore figures in bracket show 99.8<sup>th</sup> percentile

## b. Diffusion Tube Monitoring Data

The data from 3 tubes was below the target for data capture of 75%. Two of these tubes relate to Histon Road 1 and the relocation of the tube as outlined in section 2.1.2. The third tube is Victoria Road. Data from these two sites has been annualised; calculations for this are in Appendix 2.

The diffusion tube data in 2013 continues to show a typically downward trend since the peak in 2010. This trend is apparent both within and outside the AQMA although there are some exceptions to this trend. Both the Background site (Latham Road) and two Urban Background Sites (Oaktree Avenue and Cockburn Street) show a small decrease compared with 2012.

Of the 54 sites only 5 sites have recorded levels at or above the AQ Objective level compared with 12 in 2012; 19 in 2011 and 36 in 2010. All of these sites were above the target level in 2012. Four are located within the AQMA. St Andrews Street shows a small increase, Newnham Road and Victoria Avenue have remained level and Emmanuel Road has shown a reduction.

One site is located outside the AQMA. Long Road has had elevated levels in previous years. The level of nitrogen dioxide in 2013 shows a marked decrease as compared with 2012 although it remains above the target level at  $41\mu\text{g}/\text{m}^3$ . Long Road has no relevant receptors with the tube located here purely to monitor traffic.

Predicted annual mean concentrations for nitrogen dioxide at the closest receptor have been calculated for Long Road using local data from both background and urban background sites. The results are summarised in Table 2.5.

**Table 2.5 Predicted Annual Mean NO<sub>2</sub> Concentration at closest Receptor**

	Annual Mean Concentration $\mu\text{g}/\text{m}^3$ using 'background' data	Annual Mean Concentration $\mu\text{g}/\text{m}^3$ using 'Urban Background' data
<b>Long Road</b>	22	26

At the closest receptor the predicted mean annual concentrations are well below national objectives.

Of the 54 sites across Cambridge, readings for 44 have decreased, 7 have remained the same and 3 show a slight increase. Of the increases one is within the AQMA (St Andrews St) and 2 are outside (Shelford Road and Hills Road 3). Of these increases 2 are well below the AQ Objective Level. Only the small increase seen at St Andrews Street is above the AQ Objective Level. In all cases these differences are very small.

Table 2.6 summarises the annual data for 2013, with Table 2.7 showing the trend in levels over the past five years.

**Table 2.6 Results of NO<sub>2</sub> Diffusion Tubes 2013**

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2013 (Number of Months or %) <sup>a</sup>	2013 Annual Mean Concentration (µg/m <sup>3</sup> ) - Bias Adjustment factor = 0.74 <sup>b</sup>
S1	Emmanuel Street	Roadside	Y	N	12	38
S2	Histon Road 2	Roadside	N	N	12	28
S3	Magdalene Street	Roadside	Y	N	12	29
S4	Northampton Street	Roadside	Y	N	12	38
S5	Silver Street	Roadside	Y	N	12	32
S6	Long Road	Kerbside	N	N	12	<b>41</b>
S7	Newmarket Road 1	Roadside	Y	N	12	35
S8	Milton Road	Roadside	N	N	11	23
S9	Drummer Street	Roadside	Y	N	11	33
S10	Gilbert Road	Kerbside	N	N	12	22
S11	Latham Road	Background	N	N	12	12
S12	Newmarket Road 2	Roadside	N	N	12	28
S13	East Road	Roadside	Y	N	12	29
S14	Mill Road	Roadside	Y	N	10	27
S15	Hills Road	Roadside	Y	N	11	34

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S16	Regent Street	Roadside	Y	N	12	32
S17	Coldhams Lane	Roadside	N	N	12	27
S18	Pembroke Street	Roadside	Y	N	9	39
S19	Huntingdon Road 2	Roadside	N	N	12	27
S20	Elizabeth Way	Roadside	Y	N	12	32
S21	Victoria Road	Roadside	Y	N	8	33 (annualised)
S22	Madingley Road	Kerbside	N	N	12	36
S23	Huntingdon Road 1	Roadside	N	N	12	25
S24	Histon Road 1	Kerbside	N	N	7	29 (annualised)
<b>S24</b>	<b>Histon Road - NEW</b>	Kerbside	N	N	4	30 (annualised)
S25	Barton Road	Roadside	N	N	11	21
S26	Fen Causeway	Roadside	Y	N	12	25
S27	Trumpington High St	Roadside	N	N	10	27
S28	Babraham Road	Roadside	N	N	11	21
S29	Cherry Hinton Road	Roadside	N	N	12	23
S30	Arbury Road	Roadside	N	N	12	20
S31	Newnham Road	Roadside	Y	N	12	<b>42</b>
S32	Hills Road 2	Roadside	N	N	11	28
S33	Victoria Avenue	Roadside	Y	N	12	<b>41</b>
S34	Parker Street	Roadside	Y	N	12	39
S35	Abbey Road	Roadside	Y	N	12	24
S36	Cockburn Street	Urban	Y	N	12	18

		Background				
S37	Oaktree Avenue	Urban Background	Y	N	12	18
S38	Chesterton Road	Roadside	Y	N	9	25
S39	Maids Causeway	Kerbside	Y	N	9	34
S40	Emmanuel Road	Roadside	Y	N	12	<b>40</b>
S41	Downing Street	Roadside	Y	N	11	36
S42	Trumpington Street	Roadside	Y	N	9	26
S43	Lensfield Road	Roadside	Y	N	12	38
S44	Park Terrace	Roadside	Y	N	12	29
S45	St Andrew's St	Urban Centre	Y	N	10	<b>43</b>
S46	Parkside	Roadside	Y	N	11	25
S47-S49	Gonville Place (triplicate)	Roadside	Y	<b>Y</b>	11	35
S50	Hills Road 3	Roadside	N	N	11	33
S51	Shelford Road	Roadside	N	N	12	26
S52	Station Road 2 east	Kerbside	Y	N	12	30
S53	Station Road 1 West	Kerbside	Y	N	11	32
S54	Tenison Road	Roadside	Y	N	12	25
S55	Tenison Road 2	Roadside	Y	N	11	24
S56	Coldhams Lane 2	Roadside		N	11	28

**Table 2.7 Results of NO<sub>2</sub> Diffusion Tubes (2009 to 2013)**

Site ID		Site Type	Within AQMA?	Annual Mean Concentration (µg/m <sup>3</sup> ) - Adjusted for Bias				
				2009 (Bias Adjustment Factor = 0.83)	2010 (Bias Adjustment Factor = 1.00)	2011 (Bias Adjustment Factor = 0.85)	2012 (Bias Adjustment Factor = 0.76)	2013 (Bias Adjustment Factor = 0.74)
S1	Emmanuel Street	Roadside	Y	<b>52</b>	<b>56</b>	<b>46</b>	<b>42</b>	38
S2	Histon Road 2	Roadside	N	33	<b>40</b>	31	28	28
S3	Magdalene Street	Roadside	Y	35	<b>48</b>	35	31	29
S4	Northampton Street	Roadside	Y	<b>50</b>	<b>54</b>	<b>45</b>	<b>41</b>	38
S5	Silver Street	Roadside	Y	<b>44</b>	<b>53</b>	<b>43</b>	35	32
S6	Long Road	Kerbside	N	<b>52</b>	<b>61</b>	<b>44</b>	<b>45</b>	<b>41</b>
S7	Newmarket Road 1	Roadside	Y	<b>49</b>	<b>52</b>	<b>44</b>	<b>41</b>	35
S8	Milton Road	Roadside	N	27	33	28	25	23
S9	Drummer Street	Roadside	Y	<b>40</b>	<b>46</b>	36	35	33
S10	Gilbert Road	Kerbside	N	28	32	25	23	22
S11	Latham Road	Background	N	15	21	15	13	12
S12	Newmarket Road 2	Roadside	N	34	<b>40</b>	33	30	28

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S13	East Road	Roadside	Y	36	<b>46</b>	36	34	29
S14	Mill Road	Roadside	Y	37	<b>40</b>	29	29	27
S15	Hills Road	Roadside	Y	37	<b>49</b>	34	34	34
S16	Regent Street	Roadside	Y	<b>42</b>	<b>45</b>	37	34	32
S17	Coldhams Lane	Roadside	N	34	<b>41</b>	30	28	27
S18	Pembroke Street	Roadside	Y	<b>49</b>	<b>59</b>	<b>45</b>	<b>40</b>	39
S19	Huntingdon Road 2	Roadside	N	29	38	29	30	27
S20	Elizabeth Way	Roadside	Y	39	<b>50</b>	34	34	32
S21	Victoria Road	Roadside	Y	<b>43</b>	<b>49</b>	37	34	33
S22	Madingley Road	Kerbside	N	<b>41</b>	<b>53</b>	<b>43</b>	<b>41</b>	36
S23	Huntingdon Road 1	Roadside	N	31	36	29	25	25
S24	Histon Road 1	Kerbside	N	37	<b>43</b>	35	35	29
S24	Histon Road 1 - NEW	Kerbside	N	-	-	-	-	30
S25	Barton Road	Roadside	N	27	32	25	23	21
S26	Fen Causeway	Roadside	Y	31	39	29	27	25
S27	Trumpington High St	Roadside	N	32	<b>42</b>	34	28	27
S28	Babraham Road	Roadside	N	28	30	25	23	21



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S29	Cherry Hinton Road	Roadside	N	34	37	28	34	23
S30	Arbury Road	Roadside	N	26	29	24	25	20
S31	Newnham Road	Roadside	Y	<b>47</b>	<b>58</b>	<b>46</b>	<b>42</b>	<b>42</b>
S32	Hills Road 2	Roadside	N	35	<b>45</b>	32	32	28
S33	Victoria Avenue	Roadside	Y	<b>47</b>	<b>55</b>	<b>44</b>	<b>41</b>	<b>41</b>
S34	Parker Street	Roadside	Y	<b>48</b>	<b>57</b>	<b>47</b>	<b>41</b>	39
S35	Abbey Road	Roadside	Y	34	35	31	24	24
S36	Cockburn Street	Urban Background	Y	24	29	22	21	18
S37	Oaktree Avenue	Urban Background	Y	25	29	23	20	18
S38	Chesterton Road	Roadside	Y	32	<b>42</b>	28	28	25
S39	Maids Causeway	Kerbside	Y	<b>43</b>	<b>55</b>	<b>43</b>	39	34
S40	Emmanual Road	Roadside	Y	<b>53</b>	<u><b>60</b></u>	<b>48</b>	<b>46</b>	<b>40</b>
S41	Downing Street	Roadside	Y	<b>46</b>	<b>53</b>	<b>41</b>	37	36
S42	Trumpington Street	Roadside	Y	35	<b>42</b>	32	27	26
S43	Lensfield Road	Roadside	Y	<b>47</b>	<b>56</b>	<b>40</b>	<b>40</b>	38
S44	Park Terrace	Roadside	Y	37	<b>46</b>	34	32	29

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S45	St Andrew's St	Roadside	Y	<b>48</b>	<b><u>62</u></b>	<b>54</b>	<b>42</b>	<b>43</b>
S46	Parkside	Roadside	Y	34	38	31	26	25
S47- S49	Gonville Place (triplicate)	Roadside	Y	<b>41</b>	<b>52</b>	<b>40</b>	35	35
S50	Hills Road 3	Roadside	N	-	<b>53</b>	<b>54</b>	32	33
S51	Shelford Road	Roadside	N	-	-	-	25	26
S52	Station Road 2 east	Kerbside/Roadside	Y	-	<b>52</b>	<b>43</b>	37	30
S53	Station Road 1 West	Kerbside/Roadside	Y	-	<b>46</b>	39	36	32
S54	Tenison Road	Roadside	Y	-	36	30	29	25
S55	Tenison Road 2	Roadside	Y	-	38	30	29	24
S56	Coldhams Lane 2	Roadside or urban background	Y	-	39	33	30	28

**c. Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Monitoring Sites**

Diffusion tube data (bias-adjusted) from 2004 to 2013 inclusive has been plotted to show trends in nitrogen dioxide levels at different types of location in the City – Background, Urban Background, Radials, Inner Ring Road, Inner City Streets and Bus Station Area. These can be seen in Figure 2.4 a-f.

Figures 2.4 a & b show the background and urban background levels recorded; which sit well below the national objectives. These can then be compared with the average readings for the other types of locations across the city. Despite the unexplained peak in 2010 the readings for the radial, inner ring road and inner city streets (Figures c-e) sit in or around the national objectives and have since shown a small but steady decreasing trend with 2013 being no exception. This is supported by the reduced number of sites above the AQ Objective throughout these areas. No sites within the radial or inner city streets now sit above the objective level. Two sites (Newnham Road and Victoria Avenue) within the inner city area are still above the target level with both staying constant compared with 2012.

The number of motor vehicles crossing the Cambridge Radial Cordon remained fairly constant in 2013 as compared with 2012 (increase of 1%); with the number of motor vehicles crossing the river cam screenline into the centre of the city where the AQMA exists increasing by 5% as compared with 2012. In both cases this increase can be accounted for by an increase in cars; with decreases in the larger more polluting vehicles being seen across the board. Therefore despite a rise in motor vehicles in the city in 2013; reduced emissions may still be seen due to the reducing numbers of the larger more polluting vehicles.

Figure 2.4f shows the Individual plots for each of the diffusion tubes in the Bus Station Area. There is a continued small but downward trend with only two tubes in 2013 sitting above the target level; namely St Andrews Street and Emmanuel Road despite the Parker Street Automatic monitoring Site being above (although only slightly). The adjacent diffusion tube dropped below objective levels for the first time in the past 5 years. The red line, tube 9, is the data from Drummer Street itself (the Bus Station). Although the

downward trend has continued this has been fairly level for the past three years. This is likely to be because no further changes have been made to the layout of the bus station area plus 2012 showed a 6% increase in the number of buses and coaches crossing the Cambridge radial cordon. Further reductions are likely to be down to improved emissions; with a reduction in bus numbers in 2013 further supporting this trend. Only one site above the objective saw an increase (St Andrews Street) and this was very small and is out of sync with the continuing downward trend shown in the bus station area. This cannot easily be accounted for.

**Figure 2.4 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites**

**Figure 2.4a – Background Site (Latham Road)**

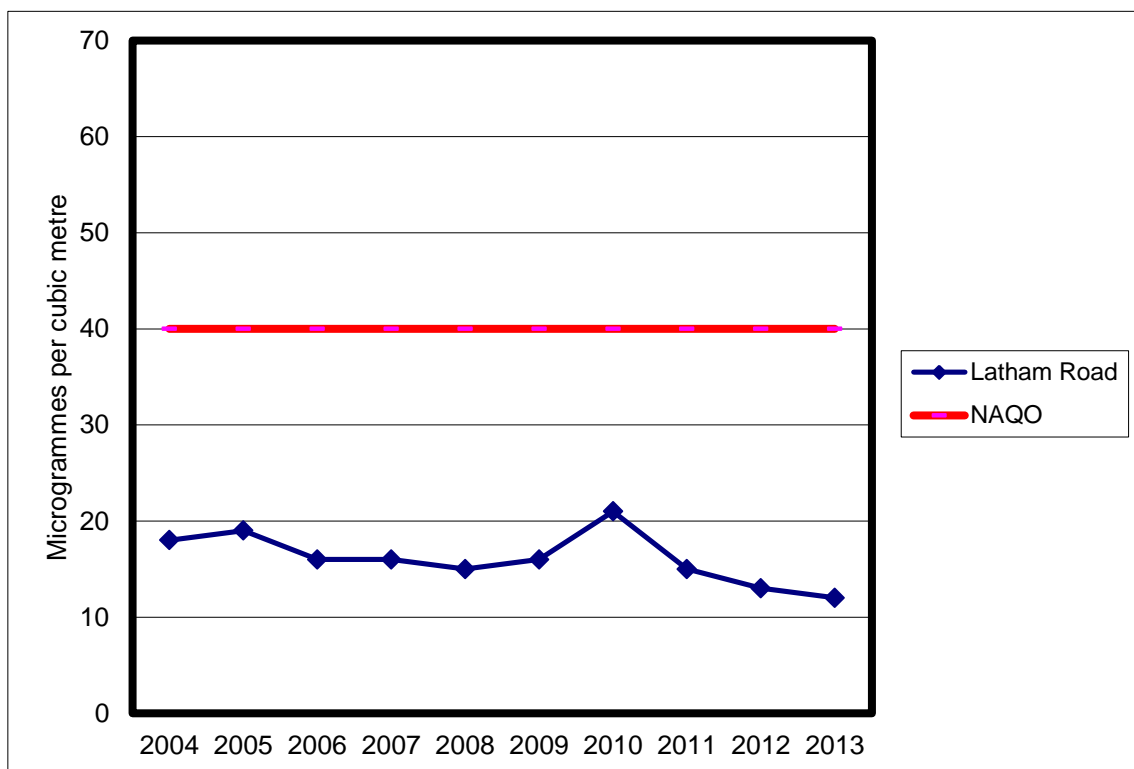


Figure 2.4b - Urban Background (average of data from Oaktree Avenue and Cockburn Street)

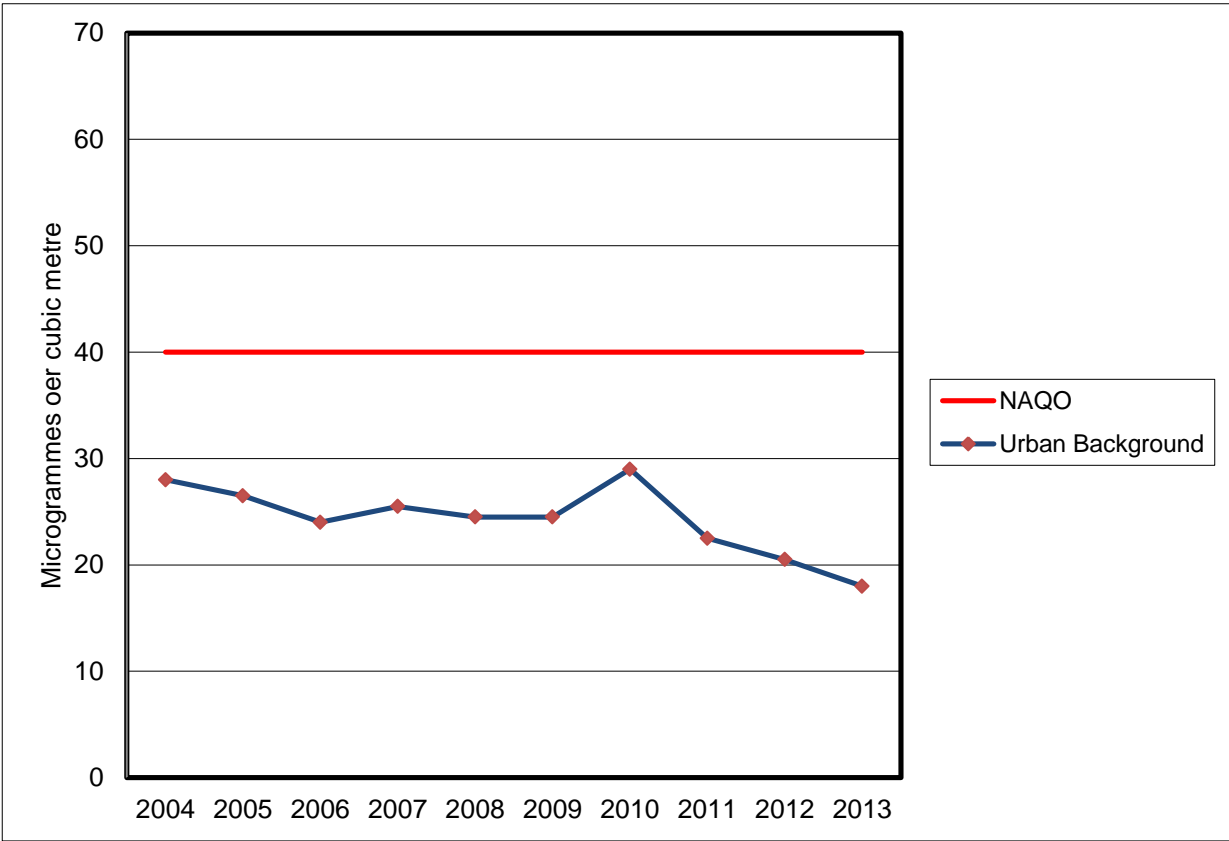


Figure 2.4c - Radials (average of data from Newmarket Road, Histon Road, Madingley Road, Huntingdon Road, Trumpington Road, Cherry Hinton Road)

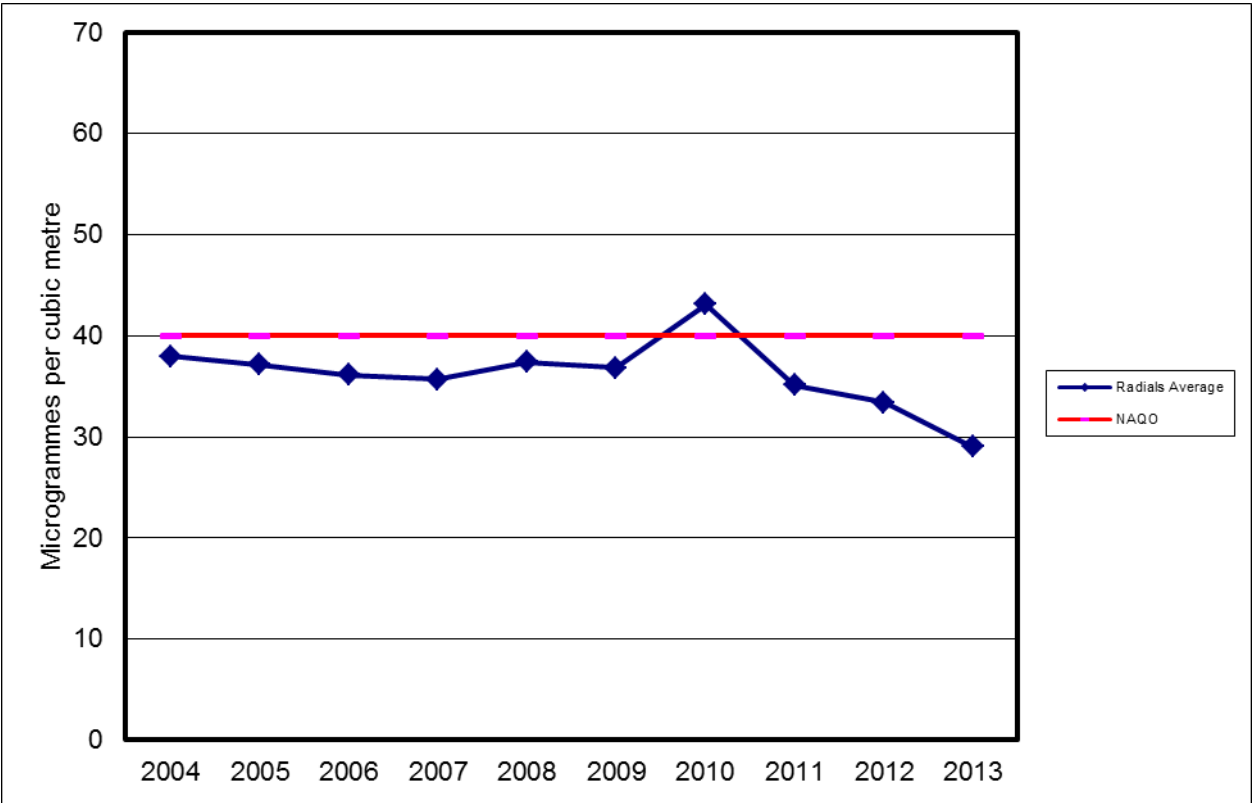
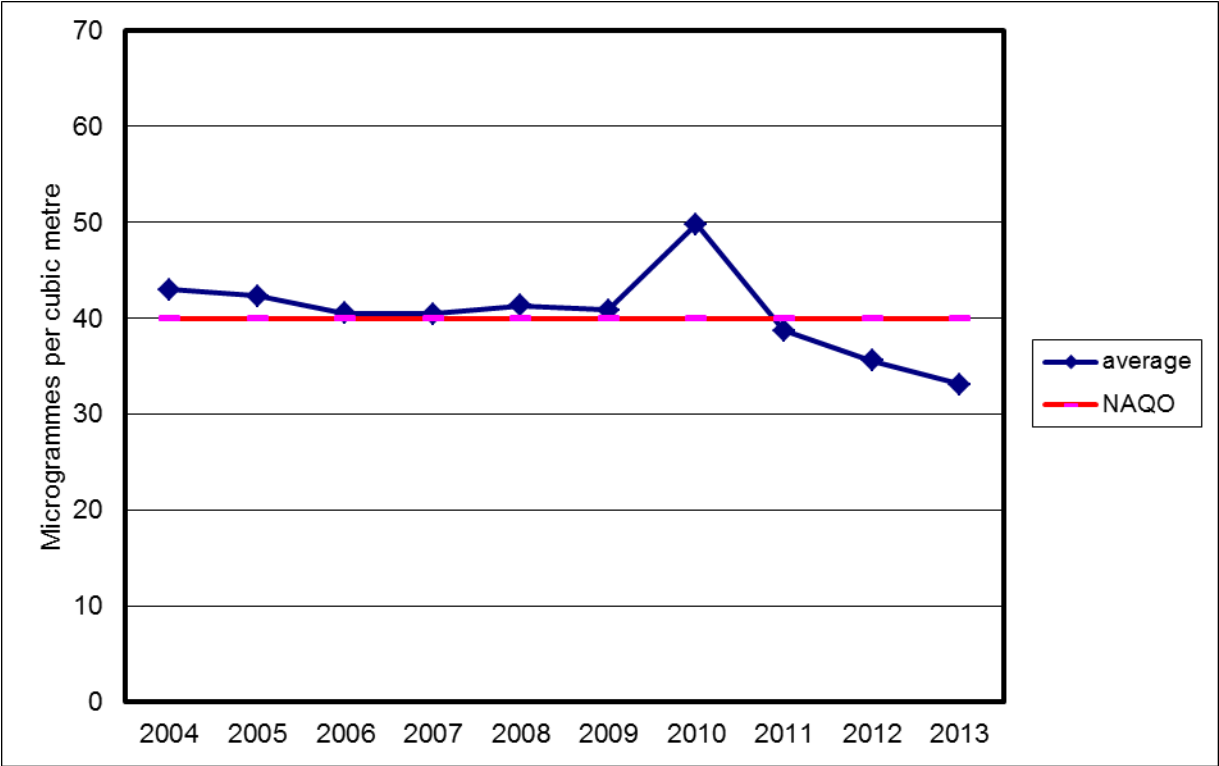
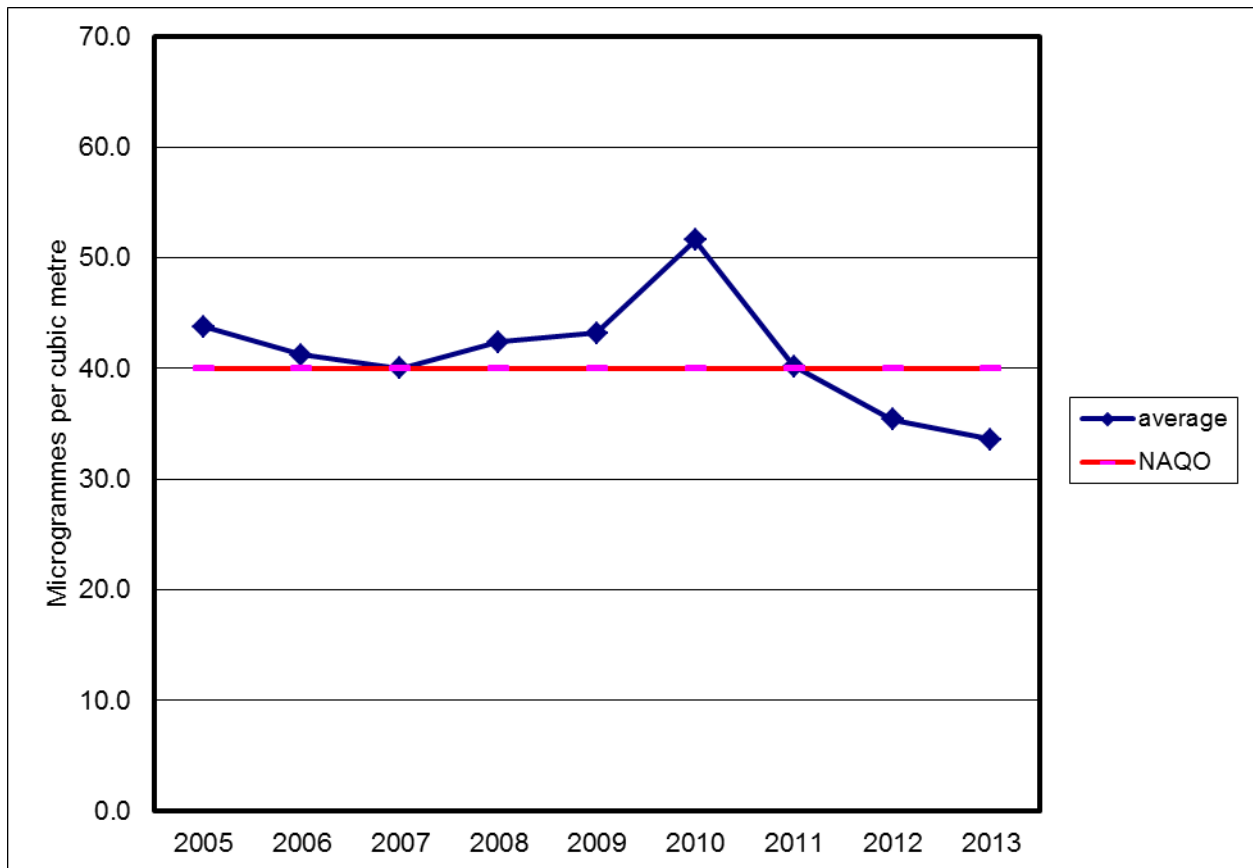


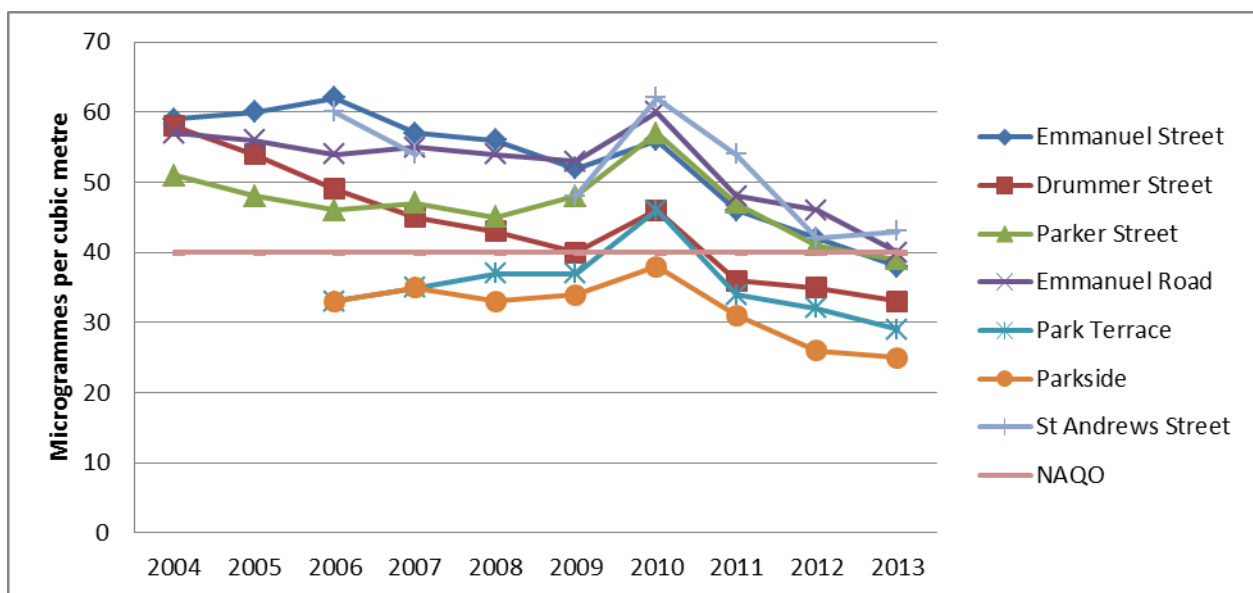
Figure 2.4d - Inner Ring Road (average of data from Northampton Street, East Road, Elizabeth Way, Victoria Road, Fen Causeway, Newnham Road, Victoria Avenue, Chesterton Road, Maids Causeway)



**Figure 2.4e - Inner City Streets (average of data from Magdalene Street, Silver Street, Regent Street, Pembroke Street, Downing Street)**



**Figure 2.4f - Bus Station Area (individual plots for each of Emmanuel Road, Emmanuel Street, Drummer Street and Parker Street, as well as Park Terrace, Parkside and St Andrews Street)**



The complete data set for 2013 can be found in Appendix 3.



### 2.2.2 Particulate Matter (PM<sub>10</sub> - and PM<sub>2.5</sub>)

All three PM<sub>10</sub> monitoring stations (Gonville Place, Montague Road and Parker Street) are measuring concentrations that do not breach the current objectives. Levels of PM<sub>2.5</sub> are measured at Newmarket Road and Gonville Place; these results are included in this section for interest and completeness. Data for Newmarket Road PM<sub>2.5</sub> has been annualised due to data capture for Newmarket Road being below the target of 90%. Calculations for this can be found in Appendix 1.

All sites are representative of relevant public exposure.

2013 showed a small increase for all sites measuring PM<sub>10</sub>. This increase was also seen at Gonville for PM<sub>2.5</sub>. Newmarket Road saw a small decrease; however this data has been annualised and is therefore open to error.

Annual mean concentrations over the past five and seven years for PM<sub>10</sub> (see Table 2.8 and Figure 2.5) have remained fairly constant but with a small increasing trend. This trend can also be seen at Gonville Place for PM<sub>2.5</sub>. Due to the absence of full data capture at Newmarket Road for both 2012 and 2013 the trend at this site continues to be unclear as data capture may not be representative. Annualisation was done using a site outside the Cambridge City Council area as PM<sub>2.5</sub> is only recorded at two sites within the Cambridge City Council Area.

2013 has been another year of increased exceedences >50µg/ as compared with previous years, although these remain well below the current objectives. This information is summarised in Figure 2.6 and Table 2.9.

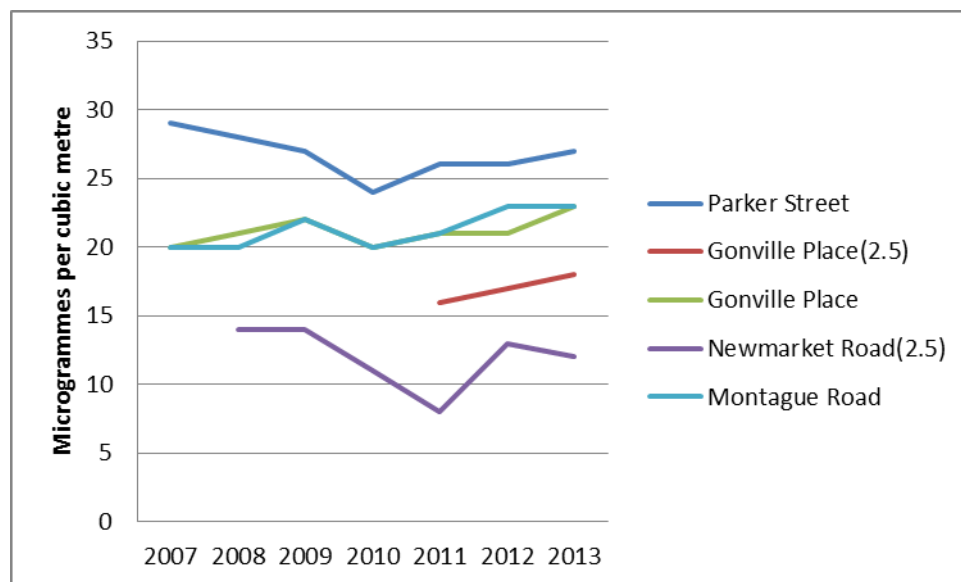
#### PM<sub>2.5</sub>

Public Health England have estimated local mortality burdens associated with particulate air pollution based on the modelled mean PM<sub>2.5</sub> levels in each local authority area. The modelled background PM<sub>2.5</sub> level for Cambridge district is 11.1µg/m<sup>3</sup>. This corresponds to an attributable fraction of deaths from particulate air pollution of 5.8%. The district average is slightly lower than levels measured at Newmarket Road and around 2/3 of the levels measured at Gonville Place.

**Table 2.8 Results of Automatic Monitoring for PM<sub>10</sub> & PM<sub>2.5</sub> : Comparison with Annual Mean Objective**

Site ID	Site Type	Within AQMA ?	Valid Data Capture for monitoring Period % <sup>a</sup>	Valid Data Capture 2013 % <sup>b</sup>	Gravimetric Equivalent (Y or N/A)	Annual Mean Concentration µg/m <sup>3</sup>				
						2009	2010	2011	2012	2013
PM <sub>10</sub>										
Gonville Place PM <sub>10</sub>	Roadside	Y	98.7	98.7	Y	20.5 (22)	(20)	21	21	23
Montague Road PM <sub>10</sub>	Roadside	Y	99.4	99.4	Y	20.4 (22)	(20)	21	23	23
Parker Street PM <sub>10</sub>	Roadside	Y	95.8	95.8	Y	24.5 (27)	(24)	26	26	27
PM <sub>2.5</sub>										
Gonville Place PM <sub>2.5</sub>	Roadside	Y	99.7	99.7	Y	-	-	16	17	18
Newmarket Rd PM <sub>2.5</sub>	Roadside	Y	91.9	59.8	Y	14	11	8	13	12 <sup>1</sup>

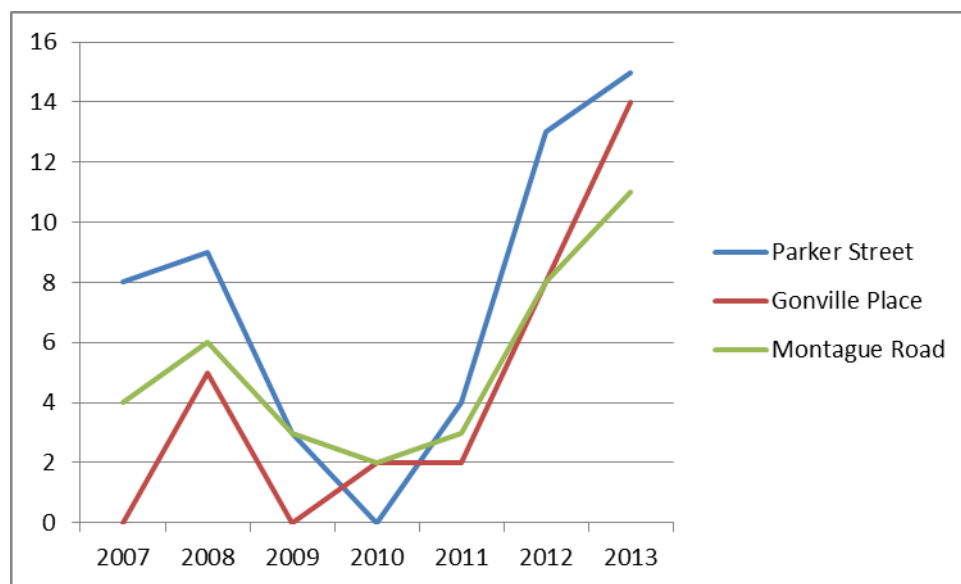
<sup>1</sup> Data has been annualised using Gonville Place and South Cambs District Council Girton Rd PM2.5 data

**Figure 2.5 Trends in Annual Mean PM<sub>10</sub> & PM<sub>2.5</sub> Concentrations**

**Table 2.9 Results of Automatic Monitoring for PM<sub>10</sub> & PM<sub>2.5</sub>: Comparison with 24-hour Mean Objective**

Site ID	Site Type	Within AQMA ?	Valid Data Capture for monitoring Period %	Valid Data Capture 2013 %	Confirm Gravimetric Equivalent (Y or N/A)	Number of Daily Means > 50 µg/m <sup>3</sup>				
						2009	2010	2011	2012	2013
PM <sub>10</sub>										
Gonville Place	Roadside	Y	98.7	98.7	Y	0	2	2	8	14
Montague Road	Roadside	Y	99.4	99.4	Y	3	2	3	8	11
Parker Street	Roadside	Y	95.8	95.8	Y	3	0	4	13	15
PM <sub>2.5</sub>										
Gonville Place 2.5	Roadside	Y	99.7	99.7	N/A	N/A	N/A	N/A	N/A	N/A
Newmarket Rd 2.5	Roadside	Y	91.9	62.3 <sup>2</sup>	N/A	N/A	N/A	N/A	N/A	N/A

<sup>2</sup> Data cannot be annualised as there is only one other site in Cambridge recording PM<sub>2.5</sub>

**Figure 2.6 Trends in Number of Exceedences of Daily Means for PM<sub>10</sub> Concentrations**

### **2.2.3 Sulphur Dioxide (SO<sub>2</sub>)**

Cambridge City Council does not measure sulphur dioxide at any of its monitoring stations.

### **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 is collected and ratified by the National Physical Laboratory. The annual mean for 2013 is 0.84 ug/m<sup>3</sup> (with some data still to be ratified) and the annual maximum is 1.55 ug/m<sup>3</sup>. The national objective of 5 µg/m<sup>3</sup> is not approached.

### **2.2.5 Other Pollutants Monitored**

No other pollutants are routinely monitored by Cambridge City Council

### **2.2.6 Summary of Compliance with AQS Objectives**

Cambridge City Council has examined the results from monitoring in the district. Concentrations within the AQMA, although beginning to show a downward trend, still exceed or are around the national objective for Nitrogen Dioxide of 40ug/m<sup>3</sup>. The AQMA should therefore remain.

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**

### **3.1 Road Traffic Sources**

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

Cambridge City Council confirms that all the following have been considered:

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

### **3.2 Other Transport Sources**

Cambridge City Council confirms that there are no new or newly identified local developments that may have an impact on air quality within the Local Authority area.

Cambridge City Council confirms that all the following have been considered:

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

### 3.3 Industrial Sources

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

Planning permission has been granted by Cambridgeshire County Council for the new 'Addenbrookes Energy Innovation Centre' (EIC), as a waste management facility. This will include:

- Clinical Waste Incineration (processing 350kg/hr clinical waste and generating an estimated 1.6MW<sub>th</sub>)
- Gas Fired CHP generating an estimated 6.5Mw<sub>e</sub>
- Two Biomass boilers – two 3MW<sub>th</sub> boilers
- Three dual fuel (oil and gas) conventional steam boilers – one 4MW<sub>th</sub> and two 10MW<sub>th</sub>

The EIC will upgrade the existing energy infrastructure already at the site.

Construction was planned for 2013 but has been delayed. Construction is planned to begin soon. The Environment Agency will be responsible for this Permitted Activity.

This will be taken into consideration in the next Updating and Screening Assessment.

Although not formally submitted Cambridge City Council are aware of further proposed applications for Energy Centres to supply new further buildings on the Addenbrookes site. These will be considered on a case by case basis although there are plans to carry out dispersion modelling to investigate the cumulative impact that multiple biomass and/or CHP systems may have on air quality in the area of and around Addenbrookes, which has many sensitive receptors (hospitals, schools, residential areas).



### 3.4 Commercial and Domestic Sources

Cambridge City 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.

Cambridge City council confirms that all the following have been considered:

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

### 3.5 New Developments with Fugitive or Uncontrolled Sources

Cambridge City 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.

Cambridge City council confirms that all the following have been considered:

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

## 4 Planning Applications

Official government targets expect Cambridge to grow by at least 19,000 new homes by 2021 representing an increase of more than 40% compared with housing numbers in 2001. This presents 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). These 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 likely to have an impact on air quality.

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.

<b><u>Name</u></b>	<b><u>Location</u></b>	<b><u>Type</u></b>	<b><u>Status</u></b>
<b>Applications approved</b>			
CB1	Station Area	331 residential units, 1,250 student units, public square, transport interchange, offices	Permission granted and S106 agreed March 2010. Construction underway. Development is being phased.
Glebe Farm	Southern Fringe	Up to 300 dwellings	Outline Planning permission granted 2008, construction has started.
Clay Farm	Southern Fringe	Up to 2,300 dwellings	Outline Planning permission granted 2008. Construction has started.
Bell School	Southern Fringe	347 dwellings and 100 student rooms	Outline Planning permission granted 2006. Building is due shortly.
Trumpington Meadows	Southern Fringe	Approx 1,200 dwellings	Outline planning permission granted 2008, S106 agreed 2009, RM approved in 2009. Construction has started.
CUP site - now Kaleidoscope	Clarendon Road - northern end of Hills Road	408 residential units	Planning permission granted, construction commenced 2008, nearing completion.
Milton Road Junior School - now Manor Care Home	Milton Road	Phase 1 - Care Home and sheltered accommodation.	Phase 1 Completed and occupied 2009. New application for Phase 2 (aparthotel) submitted but refused.
Trilatera	Cherry Hinton Road/Hills Road junction	133 residential units	Planning permission granted, construction nearly completed

## Cambridge City Council

British Telecom	Cromwell Road	140 residential units	Outline planning permission granted, construction nearly completed
NW Cambridge	University Land	Mixed-use including research, commercial and residential (90+ Ha),	Outline planning permission submitted August 2012. Reserve Matters Applications coming through.
9-15 Harvest Way, now housing, Newmarket Road	Newmarket Road	75 residential units plus office space	Planning permission granted Feb 2011
Texaco Garage	Huntingdon/Histon Road	98 student units and retail on ground floor	Approved on appeal March 2012. Demolition underway 2014.
Travis Perkins	Devonshire Road	43 residential units	Application submitted Oct 2011. Approved and construction has started.
Addenbrookes Energy Innovation Centre	Addenbrookes Hospital	Integrated system incorporating incinerator, CHP and biomass	Planning application submitted in Nov 2012 to the County Council; City Council is a consultee only.
Red House - now O'Callaghans Hotel	Station Road	Hotel	Planning permission granted but building work yet to commence
<b>Applications pending</b>			
Cambridge City FC	Milton Road	188 residential units	Submitted September 2012. Decision pending
<b>Applications at pre-App/discussion stage</b>			
Cambridge East	Marshalls Airport	Mixed use including up to 12,000 homes	Marshalls have not found a new site.
Wing	Marchalls Airport	Mixed Development	Pre Application discussion
Northern Fringe East	Sewage Works and Chesterton Sidings	Mixed use including up to 2,300 homes and new railway station	Planning Application expected imminently
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
NIAB 2	Huntingdon Rd (but inside S. Cambs boundary)	Residential	Further site investigations required. Outline planning permission expected soon.

## 5 Air Quality Planning Policies

The Cambridge Local Plan is undergoing a review. The new Local Plan will set out the planning framework to guide the future development of Cambridge. It will be one of the development plan documents, which comprise the City Council's Local Development Framework. The Cambridge Local Plan will contain a core strategy and development control policies. It will be adopted in the winter of 2014, so more details will be provided in the USA 2015.

Meanwhile, the current Policy 4/14 remains in place.

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. The updated Developers Guide will be prepared during 2013/4 and published following adoption of the new Local Plan.

## 6 Local Transport Plans and Strategies

Cambridgeshire's Third Local Transport Plan (LTP3) sets out Cambridgeshire's existing and future transport issues and how these will be addressed. It was developed following consultation with the public and stakeholders in Spring 2010 and was adopted at a meeting of the full Cambridgeshire County Council on March 29th 2011. It covers the period between 2011 and 2026.

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<sub>x</sub> and PM<sub>10</sub> 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.

More information on this will be included as and when it becomes available; however Indicators LTP 12 and LTP 13 are reported on in Chapter 8 'Implementation of Action Plan'.

### **The Transport Strategy for Cambridge City and South Cambridgeshire (TSCSC)**

The Transport Strategy for Cambridge City and South Cambridgeshire (TSCSC) has been developed alongside the Local Plans for the districts and forms part of LTP3. The strategy will detail the transport infrastructure and services necessary to deliver committed and predicted levels of growth. The backbone of the strategy will be a high quality passenger transport network of bus, guided bus and rail services, fed

and complemented by comprehensive pedestrian and cycle networks. Highway capacity and modal shift are key elements of the strategy.

### **City Deal**

City Deal funding will be awarded to Greater Cambridge (the City, South Cambridgeshire and the County Council) - up to £500m to invest in infrastructure to support economic growth - £100m between 2015-2020 and a further £400m after this if agreed economic growth targets are achieved.

## 7 Climate Change Strategies

Cambridge City Council adopted a revised Climate Change Strategy and Action Plan for 2012–2016 following a public consultation in October 2012. This updates the strategy adopted in September 2008. This revised strategy sets out the framework for action by the City Council to tackle the causes and consequences of climate change. This revised strategy puts more emphasis on the responsibility of the Council to improve its corporate activity and sets a number of key actions and targets; the first and key one of which is the development and implementation of a Carbon Management Plan.

The Carbon Management Plan sets out how the Council will reduce carbon emissions from its estate and operations. The plan identifies a programme of 63 projects and focuses on the areas of activity that contribute most to carbon emissions, including swimming pools, car parks, vehicles, offices and sheltered and temporary housing. It sets a working target to reduce the Council's carbon emissions by 20% between 2010/11 and 2015/16. However, this will be reviewed in 2014 following the provision of more detailed and accurate energy usage data.

The Local Plan drives many of the aims and objectives within this strategy relating to carbon reductions across the wider city. The Council is in the process of reviewing and updating the Local Plan. This will take a more detailed and holistic approach to tackling climate change and the sustainable management of resources with a range of policies relating to:

- Sustainable conservation
- Renewable Energy
- Carbon Reduction
- Biomass (and how this relates to Air Quality)
- District heating within the city
- Sustainable transport.

The draft Local Plan for Cambridge was submitted to the national Planning Inspectorate in March 2014. The formal 'Examination in Public' will follow.

## 8 Implementation of Action Plans

This is the fifth 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 any planning applications and the Real Emissions Project.

The first phase of the work for the £60,000 Air Quality Grant awarded by Defra for the Cambridge Real Emissions Project, collected real-time tail-pipe emissions from vehicles measured in the Air Quality Management Area. The first phase was reported to Defra in November 2013; the second phase (modelling of policy options) is about to commence.

This Progress Report 2014 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. The Hierarchy of Indicators for 2013 are summarised in results Table 8.1 with more detailed reference to some indicators in sections 8.1-8.3. Table 8.4 gives an update on progress made during 2013 towards Action Plan targets.

The Air Quality Action plan will be fully reviewed in 2014/2015. At this time all current indicators will be revisited to ensure the document remains useful and efficient in driving change.

### 8.1 Hierarchy of Indicators: 1 Air Pollutant concentrations

Table 8.2 shows the 5 year rolling means for nitrogen dioxide levels at the continuous monitor sites. Levels have continued to fall slowly with levels around the national objective beginning to look achievable. Table 8.3 shows that 5 year rolling means are falling around the bus station on the radial roads and inner city roads, further supporting this downward trend.

### 8.2 Hierarchy of Indicators: 2 Direct Effect Indicators

#### 8.2.1 Own Estate

The data for the reduction in NO<sub>x</sub> and primary PM<sub>10</sub> emissions through the local authorities' estates is no longer collected (NI194). However, a decrease was reported from 2008/9 to 2009/10.

#### 8.2.2 Buses

The calculated reduction in emissions of NO<sub>x</sub> and PM<sub>10</sub> from buses in the Cambridge Central Area, based on bus information provided to the City Council was 43% and 65% respectively in 2013 compared with 2008.

The target for number of journey kilometres in the AQMA made by different Euro standard public service vehicles was not agreed, so the latest calculated 'kilometres



in the core area' is reported. 2013 saw a large drop in the use of Euro 2 PSV in the Cambridge core area. These EURO 2 PSV will have been replaced with either EURO 3 or EURO 4 PSV; accounting for the marked increase in EURO 3 PSV between 2012 and 2013.

The Cambridge Real Emissions Project first report showed that around 80% of NO<sub>x</sub> emissions and 65% of PM emissions in the city centre are from buses. Cambridge City Council will revisit the Quality Bus Partnership (with the County Council) and look for opportunities to make further and effective improvements to the bus fleet.

### **8.2.3 Taxis**

The reduction in emissions of NO<sub>x</sub> and PM<sub>10</sub> from taxis in the Cambridge Central Area has not 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. This situation has improved since the County Council installed a feeder rank for the taxis in late 2013.

The Cambridge Real Emissions Project initial report showed that the petrol-hybrid taxis in the fleet have significantly lower emissions than diesel taxis and recommended that Cambridge City Council encourage further uptake. We are looking at these suggestions and will report in the next round of R&A (2015).

### **8.2.4 Modal Shift**

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

### **8.2.5 Traffic levels**

Traffic levels have remained fairly constant as in previous years although there has been a small increase in vehicles crossing both the Cambridge Radial Cordon (1%) and River Cam Screenline (5%). In both cases this is accounted for by increases in cars as opposed to other vehicles. In both cases all other vehicles decrease. This in fact can be explained by the cold weather that occurred during the survey period as weather can influence cycle, car and pedestrian numbers.

## **8.3 Hierarchy of Indicators: 3 Indirect Effect Indicators**

### **8.3.1 Congestion**

The morning journey time although fallen slightly in 2012/13 remains close to 4 minutes per mile and has failed to meet the 2010/11 target.

### **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 condition of the surface footways is improving slowly, but the 2010/11 target has not yet been met. A new national footway indicator is currently being developed called the Footway Network Survey (FNS).

The number of hits on WalkIt increased in 2013 compared with 2012 from approximately 25,000 to 29,500 has decreased in 2012 compared with previous years at around 25,000.

Table 8.1: Air Quality Action Plan – Hierarchy of Indicators

HIERARCHY OF INDICATORS		
1 Air pollutant concentrations (District Councils to measure)		
INDICATOR	TARGET	PROGRESS
Annual average concentrations of NO <sub>2</sub> in 2015 at monitoring sites in Cambridge	<40 µg/m <sup>3</sup>	<u>2013</u>
· Parker		46
· Gonville		35
· Regent		38
2a Direct effect indicators (District Councils to measure)		
INDICATOR	TARGET	PROGRESS
Reduction in NO <sub>x</sub> and primary PM <sub>10</sub> emissions through local authority's estate and operations (NI 194) - Cambridge	To be confirmed	Data no longer collected
Reduction in emissions of NO <sub>x</sub> from buses in Cambridge Central Area from baseline 2008 – 430,340 grams per week <i>This figure is different from that previously reported because changes to the extent of the Core Area were made in 2010</i>	50% by 2015	2013 - <b>43%</b> 246,483 g/wk
Reduction in emissions of PM <sub>10</sub> from buses in Cambridge Central Area from baseline 2008 – 11,861 grams per week <i>This figure is different from that previously reported because changes to the extent of the Core Area were made in 2010</i>	50% by 2015	2013 – <b>65%</b> 4,072 g/wk
Reduction in emissions of NO <sub>x</sub> from taxis in Cambridge Central Area from Taxis from baseline 2008	50% by 2015	Base line to be calculated
Reduction in emissions of PM <sub>10</sub> 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

## Cambridge City Council

Reduction in NO <sub>x</sub> and primary PM <sub>10</sub> emissions through local authority's estate and operations (NI 194)	To be confirmed	Data no longer collected.
Bus patronage (NI 177)	22.5m boardings minimum 2010/11	22.1m (2009/10) 19.7m (2010/11) 20.0m (2011/12) 19.1m(2012/13)
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) 20.6% (count 2011) 21.24% (count 2012) 25.6% (count 2013)
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 32.8% increase from 2004/5 baseline (2013)
Number of journey kilometres in Cambridge Core Area made by pre-Euro and Euro 1 PSV	NONE	2,254 km (2008); NONE (2011 and 2012, 2013)
Number of journey kilometres in Cambridge Core Area made by Euro 2 PSV	To be confirmed	10,428 km (2008) 3,824 (2012) 1,518 (2013)
Number of journey kilometres in Cambridge Core Area made by Euro 3 PSV	To be confirmed	2,503 km (2008) 1,070 km (2012) 1,932 (2013)

## Cambridge City Council

Number of vehicles crossing the Cambridge Outer Cordon (baseline 184,800, 2004)	No increase	185,820 – 2010 188,750 – 2011 188,380 - 2012 <sup>3</sup> 190,578 - 2013
Number of vehicles crossing the Cam screenline	No increase	61,000 – 2009 59,400 – 2010 60,860 – 2011 58,679 – 2012 60,151 – 2013
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	Data no longer collected
Number of personal travel plans established in Cambridge	No target, report amount	Data no longer collected
How many sites with S106 funding for air quality projects in Cambridge	No target, report number	CB1 Trumpington Meadows

<sup>3</sup> Figures from previous years have been amended in the 2012 report as an historical error was identified.

## Cambridge City Council

Number of cars in car clubs in Cambridge	Year on year increase	6 cars in 5 locations, March 2010 (Streetcar) 15 cars and 1 van in 15 locations, March 2011 (Streetcar) 21 cars and 1 van in 21 locations, March 2012 (Zipcar) 15 cars and 1 van in 16 locations, May 2014 (Zipcar website)
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 – now known as <b>LTP06a</b>	76% by 2010/11	71% (2010) 74% (2011) 74% (2012) 72% (2013)
Bus punctuality (NI 178) - the average excess waiting time for frequent services– now known as <b>LTP06b</b>	53s by 2010/11	59s (2010) 67s (2011) 41s (2012) 65s (2013)

Journey time in the morning peak hour (NI 167) – now known as <b>LTP10</b>	3 min 25 seconds per mile by 2010/11	4 min 8 seconds (2007/8) 4 min 6 seconds (2008/09) 3 min 59 seconds (2009/10) 3.98 minutes (2010/11) 3.84 minutes (2011/12) 3.78 minutes (2012/13)
Condition of surface footway (LTP target) – percentage with notional residual life of less than 0 years by 2010/11	Less than 19.2%	30% (2009/10) 23.7% (2010/11) 2011/12 data not available <sup>4</sup> Defintition tbc (2013)
Number of routes generated on Walk-It	Year on year increase	16,124 (2009) 33,061 (2010) 31,903 (2011) 24,270 (2012) 29,500 (2013)

\*\* Figures from LTP2 Progress Report 2008

<sup>4</sup> Footway condition - A new national footway indicator is currently being developed called the Footway Network Survey (FNS).

**Table 8.2 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	43	42	41		40 µg/m <sup>3</sup>	No
Parker Street	51	54	54	54	54	50	49	49		40 µg/m <sup>3</sup>	No
Regent Street	44	44	43	44	43	42	42	40		40 <sup>5</sup> µg/m <sup>3</sup>	No

**Table 8.3 Progress based on NO<sub>2</sub> 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	53	50	47		40 µg/m <sup>3</sup>	No
Emmanuel Road	58	57	56	55	55	54	52	49		40 µg/m <sup>3</sup>	No
Victoria Avenue	52	50	49	48	49	48	47	46		40 µg/m <sup>3</sup>	No
Victoria Road	45	44	43	43	44	43	41	39		40 µg/m <sup>3</sup>	Yes
Downing Street	47	47	47	47	47	46	45	43		40 µg/m <sup>3</sup>	No
Maids Causeway	46	47	47	47	49	48	46	43		40 µg/m <sup>3</sup>	No

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<sup>5</sup> Actual calculated average is 40.4 µg/m<sup>3</sup>



Table 8.4 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	New Local Plan going to Inspector in 2014	2014 onwards, updated developers' guide to be produced	None	0% increase in emissions	Emissions are not measured but small fall in measured nitrogen dioxide levels and increase in measured PM levels	Emissions are not measured but small fall in measured nitrogen dioxide levels and increase in measured PM levels	Ongoing work to minimise emissions	Must continue to be maintained and enforced, whilst not stifling development
2	Implementation of the Quality Bus Partnership	Reduce emissions in the AQMA by agreement	County		2012-15	50% emissions cut by 2015	10%	QBP 2012-2015 in place	Figures broadly the same as 2012 (see above)	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		Taxi policy changed in 2012 to incorporated Euro standards.	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	Not currently in active planning phase.		None	0% increase in emissions. No targets set for improvement although some anticipated	Some reduction in air pollution around bus station area	Further small drop in measured levels of air pollutants	Core 5 in discussion again as part of TSCSC	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	LTP3 now in place, runs until 2026	Transport Strategy for Cambridge and South Cambridgeshire (Greater Cambridge) TSCSC	% 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 but drop in public transport trips; small increase in crossing outer cordon, steady traffic crossing Cam screenline	LTP3 runs until 2026	LTP3 is the umbrella for long term transport strategies to enable the County to manage increases in demand for transport arising from the Growth Agenda
6	Long term transport strategy	Forward planning to ensure that development is sustainable	County			None	0% increase in emissions arising from growth		BBAF implemented	Ongoing	£1.7m DfT funding for Better Bus Area Fund; £5m Local Sustainable Transport Fund.

## **9 Conclusions and Proposed Actions**

### **9.1 Conclusions from New Monitoring Data**

The monitoring data show that, apart from the blip in 2010, air quality in Cambridge has remained stable or shown a slight improvement. This can be clearly seen on the graphs in Chapter Two. These results are supported by both the automatic monitoring and the diffusion tube results.

Diffusion tube data show one exceedences of the objective outside the Air Quality Management Area at Long Road. Cambridge City Council has not considered proceeding to a detailed assessment for the Long Road as there are no relevant receptors - the tube is kerbside and the properties are set back at some distance from the road.

Levels of PM<sub>10</sub> remain well below national objectives although there is a small increasing trend within the levels recorded across the city and an increase in the number of daily exceedences

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

The only new local development identified in section three for further consideration at the next Updating and Screening Assessment is the proposed Addenbrookes Energy Innovation Centre. Although outside the AQMA the proposed infrastructure if installed will have a negative impact on air quality in the localised area (although levels in this area are below national objectives).

### **9.3 Other Conclusions**

We are currently looking into the cost of adding additional diffusion tubes around the Addenbrookes area where there is significant development either proposed or under construction both in relation to new residential developments but also the new Addenbrookes Energy Centre. Although levels are well below objective levels in this part of the city of the three tubes that saw a small increase in 2013; two are located in this area of the city at Shelford Road and Hills Road 3. Although Council policy

strives to have zero negative impact on air quality in the city it is inevitable that cumulative impacts of development may lead to some worsening of air quality in parts of the city where large scale development is taking place. By increasing monitoring in this area we can monitor any cumulative impacts that development may have in this area.

## **9.4 Proposed Actions**

The 2013 Progress report has not identified the need to proceed to a Detailed Assessment for any pollutant, or implement any changes to the AQMA boundary. Work on the Air Quality Action Plan is progressing with efforts targeted on areas known to improve air quality; in particular the use of buses and taxis in the Cambridge core area. The Cambridge Real Emissions Project will help formulate future targets based on real-time tail pipe emissions from vehicles in the core area. The Air Quality Action Plan will be fully reviewed in 2014/2015 for it to remain effective.

## 10 References

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## Appendices

## Appendix A – Annualised Data - Newmarket Road

## Nitrogen Dioxide

The Newmarket Road Automatic monitoring site was operating during 2013 between 10<sup>th</sup> May and 31<sup>st</sup> December 2013; following the reinstatement of the electricity supply which had been lost in 2012. 5,466 data records were taken of the possible 8,784 equating to an annual data capture of 62.3%. Valid data capture for the monitoring period was 96.5%

	AM	PM	Ratio (am/pm)
Montague Road	29	26	1.115385
Regent Street	38	38	1
Parker Street	46	44	1.045455
Gonville Place	35	35	1
		<b>Average</b>	<b>1.04021</b>

Annual Mean	
Newmarket Road – before	<b>27</b>
Newmarket Road - Annualised	<b>28</b>

Particulate Matter PM<sub>2.5</sub>

The Newmarket Road Automatic monitoring site was operating during 2013 between 10<sup>th</sup> May and 31<sup>st</sup> December 2013; following the reinstatement of the electricity supply which had been lost in 2012. Annual data capture was 59.8%. Valid data capture for the monitoring period was 91.9%.

Only two sites within the Cambridge City Council area currently monitor **PM<sub>2.5</sub>**; Gonville Place and Newmarket Road. In order to annualise the Newmarket Rd **PM<sub>2.5</sub>** data for completeness; data from Gonville Place and Girton Road; in South Cambridge was used.

Site	AM	PM	Ratio (am/pm)
Gonville Place	18	16	1.131456
Girton Rd (SCDC)	14	12	1.169878
		<b>Average</b>	<b>1.151</b>

Annual Mean	
Newmarket Road – before	<b>10</b>
Newmarket Road - Annualised	<b>12</b>

## Appendix B - Annualised Data - Diffusion Tubes

Of the 56 tubes across the Cambridge City Council area; three failed to achieve the target data capture of 75%. Two of these related to the movement of a tube due to the loss of the lamp post (Histon Road 1) and the third was Victoria Road. Data was annualised using diffusion tube data from neighbouring tubes.

### a. Victoria Road

	AM	PM	AM/PM
<b>Gilbert Road</b>	30.1	31.5375	0.954419
<b>Huntingdon Road 1</b>	32.1	35.3875	0.9071
<b>Chesterton Road</b>	34.4	27.5625	1.248073
<b>Histon Road 2 north</b>	37.4	38.1625	0.98002
			1.022403

Annual Mean (before bias adjustment)	
Data Capture – 8 Months	
Newmarket Road – before	<b>44</b>
Newmarket Road - Annualised	<b>45</b>

<b>Victoria Road – bias adjusted</b>	<b>33</b>
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### b. Histon Road 1

Histon Road 1

	AM	PM	AM/PM
<b>Gilbert Road</b>	30.1	27.8	1.082734
<b>Huntingdon Road 1</b>	32.1	32.07143	1.000891
<b>Chesterton Road</b>	34.4	35.37143	
<b>Histon Road 2 north</b>	37.4	36.12857	1.035192
			1.039605

Histon Road 1 - NEW

	AM	PM	AM/PM
<b>Gilbert Road</b>	30.1	32.05	0.939158
<b>Huntingdon Road 1</b>	32.1	37.375	0.858863
<b>Chesterton Road</b>	34.4	15.55	
<b>Histon Road 2 north</b>	37.4	40.025	0.934416
			0.910812

Annual Mean (before bias adjustment)	
Data Capture – 7 Months	
Histon Rd 1 – before	<b>38</b>
Histon Road 1 - Annualised	<b>40</b>

<b>Histon Road 1– bias</b>	<b>29</b>
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<b>adjusted</b>	
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Annual Mean (before bias adjustment)	
Data Capture – 4 Months	
Histon Road – before	<b>45</b>
Histon Road - Annualised	<b>41</b>

<b>Histon Rd 1 NEW – bias adjusted</b>	<b>30</b>
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## Appendix C – Monthly Diffusion Tube Data Set 2013

	January	February	March	April	May	June	July	August	Sept	October	November	December	Annual Mean (microgrammes per cubic metre)	Bias adjusted (0.74)	Data Capture (months)
Emmanuel Street	62.7	61.2	57.5	54.6	42.6	46.3	43	43.3	48.5	48	52.5	55	51.3	38	12
Histon Road 2 north	42.1	43.6	39.1	29.1	31.5	31.2	36.3	35.4	40.2	34.1	50.4	39.2	37.7	28	12
Magdalene Street	47.1	43.7	40.2	29.2	37	38.8	40.2	33.5	42.1	39.7	43.7	30.5	38.8	29	12
Northampton Street	61.6	49.3	47.4	39.2	45.4	42.5	51.8	41.1	51.5	73.2	54	53	50.8	38	12
Silver Street	52.6	51.6	47.2	35.5	28.7	35.4	41.1	38	46.9	46.9	54	47.1	43.8	32	12
Long Road	60.7	63.8	42.1	44	53	47.9	43	50.7	58.4	58.2	81.2	55.7	54.9	41	12
Newmarket Road 1	53.1	55.5	44.4	40.6	47.3	39.1	38.3	41.7	52.7	47.7	58.2	55.3	47.8	35	12
Milton Road* Drummer Street	47.9	36.2	31.9	25.9	23.3	21.7	21.9	22.7		33	39.2	34.2	30.7	23	11
Gilbert Road	60.5	56.6	67.5		37.1	40.8	43.8	33.3	42.4	39.2	28.1	45.9	45.0	33	11
Latham Road	39.3	37.5	31.2	25	22.7	19.7	19.2	20.5	31.6	33.6	42.5	38	30.1	22	12
Newmarket Road 2	22.2	23.8	18	12.8	11.3	9.2	10.1	10.5	16.2	16.5	24.8	20	16.3	12	12
East Road	52.3	46	34.6	26.1	31.8	23.8	24.5	33	45.2	43.5	50.1	41.4	37.7	28	12
Mill Road	51.2	37	35.1	35.1	28.9	34.8	34.8	33.2	32.9	38.4	61.4	46.4	39.1	29	12
Hills Road	45.8	46.3	42.6		31.3	30.7	31.7		41.1	33.2	31.3	34.5	36.9	27	10
Regent Street		56.9	52	38.4	42.6	42.5	44.1	38.9	46.2	43.8	57.1	41.7	45.8	34	11
Coldhams Lane	44.1	51.3	39	33.3	38.8	35.3	36.8	40.8	43	45.6	61.7	47.5	43.1	32	12
Pembroke Street	49.2	49.9	38	29.3	30.5	25.7	23	27.6	36	25.9	60.3	35.2	35.9	27	12
Huntingdon	67.1		53.8	48.4	46.5	41.8	50.3	43	62.1	59.7			52.5	39	9
	96.8	46.7	37.2	28.5	24	19.1	22.6	23.6	33.1	31.4	47.1	33.5	37.0	27	12



## Cambridge City Council

Road 2 west															
Elizabeth Way	61.5	54.5	54.1	35.3	29.8	39.6	37	32.2	44.4	37.9	57.7	41.1	43.8	32	12
Victoria Road	55.4	45.5	42.1	36.5	36.1			44.2		39.5	52.4		39.1	29	8
Madingley Road	61.3	63.1	47.6	41.3	40.6	44.8	45.2	28.4	51.9	52.3	57.8	46.2	48.4	36	12
Huntingdon Road 1	39.6	40.4	37.7	26.6	28.5	27.5	24.2	35.3	39.2	32	43	28.2	33.5	25	12
Histon Road 1	52	48.6	38.9	32.8	34.7	30.5	28.7	x	x	x	x	x	38.0	28	7
Histon Road 1 new								35.3	41.6	45	58.6		45.1	33	4
Barton Road Fen	39	40.4	38.4	22.6	24.8	22.6	22.7	21.5	30.5	23.1		25.6	28.3	21	11
Causeway Trumpington Road	46.5	46.2	43.6	31.6	25.5	26.5	25.3	26.3	34.6	24.5	44	27.5	33.5	25	12
Babraham Road*	46.1	44.8	40.6	29	28.8	30		26.1	38.6	37.6	48.1		37.0	27	10
Cherry Hinton Road	49.2	32.9	23.8		20.3	17.6	18.6	25.1	27.9	28.4	39.9	28.1	28.3	21	11
Arbury Road*	42.9	38.4	31.5	23.8	24.4	20.1	18.2	23.6	32.5	33.7	48.1	38.6	31.3	23	12
Newnham Road	32.7	37.4	30.5	21.9	21.4	17.8	19.2	19.6	27.9	29	43	30.2	27.6	20	12
Hills Road 2 VI form	68.4	61.3	63.6	53.3	50.3	48.7	62	50	61.4	54.1	59.1	50.4	56.9	42	12
Victoria Avenue	38	54.6	43.1	33	32.6		29.4	29.5	42.1	40.5	32	37.3	37.5	28	11
Parker Street	53.4	66.8	67.2	57.6	45.7	49.7	50.5	43	60.3	61.1	54.5	47.7	54.8	41	12
Abbey Road*	63.2	55.5	53.1	45.7	49.5	43.5	47.9	46.1	54	55.3	61.4	50.6	52.2	39	12
Cockburn Street	91.8	34.7	27	22.4	23.8	15.8	17.2	19	28.4	29.5	43.4	34.5	32.3	24	12
Oaktree Avenue	30.5	30.2	28.1	20.9	20.6	17.3	16.3	17.5	22.3	24.8	30.9	28.7	24.0	18	12
Chesterton Road	32.5	33.4	23.3	18.4	20.1	15.6	15.9	18.4	25	26.2	37.7	32.6	24.9	18	12
Maids Causeway	39.8	43.7	43.5	34.4	31.7	27.5	27	27.4	34.8			34.4		25	9
Emmanual Road	58.5	61.8		37.9	39.6		35.2		47.4	48	42	45.8	46.2	34	9
Downing	59.1	62.1	62.1	2.4	47.8	50.8	58.4	49.2	57.5	50.6	45.3	53.4	49.9	37	12
	61.4	55.3	49.9	42.1	46.6	36.3	45.7	41.4		44.4	58.9	51.5	48.5	36	11

## Cambridge City Council

Street															
Trumpington															
Street	49		38.9	29.9	26.5	27.8		26.5	39.2		38.3	43.8	35.5	26	9
Lensfield															
Road	54.2	58.2	60.3	43.7	43.1	44.5	46.9	46.3	51.1	48.8	65.6	46.1	50.7	38	12
Park Terrace	54.8	41.3	39.8	35.3	36.9	32.3	33.5	33.1	40.6	37.5	52.1	39.9	39.8	29	12
St Andrew's															
St			55.7	52.3	55.2	47.8	55.3	51	56.1	64.9	71.4	65.6	57.5	43	10
Parkside	47.9	44.6		28.1	26.1	25.9	27.4	25.7	33.2	29.4	43.8	35.3	33.4	25	11
Gonville 1	49.2	51.6	46.1	39.2	37.7	46.3	45	40.2	50	50	60.7	42.7	46.2	34	11
Gonville 2	52.4	50.8	52.3	38.1	39.6	44.3	41.4	37.9	51	55.8	30.7	44.5	44.9	33	12
Gonville 3	47.8		47.1		38.8	47.1	43.1	37.1	38	55.1	58	46.7	45.9	34	10
Hills Road 3															
Botanic	48.4	46.8	52.7	33.5	32.2	36		31	40.5	39.8	90.7	40.5	44.7	33	11
Shelford															
Road	46	43.3	34.4	28.2	32.5	24.8	24.6	29.6	38.5	34.4	51.3	33.1	35.1	26	12
Station Road															
2 East -															
Station	53.1	52.4	50.9	33	31.7	29.6	34.1	27.6	41	36.4	53.4	37	40.0	30	12
Station Road															
1 West -															
Jupiter	46.8	39.8	47.1	36.3	34.7		41.5	41.1	42	45.5	59.2	44.1	43.5	32	11
Tenison															
Road 1 96	43	42.4	28.8	26	24.6	23.2	20.2	24.1	33.1	33.4	62.1	39.6	33.4	25	12
Tenison															
Road 2															
Ravensworth	46.3	41.5	34.5	25.6		23.4	22.9	24.3	32.5	33.4	44.3	35.3	33.1	24	11
Coldhams															
Lane 2															
Silverwood	49.8	40.7	43.5	31.8	37.4		32.4	26.6	36.4	28.3	49.7	38.1	37.7	28	11