

2012 Air Quality Updating and Screening Assessment for Cambridge City Council

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

April 2012

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Executive Summary

New monitoring results show a return to typical nitrogen dioxide levels in 2011 from the peak in 2010.

- The continuous monitoring instruments show no overall trend over past 5 years for <u>nitrogen dioxide</u>, exceedences of the annual mean objective for nitrogen dioxide are recorded in Regent St, Gonville Place, Montague Road and Parker Street.
- The continuously monitoring instruments show an overall trend for falling levels of <u>particulate matter</u> over the past 5 years.
- Diffusion tubes show overall flat trends in nitrogen dioxide with exceedences on inner ring roads, inner city streets and the bus station area.
- Diffusion tubes show a downward trend in the area around the bus station.

Diffusion tube data broadly confirm the current boundary of the AQMA, so at this stage Cambridge City Council is not considering re-drawing the boundaries of the AQMA.

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

Against a background of increased growth in East Anglia – Cambridge and its subregion in particular – Cambridge City Council face a continuing challenge in preventing deterioration in air quality resulting from new housing that will inevitably bring new residents and more vehicle movements, although construction has been slower than anticipated. Significant transport infrastructure improvements are required to accommodate planned growth.

The Addenbrookes Access Road opened in 2010 and the Cambridgeshire Guided Busway opened in 2011. The planned Chesterton Railway Station is expected to open in late 2015. No improvements to the City Centre infrastructure have been made in the past three years although funding has been obtained from the Better Bus Area Fund for further improvements and a bid to the Local Sustainable Travel Fund was made in early 2012 which is aimed at enhancing commuter journeys into Cambridge.

The Air Quality Action Plan targets bus emissions in the City centre as they are the largest single source of air pollution and a Cambridge Bus Emissions Reduction Commitment has been incorporated into the second Quality Bus Partnership (2012-2015). Three of the operators have committed to the new partnership, at the time of writing. Improvements to the fleet have already been made.

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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. Traffic counts recorded that 185,728 motor vehicles crossed the Cambridge Radial Cordon between 7am and 7 pm each day in 2011, 98% of the number recorded in the baseline year of 2001 and less than the target of 185,000. The number of motorcycles increased by 31% in 2011 compared with 2010, which is a small increase on the baseline year following a decline in recent years. The number of heavy goods vehicles increased by 28% in 2011, but still 82% of the baseline year. The number of light goods increased by 2% and cars by 1%. Public Service Vehicles (PSV) numbers fell by 5% last year as some services were cut but overall numbers are still up, 124% of those in 2001.

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 but levelled off in 2008 and has fallen slightly since then. Traffic trends reported show that between 2001 and 2011 the number of cycles, motorcycles and PSV crossing the River Cam screenline have risen; whereas the number of cars, heavy goods vehicles and light goods vehicles fell. (Data from Traffic Management Report 2011, 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 Report

This report fulfils the requirements of the Local Air Quality Management 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.

The objective of this Updating and Screening Assessment is to identify any matters that have changed which may lead to risk of an air quality objective being exceeded. A checklist approach and screening tools are used to identify significant new sources or changes and whether there is a need for a Detailed Assessment. The USA report should provide an update of any outstanding information requested previously in Review and Assessment reports.

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 1.1. This table shows the objectives in units of microgrammes per cubic metre μ g/m³ (milligrammes per cubic metre, mg/m³ for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

	Air Quality	Date to be	
Pollutant	Concentration	Measured as	achieved by
Bonzono	16.25 <i>µ</i> g/m³	Running annual mean	31.12.2003
Delizene	5.00 <i>µ</i> g/m ³	Running annual mean	31.12.2010
1,3-Butadiene	2.25 <i>µ</i> g/m ³	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m ³	Running 8-hour mean	31.12.2003
Lood	0.5 μg/m ³	Annual mean	31.12.2004
Lead	0.25 μg/m ³	Annual mean	31.12.2008
Nitrogen dioxide	200 μg/m ³ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 <i>µ</i> g/m³	Annual mean	31.12.2005
Particles (PM ₁₀) (gravimetric)	50 μg/m ³ , not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu g/m^3$	Annual mean	31.12.2004
	350 μ g/m ³ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
Sulphur dioxide	125 μ g/m ³ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 μg/m ³ , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

Table 1.1 Air Quality Objectives included in Regulations for the purpose of LAQM in England

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. 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.

First Round of Review and	Ambient concentrations of pollutants of concern should	2000
Assessment	meet national objectives by target date.	
Second Round of Review and	Concentrations of nitrogen dioxide may not meet	2003
Assessment	national objectives by target date. Proceed to a	
	Detailed Assessment. Other pollutants of concern	
	should not pose a problem.	
Detailed Assessment of Nitrogen	Concentrations of nitrogen dioxide in central	2004
Dioxide	Cambridge predicted not to meet national objectives by	
	target date. AQMA declared.	
AQAP agreed	Air Quality Action Plan integrated into forthcoming	2005
	LTP2 (2006-2011)	
Third Round of Review and	Concentrations of nitrogen dioxide in central	2006
Assessment	Cambridge not meeting national objectives. Measured	
	results were in line with those predicted in 2004. AQMA	
	remains in place.	
Further Assessment of Nitrogen	Heavy-duty vehicles (principally buses) are the largest	2006
Dioxide	single source of air pollution in the AQMA.	
Fourth Round of Review and	Concentrations of nitrogen dioxide in central	2009
Assessment	Cambridge not meeting national objectives. Measured	
	results were in line with those predicted in 2004. AQMA	
	remains in place.	
Air Quality Action Plan	Joint AQAP prepared with Huntingdonshire and South	2009
	Cambridgeshire District Councils.	
Fifth Round of Review and	Concentrations of nitrogen dioxide in central	2012
Assessment	Cambridge not meeting national objectives. Measured	
	results were in line with those predicted in 2004. AQMA	
	remains in place.	
		1

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. 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-NO₂-NOx chemiluminesence 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-NO2-NOx chemiluminescence analyser at Newmarket Road and the Casella Monitor ML2041 chemiluminescence analyser at Regent Street.

Levels of PM₁₀ are continuously monitored with BAM-1020 instruments at three city centre locations in Cambridge, Montague Road, Parker Street and Gonville Place. PM_{2.5} levels are monitored at Gonville Place using a BAM-1020 with a PM_{2.5} 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.

Figure 2.1 Map of Automatic Monitoring Sites



Project Location & Name: J:\Projects\ArcGIS_Projects\Basemap; Layout Name: n/a

Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	X OS GridRef	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Monitoring Technique	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,} PM _{2.5}	Y	Chemiluminesence, M200E 2 x BAM-1020	Y (1.8m)	3.3m	Yes
Montague Road	Roadside	546 057	259 118	NO ₂ , PM ₁₀	Y	Y Chemiluminesence, M200E BAM-1020		3.9m	No
Newmarket Rd	Roadside	546 317	258 900	NO ₂ , PM _{2.5}	Y	Y Chemiluminesence, 42c SHARP-5030		3.3m	Yes
Parker Street	Roadside	545 366	258 391	NO _{2,} PM ₁₀	Y	Chemiluminesence, M200E BAM-1020	Y (0.5m)	3.3m	Yes
Regent Street	Roadside	545 289	258 118	NO ₂	Y	Chemiluminesence, ML2041	Y (0.5m)	2.3m	Yes

2.1.2 Non-Automatic Monitoring Sites

Nitrogen Dioxide

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. 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 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 2011 is 0.85 – results reported below have been bias-adjusted.

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 national objective of 5 μ g/m³ is not approached.



Figure 2.2 Map of Non-Automatic Monitoring Sites

Table 2.2 Details of Non-Automatic Monitoring Sites

						Is monitoring	Relevant		
						collocated	Exposure?	Distance to	Does this
						With a	(Y/N WI[[] distance (m)	Kerb of	location
		X OS Grid	YOS	Pollutants	In	Analyser (Y/N)	to relevant	(N/A if not	worst-case
Site Name	Site Type	Ref	Grid Ref	Monitored	AQMA?		exposure)	applicable)	exposure?
Emmanuel Street	Roadside	545,293	258,418	NO ₂	Y	N	Y (0m)	2.4m	Y
Magdalene Street	Roadside	544,674	258,992	NO ₂	Y	N	Y (0m)	2.0m	Y
Northampton Street	Roadside	544,492	259,021	NO ₂	Y	N	Y (0m)	2.0m	Y
Silver Street	Roadside	544,783	258,116	NO ₂	Y	N	Y (0m)	1.0m	Y
Newmarket Road 1	Roadside	546,195	258,867	NO ₂	Y	N	Y (2m)	1.7m	Y
Milton Road*	Roadside	545,977	260,352	NO ₂	N	N	Y (3m)	8.0m	Ν
Drummer Street	Roadside	545,247	258,472	NO ₂	Y	N	Y (0m)	2.1m	Y
Gilbert Road	Kerbside	545,314	259,777	NO ₂	N	N	Y (>3m)	1.0m	Y
Latham Road	Background	544,784	256,746	NO ₂	N	N	Ν	N/A	
Newmarket Road 2	Roadside	547,998	259,349	NO ₂	Y	N	Ν	3.7m	Ν
East Road	Roadside	545,908	258,439	NO ₂	Y	N	Y (1m)	4.0m	Y
Mill Road	Roadside	546,080	257,944	NO ₂	Y	N	Y (0m)	2.0m	Y
Hills Road	Roadside	545,557	257,695	NO ₂	Y	N	Y(2m)	0.4m	Y
Regent Street	Roadside	545,289	258,118	NO ₂	Y	N	Y(0.5m)	2.3m	Y
Pembroke Street	Roadside	544,884	258,098	NO ₂	Y	N	Y (0m)	1.2m	Y
Elizabeth Way	Roadside	546,062	259,260	NO ₂	Y	N	Ν	1.6m	Ν
Victoria Road	Roadside	544,422	259,544	NO ₂	Y	N	Y (0m)	1.8m	Y
Madingley Road	Kerbside	543,784	259,093	NO ₂	N	N	Y(>3m)	0.8m	Ν
Huntingdon Road	Roadside	543,694	259,867	NO ₂	N	N	Y(>3m)	2.0m	Ν
Histon Road	Kerbside	544,308	259,664	NO ₂	N	N	Y (1m)	0.5m	Y

						Is monitoring collocated	Relevant Exposure?	Distance to	Does this
						with a Continuous	(Y/N with	kerb of	location
		X OS Grid	YOS	Pollutants	In	Analyser (Y/N)	to relevant	(N/A if not	worst-case
Site Name	Site Type	Ref	Grid Ref	Monitored	AQMA?	, , ,	exposure)	applicable)	exposure?
Fen Causeway	Roadside	544,957	257,569	NO ₂	Y	Ν	Y(>3m)	2.1m	Y
Trumpington High St	Roadside	544,575	255,307	NO ₂	Ν	Ν	Y(0m)	2.7m	Y
Babraham Road*	Roadside	546,948	255,169	NO ₂	Ν	Ν	Y(>3m)	1.2m	Y
Cherry Hinton Road	Roadside	548,331	256,242	NO ₂	Ν	Ν	Y(>3m)	0.8m	Y
Arbury Road*	Roadside	545,693	260,473	NO ₂	Ν	Ν	Y(1m)	1.9m	Ν
Newnham Road	Roadside	544,529	257,730	NO ₂	Y	Ν	Y (0m)	1.6m	Y
Victoria Avenue	Roadside	545,331	259,438	NO ₂	Y	Ν	Y (0m)	1.4m	Y
Parker Street	Roadside	545,370	258,399	NO ₂	Y	Ν	Y (0m)	1.4m	Y
Abbey Road*	Roadside	546,163	258,983	NO ₂	Y	N	Y (1m)	1.7m	Ν
Cockburn Street	Urban Background	546,596	257,594	NO ₂	Y	Ν	Y (0m)	1.5m	Y
Oaktree Avenue	Urban Background	545,885	260,088	NO ₂	Y	Ν	Y (2m)	1.0m	Y
Chesterton Road	Roadside	545,566	259,578	NO ₂	Y	Ν	Y (2m)	2.7m	Y
Maids Causeway	Kerbside	545,710	258,782	NO ₂	Y	N	Y (3m)	0.8m	Y
Emmanual Road	Roadside	545,405	258,521	NO ₂	Y	N	Y (0m)	1.5m	Y
Downing Street	Roadside	545,162	258,240	NO ₂	Y	N	Y (0m)	1.3m	Y
Trumpington Street	Roadside	544,999	257,871	NO ₂	Y	N	Y(2m)	1.4m	Y
Lensfield Road*	Roadside	545,271	257,675	NO ₂	Y	N	Y(>3m)	1.8m	Y
Park Terrace	Roadside	545,429	258,271	NO ₂	Y	N	Y (>3m)	1.9m	Y
St Andrew's St	Urban Centre	545,147	258,367	NO ₂	Y	N	Y(0m)	0.8m	Y
Parkside	Roadside	545,539	258,295	NO ₂	Y	Ν	Y (2m)	0.5m	Y
Barton Road	Roadside	544,100	257,473	NO ₂	Ν	Ν	Y (>3m)	2.2m	Y
Coldhams Lane	Roadside	547,216	258,286	NO ₂	Ν	Ν	Y (>3m)	3.5m	Y

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
Hills Road 2	Roadside	546,166	256,580	NO ₂	N	N	Y (0m)	3.6m	Y
Histon Road 2	Roadside	544,284	261,273	NO ₂	N	N	Y (>3m)	2.0m	N
Huntingdon Road 2	Roadside	543,101	260,344	NO ₂	N	N	Y (>3m)	2.5m	N
Gonville Place	Roadside	545,050	257,828	NO ₂	Y	N	Y (0m)	3.3m	Y
Long Road	Kerbside	544,867	255,709	NO ₂	N	N	Y (>3m)	0.6m	N

2.2 Comparison of Monitoring Results with AQ Objectives

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data

The AQ objective for the annual mean concentration was exceeded at Gonville Place, Montague Road, Parker Street and Regent Street in 2011. No hourly exceedences were reported. All sites are representative of relevant public exposure and all sites are within the AQMA for nitrogen dioxide.

The overall trends vary from site to site (Figure 2.3). The trends at the AURN site at Regent Street and Gonville Place is fairly flat (albeit with a notable peak at Gonville Place in 2010). The overall trends at Newmarket Road and Parker Street are downwards, slightly. Recorded levels of nitrogen dioxide at the site at Montague Road rose slowly initially and then increased by more than 25% in 2010, which was sustained in 2011. Traffic count data supplied by the County Council (Traffic Monitoring Report 2011) shows that the number of vehicles recorded on Elizabeth Way has remained fairly constant between 2001 and 2011 at around 25,000 per 12-hour count. The increase in recorded levels of nitrogen dioxide at Montague Road is unexplained and not matched by any increase in recorded levels of particulate matter.

		Within	Valid Data Capture	Valid Data		Annual Me	ean Concei	ntration µg	/m ³
Site ID	Site Type	AQMA ?	for period of monitoring % ^a	Capture 2011 % ^b	2007	2008	2009	2010	2011
Gonville Place	Roadside	Y	94.5	94.5	41	42	42	52	40
Montague Road/ Elizabeth Way	Roadside	Y	93.7	93.7	28	29	30	43	42
Newmarket Rd	Roadside	Y	95.8	95.8	33	34	33	30	29
Parker Street	Roadside	Y	96.5	96.5	54	49	52	49	48
Regent Street	Roadside	Y	95.3	95.3	42	44	41	40	40

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

^a i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year. ^b i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)

Table 2.4 Results of Automatic Monitoring for Nitroge	n Dioxide: Comparison with 1-hour mean Objective
-------------------------------------------------------	--------------------------------------------------

			Valid Data		Number of Exceedences of Hourly Mean (200 μ g/m ³)							
Site ID	Site Type	Within AQMA ?	Capture for period of monitoring %	Valid Data Capture 2011 %	2007 ^c	2008 ^c	2009 ^c	2010 °	2011 ^c			
Gonville Place	Roadside	Y	94.5	94.5	0	0	0	9	0			
Montague Road/ Elizabeth Way	Roadside	Y	93.7	93.7	0	1	1	2	0			
Newmarket Rd	Roadside	Y	95.8	95.8	0	0	0	0	0			
Parker Street	Roadside	Y	96.5	96.5	0	0	0	0	0			
Regent Street	Roadside	Y	95.3	95.3	0	0	0	0	0			

Figure 2.3 Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Automatic Monitoring Sites



Diffusion Tube Monitoring Data

The diffusion tube data in 2011 does not show the significant increase in nitrogen dioxide levels that was recorded across the city in 2010. Levels are similar to those in 2009 and 2008.

Only two locations outside the AQMA have recorded levels of nitrogen dioxide above the national objectives. These locations are Madingley Road and Long Road, which both have no relevant receptors – the tubes were located here to monitor traffic changes.

Table 2.5 Results of Nitrogen Dioxide Diffusion Tubes in 2011

					Data Capture	Data with less than 9	Confirm if data has	Annual mean concentration
			Within		2011 (Number	months has	been	(Blas Adjustment
			AQMA	Triplicate or	of	annualised	corrected	factor = 0.85)
Site ID	Location	Site Type	?	Tube	Months)	(Y/N)	(Y/N)	2011 (μg/m ³)
82202 – Tube 34	Parker Street	Roadside	Y	Ν	12	N	N	34
82204 – Tube 36	Cockburn Street	Roadside	Y	Ν	12	N	Ν	22
82205 – Tube 37	Oaktree Avenue	Roadside	Y	Ν	12	Ν	Ν	23
82935 – Tube 24	Histon Road 1	Roadside	Ν	Ν	10	Ν	Ν	35
83957 – Tube 07	Newmarket Road 1	Roadside	Y	Ν	12	Ν	Ν	44
85942 – Tube 08	Milton Road	Roadside	Ν	Ν	11	Ν	Ν	28
83959 – Tube 09	Drummer Street	Roadside	Y	Ν	12	Ν	Ν	36
83960 – Tube 10	Gilbert Road	Kerbside	Ν	Ν	12	Ν	Ν	25
83961 – Tube 11	Latham Road	Background	Ν	Ν	12	Ν	Ν	15
83962 – Tube 12	Newmarket Road 2	Roadside	Ν	Ν	12	Ν	Ν	33
83963 – Tube 13	East Road	Roadside	Y	Ν	12	Ν	Ν	36
83964 – Tube 14	Mill Road	Roadside	Y	Ν	11	Ν	Ν	29
83965 – Tube 15	Hills Road 1	Roadside	Y	Ν	11	Ν	Ν	34
83966 – Tube 16	Regent Street	Roadside	Y	Υ	12	Ν	Ν	37
83968 – Tube 18	Pembroke Street	Roadside	Y	Ν	12	Ν	Ν	45
83970 – Tube 20	Elizabeth Way	Roadside	Y	Ν	12	Ν	Ν	34
84972 – Tube 21	Victoria Road	Roadside	Y	Ν	11	Ν	Ν	37
84694 – Tube 22	Madingley Road	Kerbside	Ν	Ν	12	Ν	Ν	43
84695 – Tube 23	Huntingdon Road	Roadside	Ν	Ν	12	Ν	Ν	29
84701 – Tube 26	Fen Causeway	Kerbside	Y	Ν	10	Ν	Ν	29
84702 – Tube 27	Trumpington High St	Roadside	Ν	Ν	11	Ν	Ν	34
85943 – Tube 28	Babraham Road	Roadside	N	Ν	11	N	Ν	25

					Data	Data with	Confirm if	Annual mean
					2011	months has	been	(Bias
			Within	Triplicato or	(Number	been	distance	Adjustment
			AQMA	Collocated	of	annualised	corrected	factor = 0.85)
Site ID	Location	Site Type	?	Tube	Months)	(Y/N)	(Y/N)	2011 (μg/m³)
84704 – Tube 29	Cherry Hinton Road	Roadside	Ν	Ν	12	Ν	Ν	28
85944 – Tube 30	Arbury Road	Roadside	Ν	Ν	12	Ν	Ν	24
84707 – Tube 31	Newnham Road	Roadside	Y	Ν	11	Ν	Ν	46
84709 – Tube 33	Victoria Avenue	Roadside	Y	Ν	12	Ν	Ν	44
85946 – Tube 35	Abbey Road	Roadside	Y	Ν	11	Ν	Ν	31
84712 – Tube 38	Chesterton Road	Roadside	Y	Ν	11	Ν	Ν	28
84713 – Tube 39	Maids Causeway	Roadside	Y	Ν	11	Ν	Ν	43
84712 – Tube 40	Emmanual Road	Urban Background	Y	Ν	12	Ν	Ν	48
84715 – Tube 41	Downing Street	Urban Background	Y	Ν	12	Ν	Ν	41
84716 – Tube 42	Trumpington Street	Roadside	Y	Ν	11	Ν	Ν	32
85945 – Tube 43	Lensfield Road	Kerbside	Y	Ν	12	Ν	Ν	40
84718 – Tube 44	Park Terrace	Roadside	Y	Ν	12	Ν	Ν	34
84719 – Tube 45	St Andrew's Street	Roadside	Y	Ν	8	Ν	Ν	54
85937 – Tube 25	Barton Road	Roadside	Ν	Ν	12	Ν	Ν	25
85938 – Tube 17	Coldham's Lane	Roadside	Ν	Ν	12	Ν	Ν	30
85939 – Tube 32	Hills Road 2	Roadside	Ν	Ν	8	Ν	Ν	32
85940 – Tube 2	Histon Road 2	Urban Centre	Ν	Ν	11	Ν	Ν	31
85941 – Tube 19	Huntingdon Road 2	Roadside	Ν	Ν	12	Ν	Ν	29
Tube 6	Long Road	Roadside	N	Ν	10	Ν	Ν	44
Tube 1	Emmanual Street	Roadside	Y	Ν	9	Ν	Ν	46
Tube 3	Magdalene Street	Roadside	Y	Ν	12	Ν	Ν	35
Tube 4	Northampton Street	Roadside	Y	Ν	11	Ν	Ν	45
83975 – Tube 5	Silver Street	Roadside	Y	Ν	11	N	N	43

Site ID	Location	Site Type	Within AQMA ?	Triplicate or Collocated Tube	Data Capture 2011 (Number of Months)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.85) 2011 (μg/m ³)
Triplicate, co-located with continuous analyser 47, 48, 49	Gonville Place	Roadside	Y	Y	12	Ν	Ν	40

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

*Annual mean concentrations for previous years are optional.

Table 2.6 Results of Nitrogen Dioxide Diffusion Tubes (2007 to 2011)

				Annual mean concentration (adjusted for bias) μg/m ³						
Site ID	Site Type	Site Location	Within AQMA ?	2007 Bias Adjustment Factor = 0.8	2008 Bias Adjustment Factor = 0.8	2009 Bias Adjustment Factor = 0.83	2010 Bias Adjustment Factor = 1.00	2011 Bias Adjustment Factor = 0.85		
82202 – Tube 34	Roadside	Parker Street	Y	47	45	48	57	47		
82204 – Tube 36	Roadside	Cockburn Street	Y	26	22	24	29	22		
82205 – Tube 37	Roadside	Oaktree Avenue	Y	25	27	25	29	23		
82935 – Tube 24	Roadside	Histon Road 1	N	36	37	37	43	35		
83957 – Tube 07	Roadside	Newmarket Road 1	Y	45	48	49	52	44		
85942 – Tube 08	Roadside	Milton Road	N	26	29	27	33	28		
83959 – Tube 09	Roadside	Drummer Street	Y	45	43	40	46	36		
83960 – Tube 10	Kerbside	Gilbert Road	N	27	26	28	32	25		
83961 – Tube 11	Background	Latham Road	N	16	15	15	21	15		
83962 – Tube 12	Roadside	Newmarket Road 2	N	35	33	34	40	33		
83963 – Tube 13	Roadside	East Road	Y	38	35	36	46	36		
83964 – Tube 14	Roadside	Mill Road	Y	35	37	37	40	29		
83965 – Tube 15	Roadside	Hills Road 1	Y	41	38	37	49	34		
83966 – Tube 16	Roadside	Regent Street	Y	35	38	42	45	37		
83968 – Tube 18	Roadside	Pembroke Street	Y	42	44	49	59	45		
83970 – Tube 20	Roadside	Elizabeth Way	Y	38	39	39	50	34		
84972 – Tube 21	Roadside	Victoria Road	Y	42	44	43	49	37		
84694 – Tube 22	Kerbside	Madingley Road	N	39	44	41	53	43		
84695 – Tube 23	Roadside	Huntingdon Road	N	29	29	31	36	29		
84701 – Tube 26	Kerbside	Fen Causeway	Y	31	29	31	39	29		
84702 – Tube 27	Roadside	Trumpington High St	N	32	34	32	41	34		
85943 – Tube 28	Roadside	Babraham Road	N	26	35	28	30	25		
84704 – Tube 29	Roadside	Cherry Hinton Road	N	34	37	34	37	28		

				Annual mean concentration (adjusted for bias) μg/m ³						
Site ID	Site Type	Site Location	Within AQMA ?	2007 Bias Adjustment Factor = 0.8	2008 Bias Adjustment Factor = 0.8	2009 Bias Adjustment Factor = 0.83	2010 Bias Adjustment Factor = 1.00	2011 Bias Adjustment Factor = 0.85		
85944 – Tube 30	Roadside	Arbury Road	Ν	23	23	26	29	24		
84707 – Tube 31	Roadside	Newnham Road	Y	44	48	47	58	46		
84709 – Tube 33	Roadside	Victoria Avenue	Y	46	48	47	55	44		
85946 – Tube 35	Roadside	Abbey Road	Y	27	24	34	35	31		
84712 – Tube 38	Roadside	Chesterton Road	Y	35	32	32	42	28		
84713 – Tube 39	Roadside	Maids Causeway	Y	46	49	43	55	43		
84712 – Tube 40	Urban Background	Emmanuel Road	Y	55	54	53	60	48		
84715 – Tube 41	Urban Background	Downing Street	Y	44	47	46	53	41		
84716 – Tube 42	Roadside	Trumpington Street	Y	34	34	35	42	32		
85945 – Tube 43	Kerbside	Lensfield Road	Y	43	42	47	56	40		
84718 – Tube 44	Roadside	Park Terrace	Y	35	37	37	46	34		
84719 – Tube 45	Roadside	St Andrew's Street	Y	25	27	27	32	54		
85937 – Tube 25	Roadside	Barton Road	Ν	32	33	34	41	25		
85938 – Tube 48	Roadside	Coldham's Lane	Ν	34	30	35	45	30		
85939 – Tube 49	Roadside	Hills Road 2	Ν	33	34	33	40	32		
85940 – Tube 2	Urban Centre	Histon Road 2	Ν	28	30	29	38	31		
85941 – Tube 19	Roadside	Huntingdon Road 2	Ν	45	51	52	61	29		
Tube 6	Roadside	Long Road	Ν	57	56	52	56	44		
Tube 1	Roadside	Emmanuel Street	Y	37	37	35	48	46		
Tube 3	Roadside	Magdalene Street	Y	44	48	50	54	35		
Tube 4	Roadside	Northampton Street	Y	42	46	44	53	45		
83975 – Tube 5	Roadside	Silver Street	Y	35	42	41	52	43		
Triplicate, 47, 48, 49	Roadside	Gonville Place	Y	35	42	41	52	40		

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

Diffusion tube data (bias-adjusted) from 2004 to 2011 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. The plots are shown in Figure 2.4 below.

The first three plots show levels of pollution below the national objective – all trends are fairly flat over the last 5 years – with the exception of the increase in 2010, as discussed above. Data from the Inner Ring Road and the Inner City Streets show levels of pollution at or above the national objectives – again, trends are fairly flat – with the exception of the increase in 2010.

Individual plots are shown of the data from each of the diffusion tubes in the Bus Station Area – here the overall trend is slightly downwards, although still remaining above the national objectives. The pink line, tube 9, is the data from Drummer Street itself (the Bus Station), which shows the most consistent downwards trend over the past 5 years. Congestion within the bus station has declined as improvements to the road layout adjacent to the bus station have been made, including the re-location of the long-distance coaches. Diffusion tube results from Parkside, Park Terrace and St Andrews Street have been included for this report. Parkside and Park Terrace results are consistent with the data set as a whole; St Andrews Street results do not show any clear pattern.

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 Emmanual Road, Emmanual Street, Drummer Street and Parker Street, as well as Park Terrace, Parkside and St Andrews Street)



2.2.2 PM₁₀ and PM_{2.5}

All three PM₁₀ monitoring stations (Gonville Place, Montague Road and Parker Street) are measuring concentrations that do not breach the current objectives, although concentrations in Parker Street have often approached the annual mean objective in the past.

Levels of PM_{2.5} are measured at Newmarket Road and Gonville Place; these results are included in this section for interest and completeness.

All sites are representative of relevant public exposure.



Figure 2.5 Trends in Annual Mean PM_{10} and $PM_{2.5}$ Concentrations

A comparison of the data over the past five years show a fairly flat pattern at Gonville Place and Montague Road; and a falling trend at Parker Street with a small rise in 2011 (also seen at Gonville Place and Montague Road).

There are now four years of $PM_{2.5}$ data from Newmarket Road, showing a distinct decline in recorded levels at this site.

			Valid Data		Gravimetric	Annual Mean Concentration μg/m ³					
Site ID	Site Type	Within AQMA ?	Capture for monitoring Period % ^a	Valid Data Capture 2011 % ^b	Equivalent (Y or NA)	2007	2008	2009	2010	2011	
Gonville Place PM ₁₀	Roadside	Y	94.4	94.4	Y	20	21	20.5 (22)	(20)	21	
Gonville Place PM _{2.5}	Roadside	Y	97.9	13.0	Υ	-	-	-	-	16	
Montague Road PM ₁₀	Roadside	Y	95.5	95.5	Y	20	20	20.4 (22)	(20)	21	
Newmarket Rd PM ₁₀	Roadside	Y	0.0	0.0	Υ	23	-	-	-		
Newmarket Rd PM _{2.5}	Roadside	Y	97.5	97.5	Y	-	14	14	11	8	
Parker Street PM ₁₀	Roadside	Y	89.3	89.3	Y	29	28	24.5 (27)	(24)	26	

Table 2.7 Results of Automatic Monitoring of PM₁₀: Comparison with Annual Mean Objective

^a i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

^b i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)

PM₁₀ figures in brackets are TEOM-corrected (Factor 1.3). VCM corrected data shown from 2009. The 2011 data is part-TEOM corrected (1.3) and BAM-corrected (Factor 0.83333) from the instrument changeover date. PM_{2.5} data have not been corrected. PM_{2.5} data have not been annualised because data collection began in mid-November; there is insufficient data for the exercise to be meaningful. Further, there are no annual mean objectives with which to compare the data.

		Within	Valid Data Capture for	Valid Data Capture 2011 % ^b	Confirm	Number of Exceedences of 24-Hour Mean (50 µg/m ³)					
Site ID	Site Type	AQMA ?	monitoring Period % ^a		Gravimetric Equivalent	2007	2008	2009	2010	2011	
Gonville Place	Roadside	Y	94.4	94.4	Y	4	5	0	2	2	
Gonville Place 2.5	Roadside	Y			Y	-	-	-	-	-	
Montague Road	Roadside	Y	95.5	95.5	Y	0	6	3	2	3	
Newmarket Rd 10	Roadside	Y			Y	-	-	-	-	-	
Newmarket Rd 2.5	Roadside	Y	97.5	97.5	Y	-	-	-	-	-	
Parker Street	Roadside	Y	89.3	89.3	Y	8	9	3	0	4	

Table 2.8 Results of Automatic Monitoring for PM₁₀: Comparison with 24-hour mean Objective

^b i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.) ^c if data capture is less than 90%, include the 90th percentile of 24-hour means in brackets

2.2.3 Sulphur Dioxide

Cambridge City Council no longer measures 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 2011 is 0.78 ug/m³. Three of the fortnightly periods exceeded 1 ug/m³ – they were in February, March and November. The national objective of 5 ug/m³ is not approached.

2.2.5 Other pollutants monitored

No other pollutants are routinely monitored in Cambridge City Council district.

2.2.6 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 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

Cambridge City Council confirms that there are no new/newly identified congested streets with a flow above 5,000 vehicles per day and residential properties close to the kerb, that have not been adequately considered in previous rounds of Review and Assessment.

3.2 Busy Streets Where People May Spend 1-hour or More Close to Traffic

Cambridge City Council confirms that there are no new/newly identified busy streets where people may spend 1 hour or more close to traffic.

3.3 Roads with a High Flow of Buses and/or HGVs.

Cambridge City Council confirms that there are no new/newly identified roads with high flows of buses/HDVs.

3.4 Junctions

Cambridge City Council confirms that there are no new/newly identified busy junctions/busy roads.

3.5 New Roads Constructed or Proposed Since the Last Round of Review and Assessment

The Addenbrookes Access Road (AAR) connects Addenbrookes Hospital only with access from the south of Cambridge (M11 at Trumpington). It opened in October

2010 and has a daily flow of less than 10,000 vmpd. The flow along this 1.5 mile stretch is predicted to be 21,500 vehicles per day in 2023 when the Southern Fringe developments are completed.

Construction has begun on these greenfield sites, but no housing has yet been completed, so that traffic on this road is well below capacity. The Section 106 Agreements for these developments included funding for air quality monitoring using diffusion tubes, which will start when the development triggers have been met and suitable sites within the development can be located. The Glebe Farm development site will be located north of the AAR between Hauxton Road and Shelford Road. The Clay Farm development site will be located north of the AAR to the east of Shelford Road.

The existing background NO₂ is below 25 μ g/m³.

Traffic count data recorded in 2011 show a two way 12-hour flow of 8,587 just east of the Hauxton Road junction (the T-junction on the left in Figure 3.1 below); a two way 12-hour flow of 7,966 west of the Shelford Road junction and 6,177 just east of the Shelford Road junction (the crossroads in the middle of Figure 3.1). Since production of this map, the access road has now been connected to Robinson Way in the upper right hand corner of Figure 3.1; this is the hospital perimeter road.

Cambridgeshire County Council use a conversion factor of 1.194 for 12-hour counts to 24 hour AADT on Trumpington High Street (A1309) and 1.198 on Hills Road (A1307), which are nearby roads of a similar character to Hauxton Road and Shelford Road. Using a conversion factor of 1.198 there are likely to be more than 10,000 vmpd on the section near Hauxton Road (but no receptors) and nearly 10,000 vmpd at the Shelford Road interchange.

Section of Addenbrookes Access Road	12 hour Count	Conversion Factor	24 hour AADT equivalent
East of Hauxton Road	8,587	1.198	10,287
West of Shelford Road	7,996	1.198	9,579
East of Shelford Road	6,177	1.198	7,400

Table 3.1 Traffic Count on Addenbrookes Access Road

Currently, there are potential receptors on Shelford Road; diffusion tube monitoring began here in April 2012.



Figure 3.1 Addenbrookes Access Road (supplied by Cambridgeshire County Council)

The opening of this road has resulted in a decrease on traffic on Long Road (no County Council traffic count data, anecdotal evidence) with a noticeable drop in recorded level of nitrogen dioxide from typical levels.

	Long Road	Trumpington High Street
2008	51	34
2009	52	32
2010	61	41
2011	44	34

Table 3.2 Diffusion Tube Data near Addenbrookes Access Road

Cambridge City Council has assessed new/proposed roads meeting the criteria in Section A.5 of Box 5.3 in TG(09), and concluded that it will not be necessary to proceed to a Detailed Assessment, but this might be likely in the future. Diffusion tube monitoring started in April 2012.

3.6 Roads with Significantly Changed Traffic Flows

Cambridge City Council confirms that there are no new/newly identified roads with significantly changed traffic flows.

3.7 Bus and Coach Stations

Cambridge City Council confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

There is one airport in Cambridge, known as Cambridge Airport. Annual flight numbers at Cambridge average approximately 25,000 per annum, of which approximately 85% are light aircraft, being flown in connection with flying training or for private purposes. Around 600 movements per annum are aircraft flying into the airfield for maintenance by Marshall Aerospace; the balance is a variety of general aviation executive jet aircraft and some Charter Flights. Charter Flights are generally confined to passenger flights bringing people to Cambridge for a variety of conferences in connection with the University and the Hospital and several summer holiday destinations. There are also a number of Charter Flights in connection with the Racing Community at Newmarket, which particularly includes freight or race horses. Very little freight is transported in and out of Cambridge Airport.

The existing background NOx is below 25 μ g/m³.

Cambridge City Council confirms that there are no airports requiring assessment in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary Trains

Diesel locomotives idle at the train wash, which is more than 15 metres away from any receptor and is a process taking less than 5 minutes.

Cambridge City Council confirms that there are no locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.

4.2.2 Moving Trains

None of the rail lines with a heavy traffic of diesel passenger trains pass through Cambridge.

The existing background NO₂ is below 25 μ g/m³.

Cambridge City Council confirms that there are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

4.3 Ports (Shipping)

Cambridge is inland, with no port areas.

Cambridge City Council confirms that there are no ports or shipping that meet the specified criteria within the Local Authority area.

5 Industrial Sources

5.1 Industrial Installations

5.1.1 New or Proposed Installations for which an Air Quality Assessment has been Carried Out

Cambridge City Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.1.2 Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been Introduced

Cambridge City Council confirms that there are no industrial installations with substantially increased emissions or new relevant exposure in their vicinity within its area or nearby in a neighbouring authority.

5.1.3 New or Significantly Changed Installations with No Previous Air Quality Assessment

Cambridge City Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.2 Major Fuel (Petrol) Storage Depots

There are no major fuel (petrol) storage depots within the Local Authority area.

5.3 Petrol Stations

Cambridge City Council confirms that there are no petrol stations meeting the specified criteria.

5.4 **Poultry Farms**

Cambridge City Council confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

Cambridge City Council is aware of three biomass installations in the District. Details are listed in Appendix C; calculations carried out for this assessment are listed in Appendix D.

- 1. Biomass boilers installed at Manor Care Home, 33 Milton Road, 2 x 150kW.
- 2. Biomass boiler installed at Simon's House, Histon Road, 150kW, KWB TDS 150.
- Biomass boilers installed at Vet School, Madingley Road, 2 x150kW, Herz Firematic 150.

Manor Care Home

Using the procedure set out in TG(09) Section D1a and nomogram 5.19 no further assessment is required for PM10. Insufficient information was provided (nor does it appear to be available) for an assessment of nitrogen dioxide (the boiler was installed without the knowledge of the Environmental Health Department). Northumbrian Water Scientific Services carried out an air quality assessment using estimated values for NOx. Using these estimated values with the procedure set out in TG(09) Section D1a and nomogram 5.20 a background emission rate of slightly higher than the threshold emission rate is calculated. However, the Northumbrian Water Scientific Services Air Quality Assessment calculated a maximum local contribution of $1.3 \,\mu$ g/m³ NO₂ as a result of the biomass boiler installation. Further, the diffusion tube at Gilbert Road is within 25 metres of the boiler; the annual mean nitrogen dioxide recorded here in 2011 is 25 μ g/m³. No observable increase in nitrogen dioxide has been recorded since the boiler was installed. Therefore, Cambridge City Council concludes that further assessment is not required

for the Manor Care Home, Milton Road.

Simon's House

Using the procedure set out in TG(09) Section D1a and nomogram 5.19 no further assessment is required for PM10. Neither diffusion tube on Histon Road exceeds the annual mean National Air Quality Objective for nitrogen dioxide. Therefore, Cambridge City Council concludes that further assessment is not required.

Veterinary School

Using the procedure set out in TG(09) Section D1a and nomogram 5.19 no further assessment is required for PM10. The roadside diffusion tube on Madingley Road is at least 1km from the Vet School, which is located at the edge of the City. Therefore, Cambridge City Council concludes that further assessment is not required.

Cambridge City Council has assessed the biomass combustion plant, and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.2 Biomass Combustion – Combined Impacts

Data collected for the 2009 USA estimated that 210 - 276 of the homes in Cambridge use solid fuel as a main heat source, with little variation by ward, that is 2-3 households per 500m x 500m area. Table 5.3 in TG(09) shows that the worst domestic emissions are from wood-burning fireplaces, producing 27.43 kg/year PM₁₀. Therefore each 500m x 500m area could produce a maximum of 85 kg per annum. Comparison with the nomogram in Figure 5.22 shows that with a background concentration of 20.92 μ g/m³ (the maximum background in Cambridge 2008¹) around 5000kg of particulate matter would be required to approach the daily mean objective for PM₁₀.

The three biomass installations in place are in different 500m x 500m areas. None of them would contribute sufficient particulate matter², combined with the potential contribution from domestic sources, to approach the daily mean objective for PM_{10} .

Therefore, Cambridge City Council does not need to proceed to a detailed assessment related to the combined impacts of biomass combustion at this stage.

Biomass boilers may be part of future energy centres at the Addenbrookes/Papworth hospital site; these will be assessed in due course when further details are available.

¹ www.airquality.co.uk/archive/laqm/tools.php?tool=background06

² Milton Road – 568 kg pa, Histon Road – 91 kg pa, West Road - 293 kg pa

Cambridge City Council has assessed the biomass combustion plant, and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.3 Domestic Solid-Fuel Burning

There are no significant areas of domestic solid fuel burning in Cambridge City Council district. Therefore, Cambridge City Council does not need to proceed to a detailed assessment related to biomass combustion at this stage.

Cambridge City Council confirms that there are no areas of significant domestic fuel use in the Local Authority area.

7 Fugitive or Uncontrolled Sources

There are no quarrying site, mineral extraction sites, operational landfill sites, coal and material stockyards, materials handling yards or waste management sites in Cambridge. There are major construction sites, but these are typically short-lived.

The City Council, in association with the Cambridge Forum for the Construction Industry, runs a 'Considerate Contractor Scheme' (CCS) designed to ensure that construction and routine maintenance activities in the City area progress without making life unpleasant for people who live and work nearby³. The CCS states that dust and smoke should be kept to a minimum and mud spills should be immediately cleaned up.

In addition, schemes to minimise the production of airborne dust during the construction period will be required by planning condition. Cambridge City Council considers the guidance on dust issues produced by the Greater London Authority (GLA) and the London Councils to be best practice and recommend that developers refer to it. City Council expects to see an Emissions Control plan for every development submitted with the planning application. The plan and the mitigation measures employed should be proportional to the potential impact.

Cambridge City Council confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area.

³ http://www.cambridge.gov.uk/ccm/content/building-control/code-of-good-practice.en

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

The monitoring data show that, apart from the blip in 2010, there has been little change in air quality in Cambridge in the past three years. This can be clearly seen on the graphs in Chapter Two. Air quality is improving in the area around the bus station.

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

Some diffusion tube results within the AQMA show levels of pollution are below the national objectives. They are mostly just under the national objective (>35 μ g/m³) and there is no particular pattern to their distribution, so at this stage Cambridge City Council is not considering re-drawing the boundaries of the AQMA.

8.2 Conclusions from Assessment of Sources

Road transport remains the principal local source of emissions in Cambridge City.

8.3 Proposed Actions

This USA has not identified the need to proceed to a Detailed Assessment for any pollutant, or changes to the AQMA boundary. It has highlighted that a change to the existing monitoring programme is required in the south of the City. The next R&A action will be the 2013 Progress Report.

9 References

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Acknowledgements

Thanks to our many and varied colleagues at Cambridgeshire County Council who provided information and data for this report.

10 Appendices

Appendix A: Monthly Diffusion Tube Data 2011 Appendix B: Biomass Installations in Cambridge Appendix C: Assessment of Biomass Installations for potential to lead to an exceedence of an Air Quality Objective – Calculation Methodology Appendix D: AQAP Update

													Annual	Bias-	
	January	February	March	April	Мау	June	July	August	September	October	November	December	mean	adjusted	Months
1 Emmanuel Street	65.6	66.5	60.4	62.6		38.4		39.8	46.2		59 f	6 45 6	5 54	46	9
3 Macdalene Street	47	7 <u>48</u> 1	50.1	50 1	32.7	37.3	437	' 33 1	28.6	30	a 490) 29 <i>4</i>	1 <u>4</u> -	1 35	12
4 Northampton Street	58 6		62 7	57.5	1/1	47.2	12.6	137	, 20.0	56.9	2 61 F	5 <u>17</u> .	· · ·	3 15	11
5 Silver Street	58 1	58.5	48.5	50.8	41.9	51 9	72.0	38.4	48.3	55 0) 5F	3 43 2	- 50 - 50) 43	11
7 Newmarket Boad 1	64 F	5 65	53.8	53.9	43.2	49.7	30.8	47.5	52.3	49 (587 587	7 59	- 50	, 40 2 44	12
8 Milton Boad*	43 0) 42 1	37.1	35.3	20.8	26.7	22	25.6	27.7	-0.0	5 49 4	1	33	 3 28	11
9 Drummer Street	-0.0	1 53.6	59.7	/00.0	32.0	32.0	37 /	30	30.0	/1.9	s 5/ 1	, 36 (S 19	, <u>2</u> 0 3 36	12
10 Gilbert Boad	/1 0	+ 00.0 A /0	33.7	20 1	17.8	20.7	10.7	· 00	00.0 273	30 4	5 40.0	a 30.0	יד ע ו אנ	, 30) 25	12
11 Latham Boad	26.3	, -0 3 24.8	18.1	17 9	9.1	11	8.2	. <u>20.2</u> 12.8	. 27.0	19 (32 5	5 16 8	R 17	, 20 7 15	12
12 Newmarket Boad 2	20.0	24.0 2 /27	10.1	12.0	28.4	33.0	27	· 12.0	37	10.0	58 F	× 11.	1 30	טי ריב ג	12
13 East Boad	54 6	, 46.7	42.2	65.6	31.6	32.6	3/ /	32.8	, 330	 34	7 17 2) 41) /7/	+ 00 1 /2	, 00 2 36	12
14 Mill Boad	19	× 1/1 2	/15	35.0	22 /	2/	26.3	21.6		36.3	۲۲.۲ ۸۸۶ O	 2	ידי י <u>י</u> ער כ	. 00 1 20	11
15 Hills Boad	55.0	, 11 .2	/19	/8.9	25.4	24.2	/1 9	21.0	, , ,	21		36.	- 0-	, <u>2</u> 3	11
16 Pagant Street	51.0	- 00.4 0 400	40	40.0	20.0	42.0	21.0	0 31.2 0 204	. 32	40	, 7 50 <i>6</i>	30.		/ 34 1 97	10
18 Dombroko Street	51.0		47.7 64.0	40.2	. 30.9 . 46.6	43.2	44.0) 30.4) 447	· 41.9	49.	50.0	7 EAU		F 37	12
20 Elizabeth May	04.0 55 C	5 02.0	51 O	43.7 E1 7	40.0	41.0	44.C	9 44.7		02.0	$5 \qquad 55.7$	0 00 0) 40) 94	10
20 Elizabelli Way	55.5	5 52.7	51.8	51.7	29.4	20.9	27.4	· 29	20.7	40.0) 55.8 I 55.8) 32.4 : 440	2 40 2 40	/ 34 1 37	12
21 Victoria Road	51.4	+ 59.5	53.1	E0 0	37.0	30.0	30.1	27.7	J J J J J J J J J J J J J J J J J J J	50.4	+ 33.0) 44.: 1 95 ⁻	9 44 7 5-	+ 37 • 40	10
22 Madingley Road	04.2	2 00.7	53.1		04.0	41.2	40.9	0 39.3	49.3	52.0	5 /0.4	+ 35.		43	12
	41.1	43.4	34.7	38.7	24.6	27.5	30.2	26.4	24.6	36.3	3 47.2	2 29.	7 32 7 4	+ 29	12
24 Histon Road 1	50.1	I 50.5	42.3			26.7	27.4	33.2	38.5	40.3	54.5	5 43. 5 65.	4	35	10
26 Fen Causeway	47.7	44.7	42.9	33.3	22.8	21.6		22.8	19.5	10.1	59.2	2 25.8	9 34	+ 29	10
27 Trumpington Road	41.9	68.4	39.4	43.6	21.5	26.4	25.5	27.8	30.1	43.9	65.9)	39) 34	11
28 Babraham Road*	37.3	3	29.4	28.8	22.8	28.1	20.1	25.6	25.2	32	2 40.2	2 35.	7 30) 25	11
29 Cherry Hinton Road	46.4	44.8	37.5	37.7	19.2	23.8	21.8	24.2	26.8	34.4	42.5	5 36.8	3 33	3 28	12
30 Arbury Road*	35.3	3 35.5	30.4	29	16.2	21.7	19.1	22.4	21.8	32.2	2 41	28.8	3 28	3 24	12
31 Newnham Road	64.7	7 71.6	60	61.5	43.7		19.1	45.6	53.2	59.1	71.3	3 44.	1 54	46	11
33 Victoria Avenue	59.6	63.8	66	61.1	40.1	36.6	44.3	38.6	43.6	55.3	69.1	39.4	4 51	44	12

Appendix A Monthly Diffusion Tube Data 2011 – microgrammes per cubic metre

Cambridge City Council

34 Parker Street	65	65.9	63.2	64.2	44.8	47	48.1	44.3	48.5	56	67.3	49.7	55	47	12
35 Abbey Road*	44.2	44.2	36.6	33.1	20.5		32.8	24.2	31.3	38.7	53	39.8	36	31	12
36 Cockburn Street	40.3	33.1	29	28.8	17.6	20	17	20.5	20.9	27	35.6	25.5	26	22	12
37 Oaktree Avenue	38.5	36.3	30.1	29.3	15.1	22.5	15.1	20.6	19	27.1	37.6	28	27	23	12
38 Chesterton Road	49.3	46.5	40.6	34.4	24.4	27.5	14.6	13.2	28.4		43.7	41.9	33	28	11
39 Maids Causeway	65.5	57.6	46.9	43.6	36.8		40.3	74.6	43	48.3	58.3	42.4	51	43	11
40 Emmanual Road	68.3	59.5	66	68.2	47.6	52.5	54.2	50	47.4	57.4	58.9	46.1	56	48	12
41 Downing Street	59.1	55.6	63	56.2	33.2	41.7	34.9	40.7	39.5	52.9	58.1	49.6	49	41	12
42 Trumpington Street	52	49.1	42.3	36.6	23.3	28.2	26.9	29.4	30.3		56.2	41.7	38	32	11
43 Lensfield Road	63.7	57.7	57.8	52.9	36.6	39.3	38.4	35.9	43	52	56	25	47	40	12
44 Park Terrace	54	54.2	47.4	43.8	28.7	36.8	34.3	28.1	36.1	37.1	55.4	22	40	34	12
45 St Andrew's St	81.9	77.1	66.1	68.6		52.1	48.2				75.6	36.1	63	54	8
46 Parkside	51.6	49.1	41.9	31.3	25.8	30.4	28.2	25.9	26.1	38.4	51.1	37.2	36	31	12
47 Gonville 1	56.4	57.6	52	49.1	41.3	44.4	43.2	41.2	45	56	57.2	37.2	48	41	12
48 Gonville 2	54.2	59.2	56.8	47.5	44.9	39.9	37.5	34.4	40.1	52.2	61.9	38.3	47	40	12
49 Gonville 3	51.2	48.9	51	45.1	36.9	42.5	38.8	35.3	45.2	45	56.6	41	45	38	12
50 Hills Road 3 Botanic	60.7		65.8	55.6	42.5	85.7	61	42.2	37.6	40.9	58	34	53	45	11
52 Station Road 2 East - Station	63	50.9	53.5	47.2		40.8	44.6	43.4	46.8	54.3	60.1	47.2	50	43	11
53 Station Road 1 West - Jupiter	57.9	64.7	56.9	53.7	34.5	36.3	35.6	35.4	34.7	46.6	51.3	39.3	46	39	12
54 Tenison Road 1 96	46.4	46.1	41.3	41.5	22.8	27	22.3	24.4	28.9	33.8	50.8	31.6	35	30	12
55 Tenison Road 2 Ravensworth	52.2	47.6	38.3	37	20.9	19.5	45	18.7	24.9		46	38.8	35	30	11
56 Coldhams Lane 2 Silverwood	55.1	47.6	40.6	47.4	26.8	18.1	27.4	27.3	25.3	51	57.7	38.5	39	33	12
2 Histon Road 2 north	46.6	44.2	37.4	39.6	21.4		25.9	26.4	32.5	37.5	55.8	30.5	36	31	11
6 Long Road			54.7	62.3	39.5	45.8	36.5	51.2	49.9	53.7	69.4	60.5	52	44	10
17 Coldhams Lane	54.6	43.7	40.1	42.6	27.1	28.3	25.1	28.1	26.2	37.3	43.6	30.2	36	30	12
19 Huntingdon Road 2 west	53	42.7	39.1	37.6	16.9	28.3	25.2	24.8	25.4	36	51	32.2	34	29	12
25 Barton Road	41	38.9	34.9	32.2	20.8	21.8	20.4	22.3	22.7	31.1	45.4	27.1	30	25	12
32 Hills Road 2 VI form	58.5			48.3	27.4	27.5		27.5	23.6		50.6	33.3	37	32	8

Cambridge City Council

Name of		Application	Installation				Make of			Stack Height
Development	Address	Reference	Date	Grid ref X	Grid ref Y	Boiler /CHP	Appliance	Thermal Output	Fuel Type	(m)
Manor Care	Milton						Tatano		chip or	
Home	Road	07/0328/FUL	2010?	545330	259750	boiler	2213	2 x 150kW	pellet	12
Simon's	Histon						KWB TDS		chip or	
House	Road	09/0494/FUL	2010	544340	259910	boiler	150	150 kW	pellet	12
							Herz			
	Madingley						Firematic			
Vet School	Road	10/0644/FUL	2011	542700	259100	boiler	150	2 x 150kW	pellet	15.5

Appendix B Biomass Installations in Cambridge

Name of Development	Efflux Velocity (m/s)	Volumetric Flow Rate (m3/s)	PM Emission Rate mg/m3	PM Emission Rate g/s	PM Emission Rate g/GJ	NOx Emission Rate g/s	NOx Emission Rate g/GJ	PM Abatement	CCA Compliant (Yes/ No)	in AQMA or distance to AQMA boundary
Manor Care Home	2.8	0.19792* 0.4**	45 max	0.018 also est. 0.066		not known, est. 0.054		no	no	200m
Simon's House	5	0.132		0.0029***	19	0.0117***	78	no	yes	500m
Vet School	2.5			0.0093***	31	0.0387***	129	no	yes	more than 1000m

* from website calculator

** estimate from NIFES

***from calc on P 5-43 of TG(09)

g/GJ x boiler capacity in kW / 1,000,000

Appendix C Assessment of Biomass Installations for potential to lead to an exceedence of an Air Quality Objective – Calculation Methodology

Milton Road PM

Calculate background-adjusted emission rates using procedures set out in Para 5.78.

$$EA = E/(32-G)$$

Where E is the emission rate in g/s and G is the annual average concentrations in microgrammes per cubic metre.

Emission rate of 45mg/m³ supplied from the Biomass Information Form.

Volume Flow Rate taken from NIFES comments 0.4 m³/s

Rate converted to g/s thus: $45/1000 \times 0.4 = 0.018$ g/s

G taken from 2008 Background Maps (17.9234)

EA = E/(32-G) EA = 0.018/(32-17.9234) EA = 0.0013

Using Nomogram in 5.19, Effective Stack Height of 12m and Diameter of 0.3 metres (supplied from the Biomass Information Form), a threshold emission rate of 0.007 is calculated. As EA is smaller than the threshold emission rate, there is no requirement to proceed to a Detailed Assessment.

An alternative given emissions rate of 0.066g/s (from information in an assessment carried out by Northumbrian Water Scientific Services) gives the following calculation:

EA = E/(32-G) EA = 0.066/(32-17.9234) EA = 0.0047

As EA is smaller than the threshold emission rate, there is no requirement to proceed to a Detailed Assessment.

Milton Road NOx

Calculate background-adjusted emission rates using procedures set out in Para 5.81 (annual mean) and 5.84 (1-hour mean).

Annual mean calculation:

$$\mathsf{E} A = \mathsf{E} / (40 - \mathsf{G})$$

Where E is the emission rate in g/s and G is the annual average concentration in microgrammes per cubic metre.

Emission rate of 0.054g/s (from information in an assessment carried out by Northumbrian Water Scientific Services) gives the following calculation:

$$EA = E/(40-G)$$

 $EA = 0.054/(40-18.77425)$
 $EA = 0.0025$

Using Nomogram in 5.20, Effective Stack Height of 12m and Diameter of 0.3 metres (supplied from the Biomass Information Form), a threshold emission rate of 0.002 is calculated. The EA is just larger than the threshold emission rate.

Hourly mean calculation:

$$EA = 40E/(200-2G)$$

Where E is the emission rate in g/s and G is the annual average concentration in microgrammes per cubic metre.

Emission rate of 0.054g/s gives the following calculation:

Using Nomogram in 5.21, Effective Stack Height of 12m and Diameter of 0.3 metres (supplied from the Biomass Information Form), a threshold emission rate of 0.09 is calculated. As, the EA is smaller than the threshold emission rate of 0.09, there is no requirement to proceed to a Detailed Assessment.

Histon Road PM

Calculate background-adjusted emission rates using procedures set out in Para 5.78.

EA = E/(32-G)

Where E is the emission rate in g/s and G is the annual average concentrations in microgrammes per cubic metre.

Emission rate of 0.0029 g/s calculated from g/GJ data supplied in the Biomass Information Form - conversion factor in TG(09).

G taken from 2008 Background Maps (18.29027)

EA = E/(32-G) EA = 0.0029/(32-18.29027) EA = 0.00023

Using Nomogram in 5.19, Effective Stack Height of 12m and Diameter of 0.3 metres (supplied from the Biomass Information Form), a threshold emission rate of 0.007 is calculated. As EA is smaller than the threshold emission rate, there is no requirement to proceed to a Detailed Assessment.

Histon Road NOx

Calculate background-adjusted emission rates using procedures set out in Para 5.81 (annual mean) and 5.84 (1-hour mean).

Annual mean calculation:

$$\mathsf{E} A = \mathsf{E} / (40 \text{-} \mathsf{G})$$

Where E is the emission rate in g/s and G is the annual average concentrations in microgrammes per cubic metre.

Emission rate of 0.0117 calculated from g/GJ data supplied in the Biomass Information Form - conversion factor in TG(09).

G taken from 2008 Background Maps (19.59756)

Using Nomogram in 5.20, Effective Stack Height of 12m and Diameter of 0.3 metres (supplied from the Biomass Information Form), a threshold emission rate of 0.002 is calculated. As EA is smaller than the threshold emission rate, there is no requirement to proceed to a Detailed Assessment.

Hourly mean calculation:

Emission rate of 0.0117g/s gives the following calculation:

EA = 40E/(200-2G) EA = 40 x 0.0117/(200-(2x19.59756)) EA = 0.003

Using Nomogram in 5.21, Effective Stack Height of 12m and Diameter of 0.3 metres (supplied from the Biomass Information Form), a threshold emission rate of 0.09 is calculated. As, the EA is smaller than the threshold emission rate of 0.09 there is no requirement to proceed to a Detailed Assessment.

West Road PM

Calculate background-adjusted emission rates using procedures set out in Para 5.78.

$$EA = E/(32-G)$$

Where E is the emission rate in g/s and G is the annual average concentration in microgrammes per cubic metre.

Emission rate of 0.0093 g/s calculated from g/GJ data supplied in the Biomass Information Form - conversion factor in TG(09).

G taken from 2008 Background Maps (19.71724)

Using Nomogram in 5.19, Effective Stack Height of 12m and Diameter of 0.3 metres (supplied from the Biomass Information Form), a threshold emission rate of 0.01 is calculated. As EA is smaller than the threshold emission rate, there is no requirement to proceed to a Detailed Assessment.

West Road NOx

Calculate background-adjusted emission rates using procedures set out in Para 5.81 (annual mean) and 5.84 (1-hour mean).

Annual mean calculation:

$$\mathsf{E}A = \mathsf{E}/(40\text{-}\mathsf{G})$$

Where E is the emission rate in g/s and G is the annual average concentration in microgrammes per cubic metre.

Emission rate of 0.0387 calculated from g/GJ data supplied in the Biomass Information Form - conversion factor in TG(09).

G taken from 2008 Background Maps (18.66475)

As EA is smaller than the threshold emission rate of 0.02, there is no requirement to proceed to a Detailed Assessment.

Hourly mean calculation

Emission rate of 0.0387g/s gives the following calculation:

The EA is smaller than the threshold emission rate of 0.09. Therefore, there is no requirement to proceed to a Detailed Assessment.

Appendix D: AQAP Update Introduction

This is the third year that Cambridge City Council is reporting on the updated Air Quality Action Plan. The update contains the headline indicators reported on previously, comments on progress and an overview of the current position.

In addition, an update is now provided of the actions listed in the Air Quality Action Plan 2008 (ref). The overview from this table shows that many of those actions that were already in place or scheduled into work programmes have been completed and/or are ongoing or established.

Most of our efforts in the last year have focussed on continuing with actions that are known to improve air quality. In Cambridge City this has involved keeping a close eye on planning applications and attempting to reach an agreement for PSV emissions improvements in Cambridge, via LTP3 and the second Quality Bus Partnership. At the County Council infrastructure developments including the Addenbrookes Access Road opened in 2010, Cambridgeshire Guided Busway opened in 2011, funding has been obtained for planned Chesterton Railway Station is expected to open in late 2015, £1.7m funding has been obtained from the Better Bus Area Fund and a £5m bid has been made to the Local Sustainable Transport Fund.

Air quality appears to be improving in the area around the bus station as shown in by the Five–year Rolling Means (Figure AppA.1), but is level elsewhere and above the National Air Quality Objectives for nitrogen dioxide in the city centre and on the inner ring road. This reflects the infrastructure improvements made in 2008 in the central part of Cambridge. No improvements to the City Centre infrastructure have been made in the past three years although the County Council has recently obtained $\pounds 1.7m$ funding from the Better Bus Area Fund.

The Better Bus Area Fund programme incorporates bus priority and traffic management measures including enforcement of restrictions, facilities and interchange improvements as well as targeted information and ticketing improvements with the aim of reducing congestion, improving journey times and reliability and increasing accessibility, attractiveness and ultimately bus travel as a mode of choice. These measures will be necessary to bring air pollution below the National Objectives for nitrogen dioxide and will also result in lower levels of particulate matter in central Cambridge.

A bid to the Local Sustainable Travel Fund was made in early 2012 which is aimed at enhancing commuter journeys in two critically important economic corridors in Cambridgeshire by improving links to transport interchanges, transport corridors and employment areas as well as marketing and information initiatives. These measures will be necessary to bring air pollution below the National Objectives for nitrogen dioxide on the inner ring road and at key junctions and will also result in lower ambient levels of particulate matter.

The current Local Transport Plan (LTP3 2011-2026) has indicators on road safety, trends in travel, road and footway condition and environment. Two of these relate to air quality – trends in air quality in AQMAs (NO₂ and PM₁₀) and Air Quality in Cambridge City Centre (reducing emissions from buses, as described in the QBP agreement).

Whilst the main source of air pollution in Cambridge is related to emissions from traffic, data from the Background Maps (2010)⁴ indicates that more than 15% of NOx emissions are from domestic heating sources. Cambridge City Council has a variety of initiatives to reduce domestic emissions from promoting energy efficiency to renewable energy. We continue to promote Government initiatives such as CERT, FiT's and RHI and we are able to provide individual assistance to residents if they need any advice or guidance on these schemes.

The City Council has also introduced a number of focussed projects, for example; partnering with HeatSeekers and Mark Group to provide vehicle based thermal imaging of homes to offer an innovative way to promote and engage with residents about energy efficiency. We have also secured funding to provide free loft and cavity wall insulation to maximise the current CERT scheme before it closes; the Property Accreditation Scheme offers further assistance to improve standards, including energy efficiency, in rented properties.

Cambridge also benefits from an engaged voluntary sector who provide strong links to local residents and assist with promotion. This has fed into work to analyse Green Deal potential and possible partnerships across the whole county. Cambridge Retrofit

⁴ http://laqm.defra.gov.uk/maps/maps2010.html

also provides an opportunity to pull together a wide range of sectors to try and motivate a focussed approach in Cambridge to meet the carbon emission targets of 80% reduction by 2050.

The Cambridge Retrofit Project (part of the national Climate Change Risk Mitigation Project) commenced earlier this year. The Project plans to mobilise occupants, local authorities, business sector, financiers, building owners and managers, developers, national policy officials, educators, technology suppliers and service companies to bring about the complete retrofitting of the existing commercial building stock in the city of Cambridge. It is facilitated in the first year (2012) by the Cambridge Centre for Climate Change Mitigation Research (4CMR) to ensure that the information on which it is based is reliable, and uses the convening power of the University of Cambridge to engage and organise. Cambridge was chosen because Cambridge City Council has developed an ambitious plan for carbon reduction, providing a vision for how Cambridge can play "an exemplary role in the global effort to tackle climate change"⁵.

Together, these initiatives will help to reduce emissions of NOx from buildings and have a positive impact on background levels of NOx across the city.

The next steps

The Air Quality Action Plan now needs to be revised and brought up-to-date. Completed actions and actions that will not take place should be removed. Stakeholders should be revisited to understand how their roles function in the new local authority staffing and funding landscape (both City and County Councils have undergone significant restructuring in the past three years). An Air Quality Action Plan Steering Board is not in place, so this task will fall to the Scientific Team at Cambridge City Council.

⁵ http://sites.google.com/site/cambridgeretrofit/about

Hierarchy of Indicators: 1 Air Pollutant concentrations

As discussed above progress towards obtaining levels of nitrogen dioxide below the National Objectives remains elusive. Table App1 shows that 5 year rolling means at the continuously monitoring sites are level at Regent Street, falling at Parker Street (near the bus station) and rising at Gonville Place. Table App2 and Figure App.1 show that 5 year rolling means are falling around the bus station (Emmanuel Street and Emmanuel Road) and on some radial roads (Victoria Avenue), but stable or rising in other areas (Victoria Road, Downing Street and Maids Causeway). Levels remain above the National Air Quality Objective for annual mean nitrogen dioxide.





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Table App1 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				40 μg/m ³	No
Parker Street	51	54	54	54	54	50				40 μg/m ³	No
Regent Street	44	44	43	44	43	42				40 μg/m ³	No

Table App2 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	53				40 μg/m ³	No
Emmanuel Road	58	57	56	55	55	54				40 μg/m ³	No
Victoria Avenue	52	50	49	48	49	48				40 μg/m ³	No
Victoria Road	45	44	43	43	44	43				40 μg/m ³	No
Downing Street	47	47	47	47	47	46				40 μg/m ³	No
Maids Causeway	46	47	47	47	49	48				40 μg/m ³	No

Hierarchy of Indicators: 2 Direct Effect Indicators

Own Estate

The data for the reduction in NOx and primary PM_{10} emissions through the local authorities' estates is no longer collected (NI194). However, a decrease was reported from 2008/9 to 2009/10 (see Table App3).

Buses

The Air Quality Action Plan targets bus emissions in the City centre as the largest single source of air pollution; the City Council proposed a Cambridge Bus Emissions Reduction Commitment (CBERC) to the Quality Bus Partnership (QBP), requiring a 50% reduction in emissions of nitrous oxides in the central part of Cambridge between the baseline year of 2008 and the final year of the second QBP, 2015.

The calculated reduction in emissions of NOx and PM_{10} from buses in the Cambridge Central Area, based on bus information provided to the City Council, was 42% and 64% respectively in 2011 compared with 2008.

The figures in this report are different from those presented in earlier documents. The Core Area has been extended to include part of Hills Road, Station Road and the CB1 development – because an intensification of bus use is anticipated in this area. The new emission factors, revised to represent more realistic scenarios, are used which has increased the calculated amount of emissions.

The considerable drop in calculated emissions is based on the County Council supplied data that shows a) removal of all pre-Euro and Euro 1 buses from the fleet, b) approximately 50% reduction in the number of Euro 2 buses, c) increase in Euro 3 and Euro 4 buses and d) substantial uptake of Euro 5 buses.

Reduction in Euro 2 journey kilometres and increase in Euro 3 journey kilometres are welcomed, but in practice a substantial number of pre-Euro and Euro 1 PSV remain in service and contribute a significant proportion of emissions.

The target for emissions reductions in the AQMA was set out in the 2012-2015 Cambridge Bus Emission Reduction Commitment. Individual operators have their own targets. Back-stop standards are also included to require the removal of the older vehicles still using the city centre.

Headline emis	sion reducti	ion targets	2008-2015	5				
Year	2008	2009	2010	2011	2012	2013	2014	2015
%NOx emission Reduction	Baseline	10	10	7.5	7.5	5	5	5
Required NOx emissions, grams/wk	430,340	387,386	344,272	311,996	279,720	258,204	236,687	215,170
Actual NOx emissions, grams/wk	430,340			250,913				

Table App3 NOx emissions targets in the Cambridge Core Area - 2008 to 2015

Table App4 Back-stop standards for PSV in the Cambridge Core Area

Back Stop Standard	Implementation Date
94% Euro 2 or better	Current position
100% Euro 2 or better	July 2012
75% Euro 3 or better	Current position
90% Euro 3 or better	December 2012
75% Euro 4 or better	December 2013
90% Euro 4 or better	December 2015

The actual buses in use will require monitoring and enforcement to ensure compliance with agreement made in the second Quality Bus Partnership. The mechanism for this has been included in the CBERC – controlled access to the central area.

The CBERC has been incorporated into the second QBP (2012-2015) and three of the operators have committed to the new partnership, at the time of writing. Some operators have already made improvements to the fleet.

Taxis

The reduction in emissions of NOx and PM_{10} 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 the Annual Traffic Counts carried out for the County Council, which count 12-hour periods and peak-time periods, would not note this increase in vehicle movements. 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 or waiting on double yellow lines and thus narrowing the roads, parking in cycle lanes or driving around the centre of Cambridge looking for a rank. This has resulted in increased congestion, particularly during the last year, in St Andrew's Street without sufficient parking enforcement. Interestingly, Figure 2.4f (Diffusion tubes in the Bus Station area) shows that air quality in St Andrew's Street did not return to the pre-2010 levels, possibly as a result of increased congestion in this street. There is a proposal in the Better Area Bus Fund to remove taxi ranks from St Andrew's Street to decrease congestion, but this is proving to be politically sensitive.

Proposals for an accelerated improvement in taxi emissions are currently out to consultation⁶, with the aim of removing the Euro 3 and Euro 4 taxis sooner than under the current 8-year rule whereby all taxis must be less than 8 years old. Four options are being consulted upon:

Option 1. Status Quo. Under the 8 year rule, Euro 3 vehicles would be phased out completely in 2013 and Euro 4 vehicles would be phased out by 2017. This will lead to a small improvement in air quality.

Option 2. Status Quo for existing fleet; higher standards for newly registered vehicles; newly licensed vehicles must be less than 4 years old and at least Euro 5 standard. This would have a small improvement in air quality.

⁶ http://www.cambridge.gov.uk/ccm/content/consultations/taxi-and-private-hire-age-limit-and-emissions-policy-consultation.en

Option 3. Keep the current age limit policy and include the requirement that by 01 January 2015, a vehicle licence will only be renewed if the vehicle complies with the Euro 5 standard or higher.

Option 4. Improve the standard of new vehicles by requiring that they meet the Euro 5 standard or higher and include the requirement that by 01 January 2015, a vehicle licence will only be renewed if the vehicle complies with the Euro 5 standard or higher.

Removal of Euro 3 vehicles from the taxi fleet and replacement with Euro 4 vehicles would lead to a 14% reduction in emissions of both PM and NOx.

Removal of Euro 3 and Euro 4 vehicles from the taxi fleet and replacement with Euro 5 vehicles would lead to a 96% reduction in emissions of PM and 40% reduction in emissions of NOx.

Modal Shift

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

Traffic levels

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

Hierarchy of Indicators: 3 Indirect Effect Indicators

Congestion

The morning journey time has remained close to 4 minutes per mile from 2008/9 and considerable improvement is required to meet the target set for 2010/11.

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.

Walking

The condition of the surface footways is improving slowly, but the 2010/11 target has not yet been met. The number of hits on WalkIt appears to have stabilised at around 31-32,000 per annum.

App3 Hierarchy of Indicators

HIERARCHY OF INDICATORS											
1 Air pollutant concentrations (District Councils to measure)	1 Air pollutant concentrations (District Councils to measure)										
INDICATOR	TARGET	PROGRESS									
Annual average concentrations of NO ₂ in 2015 at monitoring sites in Cambridge		<u>2011</u>									
 Parker Gonville Regent 	<40 μg/m³	40 48 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 <i>This information is no longer collected.</i>	No Target Set	NOx 15,418kg; PM10 536kg (2008/09) NOx 14,592kg; PM10 473kg (2009/10) - NOx reduction 18.7%; PM10 reduction 11.8 %****									
Reduction in emissions of NO_x from buses in Cambridge Central Area from baseline 2008 - 430,340 grams per week This figure is different from that previously reported because changes to the extent of the Core Area were made in 2010.	50% by 2015	2011 - 250,910 g/wk (42% reduction)									

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Reduction in emissions of PM ₁₀ from buses in Cambridge Central Area from baseline 2008 – 11,861 grams per week This figure is different from that previously reported because changes to the extent of the Core Area were made in 2010	50% by 2015	2011 – 4,293 g/wk (64% reduction)
Reduction in emissions of NO_x from taxis in Cambridge Central Area from Taxis from baseline 2008	50% by 2015	Base line estimated
Reduction in emissions of PM_{10} from taxis in Cambridge Central Area from Taxis from baseline 2008	50% by 2015	Base line estimated
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) <i>This information is no longer collected.</i>	No target set	NOx 15,418kg; PM10 536kg (2008/09) NOx 14,592kg; PM10 473kg (2009/10) - NOx reduction 18.7%; PM10 reduction 11.8 %****
Bus patronage (NI 177) – now known as LTP05	22.5m boardings minimum 2010/11	22.1m (2009/10)*** 22,5m (2010/11)***
Number of cycle journeys (LTP target) – now known as LTP07	Up by 10.6% by 2010/11	16.9 to end March 2010; 19.6 to end March 2011*** 29.7% (8% increase in cycling between 2010 and 2011)
Number of vehicles crossing the Cambridge Radial Cordon (baseline 184,800, 2004) – now known as LTP09	No increase	185,000 – 2009 183,000 – 2010 185,728 - 2011

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Number of vehicles crossing the Cam screenline	No increase	61,000 – 2009 59,400 – 2010 60,860 - 2011
Modal share of journeys to school by private car (NI 198) – reduction from 23.7% in 2007 – now known as LTP08	20% by 2010/11	21.04% (count 2010)*** 20.6% (count 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) NONE (2011) but see text
Number of journey kilometres in Cambridge Core Area made by Euro 2 PSV	To be confirmed	10,428 km (2008) 9,112 km (2009) 3820 km (2011)
Number of journey kilometres in Cambridge Core Area made by Euro 3 PSV	To be confirmed	2,503 km (2008) 2,835 km (2009) 1056 (2011)
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	63 members of Travel for Work Partnership in Cambridge City district employing 37,553 commuters (45 in 2009; 54 in 2010)***
Number of personal travel plans established in Cambridge	No target, report amount	PTP team disbanded; PTP incorporated into Residential Travel Planning.***
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How many sites with S106 funding for air quality projects in Cambridge	No target, report number	CB1, Trumpington Meadows, Glebe Farm, Clay Farm
Number of cars in car clubs in Cambridge	Year on year	6 cars in 5 locations, March 2010 (Streetcar) 15 cars and 1 van in 15 locations, March 2011 (Streetcar)
	increase	21 cars and 1 van in 21 locations, March 2012 (Zipcar)
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 LTP06a	76% by 2010/11	71%*** (2010) 74%*** (2011)
Bus punctuality (NI 178) - the average excess waiting time for frequent services- now known as LTP06b	53s by 2010/11	59s*** (2010) 67s*** (2011)
Journey time in the morning peak hour (NI 167) – now known as LTP10	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***)

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) 2011 data not available
Number of routes generated on Walk-It	Year on year increase	16,124 (2009) 33,061 (2010) 31,903 (2011)

** Figures from LTP2 Progress Report 2008

*** Figures from County Council colleagues

**** Figures from Cambridge Environment Report 2009-1

Table App4 Action Plan Progress

Colour coded:

Turquoise – Managing the Network Green – Lowering Vehicle Emissions Orange – Strategic Planning Purple – Promote Smarter Travel Yellow – Raising Awareness

Blue – actions in place/underway/ongoing

	Air Quality Action Plan Measures										
	Action	Description	Indicator/ Policy	Lead Council	Partners/ Contacts	Timescale	UPDATE ON DELIVERY				
	Managing the network - infrastructure changes										
1	Cambridgeshire Guided Busway	New route from St Ives to Trumpington, mostly on bus-specific land	N/A	Cambridgeshire County Council	Bus operators		OPEN in 2011				
2	A14 improvements	New alignment and improvements Ellington - Fen Drayton Widening of carriageway Fen Drayton - Histon and parallel link at Bar Hill Widening of carriageway Histon - Fen Ditton	Approval of draft Order	Cambridgeshire County Council	Highways Agency	Completion of proposed upgrading by 2015	ON HOLD, parts of schemes may go forward				
3	New Roads	Link between Madingley Road and Huntingdon Road	N/A	Cambridgeshire County Council	City Council, University of Cambridge	Depends on NWC development	NOT IN CURRENT PLANNING APPLICATION				
4	Rail infrastructure	New station at Chesterton	N/A	Cambridgeshire County Council	District Councils, Network Rail	not known	Due to open in late 2015				

5	Low emission zone	Create areas that have lower speed limits, speed reduction methods, traffic restrictions	Core Scheme V	Cambridgeshire County Council	City Council	Ongoing, where appropriate	not going forward
6	Reduction in speed limits	Create new areas of 20mph zones	N/A	Cambridgeshire County Council	City Council	Ongoing, where appropriate	NOT AGREED
7	Cycle City	Provision of new infrastructure and promotion of cycling across Cambridge		Cambridgeshire County Council			Partially completed.
8	Improving City Centre Infrastructure	Re-design bus stops and introduce one way system in bus station area.	Core Schemes IV	Cambridgeshire County Council	City Council	Ongoing	Project completed 2009.
9	Provision of new cycleways	New cycle path from Sawston to Babraham Park and Ride	N/A	Cambridgeshire County Council	SCDC	2009	Completed.
10	Provision of new cycleways	New cycle and footpath Northfield Ave to provide a link to the Guided Bus and a crossing for Kings Hedges Rd	N/A	Cambridgeshire County Council	SCDC and City Council	2008	Completed.
11	Provision of new cycleways	Widening of path on Coe Fen between Newnham and Brooklands Avenue, part of NCN 11	N/A	Cambridgeshire County Council	City Council	2008	Completed.
	Managing the net	work - public transport improvemen	ts				
13	Continuously improving quality o bus services by establishing Quality Bus Partnership	Stricter limits for buses and year-on- fyear fleet improvements Regulated by rising bollard rtransponder entitlement Twice-yearly MOT		Cambridgeshire County Council	Bus companies, QPB Board	90% Euro 3 by January 2011	Second QBP 2012-2015
15	Increase bus patronage	Increase bus customer satisfaction/ bus punctuality		Cambridgeshire County Council	Bus companies	Ongoing	Funds won from Better Bus Area Fund
16	Increasing public transport provision	Higher frequency of buses, during the day and extending service in the evenings and Sundays	LTP, NI177	Cambridgeshire County Council	District Councils/bus operators,/ developers	Ongoing	Bus services about the same; new routes introduced and some routes dropped.
17	Increasing public transport provision	Increase in number of Park and Ride sites, Cowley Road site to be relocated to Milton, other sites to be extended	LTP	Cambridgeshire County Council	District Councils/bus operators,/ developers	Ongoing	Cowley Road site relocated to Milton
18	Increasing public transport provision	Extension of number of Park and Ride operations to include Sunday and off-peak	LTP	Cambridgeshire County Council	District Councils/bus operators	Ongoing	Services operate to 8pm Mon-Sat; to 6pm Sun.

19	Provision of Bus Priority measures	Extension of designated bus lanes planned in the City		Cambridgeshire County Council			NONE AGREED
20	Subsidised public transport	Non-commercial but important routes are subsidised in part	NI177	Cambridgeshire County Council	Bus companies	Ongoing	SUBSIDIES REDUCED
21	Improving bus information provision	Provide Real Time Information at stops. Equipment installed on buses will communicate with on street equipment to indicate exactly when each bus will arrive.	% buses kitted out; % stops with RT signs:	Cambridgeshire County Council	ACIS UK, Bus companies	2004 - Ongoing	93% of Cambridgeshire journeys covered. 146 displays at specific stops and 11 large screen displays. Touch screen information at Busway stops.
22	Improving bus information provision	Provide interactive maps at stops that can be used to find out how to get from one part of the County or City to another using public transport, with details of bus times	% stops with maps: number of users	Cambridgeshire County Council	Bus companies		Street displays already in place in Cambridge with a target of more than 250 by end 2013/14.
	Managing the net	work - demand management					
24	Congestion Charging	Charging at peak hours to enter Cambridge	To reduce vehicle kilometres in Cambridge by 10% on current day levels	Cambridgeshire County Council	Cambridge City Council/ SCDC	Long-term	NOT GOING FORWARD
25	HGV restrictions	HGV access to certain areas limited		Cambridgeshire County Council	Highways Agency	delayed	Staff not in place to carry this measure through
26	Parking Management and Charging	Increase Controlled Parking Zones; Policies to discourage long-term parking in Cambridge centre	N/A	Cambridgeshire County Council	City Council	Ongoing	No significant changes to CPZ in reporting period.
28	Employee Travel Plan (City Council)	Launched in 2008.		City Council	Employees	Ongoing	In place and ongoing.
	Lowering Vehicle	emissions					
31	Improve emissions performance of council fleet	Replacing of older "dirtier" vehicles with newer "cleaner" technologies		All Councils	Fleet manager	Ongoing	Ongoing. 4 vans with start/stop technology on order and 5 vans/light tippers with hybrid drive system.
32	Improve emissions performance of council fleet	Apply to EST for a Green Fleet Review to develop a carbon reduction programme for the vehicle fleet		City Council	Fleet manager		Completed.

33	Improve emissions performance of council fleet	Use of Additives to lower fuel consumption - ChemEcol being trialled at City Council		City Council	Fleet manager	Ongoing	Still in use saving 10% fuel
34	Reduce emissions from council fleet	Introduce a digital web-based tracking system for Council vehicles to more effectively monitor and control fuel efficiency		City Council	Fleet manager		In place. Resulted in significant savings in first year from behaviour management, reducing speeding and unnecessary idling.
35	Reduce emissions from council fleet	Conduct a trial use of a) biodiesel in Council refuse collection vehicles and b) electric powered van		City Council	Fleet manager		5% biodiesel blend currently in use. 3 electric vehicles purchased, 2 currently in fleet. High replacement battery costs.
37	Taxi fleet compliance	Twice-yearly emissions checks made to all taxis operating within district 8 year age limit		City Council	Licensing / Taxi fleets	Ongoing	Ongoing
38	Reduce emissions from taxis	Investigate with partners introduction of carbon dioxide vehicle emissions standards in respect of Taxi Licensing Functions.		City Council	Licensing / Taxi fleets	2009 - 10	At consultation stage.
40	Establish Freight Quality Partnership	Set up partnership with freight organisations to encourage better environmental practices		Highways and Acces, Cambridgeshire County Council	Highways Agency Supermarkets Haulage companies		Staff not in place to carry this measure through
41	Parking Management and Charging	Variable Parking Charges - car parks and residential permits - depending on emissions		City Council	Parking Contractors, NCP		Not going forward.
43	Encourage uptake of low emission vehicles	Install electric charging points for vehicles in City Council car parks		City Council	Parking Contractors, NCP	Parking Contractors, NCP etc	INSTALLED
44	Road-side testing of exhaust emissions	Spot checks by the roadside (with the aid of police officers) or at car parks. Ensure that pollution from vehicle exhausts is minimised.	N/A	City Council	VOSA / Police Highways Agency	Ongoing	Poor infrastructure to enable checks to be carried out safely (Cambridge). Staff not in place to carry this measure through
	Lowering Emission	ns from Buildings - commercial/indu	ustrial/public				
46	Energy Efficiency Audit of Council property	Improved energy management		City Council	Property and Building Services/ Estates		Audits carried out in 2009 of Community Centres, Car Parks and Toilets, Pools and Leisure Centres.

48	Improved energy performance of public sector administrative and community buildings	Undertake energy assessements and introduce Display Energy Certificates at required Council buildings		City Council, Property and Building Services	Property and Building Services/ Estates		Completed.		
49	Improved energy performance of public sector administrative and community buildings	Installation of energy-saving measures, automated energy monitoring systems, energy eficiency measures		City Council	Property and Building Services/ Estates		More energy efficient lighting, boilers, hand-dryers installed in some buildings - part of Carbon Management Plan 2011- 16.		
50	Improved energy performance of new build	Requirement for high sustainability standards for new schools and other buildings	City Council Local Plan 3/1	City Council	Development Control		Ongoing.		
	Lowering Emissions from Buildings - domestic								
52	Home Energy Strategy	Objectives and tasks to increase the efficient use of energy in existing homes in Cambridge		City Council	Energy Efficiency Officers		None known Incorporated into Housing Strategy		
53	Affordable Warmth Policy	Eradication of fuel poverty in all households where reasonably practicable by 2016 - some specific measures for private and public sector housing Provide free and impartial energy efficiency advice to all local residents.		City Council	Energy Efficiency Officers		None known Incorporated into Housing Strategy		
54	Improved energy performance of private sector housing	Develop partnerships with external organisations to assist with the delivery of affordable warmth in the private sector. set up a second Energy Action Zone; offer a free SAP energy inspection and certificate to members of the Landlord Accreditation Scheme; grants to low income and elderly residents.		City Council	Community Services/Housi ng Teams, Home Improvement Agency Service		Partnerships developed, e.g., Heatseekers, Cambridge Home Insulation Scheme. Working with local volutary groups, University and local small businesses. Also some grant fundining for energy efficiency measures for private landlords. Currently investigating opportunities for Green Deal, with LA partners.		

55	Improved energy performance of public sector housing	Improve the energy efficiency of council owned housing stock by continuing to invest via the Decent Homes programme and external funding - loft insulation, cavity wall insulation and heating systems; dry- lining; renewing old bathrooms and kitchens and replacing old boilers.		City Council	Community Services/ Housing Teams	Ongoing	Decent Home programme completed.
56	Improved energy performance of new build housing	Requirements for 10% or 20% renewable energy source (depending on size), high Sustainable Homes code levels	Local Plan Policy 3/1	All Councils	Development Control	Ongoing	Ongoing
	Strategic Planning	I					
61	Involvement in regional development plans (RSS)	RSS is high level strategy with policies that seek to accommodate rapid growth in the region whilst protecting the environment.		County Council	District Councils	2001 - 2021	No longer in place since 2010
62	Local Transport Plan	LTP2 includes transport programme of schemes to improve transport facilities, reduce road accident casualties, and provide some additional capacity		County Council	District Councils	2006 - 2011	Minor improvements in air quality under 2nd LTP (bus station area in Cambridge). New plan in place, LTP3 2011-2026.
63	Long Term Transport Strategy	LTTS links the LTP2 programme to the Growth Agenda, and sets out overall programme of funding that will be required to deal with the transport demand of new development	N/A	County Council	District Councils	2006 - 2021	Superceded by 3rd Local Transport Plan
64	Cambridge Local Development Framework	Identify opportunities in the LDF to require new homes to meet the Code for Sustainable Homes Level 3, to increase used of renewable and locally generated energy, minimise trafffc generation and promote public transport, cycling and walking		City Council	Development Control and Planning Policy	2009 -10	Incorporated into Local Plan. Ongoing.
66	Air quality policy in Local Development Documents	Sets out requirements for air quality assessments for planning applications	Local Plan section 4/14 AQMA	City Council	Environmental Services	Ongoing	Ongoing work.
67	Sustainable Design and Construction Document	Sets out standards for construction in terms of insulation and lower energy use etc	N/A	City Council	Sustainable City	Ongoing	Ongoing work.

68	Production of Supplementary Planning Documents	Sets out requirements for air quality assessments for planning applications		City Council	Environmental Services Development Control	Ongoing	In place
69	Production of Supplementary Planning Documents & guidance	Possibility of SPD to set out requirements for RTP	None known	County Council	District Councils	2008/9	Not in place, nor in the pipeline.
70	Workplace provision of cycle facilities	Cycle Parking standards in Local Plan/LDF	Local Plan Policy 8/6	City Council	Transport Policy	Ongoing	In Place
71	Incorporate cycling and walking into Land Use Planning	S106 agreements. Development briefs, Area Transport Plans, Local Transport Plan, Cambridgeshire Structure Plan	Local Plan Policy 8/4, 8/5	All Councils	Development Control	Ongoing	In Place but only 0.5 FTE post to cover all cycling/walking work (formerly 1.0 FTE)
	Development Con	trol		•		• •	
74	Policies on development affecting an AQMA	New development not permitted to adversely impact AQMA or proposed users	Local Plan section 4/14	City Council	Development Control	In place	In Place
75	Introduction of Car Clubs	Occasional access to a car without need to own, initiated with S106 funds		City Council	Development Control	Ongoing.	Car Club in Place in Cambridge with 20+ vehicles
76	Residential Travel Plans	Required for all new developments over a certain size	N/A	City Council	Development Control	Ongoing.	Required for development that require a Transport Report - more than 10 dwellings or larger than 0.5 Ha
77	Car Parking Standards	Maximum levels of car parking permitted for various types of development in different areas of the City.	Parking Standards in Local Plan.	City Council	Development Control	In Place	ONGOING
79	Improve cycle parking facilities	Work with Cambridge Cycling Campaign to prepare a new design guide for cycle parking in residential areas		City Council	Cambridge Cycling Campaign		Produced in February 2010

80	Cycle Parking Standards	Minimum requirements in terms of cycle parking provision for new developments and change of use.	Parking Standards in Local Plan	City Council		In place	ONGOING
	Promote Smarter	Travel Choices					
82	Residential Travel Plans	Required for all new developments over 80 dwellings. Districts set own requirements.		Cambridgeshire County Council	Development Control, developers		Draft guidance produced and available from County Council.
83	Personalised Travel Plans	PTP Arbury Park (new development) providing personal travel planning and sustainable travel advice to each household	None known	Cambridgeshire County Council	SCDC, Highways Agency	2008	No longer carried out by County Council
84	Travel for School	The primary objectives of the "Travelling to School Initiative" (TTSI) are to improve road safety for children and reduce dependence on the car by promoting walking, cycling and public transport as more responsible, accessible and desirable alternatives for the home to school journey. Includes 'Bikeability' new national standard	NI 198	Cambridgeshire County Council	Development Control, Safer Routes for School	Ongoing	Replaced by Safer Routes to School project to to identify issues that prevent or discourage walking or cycling to school. Safer Routes can help provide various engineering measures including dropped kerbs, signs, lines, new footpaths, cycle paths, guard railings, gates, accesses, cycle parking, scooter parking, covered waiting areas, or assist in the setting up of a Walking Bus or Park and Stride scheme.
85	Travel for Work plans	Required for all non-residential planning applications that require a Transport Assessment.	none known	Cambridgeshire County Council	Development Control	Ongoing	Ongoing
86	Travel for Work plans	Membership of Cambridgeshire Travel for Work partnership encouraging existing employees to travel to work	N/A	All Councils	Local organisations and companies	Ongoing	Good progress with 63 employers (37,553 commuters)
87	Encouraging car- sharing	Promotion and information about online car-sharing system - Camshare - for businesses and residents, particularly focussing on rural and congested areas. Also school staff.	Number of sign-ups and matches made	Cambridgeshire County Council	TfW partnership, residents		No longer carried out by County Council

88	Encourage bus use	Take the Bus project - promotion of the bus as an alternative to the car and provision of incentives to encourage bus travel, Taster Day and Radio Campaign	NI177	Cambridgeshire County Council			No longer carried out by County Council
89	Encourage cycle use	Adult Cycle Training		Cambridgeshire County Council			No longer carried out by County Council
90	Encourage cycle use	PushChair Scheme - cycle into town, park your bike and borrow a pushchair for free from Park Street and Grand Arcade cycle parks	N/A	City Council	Parking Services, Station Cycles, Bicycle Ambulance	Ongoing	In place
91	Publicise walking routes	County target based upon number of promotional campaigns each LA takes part in per year		All Councils			No longer carried out by County Council; may get picked up by Local Sustainable Transport Funds, if awarded
92	Publicise walking routes	Cambridge Street Signage Project.		Cambridgeshire County Council and Cambridge City Council		Ongoing	Signs in Place
93	Publicise walking routes	Walk-it	Number of queries	Cambridgeshire County Council and Cambridge City Council	Walk-It	Ongoing	Over 30,000 hits on Cambridge WalkIt per annum (2010 and 2011)
94	Publicise existing and new cycle and highway schemes	Online interactive maps on website	N/A	City Council	Sustainable City and Transport Policy	Ongoing	Downloadable maps available, and interactive map via Cycle Street Journey Planner.
95	Promotional campaigns on Health Benefits of cycling and walking	Carried out through School Travel Plans	N/A	Cambridgeshire County Council			No longer carried out by County Council; schools prepare their own Travel Plans
96	Encourage occasional/casual cycling	Consider Community Bike Hire Scheme		City Council	Sustainable City and Transport Policy	To be decided	Not in place, nor in the pipeline.
97	Encourage better bus provision	Encourage bus companies to provide better bus services into Cambridge on Sunday		City Council	County Council	Ongoing	Some services have improved.
98	Discourage car purchase	Extend Car Club scheme and introduce low carbon vehicles		City Council	Street Car	Ongoing expansion of scheme to meet demand	StreetCar now taken over by ZipCar, which now has 21 cars and 1 van in 21 locations across Cambridge. Low carbon vehicles have not been introduced.

99	Publicise sustainable travel	Promote EST's free Green fleet advice service	N/A	City Council	Sustainable City	2008 - 9	Ongoing			
100	Annual Bike Week	Activities to raise awareness of cycling benefits	N/A	City Council	Sustainable City and Transport Policy	Ongoing	Ongoing			
	Raising awareness									
102	Development of Climate Change Strategy and Action Plan	Climate Change Officer in Place, Climate Change Charter launched October 2007.	N/A	City Council	All Departments		Ongoing. All Climate Change and Carbon Management activities now under one team (Environment Strategy Group and Carbon Management Board)			
103	Annual Green Team Week	Annual Green Team Week	N/A	City Council	Sustainable City		Replaced by Climate Change champions, but not currently active.			
104	Switch Off week	Switch Off week	N/A	City Council	Sustainable City	Ongoing	No longer in place			
105	Environment Festival	Environment Festival	N/A	City Council	Sustainable City	Ongoing	No longer in place			
106	Cambridge Carbon Footprint	Community-based project aims to educate local people about their personal contribution to climate change	N/A	City Council	Sustainable City	Ongoing	Ongoing			
107	Energy 4 Good scheme	Grants towards costs of installation of renewable energies	N/A	City Council	Sustainable City	Ongoing	Replaced by externally funded RHI and FIT			