

Air Quality Review and Assessment

Cambridgeshire Local Authorities
Progress Report 2008



East Cambridgeshire
District Council



Executive Summary

This Report constitutes the 2008 Air Quality Review and Assessment Progress Report for Cambridge City Council, East Cambridgeshire District Council, Fenland District Council, Huntingdonshire District Council and South Cambridgeshire District Council.

The Report includes air quality monitoring data from 2007 and makes predictions for the future for certain air pollutants. It also covers other issues and developments that have occurred in the last twelve months that may have a bearing on local air quality.

Cambridge City Council has found no consistent pattern of a rise or fall in levels of NO₂ or PM₁₀ over recent years. The overall trend remains fairly flat. It appears that traffic and population growth in Cambridge are maintaining pressure on the Air Quality Objectives for those key pollutants.

The number of dwellings in Cambridge is due to rise by approximately a third by 2016 and continues to be an economic success. Whilst it is hoped that measures proposed in the action plan related to its AQMA will stabilise the recent decline in air quality, City Officers acknowledge that this will be difficult given the limited powers at their disposal.

East Cambridgeshire District Council has found that Air Quality Objectives are likely to continue to be met throughout its area and so will next report findings with its progress report in April 2009.

Continuous monitoring of AQMA sites within Fenland has improved over the year. Despite low data capture at Wisbech for PM₁₀ and NO₂, the data capture for SO₂ was very good and the continued absence of any SO₂ exceedance at Lynn Road is very promising. The installation of one of the scrubbers at the Premier Foods site has already made a large improvement in both PM and SO₂ emissions. Further assessments are being progressed with regard to the traffic PM₁₀ in the Air Quality Management Area.

Passive monitoring has been problematic throughout 2007 and has yielded no reliable data. Further monitoring is necessary so that the action plan can be further developed for the Wisbech NO₂ AQMA.

Huntingdonshire District Council has found that Air Quality Objectives are likely (to continue) to be met in areas outside those already declared as AQMAs. Three of the four AQMAs were enlarged in 2007 following recommendations from the Further Assessment exercise completed in 2007.

South Cambridgeshire District Council has recently completed a detailed assessment for PM₁₀ along the A14 corridor. The results of the detailed assessment show that it is necessary to declare an AQMA for PM₁₀ based on exceedences of the daily mean objective at the Bar Hill and Impington continuous monitoring stations adjacent to the A14. A consultation exercise was carried out in March and April 2008, resulting in agreement of the proposed AQMA boundary. Monitoring undertaken by South Cambridgeshire District Council during 2007 has shown that within the proposed AQMA the daily mean PM₁₀ objective continues to be exceeded

For NO₂, the annual mean objective was exceeded at the continuous monitoring site at Impington. This site is located within the existing AQMA for NO₂.

An air quality action plan focussing on reduction of PM₁₀ and NO₂ concentrations along the A14 is currently in progress in liaison with Cambridgeshire County Council, Huntingdonshire District Council and Cambridge City Council. It is anticipated that this will be completed in the summer of 2008.

South Cambridgeshire District Council has received a planning application for the new town of Northstowe. As part of the determination, the Council is considering the implementation of a low emission strategy that will seek to reduce emissions to the air from potential sources within the development and associated transport. In addition, South Cambridgeshire District Council has received notification of the upgrade of the A14 by Costain/Skanska. This project will involve the widening of sections of the A14 around Cambridge City to three lanes, which may have a significant positive impact on air quality within the district.

Within the administrative area of Cambridgeshire County there are proposed large-scale traffic schemes, which are likely to have an affect on air quality in the future. Although still at formative stages the schemes are discussed further.

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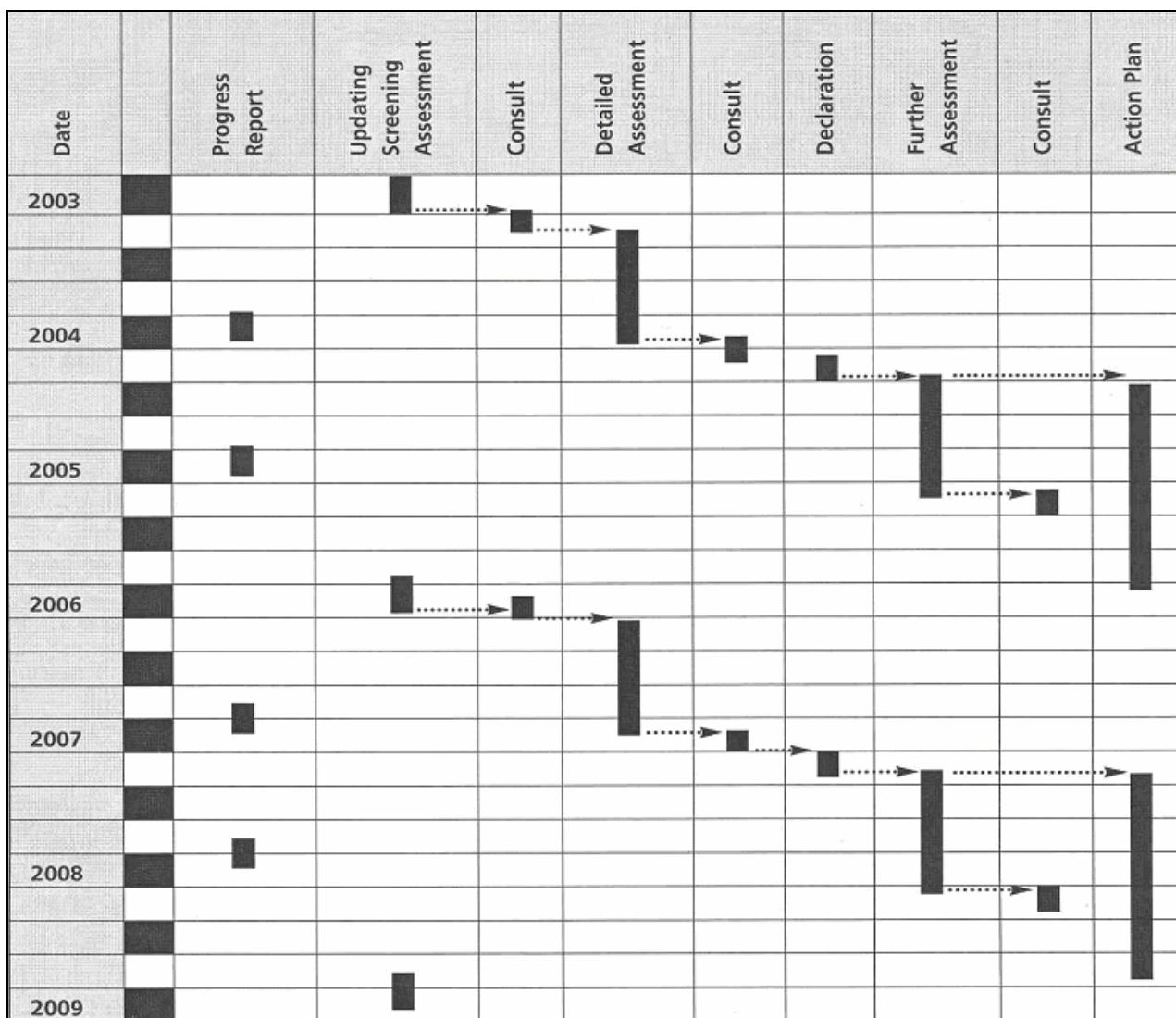
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1. Introduction

Local Authorities within the administrative area of Cambridgeshire have been jointly reporting findings, as required under the Environment Act 1995, since the introduction of the current Air Quality Management regime in 1996.

Joint reports have been submitted to, and accepted by, the Government as required. The timetabling and nature of the reports are shown in Figure 1 below. These reports have been used to inform statutory consultees and others about local air quality.

Figure 1. LAQM timetable



Reporting on the third 'round' of review and assessment began in April 2006 with the submission of the Updating and Screening Assessment (USA). The USA concluded that in East Cambridgeshire, Cambridge City and Huntingdonshire there was no evidence that there had been exceedences of any of the objectives in areas not already declared as AQMAs. It further concluded that there were no risks to the objectives in South Cambridgeshire in areas that were not already being subjected to Detailed Assessments (DAs). It also concluded that in Fenland there were risks of the NO₂ annual mean objective and the 24 hour mean PM₁₀ objective being exceeded in additional areas.

The 2006 USA, 2007 Progress Report and all previous AQR&A Reports, can be found using the following link:

<http://www.huntsdc.gov.uk/Environment+and+Planning/Air+Quality>

There are Air Quality Objectives for seven pollutants measured over different averaging periods and these are shown overleaf in Figure 2.

This report represents the first progress report of the third round of Air Quality Review and Assessment, and it's purpose is to inform on monitoring data gathered during the last calendar year and on any changes that occurred in that year that may influence local air quality.

All the pollutants with Air Quality Objectives have been considered but lead, carbon monoxide and 1,3 butadiene have not been reported as there is no indication that the objectives are at risk. The National Monitoring Network data has not suggested that any of these objectives are likely to be contravened.

Figure 2. Current UK Air Quality Objectives applying to Local Authorities in England

Pollutant	Objective	Measured as	To be achieved by
Benzene	16.25 µg/m ³	Running annual mean	31 Dec 2003
	5 µg/m ³	Annual mean	31 Dec 2010
1,3-Butadiene	2.25 µg/m ³	Running annual mean	31 Dec 2003
Carbon monoxide	10.0 mg/m ³	Maximum daily running 8 Hour mean	31 Dec 2003
Lead	0.5 µg/m ³	Annual mean	31 Dec 2004
	0.25 µg/m ³	Annual mean	31 Dec 2008
Nitrogen dioxide	200 µg/m ³ Not to be exceeded more than 18 times per year	1 hour mean	31 Dec 2005
	40 µg/m ³	Annual mean	
Particles (PM ₁₀) (gravimetric)	50 µg/m ³ Not to be exceeded more than 35 times per year	24 hour mean	31 Dec 2004
	40 µg/m ⁻³	Annual mean	31 Dec 2004
Particles (PM _{2.5}) (gravimetric)	25 µg/m ⁻³	Annual mean	2020
	15% reduction at urban background sites	Annual mean	2020
Sulphur dioxide	266 µg/m ³ Not to be exceeded more than 35 times per year	15 minute mean	31 Dec 2005
	350 µg/m ⁻³ Not to be exceeded more than 24 times per year	1 hour mean	31 Dec 2004
	125 µg/m ³ Not to be exceeded more than 3 times per year	24 hour mean	31 Dec 2004

2. New Monitoring Results

2.1 Cambridge City Council

2.1.1 Nitrogen Dioxide

Cambridge City Council had five chemiluminescence analysers in service in 2007. Three monitors are supplied and serviced by Casella Measurement (ML9841B NO-NO₂-NOx chemiluminescence analysers); two monitors are supplied and serviced by Thermo Environmental Instruments Inc (Model 42c NO-NO₂-NOx chemiluminescence analysers).

All five continuous monitors are roadside sites. The monitor at Regent Street is situated at the offices of Cambridge City Council Environmental Services Section. 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 monitor at Montague Road was commissioned in April 2007. It replaced the monitor that was formerly located in Silver Street. Data capture was more than 90% at all sites.

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

The national objectives for NO₂ are regularly exceeded at Regent Street, Parker Street and Gonville Place. Comparison of the data over the last five years (Figures 3 and 4) shows a fairly flat trend of the overall mean in Newmarket Road and Regent Street and an overall increase in Gonville Place and Parker Street in 2005 and 2006, dropping slightly in 2007. Levels in Gonville Place suddenly increased in 2005, possibly related to works at the site that involved removal of a wide, solid gate that may have been a partial barrier to air pollution from the adjacent road. The gate has not yet been replaced as works at the site are ongoing. Only one hourly exceedence for NO₂ was reported in 2007; this was at Regent Street. The new site at Montague Road has had good data capture. The reported annual mean of 28 µg/m³ is well below the national objective, although modelling for the Detailed Assessment showed that NO₂ levels in this part of Cambridge were likely to exceed the national objectives. This may in part be related to the siting of the monitor, which is discussed below.

Figure 3. Continuous monitoring results for Nitrogen Dioxide with capture rates, 2002 – 2007 ($\mu\text{g m}^{-3}$)

	Annual mean 2002	Data capture %	X	Annual mean 2003	Data capture %	X	Annual mean 2004	Data capture %	X	Annual mean 2005	Data capture %	X	Annual mean 2006	Data capture %	X	Annual mean 2007	Data capture %	X
Parker Street	46	95	1	53	90	1	49	91	0	44 ¹	83	0	65 ²	88	1	54	97	0
Gonville Place	37	80	0	39	95	0	35	92	0	48	95	9	49 ³	80	3	41	94	0
Regent Street	42	99	1	46	99	1	42	97	0	45	98	0	45	90	1	42	90	1
Newmarket Road		47	0		56	1	33	64	0	30	99	0	31	98	0	33	99	0
Montague Road ⁴																28	94	0

1 Adjusted because of low data capture

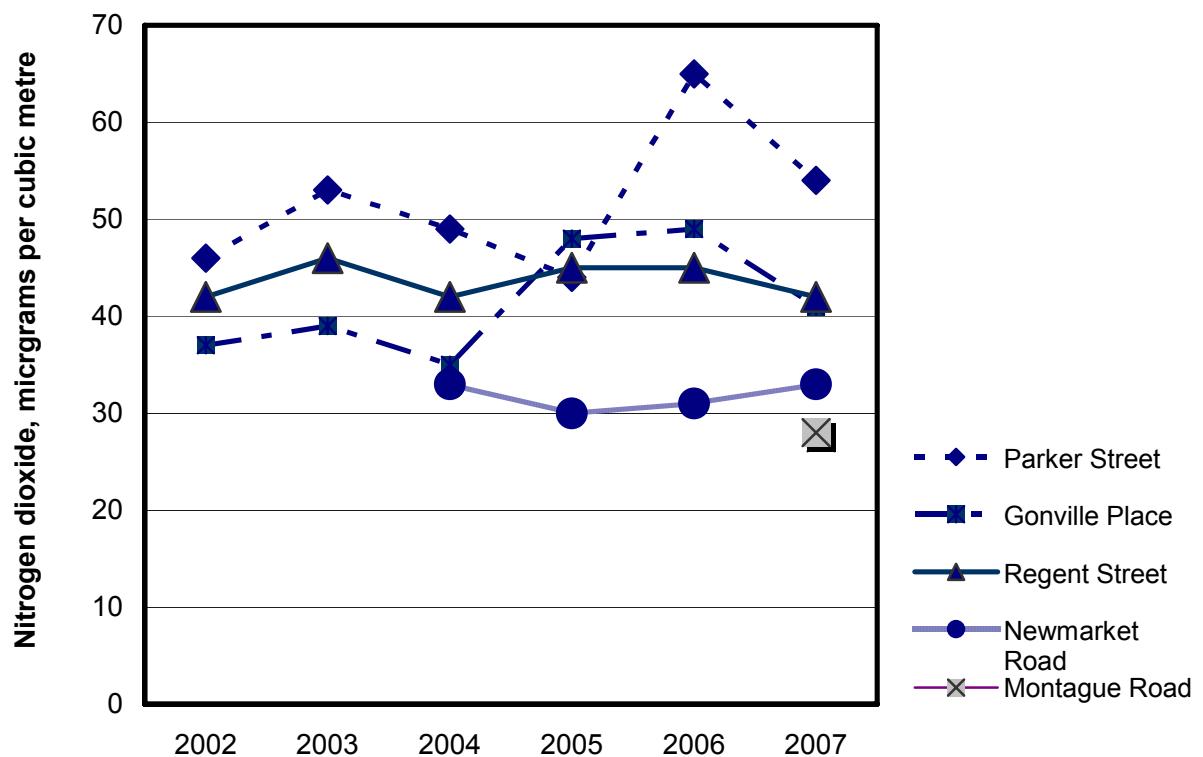
2 Adjusted because of low data capture

3 Adjusted because of low data capture

4 Site installed 18th April 2007

X = number of hourly exceedences

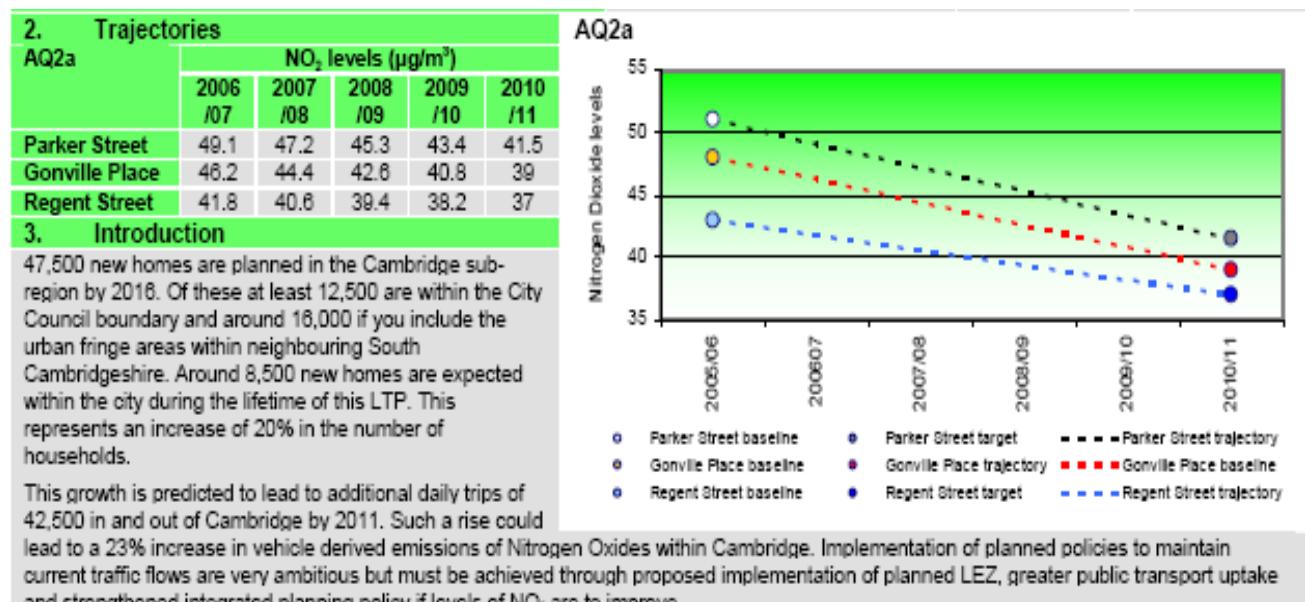
Figure 4. Comparison of annual means at continuous monitoring sites, 2002 - 2007



Local Transport Plan targets

Pollution levels in Parker Street and Regent Street are not yet on track to meet the targets set in the Local Transport Plan (Figure 5).

Figure 5. Air Quality trajectories in Cambridgeshire County Council LTP



(Table reproduced from the LTP: AQ2a (LTP8) AQ2b Cambridge Air Quality, p186)

Diffusion tube co-location study at Montague Road

One of Cambridge City Council's chemiluminescence analysers was relocated to the end of Montague Road adjacent to Elizabeth Way, the inner ring road, which has high levels of traffic. Modelling for the Detailed Assessment in 2004 showed that NO₂ levels in this part of Cambridge were likely to exceed the national objectives. However, Montague Road is a long straight road of semi-detached houses running approximately east-west, and it was considered possible that the prevailing westerly wind funnelling up the road might decrease the NO₂ levels measured at the analyser. For the eight months of data recorded in 2007 an annual mean of 28 $\mu\text{g}/\text{m}^3$ was calculated, well below the national objective.

Figure 6. Views along Montague Road, looking east (top), looking west (bottom).



To assess how representative the results from this analyser are of this section of Elizabeth Way, six NO₂ diffusion tubes were placed in the vicinity. One tube was co-located with the analyser, two were placed less than 50m to the north and south of it; and the other three were similarly spaced on the opposite side of Elizabeth Way (see Figure 7). Data were collected monthly from May to October 2007 (Figure 8). A complete data set was obtained from Tubes 1 and 2, but only five months data from Tubes 4, 5 and 6. The lower values obtained from Tube 2 confirm that the location of the continuous analyser under-represents NO₂ levels on this section of Elizabeth Way.

Figure 7. Diffusion tube locations around Montague Road



Figure 8. Monthly NO₂ (µg/m³) from the diffusion tubes at Elizabeth Way

Tube	May	June	July	August	September	October
1	61.1	39.4	46.8	53.7	55.1	58.4
2	41.0	22.2	23.3	30.8	39.1	49.5
3	47.8		30.0	39.9	1.2	
4	65.9	57.8	50.2		68.1	88.3
5	57.9	52.1	33.1	63.4		77.3
6	48.4	53.0	45.4	56.7		75.6

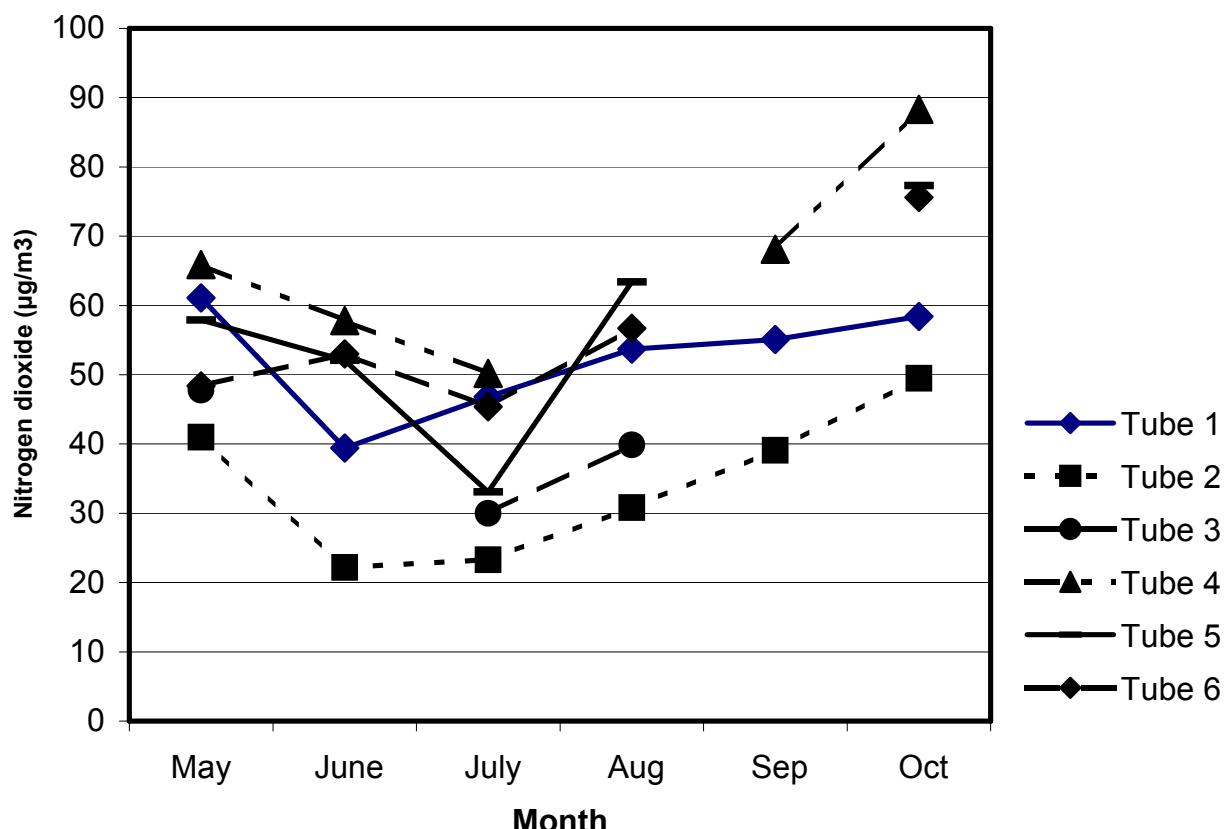
The data were examined to derive an ‘adjustment factor’ so that the data from the continuous monitor could be adjusted to provide a better estimate of the actual NO₂ levels in the area around this section of Elizabeth Way. A number of approaches could be taken to derive this factor and they are outlined below.

The data

Plotting the data (Figure 9) shows that Tube 2, the one co-located with the analyser, consistently gave the lowest reading, and Tube 4 consistently gave the highest (except for August when no value was recorded). Four results were obtained from Tube 3, of which one was discarded from the analysis because it was very low. The three remaining values for Tube 3 were all the second lowest of the month.

Approach One. The results from Tubes 1, 5 and 6 were between Tubes 4 and 3, but in a different order each month. The range between these three tubes was 9.4 - 18.9 µg/m³ and reflects the limited precision of the tubes as much as any systematic differences between their locations. The average of these three tubes is 14.8-27.1 µg/m³ above Tube 2. Therefore, it could be considered that the range of values given by Tubes 1, 5 and 6 is taken as representative of Elizabeth Way.

Figure 9. Nitrogen Dioxide readings from six diffusion tubes at Elizabeth Way



The median difference between Tube 2 and the mean of Tubes 1, 5 and 6 is 20.9, whereas the multiplication factor is 1.7. This approach gives an annual mean NO₂ concentration of

$$28 + 20.9 = 48.9 \mu\text{g}/\text{m}^3 \text{ or } 28 \times 1.7 = 47.6 \mu\text{g}/\text{m}^3.$$

Approach Two. The data plot shows that Tube 1 appears to run through the centre of the plotted data in a consistent manner, such that it could be considered that Tube 1 is representative of the area. The mean difference between Tube 2 and the mean of Tubes 1 is 18.1, whereas the multiplication factor is 1.6. This approach gives an annual mean NO₂ concentration of $28 + 18.1 = 46.1 \mu\text{g}/\text{m}^3$ or $28 \times 1.7 = 44.8 \mu\text{g}/\text{m}^3$.

Approach Three. Alternatively, the mean of the whole data set could be compared with the mean of Tube 2. The mean difference between Tube 2 and the mean of Tubes 1 is 18.1, whereas the multiplication factor is 1.6. This approach gives an annual mean NO₂ concentration of $28 + 17.3 = 45.3 \mu\text{g}/\text{m}^3$ or $28 \times 1.7 = 44.8 \mu\text{g}/\text{m}^3$.

Whichever approach is taken, and there may be a better one, the range of final adjusted NO₂ levels is small, 45 – 49 µg/m³, and shows that, in line with modelling, a ‘typical’ or more representative annual NO₂ level is above the national objective.

Passive diffusion tube data for 2007

There are forty seven NO₂ diffusion tube locations within Cambridge City, three of which are urban background sites, but most are roadside or kerbside sites. Three of the roadside sites are temporary and located at the request of the County Council to monitor the effect of infrastructure changes in the City centre.

Harwell Scientifics supply and analyse the NO₂ 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.

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 Nitrogen Dioxide Diffusion Tube Network Instruction Manual, which can be found at: www.airquality.co.uk/archive/reports/cat06/no2instr.pdf.

Some diffusion tube data were rejected from the dataset in line with advice from NETCEN. 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 should be rejected, particularly if they are an isolated occurrence. High concentrations should be included unless there is a reason to reject them. This approach was taken with the 2005, 2006 and 2007 data.

Tube data referred to within this report have been bias corrected. Cambridge City Council bias correction factors for 2000 onwards are published on the Air Quality Management website at <http://www.uwe.ac.uk/aqm/review/diffusiontube300307.xls>. However, the overall bias correction factor is used for all years in this report because our co-location site at Regent Street has a single tube so the results cannot be relied upon to be sufficiently robust.

Advice on choice of locally or nationally derived bias adjustment factors is available from the Air Quality Review and Assessment help desk. Cases where the locally obtained Bias Adjustment Factor may be more representative include tubes exposed in a similar setting to the co-location site and co-location sites with good precision for the diffusion tubes and with high quality chemiluminescence results, i.e. to national AURN standards. Cases where the Combined Bias Adjustment Factor may be more representative include where the survey consists of tubes exposed over a range of settings, which differ from the co-location site, e.g. the collocation site is in a very exposed setting and the tubes being assessed are on a building façade in a canyon-like street or co-location sites with poor precision.

A new co-location site was established in 2007 with triplicate tubes at Gonville Place. The location was selected because it is considered to be the most representative of a ‘typical’ tube location. The bias adjustment factor calculated from eight months’ data is 0.77, which shows good agreement with the overall factor. We will use the figure from this site in 2008 when we should have 12 month’s data.

The figures published on the AQM website in March 2008 are used in this report. The 2007 overall factor was reported as 0.80 and is referred to here as the ‘March Update’.

Figure 10. Bias Adjustment Factors used in this report

2000	0.79
2001	0.78
2002	0.84
2003	0.87
2004	0.88
2005	0.88
2006	0.78
2007	0.80

Figure 11. NO₂ tube results for 2007, µg m⁻³, bias-adjusted with the overall factor provided by AWE in March 2008. Data from 2000 - 2006 are shown for comparison.

Location	2000	2001	2002	2003	2004	2005	2006	2007
Emmanuel Street	56	55	63	71	59	63	62	57
Jesus Lane	36	40	48	55	47	53	46	48
Magdalene Street	35	35	37	40	34	40	37	37
Northampton Street	51	50	56	61	48	49	45	44
Silver Street	54	49	60	59	43	47	42	42
Regent Street 2	57	59	63	64	52	53	52	56
Newmarket Road 1	46	46	49	52	47	47	43	45
Milton Road	52	50	55	58	49	50	41	45
Milton Road relocated								26
Drummer Street	55	57	62	61	58	57	49	45
Gilbert Road	31	30	30	33	27	30	25	27
Latham Road	20	20	21	22	17	21	16	16
Newmarket Road 2	39	40	40	41	36	34	32	35
East Road	36	35	37	40	37	39	34	38
Mill Road	42	33	40	43	37	38	35	35
Hills Road	36	40	43	46	47	46	38	41
Regent Street (CCC office)	42	40	41	44	39	42	36	35
Trinity Street	32	32	34	36	33	35	32	33
Pembroke Street	48	49	50	54	46	50	46	42

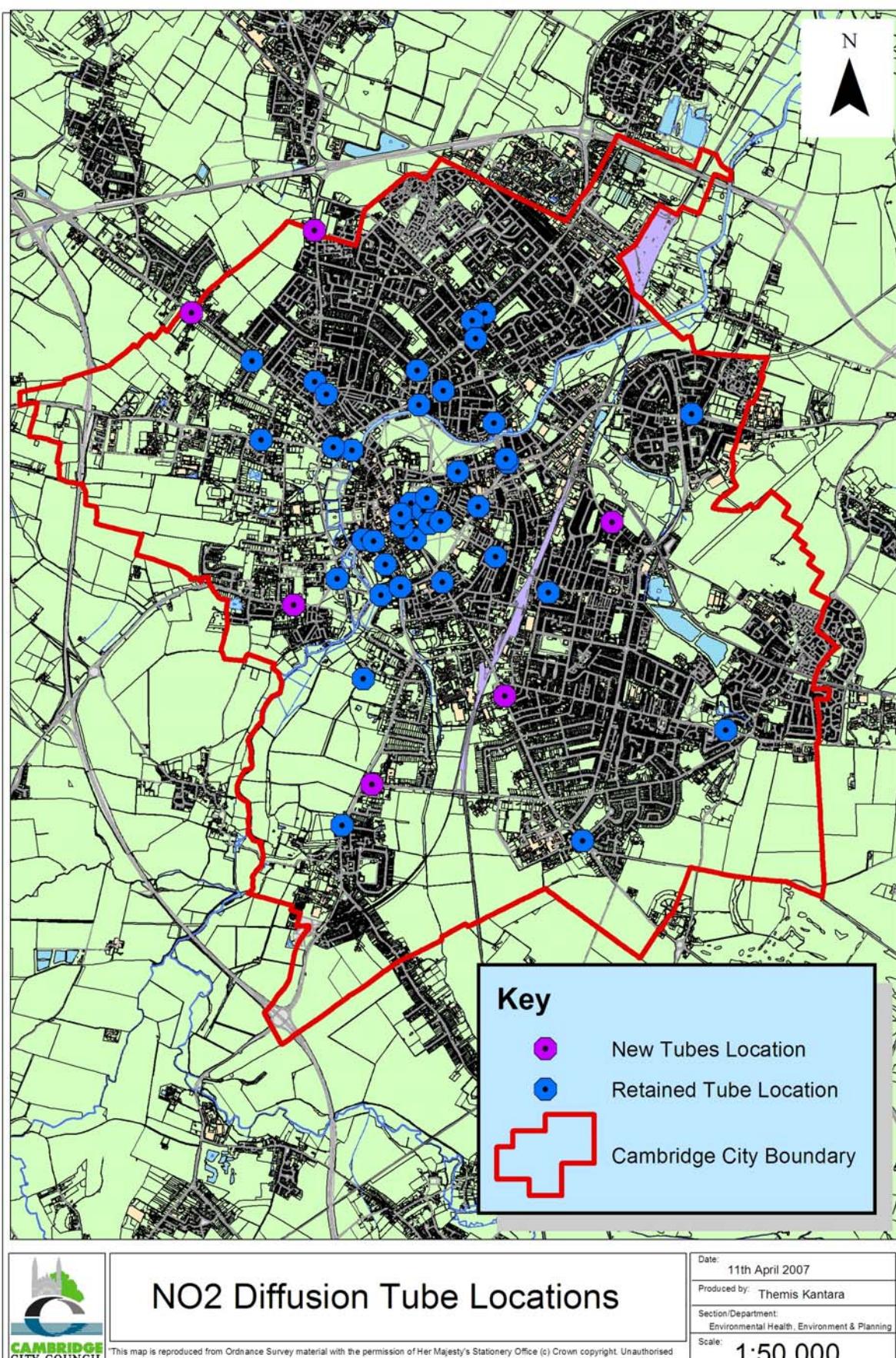
Location	2000	2001	2002	2003	2004	2005	2006	2007
Gonville Place	38	40	46	51	43	35	32	35
Elizabeth Way	44	42	45	49	43	43	37	38
Victoria Road	44	49	48	52	42	44	41	42
Madingley Road	42	40	46	48	41	45	40	39
Huntingdon Road	35	36	38	41	36	36	33	29
Histon Road	41	38	40	41	39	38	37	36
Queens Road	35	34	38	39	34	36	32	35
Fen Causeway	30	31	35	37	35	34	33	31
Trumpington Road	37	37	41	45	35	38	33	32
Babraham Road	37	40	42	44	40	42	35	38
Babraham Road relocated								26
Cherry Hinton Road	35	34	37	38	34	36	35	34
Arbury Road	39	37	44	46	38	44	39	40
Arbury Road relocated								23
Newnham Road	50	47	53	61	53	52	48	44
Chesterton Road	42	37	41	45	42	42	34	41
Victoria Avenue	40	43	52	56	49	54	47	46
Parker Street	48	44	50	56	51	47	46	47
Abbey Road	45	41	45	48	46	50	42	48
Abbey Road								27
Cockburn Street	26	27	29	32	27	28	24	26

Location	2000	2001	2002	2003	2004	2005	2006	2007
Oaktree Avenue	28	27	29	31	30	28	24	25
Chesterton Road	36	35	38	39	38	38	33	35
Maids Causeway	39	42	46	46	41	49	47	46
Emmanuel Road	44	50	54	65	58	59	54	55
Downing Street	41	41	44	48	45	52	45	44
Trumpington Street	40	39	40	43	34	35	32	34
Lensfield Road					33	37	32	35
Lensfield Road relocated								43
Park Terrace						491	33	35
St Andrew's Street						741	60	54
Parkside							33	35
Histon Road new site								33
Long Road								45
Coldhams Lane								32
Huntingdon Road new site								28
Barton Road								25
Hills Road new site								34

Approximately one half of the tubes results show exceedences of the annual mean. These are on the roads with high traffic numbers.

(1) 2 months data

Figure 12. Locations of the diffusion tubes



A review of tube locations was undertaken in early 2007 and as a result it was decided to reduce the number of tubes where air quality is well understood, to introduce some tubes in areas where our knowledge of the air quality is less developed (Barton Road, Coldhams Lane, Hills Road, Histon Road, Huntingdon Road, Long Road) and reposition some tubes closer to relevant receptors (Milton Road, Babraham Road, Huntingdon Road, Arbury Road, Lensfield Road and Abbey Road).

In most cases the tubes in new positions recorded NO₂ levels below the national objectives. The only exception was Long Road (near the junction with Trumpington Road and likely to experience an increase in traffic from planned new developments). The relocated tubes also recorded NO₂ levels below the national objectives, with the exception of Lensfield Road.

2.1.2 PM₁₀ Monitoring Data

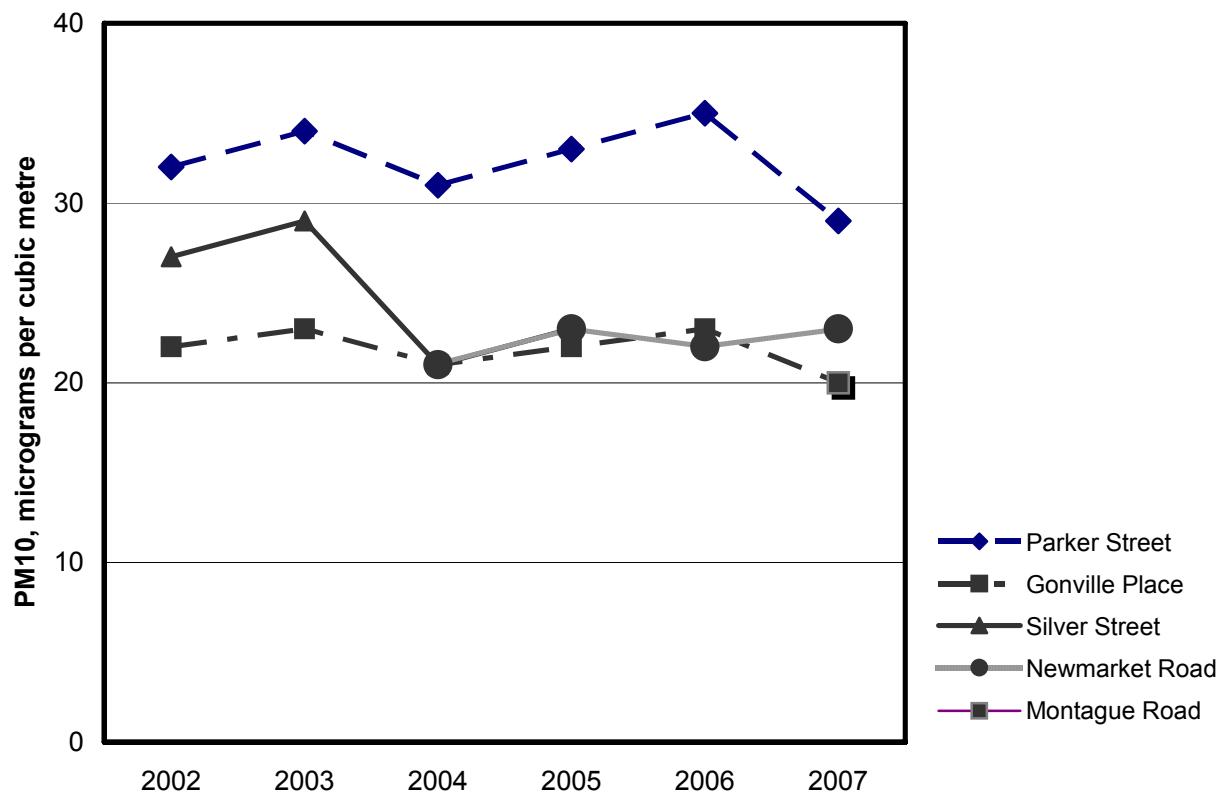
PM₁₀ are continuously monitored at four city centre locations in Cambridge. The particulate monitor at Newmarket Road is an Eberline FH 62-IN Beta-attenuation monitor with a heated inlet manifold although this is held at 40°C as opposed to 50°C, the standard used in TEOM monitors. Service, repair and calibration of the Eberline particulate monitor are carried out under an annual contract with the equipment suppliers, Thermo Electron. The particulate monitors at Montague Road, Parker Street and Gonville Place are Rupprecht & Patashnick TEOM® series 1400a ambient particulate (PM₁₀) monitors. Service, repair and calibration of these monitors are carried out under an annual contract with Casella Stanger. Both types of monitor collect particulate matter on heated filters to minimise errors associated with evaporation and condensation. However, this can lead to loss of volatile PM₁₀. As EU limit values and UK objectives are based on measurements using a gravimetric sampler, the results are multiplied by an interim default adjustment factor of 1.3 in accordance with current UK guidance. The results in Figure 13 have been adjusted.

All of the PM₁₀ monitoring stations are measuring concentrations that do not breach the current objectives, although concentrations in Parker Street are often approaching the objective. A comparison of the data over the past five years show a pattern repeated at all of the sites - levels are fairly constant at all sites, with the exception of a dip in 2004 (see Figures 13 and 14). This is likely to be related to meteorology.

Figure 13. PM₁₀ concentrations in 2002 – 2007, (µg m⁻³)

	2002		2003		2004		2005		2006			2007		
	Annual mean	Number of exceedences of 24 hour mean	Annual mean	Number of exceedences of 24 hour mean	Annual mean	Number of exceedences of 24 hour mean	Annual mean	Number of exceedences of 24 hour mean	Annual mean	Data capture %	Annual mean	Number of exceedences of 24 hour mean	Annual mean	Data capture %
Parker Street	32	25	34	33	31	15	33	20	35	28	97	29	8	99
Silver Street	27	12	29	27	21	4	23	3						
Newmarket Road					21	0	23	4	22	4	97	20	4	99
Gonville Place	22	4	23	10	21	3	22	0	23	4	98	23	5	93
Montague Road												20	0	98

Figure 14. Comparison of annual means of PM₁₀ at continuously monitoring sites 2002-2007



2.2 East Cambridgeshire

2.2.1 Nitrogen Dioxide

The annual mean objective being 40 $\mu\text{g}/\text{m}^3$ by 31 December 2005. This was achieved in the previous years Progress Report and continues to be the reference objective until it is superseded.

The twelve diffusion tube locations are given in Figure 16, most of which are located at the roadside or kerbside along with four urban background sites. No new tube locations were added to the network in 2007.

The prediction of 2010 concentrations was carried out using the Year Adjustment Calculator version 22A from:

http://www.airquality.co.uk/archive/laqm/tools/Year_Adjustment_Calculator22a.xls

Harwell Scientifics supply and analyse the NO₂ tubes for East Cambridgeshire District 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 analysed using a segmented flow autoanalyser with ultraviolet detection.

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 Nitrogen Dioxide Diffusion Tube Network Instruction Manual, which can be found at www.airquality.co.uk/archive/reports/cat06/no2instr.pdf

The diffusion tube values have been multiplied by a bias correction factor obtained from the AQR&A support provided by UWE. The bias correction factor was derived from thirteen sets of diffusion tubes (for 2007 data), which were collocated with real-time analysers in 2007.

Figure 15. Bias Adjustment Factors used in this report.

Year	Bias correction factor
2003	0.87*
2004	0.88*
2005	0.88*
2006	0.78*
2007	0.80*

*Sourced from AEA Collocation Spreadsheet 03/07 which can be found at:

- <http://www.uwe.ac.uk/aqm/review/diffusontube290208.xls> and
- <http://www.uwe.ac.uk/aqm/review/mguidance.html#Bias%20Adjustment>

Figure 16. East Cambridgeshire NO₂ tube results

Site Name	Site type	Dist from kerb (m)	2003		2004		2005		2006		2007		Adjust to 2010 µg/m-3 (From 2007 data*)
			Uncorrected NO ₂ µg/m-3	Corrected NO ₂ µg/m-3	Uncorrected NO ₂ µg/m-3	Corrected NO ₂ µg/m-3	Uncorrected NO ₂ µg/m-3	Corrected NO ₂ µg/m-3	Uncorrected NO ₂ µg/m-3	Corrected NO ₂ µg/m-3	Uncorrected NO ₂ µg/m-3	Corrected NO ₂ µg/m-3	
38 Market St, Ely	Roadside	1.5	35.7	31.1	28.6	25.2	29.7	26.1	31.8	24.8	31.6	25.3	22.6
Abbot Thurston Av, Ely	Urban B/G	1.5	25.4	22.1	20.7	18.2	20.4	18.0	19.9	15.5	19.9	15.9	14.6
Station Rd, Ely	Roadside	3.5	39.7	34.5	37.0	32.6	34.1	30.0	36.9	28.8	37.0	29.6	26.5
Fieldside, Ely	Urban B/G	3.0	27.5	23.9	21.9	19.3	21.2	18.7	19.7	15.4	22.2	17.8	16.4
Main St, Littleport	Roadside	2.0	31.5	27.4	25.4	22.4	22.7	20.0	26.9	21.0	25.8	20.6	18.4
High St, Soham	Roadside	1.5	35.1	30.5	27.4	24.1	26.2	23.1	29.5	23.0	29.0	23.2	20.8
Market Street, Fordham	Roadside	1.5	52.5	45.7	46.5	40.9	35.9	31.6	26.3	20.5	26.5	21.2	19.0

Site Name	Site type	Dist from kerb (m)	2003		2004		2005		2006		2007		Adjust to 2010 µg/m-3 (From 2007 data*)
			Uncorrected NO ₂ µg/m-3	Corrected NO ₂ µg/m-3	Uncorrected NO ₂ µg/m-3	Corrected NO ₂ µg/m-3	Uncorrected NO ₂ µg/m-3	Corrected NO ₂ µg/m-3	Uncorrected NO ₂ µg/m-3	Corrected NO ₂ µg/m-3	Uncorrected NO ₂ µg/m-3	Corrected NO ₂ µg/m-3	
Sheriff's Court, Borough Green	Urban B/G	1.5	20.6	17.9	16.6	14.6	16.7	14.7	14.6	11.4	15.7	12.6	11.6
Station Rd, Haddenham	Roadside	1	35.3	30.7	31.1	27.4	30.6	26.9	32.1	25.0	32.5	26.0	23.3
Tramar Drive, Sutton	Urban B/G	2	27.9	24.3	24.1	21.2	23.4	20.6	22.8	17.8	24.0	19.2	17.7
Nutholt Lane, Ely	Roadside	2.5	39.7	34.5	30.1	26.5	31.7	27.9	32.9	25.7	31.0	24.8	22.2
A142, Witcham	Roadside	1	40.7	35.4	33.1	29.1	34.2	30.1	37.0	28.9	36.3	29.1	26.0

2010 forecast predictions were made with the Year Adjustment Calculator (V.22a) provided at the following link:

http://www.airquality.co.uk/archive/laqm/tools/Year_Adjustment_Calculator22a.xls

Compared with the results detailed in the 2007 Progress Report, the corrected tube readings for 2007 are marginally higher than those in 2006 but still achieving the National Objectives. A map detailing the locations of the diffusion tubes are shown in Figure 18.

2.2.2 PM₁₀ Monitoring Data

PM₁₀ annual mean and number of exceedances of the annual mean for 2007.

Annual mean objective being 40µgm⁻³ and the 24 hour mean objective being 50µgm⁻³, not to be exceeded more than 35 times a year, however, for certain datasets the 90th percentile is shown below due to data capture limitations (below 90%), as per guidance in LAQM.TG(03). As EU limit values and UK objectives are based on measurements using a gravimetric sampler, the results are multiplied by an interim default adjustment factor of 1.3 in accordance with current UK guidance. The results below have been adjusted.

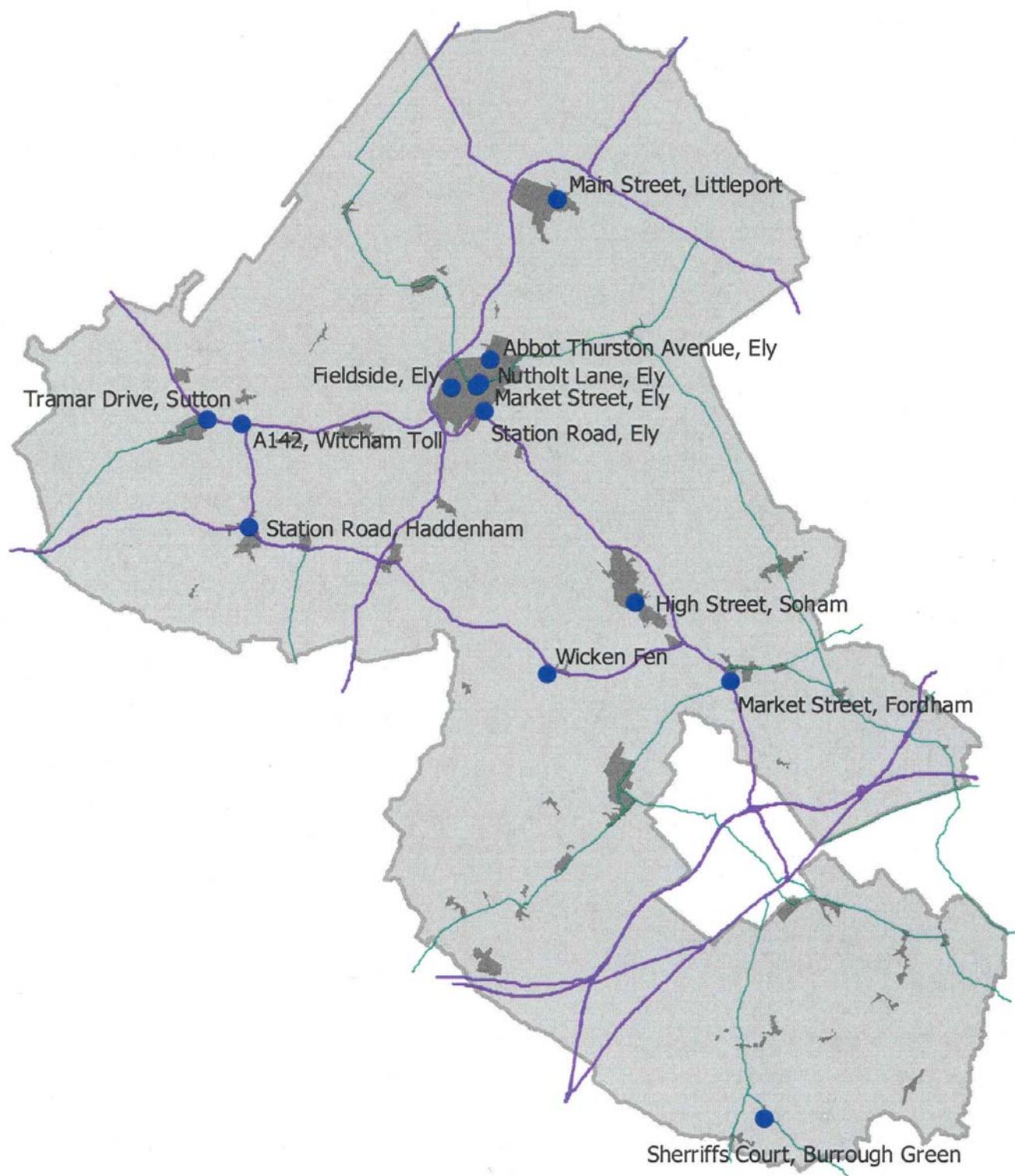
Figure 17. PM₁₀ concentrations measured at Wicken Fen (site type: rural)

PM ₁₀	2003	2004	2005	2006	2007	National Air Quality Objectives
Measured annual mean without 1.3 interim adjustment factor applied	26.2mg/m ³	15.1mg/m ³	15.7mg/m ³	20mg/m ³	17.9mg/m ³	
Data capture of hourly means	88%	100%	100%	85%	100%	90%
Annual mean with interim adjustment factor of 1.3 applied (gravimetric)	34.1mg/m ³	19.6mg/m ³	20.4mg/m ³	26mg/m ³	23.3mg/m ³	40 mg/m³
Number of exceedances of 24 hour mean > 50mg/m ³	30	9	16	17	12	35
90 th percentile (gravimetric) – reported where data capture is below 90%	62.4	N/A	N/A	36.4	N/A	

- The particulate monitor used is an Eberline FH 62-IR Beta-attenuation monitor with a heated inlet manifold, although this is held at 40°C as opposed to 50°C, the standard used in TEOM monitors.
- Data capture for the year is 100%.
- The monitor is located within the AUN rural monitoring station at Wicken Fen, approximate NG reference 556400, 269200 shown in Figure 18.

- There are no relevant receptors at the monitoring location which is surrounded to the south and east by arable land, to the north lies a wetland nature reserve and to the east the site is bordered by a public footpath, an unmade dust track, with fen drainage channels beyond. The nearest receptor is an isolated farm, some 260m to the east of the site away from the public footpath.
- Service, repair and calibration of the Eberline particulate monitor are carried out under an annual contract with the equipment suppliers, Themo Electron.
- This is the fifth year of data collection at the site. Compared with the results detailed in the 2007 Progress Report, the unadjusted PM₁₀ readings for 2007 are slightly lower than those in 2006. The 2007 results meet the Air Quality Objectives.

Figure 18. Air Quality Monitoring locations in East Cambridgeshire



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2.3 Fenland District Council

2.3.1 Monitoring Outside AQMAs

There have been data capture problems at Fenland District Council with relevant staff also leaving the organisation. This has led to discontinuity in the Council's air quality monitoring duties. As a result there is no reliable diffusion tube data for 2007. A new staff member has been recruited and the diffusion tube programme has been restarted as of December 2007. There are now procedures in place to ensure continuity of monitoring and capture.

There are twenty NO₂ diffusion tubes within Fenland District Council, which are generally located at the roadside or kerbside, there is currently 1 background site, (although this is located within the Wisbech AQMA). Eight of the twenty sites are located within the Wisbech AQMA.

Harwell Scientifics supply and analyse the NO₂ tubes for Fenland District 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 analysed using a segmented flow autoanalyser with ultraviolet detection.

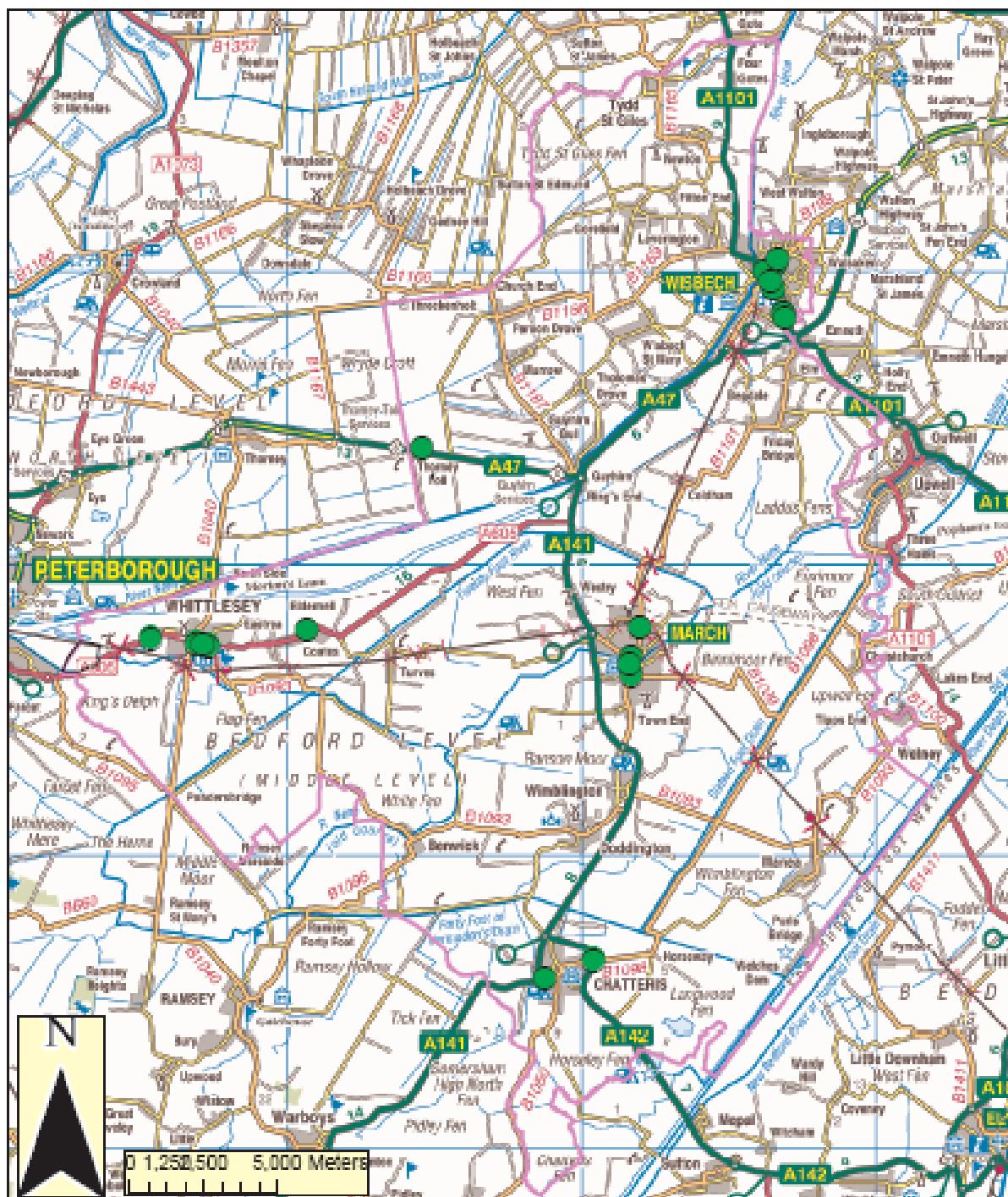
Exposure periods for the diffusion tubes are those of the UK Nitrogen Dioxide Diffusion Tube Network run by NETCEN, with the tubes being changed every four or five weeks. QA/QC procedures are as detailed in the UK Nitrogen Dioxide Diffusion Tube Network Instruction Manual, which can be found at:

www.airquality.co.uk/archive/reports/cat06/no2instr.pdf

Figure 19. Diffusion tube locations within Fenland District Council

Tube	Location	Site Type	Grid Ref
1	A605, Whittlesey	Roadside	527059 297205
2	Station Road, March	Roadside	541951 297762
3	Ramnoth Road, Wisbech (Air Quality Management Area)	Roadside	546857 308553
4	Orchard Road Roundabout, Whittlesey	Roadside	526848 297274
5	Bowthorpe Centre Churchill Road, Wisbech (Air Quality Management Area)	Kerbside	546411 309628
6	Kings Dyke, Whittlesey	Roadside	525287 297404
7	Cemetery Road Whittlesey	Roadside	527282 297157
8	Westmead Avenue / Churchill Road, Wisbech, (Air Quality Management Area)	Kerbside	546886 308366
9	A47, Thorney Toll	Roadside	534541 303903
10	A605, Coates	Kerbside	530613 297702
11	High Street, March	Roadside	541658 296190
12	Lynn Road, (Premier Foods) Wisbech (Air Quality Management Area)	Background	546588 310192
13	Lynn Road / Mount Pleasant , Wisbech (Air Quality Management Area)	Roadside	546661 310396
14	Clare St / A141, Chatteris	Roadside	538728 285743
15	Weasenham Lane, Wisbech (Air Quality Management Area)	Kerbside	546828 308543
16	Lynn Road, Wisbech (Air Quality Management Area)	Roadside	546260 309987
17	City Road, March		541602 296499
18	New Road, Chatteris	Roadside	540391 286415
19	Broad Street, March	Roadside	541653 296769
20	Napier Court, Wisbech (Air Quality Management Area)	Roadside	546485 309389

Figure 20. Monitoring Location Map



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2.3.2 Monitoring within AQMAs.

Continuous Data Management

The Council's SO₂, PM₁₀ and NOX continuous monitors data capture rates for 2007 were 94%, 83% and 80% respectively. The Council has instructed Air Quality Consultants Ltd to ratify the 2007 dataset from the continuous monitors within the district. This has not yet been completed, therefore, the following data is all provisional.

QA/QC

The Council is a member of the Scientifics Calibration Club which has established a robust QA/QC regime at both monitoring sites.

NO₂ Chemiluminescence Data (Napier Court AQMS)

Fenland District Council installed a continuous monitor at Napier Court (facing Churchill Road), Wisbech on 28 June 2006.

For the 2007 monitoring period there have been no exceedances of the 200 µg/m³ 1 hour mean with the maximum level recorded as 120 µg/m³. However, data capture rates were poor at only 80%. The uncorrected annual mean is close to the 40 µg/m³ Objective at 39.42 µg/m³ based upon all the monitoring undertaken.

As data capture was less than 90% estimated annual means have been calculated based on the approach in the Technical Guidance LAQM.TG(03), Box 6.5. Three sites were selected from the national archive to provide an appropriate ratio.

Figure 21. Correction for missing data

NO₂(µg/m³) for 2007	Norwich Centre	Southend-on-Sea	Cambridge Roadside	Average
Annual Mean (µg/m ³)	22.3	24.767	41.44	
Period Mean 18/01/07 – 6/03/07	27.371	17.154	36.035	
Ratio: AM/PM	0.815	0.778	0.825	0.806

Using the ratio the best estimate of the annual mean at Napier Court is 31.77µg/m³.

$$(39.42 * 0.806 = 31.77)$$

The Council will carry out the Further Assessment once a full twelve months of continuous monitoring and diffusion tube data is available.

Lynn Road Monitoring Station in Wisbech

The Lynn Road Monitoring Station is located adjacent to Premier Foods, Wisbech. Premier Foods (a major contributor to both SO₂ and PM₁₀) is now regulated by the Environment Agency under IPPC regime. Following discussions with both the Environment Agency and Premier Foods it is expected that both SO₂ and PM₁₀ emissions will meet European objectives by employing BAT i.e. scrubbers on boiler plant. Monitoring data from Premier Foods for 2007 has been requested by Fenland District Council to confirm this assumption, however, at the time of writing this has not been provided by either the Environment Agency or Premier Foods.

The data from Fenland District Council's own monitoring station is as follows.

SO₂

The data collection during 2007 has been very good for the API M100x SO₂ analyser, with a data capture rate of 94%. The 24 Hour mean objective has been achieved, and the 15 minute and 1 hour objectives are within the permitted level of exceedences. It should be noted that the data at this stage is only provisional.

Figure 22. 2007 SO₂ data for Wisbech

SO ₂	2007	National Air Quality Objectives
Maximum 15 Minute Mean (µg/m ³) [number of exceedences]	1840 [25]	266 [35]
Maximum 1 Hour Mean (µg/m ³) [number of exceedences]	476 [8]	350 [24]
Maximum 24 Hour Mean (µg/m ³) [number Of exceedences]	91.2 [0]	125 [3]
Level of Data Capture	94%	90%

PM₁₀

PM₁₀ is monitored using a MET One BAM1020 Particulate monitor (unheated).

Data capture for the year is 83%. This is due to problems encountered with the data logger during January and February, which resulted in limited data being captured for these months.

Service, repair and calibration of the MET One BAM1020 particulate monitor are carried out under an annual contract with SupportingU Ltd.

Annual mean objective being 40µgm-3 and the 24 hour mean objective being 50µgm-3, not to be exceeded more than 35 times a year, however, the 90th percentile is shown below due to data capture limitations (below 90%), as per guidance in LAQM.TG(03). As EU limit values and UK objectives are based on measurements using a gravimetric sampler, the results are multiplied by an interim default adjustment factor of 1.2 in accordance with current UK guidance. The results below have been adjusted.

Figure 23. PM₁₀ concentrations (µg/m₃) measured at Lynn Road (site type: urban)

PM10	2007	National Air Quality Objectives
Measured annual mean without (1.2) interim adjustment factor applied	31.3 µg/m ³	
Data capture of hourly means	83%	90%
Annual mean with interim adjustment factor of / 1.2 applied (gravimetric)	26.1 µg/m ³	40 µg/m ³
Number of exceedances of 24 hour mean > 50 µg/m ³	13	35
90th percentile (gravimetric) – reported where data capture is below 90%	38.3	

The 90th percentile indicates that the objective has not been breached with regard to the number of permitted exceedences of the 24 hour mean per annum.

SO₂ Monitoring in Whittlesey

At the time of writing Fenland District Council is still awaiting the monitoring data regarding Hanson Building Products Ltd, Whittlesey (the cause of the SO₂ Air Quality Management Area).

Arrangements are in place for this data to be provided by the Environment Agency (the site regulators) once it has been produced.

Once the data has been provided Fenland District Council will use the information in the Stage 3 assessment to determine whether the AQMA is justified.

2.4 Huntingdonshire District Council

2.4.1 Nitrogen Dioxide

Huntingdonshire DC has three real-time analysers measuring oxides of Nitrogen in their area. One analyser is housed at Pathfinder House, on the Huntingdon Ring road, with the inlet 3m from the kerb. One analyser is housed in a mobile unit that was located 10m north of the elevated A14 at Godmanchester until the end of December 2006. The third analyser is located above a shop in the AQMA in St Neots High Street. The data capture for all three analysers was in excess of 90% so no correction to the annual mean is required.

All of the analysers are Thermo Fisher 42c models linked to data loggers. These analysers are calibrated monthly, serviced every six months by Thermo Fisher and are subject to external QA/QC visits by NETCEN every six months. All of the data has been verified in-house. The analysers are located as follows:

- Huntingdon Ring Road. This analyser is located at Pathfinder House, Huntingdonshire District Council's Head Quarters, and is within the Huntingdon AQMA. This analyser's inlet is located above the pavement of the Huntingdon inner ring road. The analyser is three years old and replaced an older model which had been at that location since 1998.
- Mobile Unit. The mobile unit comprises several analysers within a trailer. This unit has been moved a number of times since its acquisition in 1999. In January 2007 it was relocated to a rural background site close to Grafham Water.
- St Neots High Street. This analyser is located above a shop in the High Street and is within the St Neots AQMA. The inlet is above the pavement of the High Street. The analyser is two years old and was purchased following the identification of high concentrations of NO₂ in and around the High Street to provide more detailed information.

Figure 24. NO₂ data capture rates for 2007

Analyser	% Data Capture
Mobile Unit (Grafham)	84
Ring Road, Huntingdon	78
High Street, St Neots	83

The data capture rates for the analysers at St Neots and the Mobile Unit were less than 100% due to numerous small communication problems and, therefore, correction of the data is not possible. The analyser on the Huntingdon Inner Ring road, however, was affected by breakdown between the beginning of August and the middle of October. Correction for this period is therefore possible using the methodology in Box 6.5 of LAQM TG(03) as shown below.

Figure 25. Correction of NO₂ data

Site	AM	PM	Ratio
Cambridge	41.4	36	1.15
Norwich	22.3	18.8	1.19
Southend	25	20	1.25
	Average Ratio		1.2

The uncorrected annual mean for Huntingdon was 34µg/m³. This figure is then multiplied by 1.2 to derive an annual mean that has been corrected for the missing data. The corrected value is shown in the table below.

Figure 26. Real time NO₂ monitoring data

Location	Real-time Analyser Corrected Annual Mean NO ₂ Concentration µg/m ³				
	2003	2004	2005	2006	2007
Mobile Unit (Graham)	27	30	28	26	19*
Ring Road, Huntingdon	46	45	35	30	40
High Street, St Neots	-	-	53	43	39

*This apparent reduction is as a result of relocation of the analyser

The analysers located in Huntingdon and St Neots are both within designated AQMAs. The Mobile Unit was located at a background site during 2007.

NO₂ Diffusion tube data 2007

Huntingdonshire District Council (HDC) has been using NO₂ diffusion tubes since 1996. Twenty seven NO₂ diffusion tubes are now exposed on a monthly basis across the district. The 'Pathfinder' tube is collocated with a real time analyser. The three 'mobile' tubes are collocated with the mobile analyser. The tube supplier is Harwell Scientifics and the preparation method is 50% TEA in Acetone. The bias adjustment figure used was provided by UWE as the 'February Update' and is 0.8.

Data from the two static real-time analysers (Figure 26 above) indicate that annual mean NO₂ concentrations at those locations have reduced significantly since 2005 and, indeed, since 2003. Diffusion tube data (Figure 29 below) appears to show the same trend.

All of the measured exceedences of the annual mean NO₂ objective observed were within designated AQMAs.

There are NO₂ diffusion tubes monitoring at the following locations in the District.

Figure 27. Diffusion tube locations

Settlement	Location description	Grid Reference
Alconbury	Manor Lane	518954, 276010
Brampton 1	Glebe Road	521433, 270910
Brampton 2	Thrapston Road	520156, 271564
Buckden	Taylors Lane	519196, 267953
Catworth	Thrapston Road	508409, 274876
Eaton Socon	Duchess Close	516370, 259514
Fenstanton 1	Headlands	532160, 268328
Fenstanton 2	Connington Road	531770, 268215
Fenstanton 2	Hilton Road	531427, 268397
Godmanchester	Cambridge Villas	525319, 270571
Huntingdon 1	Blethan Drive	522293, 272909
Huntingdon 2	George Street	523661, 271802
Huntingdon 3	Lodge Close	523177, 271627
Huntingdon 4	Pathfinder House	524056, 271533
Huntingdon 5	St Peters Road	523435, 272464
Huntingdon 6	Tennis Court Avenue	524274, 271939
Mobile (triplicate tubes)	Various	NA
Ramsey	Blenheim Road	528433, 284936
Sawtry 1	Beaumaris Road	517249, 283154
Sawtry 2	Fen Lane	517440, 283443
Southoe 1	Lees Lane	518714, 264308
Southoe 2	Lees Lane	518638, 264329
Stibbington	Great North Road	508326, 298684
St Ives	Ramsey Road	531206, 272334
St Neots 1	Avenue Road	518925, 260503
St Neots 2	Harland Road	518489, 260871
St Neots 3	The High Street	518323, 260263
St Neots 4	The High Street	518433, 260321
St Neots 5	The Paddocks	517869, 260132

Figure 28. Monitoring locations

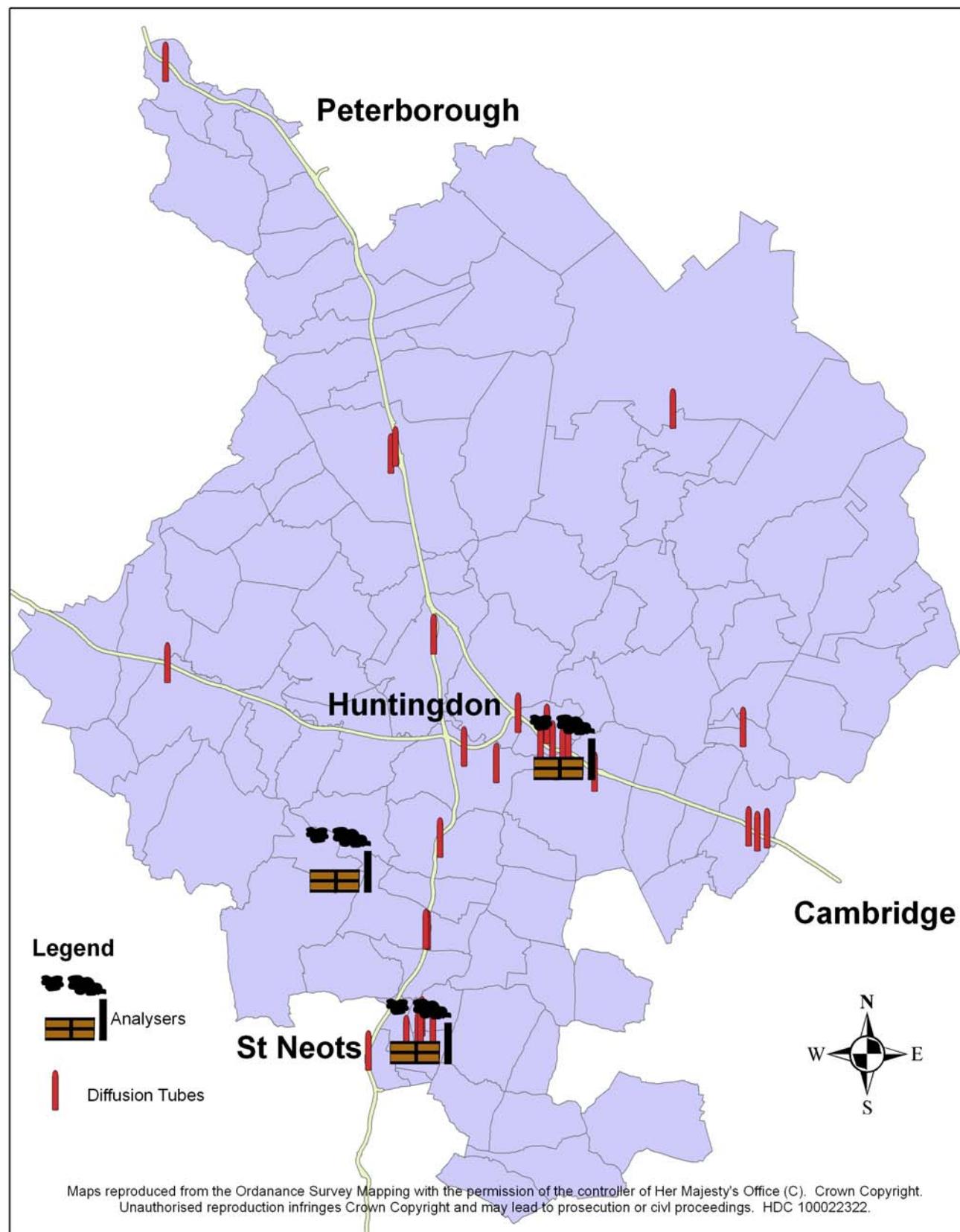


Figure 29. NO₂ diffusion tube annual means

Location	Bias adjusted NO ₂ annual mean concentration µg/m ³				
Year	2003	2004	2005	2006	2007
Fenstanton					
Headlands	32	28	31	-	-
Hilton Road	-	-	-	39	39
Connington Road	-	-	-	32	30
Huntingdon					
Ring Road	50	49	51	41	39
George Street	-	-	-	54	44
St Peters Road	-	-	-	31	32
Blethan Drive	45	39	42	36	35
Tennis Court Avenue	40	35	36	34	31
Lodge Close	-	-	-	23	24
Godmanchester	38	31	32	29	30
Laws Crescent, Brampton	40	35	43	31	35
Glebe Road, Brampton	26	23	26	-	-
St Neots					
The High Street 1	46	38	42	34	37
The High Street 2	-	-	-	40	38
The Paddocks	31	28	30	24	26
Avenue Road	27	24	25	20	21
Harland Road	25	23	23	21	19
A1					
Eaton Socon	-	-	-	30	32
Lees Lane, Southoe 1	31	24	24	22	22
Lees Lane, Southoe 2	26	22	24	-	-
Taylors Lane, Buckden	29	26	28	23	26
Manor Lane, Alconbury	33	27	29	24	24
Fen Lane, Sawtry	30	23	26	24	24
Beaumaris Road, Sawtry	26	23	25	-	-
Great North Road, Stibbington	-	-	-	36	30
Other					
Thrapston Road, Catworth	-	-	-	26	25
Blenheim Road, Ramsey	26	24	26	20	21
Ramsey Road, St Ives	27	25	28	23	22
Mobile 1 (Graham)					14
Mobile 1 (Graham)					14
Mobile 1 (Graham)					15

2.4.2 PM₁₀ Monitoring Data

Huntingdonshire District Council operates a real time fine particulate (PM₁₀) analyser at its Mobile Unit which is located at the Cambridgeshire County Council Training Centre situated at West Perry by Grafham Water. The analyser was located in Godmanchester just north of the elevated A14 until January 2007 so the apparent drop in the concentration is actually a result of this relocation. The instrument is an FH 62 I-R supplied by Thermo Fisher. In 2007 the data capture rate for the instrument was 89%, the missing data consisting of numerous small gaps, so no correction was possible for data capture. A correction factor of 0.786 is applied, however, in accordance with the Government Guidance for MET-one BAMs, which operate on a similar basis to the FH 62. (UK Equivalence Programme for Monitoring of Particulate Matter, defra 2006).

Figure 30. PM₁₀ data µg/m³ gravimetric equivalent

Year	2004	2005	2006	2007
Data capture	96%	96%	96%	89%
Raw annual mean (µg/m ³)	17.4	18.3	18.3	15.4
Corrected annual mean (µg/m ³)	13.7	14.4	14.4	12.1

PM₁₀ monitoring results over the last four years have been consistently below the annual mean objective.

Following the publication of the findings of the UK Equivalence Programme of Monitoring Particulate Matter it appears that it may not possible to accurately correct data from the FH 62 I-R.

In addition to the above it is expected that the new Air Quality Strategy, expected later this year, will introduce a requirement for monitoring PM_{2.5}.

In view of the above it has been decided not to purchase new particulate monitoring equipment until there is a consensus of opinion on which instruments are suitable and until the new particulate matter objectives have been published.

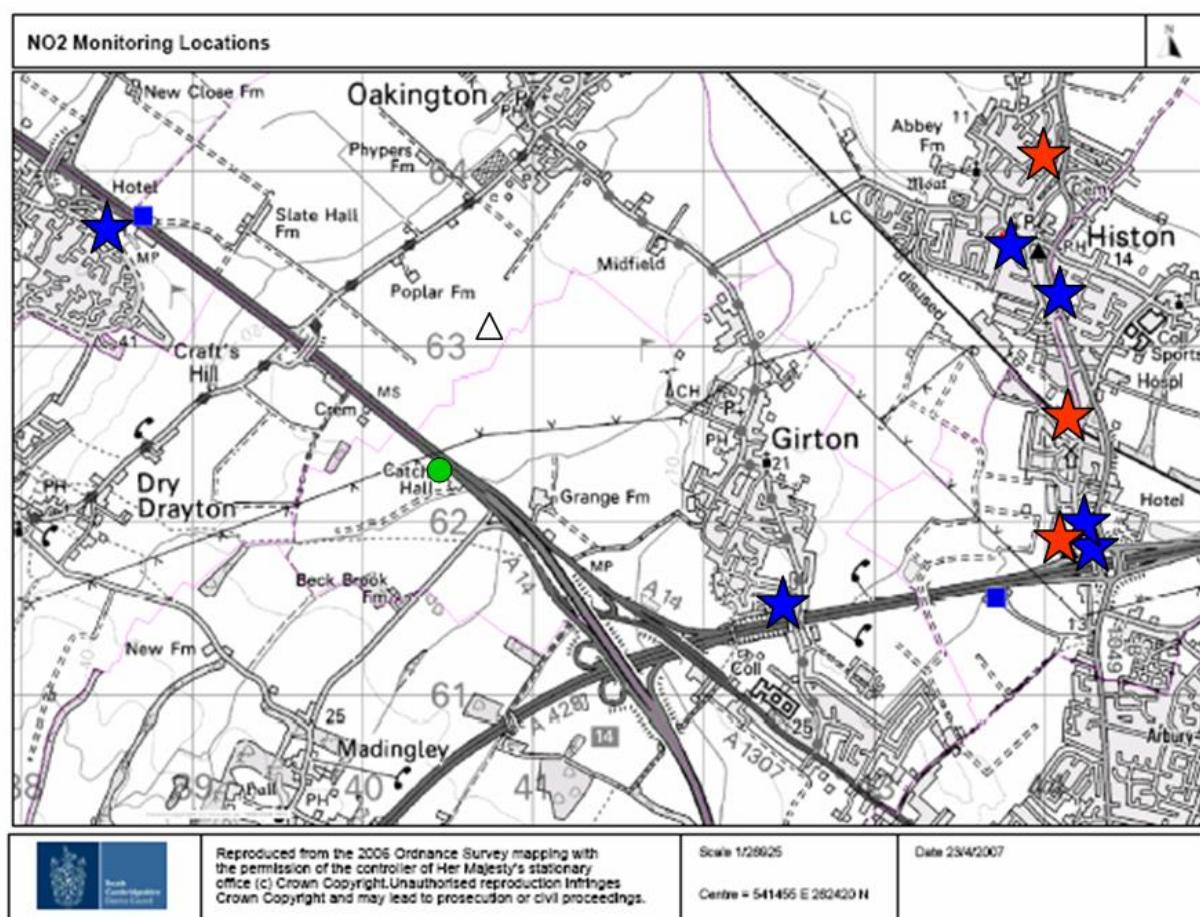
2.5 South Cambridgeshire District Council

The A14 trunk road, which passes through the South Cambridgeshire District Council area is a strategic route of national importance and also forms part of the trans European Highway, linking the Midlands and North of England to the ports of Felixstowe and Harwich and, to the south, the M11 and Stansted. Additionally it is the most important route for local traffic linking Huntingdon and Cambridge with St Ives and other villages along the A14 corridor. It has a higher than national average proportion of heavy goods vehicles (hgv). The national average currently stands at 15% hgv, whereas, the A14 has up to 21% hgv in stretches around Cambridge.

Improvement measures to the local transport infrastructure are already underway with the development of the Cambridge Guided Busway. This is seen as an alternative mode of transport for commuters wanting to travel along the A14 between St Ives and Cambridge and will include two new park and ride sites. It is hoped that this will achieve a target of removing 2-3% of current car commuters off this section of the A14. The busway is planned to open in spring 2009.

With the above in mind, monitoring locations have been targeted along the A14 and adjacent to and within the nearby villages at relevant locations as advised within the Technical Guidance document LAQM TG(03).

Figure 31. Map of monitoring locations along the A14 corridor



	NO ₂ diffusion tube site with annual mean above the objective (before bias correction) in 2007.
	New NO ₂ diffusion tube site for 2008.
	NO ₂ diffusion tube site with annual mean below the objective in 2007.
	Continuous monitoring locations.

2.5.1 Nitrogen Dioxide

Monitoring by chemiluminescence and diffusion tube analysis is undertaken at locations across the district and results are available on request by following the links on our website at:

www.scambs.gov.uk.

Continuous monitoring of NO₂ has taken place at a roadside location on the eastbound carriageway of the A14 at Bar Hill (TL 386 637) since 2001. The monitor employed is a Thermo Electron oxide of nitrogen analyser that utilises the chemiluminescent technique to obtain continuous hourly average ambient oxides of nitrogen concentrations. NETCEN provides an independent audit and data review service of this equipment. The results available for this site are a fully scaled and ratified dataset from January 2001 to December 2007.

Figure 32. SCDC Mobile Unit at Bar Hill



Progress Report Guidance LAQM.PRG(03) suggest that if data is available for less than 9 months then it should be adjusted to provide an estimate of the annual mean using the procedure set out in LAQM.TG(03). Data for Bar Hill has been adjusted for 2001, 2002 and 2004 but data capture achieved over 90% in the years 2003, 2005, 2006 and 2007 therefore no adjustment has been made to the results.

From the results in Figure 33, it would appear that there are no implications for either the hourly objective or the annual mean objective in 2007.

Figure 33. Air quality statistics for NO₂ measured at the A14 Bar Hill

	NO ₂ 2001	NO ₂ 2002	NO ₂ 2003	NO ₂ 2004	NO ₂ 2005	NO ₂ 2006	NO ₂ 2007	National Air Quality Objectives
Maximum hourly mean	124µg/m ³	145µg/m ³	166µg/m ³	161µg/m ³	187µg/m ³	157µg/m ³	132µg/m ³	
Hourly mean 99.8 th percentile	109µg/m ³	113µg/m ³	132µg/m ³	118µg/m ³	118µg/m ³	122µg/m ³	110µg/m ³	200 µg/m ³ [18 exceedences]
Number of exceedences of the AQS 200µg/m ³			0	0	0	0	0	18
Annual recorded mean	38µg/m ³	44µg/m ³	50µg/m ³	46µg/m ³	42µg/m ³	43µg/m ³	34µg/m ³	40 µg/m ³
Data capture	72%	67%	91.7%	84.1%	90.4%	95.4%	93.5%	90%
Annual mean (adjusted)	41µg/m ³	42µg/m ³	N/a	45µg/m ³	N/a	N/a	N/a	40 µg/m ³
Estimated annual mean in 2005	36µg/m ³	39µg/m ³	47µg/m ³	44µg/m ³	N/a	N/a	N/a	40 µg/m ³
Estimated annual mean in 2010	29µg/m ³	32µg/m ³	39µg/m ³	36µg/m ³	34µg/m ³	37µg/m ³	30µg/m ³	

In February 2002 a similar monitor was installed at Impington on the westbound carriageway of the A14. From 2002 until 2005 this site was independently audited and data reviewed by Air Quality Monitoring Services Ltd. Since 2005 however, NETCEN has provided an independent audit and data review service of this equipment. The results available are a fully scaled and ratified dataset from February 2002 to December 2007. Data capture in 2007 was 95.7% but below 90% in 2002, 2003, 2004 and 2006.

This site, which is partly funded by the Cambridgeshire Transport Plan, was set up to represent a worst-case relevant exposure. As can be seen in Figure 34, the monitor is positioned in a roadside location eight metres from the kerbside of the A14 westbound adjacent to the convergence of the slip road from the A1049. This stretch of carriageway is regularly congested at peak times. The monitor is between two residential properties whose gardens are a similar distance from the kerbside, which is just perceptible in Figure 34.

Figure 34. Monitoring Unit on the A14 at Impington, Cambridgeshire



The NO₂ results for this monitoring station are provided in Figure 35, on the following page.

Figure 35. Air quality statistics for NO₂ measured at the A14 (W), Impington

	NO ₂ 2002	NO ₂ 2003	NO ₂ 2004	NO ₂ 2005	NO ₂ 2006	NO ₂ 2007	National Air Quality Objectives
Maximum hourly mean	236.7 µg/m ³	485.5 µg/m ³	299.5 µg/m ³	281.0 µg/m ³	160.0 µg/m ³	145.0 µg/m ³	
Hourly mean 99.8 th percentile	184.3 µg/m ³	294.7 µg/m ³	250.7 µg/m ³	93.3 µg/m ³	106.4 µg/m ³	126.0 µg/m ³	200 µg/m ³ [18 exceedences]
Number of exceedences of the AQS 200µg/m ³	2	141	0	1	0	0	18
Annual recorded mean	48.5 µg/m ³	52.2 µg/m ³	41.3 µg/m ³	31.0 µg/m ³	30.0 µg/m ³	41.0 µg/m ³	40 µg/m ³
Data capture	72%	80.7%	86.4%	92.4%	76%	95.7%	90%
Annual mean (adjusted)	52.7 µg/m ³	52.2 µg/m ³	42.1 µg/m ³	N/a	30.6 µg/m ³	N/a	40 µg/m ³
Estimated annual mean in 2005	48.5 µg/m ³	49.5 µg/m ³	41.2 µg/m ³	N/a	N/a	N/a	40 µg/m ³
Estimated annual mean in 2010	39.9 µg/m ³	40.7 µg/m ³	25.4 µg/m ³	25.4 µg/m ³	26.0 µg/m ³	36.2 µg/m ³	

Until 2007 the results were indicating a fluctuating but generally downward trend. However, 2007 results show that the Air Quality Objectives for annual mean at this site will not be met. There are no exceedences of the hourly mean in 2007.

Diffusion Tube Monitoring Network

The monitoring of NO₂ by diffusion tube has been an ongoing project since 1995. There are currently nineteen sites within the District as detailed in Figure 36. It should be noted that the tube at Haslingfield has since been removed and placed at the façade of a relevant receptor alongside the A14 at Bar Hill.

The tubes are supplied and analysed by Harwell Scientifics, a UKAS accredited laboratory (0322). The tube preparation method is 50% TEA in Acetone and analysis is by desorption with distilled water, and the extract analysed using a segmented flow auto analyser with ultraviolet detection. The exposure periods for the diffusion tubes are those of the UK Nitrogen Dioxide Diffusion Tube Network run by NETCEN which effectively is a four or five week duration. QA/QC procedures are as detailed in the UK Nitrogen Dioxide Diffusion Tube Network Instruction Manual, this document can be found at www.airquality.co.uk/archive/reports/cat06/no2instr.pdf

The diffusion tube bias adjustment is calculated from a co-location study carried out at thirteen sites giving a bias adjustment factor of 0.8 for 2007. The following table shows the annual mean diffusion tube concentration recorded for 2007, corrected for bias and year adjusted to 2010. As the method prescribed in technical guidance for future year estimation only relates to roadside sites this calculation has not been undertaken for background sites.

Figure 36. Annual mean NO₂ Concentration (µg/m³) measured by diffusion tube in South Cambridgeshire

Diffusion Tube Site	Site Designation	Annual Mean 2007 µg/m ³	Corrected for bias µg/m ³	Estimated to 2010
High Street, Histon. TL439 637	Roadside	47.1	21.9	19.3
Narrow Lane, Histon. TL441 641	Background	25.1	20.1	17.7
High Street, Sawston. TL486 490	Roadside	41.8	33.4	29.4
Paddock Way, Sawston. TL487 493	Background	23.3	18.6	16.4
The Coppice, Histon. TL442 620	Background	27.4	21.9	19.3
Lone Tree Ave, Histon. TL441 618	Background	28.1	22.5	19.8
A505, Thriplow. TL440 445	Roadside	28.4	22.7	20.0
High Street, Linton. TL561 468	Roadside	32.7	26.2	23.1
High Street, Tadlow. TL281 474	Background	27.9	22.3	19.6
High Street, Harston. TL425 510	Roadside	40.5	32.4	28.5
Garner Close, Milton. TL475 631	Background	28.4	22.7	20.0

Diffusion Tube Site	Site Designation	Annual Mean 2007 $\mu\text{g}/\text{m}^3$	Corrected for bias $\mu\text{g}/\text{m}^3$	Estimated to 2010
Cambridge Rd, Girton. TL425 614	Roadside	40.5	32.4	28.5
Brook Close, Histon TL439635	Roadside	32.2	25.8	22.7
Water Lane, Histon TL440633	Roadside	42.9	34.2	30.1
Cambridge Rd, Impington TL442618	Background	34.2	27.4	24.1
New Rd, Sawston TL484497	Roadside	31.6	25.3	22.3
Mill Lane, Sawston TL485493	Roadside	23.5	18.8	16.5
Elms Drive, Haslingfield TL410520	Background	21.2	17.0	15.0
Crafts Way, Bar Hill TL386637	Background	28.9	23.1	20.3

Once corrected for bias there are no measurements over $40 \mu\text{g}/\text{m}^3$.

Historically, readings have been high at three tube locations: High Street, Histon; Cambridge Road, Girton and High Street, Sawston. Trend data for these sites is reported below with readings corrected for bias and graphed over the measurement period.

Figure 37. Measurements for locations where the annual mean objective for NO₂ are highest

Location	2001	2002	2003	2004	2005	2006	2007
High Street, Histon. TL439 637	44.9 (35.1)	45.3 (38)	50.6 (43.7)	44.0 (39.2)	43.4 (36.4)	48.3 (37.7)	47.1 (37.7)
Water Lane, Histon. TL439 637	N/a	N/a	N/a	N/a	49.0 (43.1)	41.3 (38.2)	42.9 (34.3)
Cambridge Rd, Girton. TL425 614	46.6 (36.4)	47.9 (40.3)	51.7 (44.8)	40.7 (36.2)	45.3 (41.7)	41.9 (32.7)	34.2 (27.4)
High Street, Sawston. TL486 490	45.3 (35.3)	46.0 (38.6)	49.0 (42.6)	40.3 (35.9)	39.2 (36.5)	38.6 (30.1)	41.8 (33.4)
High Street Linton	39.0 (30.4)	38.6 (32.4)	38.6 (33.6)	37.4 (33.3)	32.1 (30.0)	40.0 (31.2)	41.7 (33.4)
High Street, Tadlow. TL281 474	20.8 (16.1)	20.6 (17.4)	27.8 (24.1)	19.7 (17.4)	20.2 (16.2)	18.0 (14.0)	16.9 (13.5)

**Figures in brackets denote the concentrations after bias adjustment*

From Figure 37, above, the tubes at High Street, Linton and High Street, Histon have shown a general increase in concentrations of NO₂ over the last 2 years, whereas High Street, Sawston has fallen and risen and the tubes at Girton and Tadlow have shown a reduction in concentrations.

The diffusion tube at High Street, Linton is located on the façade of a property at a point where the road is narrow and is the same distance from the road as the houses in this area, thus a relevant location. Recent alterations in the road layout may be having an impact on air quality however this will continue to be monitored closely to ensure that air quality does not deteriorate significantly.

The diffusion tube at High Street, Histon is located at the façade of a property and approximately one metre from the road. The High Street is the busiest road in Histon and due to speed reduction measures, traffic moves slowly through the village.

The concentrations of NO₂ at the diffusion tube in Water Lane, Histon show a downward trend since it was established in 2005. The tube is in a roadside location, approximately 1.6m from a relevant receptor and 1.6m from the road. Concentrations of NO₂ at this location have remained consistently high although still within the annual mean objective.

Despite a rise in the concentrations at some diffusion tube locations in 2006 and 2007, adjusting the figure for bias brings the concentrations down to below the national objective.

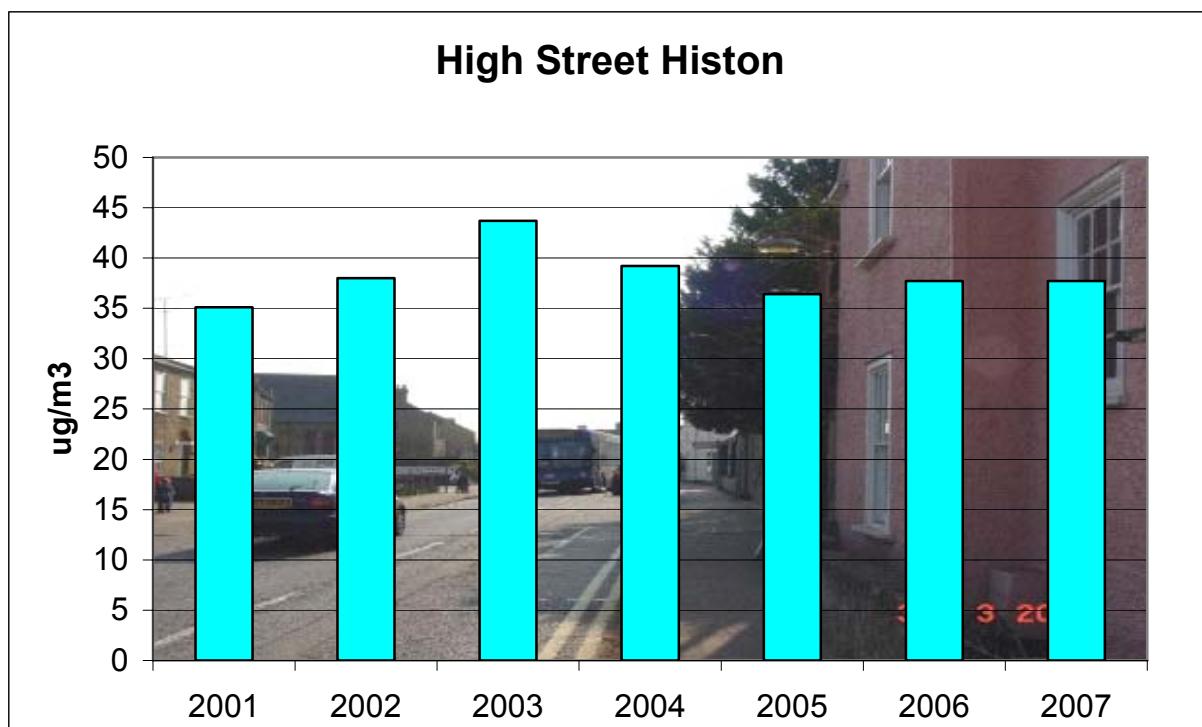
The data provided in Figure 37 for the diffusion tube in High Street, Tadlow is thought to be representative of concentrations close to rural background. Tadlow is a small village off the B1042 but traffic flows along this stretch of road are only a very small fraction of flows through the District. This gives a good indication as to how much traffic emissions are responsible for poor air quality within South Cambridgeshire.

Within all the diffusion tube locations discussed, there appears to be a continuing trend downwards since 2005.

High Street, Histon is a narrow village road which although is not subject to excessive traffic flows can become congested at peak times owing to vehicles parking on the road and causing obstructions to the flow of traffic. The tube is adjacent to a residential façade and is therefore in a relevant location.

Additional monitoring locations were commissioned in 2005 when a new road traffic scheme was implemented in the village. The scheme was abandoned after eight months and any direct effect on air quality was difficult to establish. Concentrations remain below but close to the objective. A graph of the annual results for this diffusion tube location is provided in Figure 38, below:

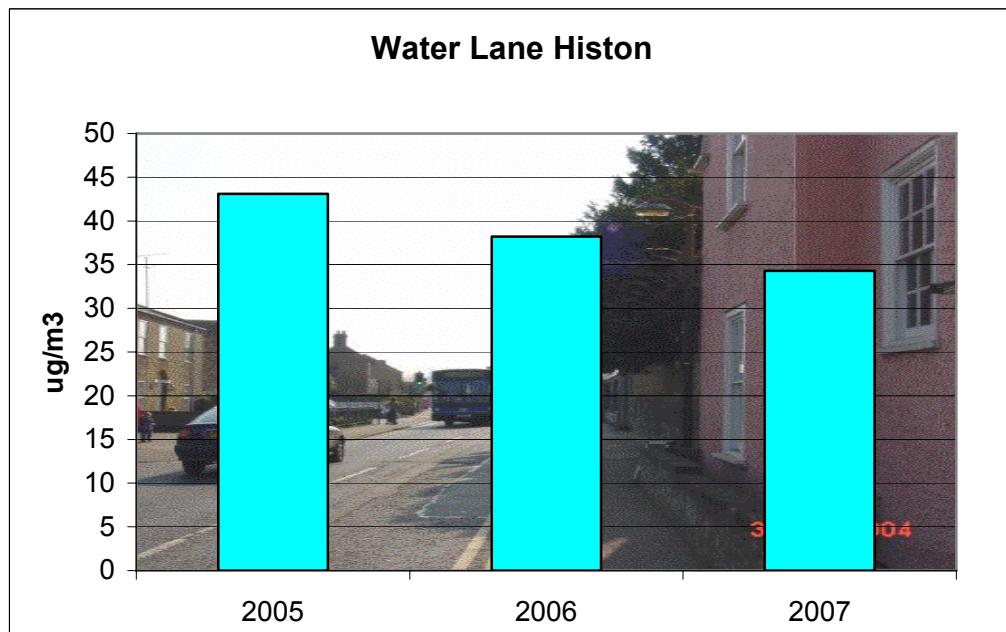
Figure 38. NO₂ diffusion tube data trend in High Street, Histon (bias adjusted).



The diffusion tube at Water Lane in Histon was commissioned in 2005. Since being established, it has consistently shown high levels of NO₂. Water Lane is a section of the busy B1049, which acts as a distributor road between surrounding villages and the A14 and Cambridge. The tube location is approximately 1.5km north of the junction of the B1049 with the A14.

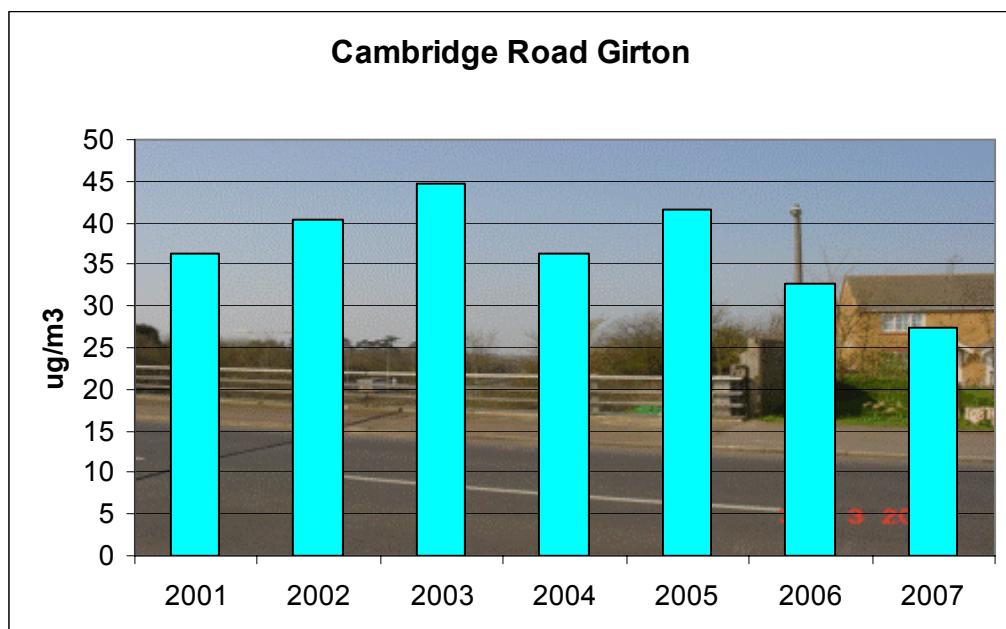
The highest levels of traffic along the B1049 are experienced during the morning and afternoon rush hours. Figure 39, on the following page, shows the concentrations of NO₂ measured at Water Lane. Concentrations show a downward trend but remain within the annual mean objective. Monitoring will continue at this location for the foreseeable future.

Figure 39. NO₂ diffusion tube data trend in Water Lane, Histon (bias adjusted).



The monitoring location in Girton is at the entrance to a small development and opposite a local shop. The tube is situated on a lamppost in a roadside location, on a bridge over the A14 dual carriageway. The site is an equivalent distance from the A14 as local residential gardens and is a relevant location within the Air Quality Management Area for NO₂. As can be seen from Figure 40, below, the concentration of NO₂ measured in 2007 is the lowest since the diffusion tube was installed. The general trend since 2005 has been down. This location is important within the monitoring network, therefore monitoring here will continue despite the low concentrations of NO₂ recorded in recent years.

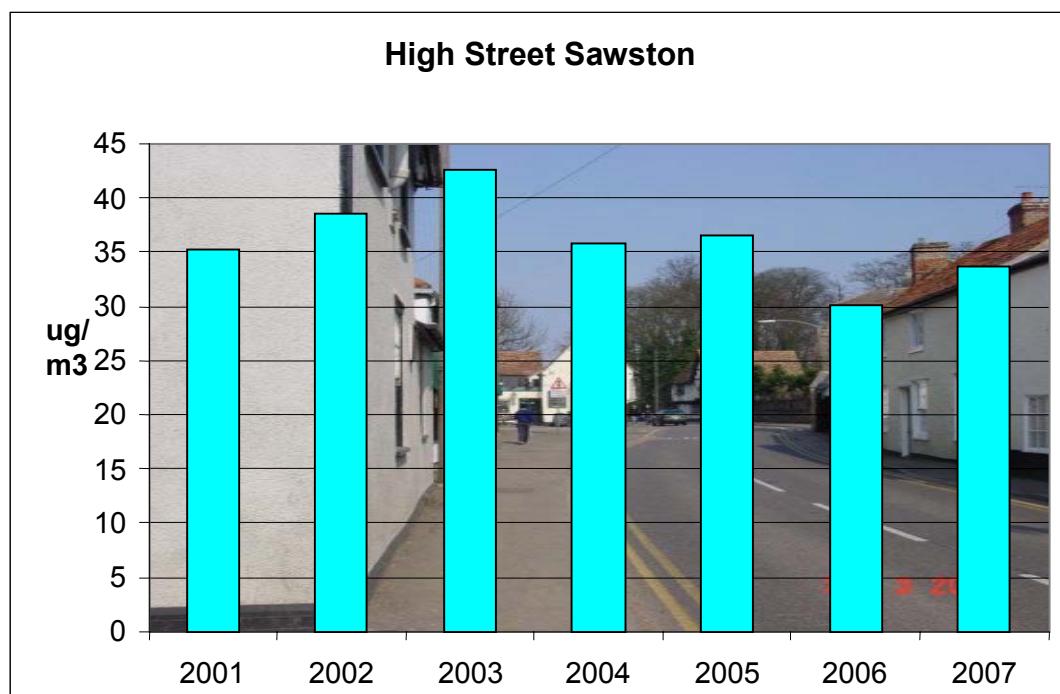
Figure 40. NO₂ diffusion tube data trend in Cambridge Road, Girton (bias adjusted).



The fourth location that previously exceeded the annual mean objective is located in Sawston, currently our largest village with a population of 8,000. The monitoring site is adjacent to the façade of a local public house and the same distance from the roadside as the façade of residential properties and is therefore in a relevant location.

As can be seen from Figure 41, these results have been below the annual mean objective since 2004. No further action is considered necessary at this stage, however, monitoring will continue at this location in future years.

Figure 41. NO₂ diffusion tube data trend in High Street, Sawston (bias adjusted).



2.5.2 PM₁₀ monitoring data within an Air Quality Management Area

Fine particles are monitored at two locations in South Cambridgeshire, on the A14(E) at Bar Hill (TL385 637) and on the A14(W) at Impington (TL437 616). Measurements at both sites are made using an Eberline FH 62-IR Beta-attenuation Monitor. This instrument has a heated inlet manifold, which is held at 40°C, the temperature is sufficient to drive off the volatile content of the sample and therefore the guidance given in LAQM.TG(03) is to correct for this by multiplying all measurements by a factor of 1.3 prior to comparison with the Air Quality Objectives. Results are quoted as $\mu\text{g}/\text{m}^3$ TEOM equivalents prior to correction and as $\mu\text{g}/\text{m}^3$ gravimetric subsequently.

The PM₁₀ results measured at Bar Hill are quality assured and reported by NETCEN. The site was commissioned in March 2001 as described above for NO₂ and there is a fully scaled and ratified dataset available pursuant to this period (Figure 42).

Figure 42. PM₁₀ concentrations measured at the A14 (E) Bar Hill

	2001	2002	2003	2004	2005	2006	2007	National Air Quality Objectives
Measured annual mean (TEOM equivalent)	22µg/m ³	23 µg/m ³	25µg/m ³	21µg/m ³	22µg/m ³	26µg/m ³	27µg/m ³	
Data capture of hourly means	75.2 %	96.5 %	92.4 %	84.7%	92.9%	98.2%	99.2%	90 %
Estimated annual mean (see below)	22µg/m ³	N/a	N/a	20µg/m ³	N/a	N/a	N/a	
Annual mean (gravimetric)	29µg/m ³	30µg/m ³	33µg/m ³	27µg/m ³	29µg/m ³	34µg/m ³	36µg/m ³	40 µg/m ³
Number of exceedences of 24 hour mean > 50µg/m ³	(9) (measured)	27	40	17	25	51	49	35
90 th percentile (gravimetric) – reported where data capture is below 90%	48µg/m ³	N/a	N/a		N/a	N/a	N/a	

The results in Figure 42 show that there have been exceedences of the daily mean objective in 2003, 2006 and 2007 of 40 days, 51 days and 49 days respectively, whilst the annual mean is within the objective in all years. Monitoring at the A14(W) in Impington has been operating since 19 February 2002. The analyser is identical to the one at Bar Hill and, therefore, the data has been handled in the same manner. Air Quality Monitoring Services Ltd provided data ratification and auditing services at this site until 2004, since then NETCEN have provided a full data audit and ratification process for this dataset. The data sets for all years are presented in Figure 43, below.

Figure 43. PM₁₀ concentrations measured at the A14(W) Impington

	2002	2003	2004	2005	2006	2007	National Air Quality Objectives
Measured annual mean (TEOM equivalent)	23µg/m ³	30µg/m ³	26µg/m ³	32µg/m ³	28µg/m ³	26µg/m ³	
Data capture of hourly means	80.2 %	88.1 %	72.2%	42%	81.1%	95.5%	90 %
Estimated annual mean (see below)	23µg/m ³	30µg/m ³	26µg/m ³	31µg/m ³	28µg/m ³	34µg/m ³	
Annual mean (gravimetric)	30µg/m ³	39µg/m ³	33µg/m ³	42µg/m ³	36µg/m ³	N/a	40 µg/m ³
Number of exceedences of 24 hour mean > 50µg/m ³	22 (measured)	72 (measured)	6	37	42	34	35
90 th percentile (gravimetric) - reported where data capture is below 90%	55µg/m ³	66µg/m ³				N/a	

Historically, data capture at this site has been poor. However, during 2007 data capture improved and achieved the target of 90%.

Monitoring shows that the annual mean objective was achieved in all years except for 2005. In 2007, the 24 hour mean objective appears to have been met but only by one day

Both the monitoring locations detailed in Figures 42 and 43 have been the subject of detailed assessments in December 2007. As part of the assessment, dispersion modelling was carried out. The results of the dispersion modelling concurred with the actual monitoring results in that the annual mean objective is being achieved but modelling has also shown that using 2006 data, the daily mean objective is not being met

An AQMA for PM₁₀ is to be formally declared along a stretch of the A14 between Histon and Bar Hill to include both monitoring locations and some nearby residences.

Monitoring will continue at both the Bar Hill and Impington locations. In addition to this, further monitoring of PM₁₀ and NO₂ is to be introduced at the site of a school on the Arbury Park development, close to the A14 at Histon. Should further opportunities arise, South Cambridgeshire District Council will act to expand the monitoring network within the District.

The largest significant factor on air quality in South Cambridgeshire is traffic emissions. With this in mind, work will continue with Cambridgeshire County Council on the Transport Plan to ensure that the air quality impact of transport is considered and mitigated.

South Cambridge District Council has recently completed the development of a Local Air Quality Strategy. The strategy is currently under consultation. This strategy, along with the proposed A14 improvements, will be examined with the intention to reduce the levels of fine particulates in this area.

2.5.3 Benzene

No further monitoring has been undertaken since that carried out in 2003. Results found concentrations to be significantly below the air quality standards. Conditions have not changed which may affect this position.

2.5.4 Sulphur Dioxide

Continuous monitoring of SO₂ has continued at the Fruit Farm, Barrington since 2003. An API SO₂ analyser, utilising the ultra violet fluorescence technique is used to obtain continuous 15-minute average ambient SO₂ concentrations. It was commissioned by NETCEN who also audits the equipment and scales and ratifies the data. The full dataset is available to 31 December 2007 and shows that all standards are being achieved (Figure 44). Monitoring of SO₂ will continue at Barrington Fruit Farm for the foreseeable future.

Figure 44. Sulphur dioxide concentrations measured at Barrington

Location	Year	Maximum 15 Minute Mean ($\mu\text{g}/\text{m}^3$) [number of exceedences]	Maximum 1 Hour Mean ($\mu\text{g}/\text{m}^3$) [number of exceedences]	Maximum 24 Hour Mean ($\mu\text{g}/\text{m}^3$) [number of exceedences]	Data Capture (%)
Challis Green, Barrington	1998	192 (0)	160 (0)	32 (0)	23
	1999	125 (0)	117 (0)	32 (0)	83
	2000	114 (0)	85 (0)	32 (0)	60
	2001	106 (0)	106 (0)	29 (0)	96
	2002	138 (0)	94 (0)	18 (0)	94
	2003	133 (0)	104 (0)	41 (0)	97
Fruit Farm, Barrington	2003	330 (5)	269 (0)	80 (0)	94
	2004	82 (0)	61 (0)	17 (0)	73
	2005	21 (0)	19 (0)	6 (0)	78
	2006	43 (0)	27 (0)	9 (0)	95
	2007	96 (0)	72 (0)	24 (0)	91
National Air Quality Objective	2004-5	266 (35)	350 (24)	125 (3)	90

3. New Local Developments

3.1 Cambridge City Council

New Part A Processes

The application made to the Environment Agency for an IPPC permit to operate the following activities; disposal of hazardous waste other than by landfill or incineration, Part A (1), at Cambridge Waste Management Centre, Cowley Road, has now been determined and the permit issued.

No new Part A applications have been made.

New Part B Processes

One application for variation to an existing permit to include a Stage Two Vapour Recovery system at a petrol station has been received. One Part B permit has been revoked following closure of the premises. Two Part B premises have closed and three others have surrendered their permits.

No new Part B applications have been made.

New Retail Developments

There are new relevant retail developments in the district.

The Grand Arcade re-development in the centre of the City continues. Initially this led to some short-term increases in PM₁₀ during demolition work. There is a significant volume of HDV movements associated with this site however there is no evidence to suggest that they are impacting on air quality in the City centre – probably because other vehicle movements have been diminished by traffic restrictions whilst construction work is in progress. No additional car parking spaces have been allocated to this development so there should be no additional impact on air quality upon completion.

The Bradwells Court/Christ's Pieces development opened in 2007. This is a smaller development, replacing an older retail area. No additional air quality impacts are anticipated.

New Road Schemes

No new road schemes have been developed in the last year. However, some may be in place before 2010. Of note is the proposed expansion to eight lanes of the A14 north of Cambridge and in the South the proposed Addenbrookes Link Road, which will define a new housing development associated with it. The latter has been subject to a full assessment of Air Quality but has been based on a flawed Transport Assessment, such that an AQA has not yet been accepted.

New Mineral Developments

No new mineral developments have been approved.

New Housing Developments

Substantial housing developments are already under construction on the northern fringe of the City (Arbury Camp) and although they lie largely outside the administrative area they will have an impact on the City. Substantial housing developments at the NIAB site, Clay Farm, Glebe Farm and the former Monsanto site are also coming forward for development before 2010 - these will have a significant impact in the south of the District and again will be subject to a full review of air quality prior to approval. Transport and air quality assessments have been provided for some of these sites, but at the time of writing the transport assessments have been of poor quality and not accepted by transport planners at the City or the County councils. Therefore, air quality assessments have also been inadequate. None address the issue of the impact of the development on the AQMA, some state that as the proposed development site is outside an AQMA it is therefore suitable for development. We have noticed a paucity of understanding of PPS23 and, rather worryingly, lack of reference to the Environmental Protection UK guidance (2006 or 2004). The inadequacy of the air quality assessments received delays the decision-making process, both because they take longer to assess and because work is returned to be re-submitted.

New Landfill Developments

No new landfill sites have been approved.

Mixed Use Development

The station area is planned for redevelopment for commercial, retail and housing uses. Developments as a whole are currently subject to a detailed assessment for Air Quality, in line with PPS23. This development is within the AQMA and as such will be carefully scrutinised in air quality terms. The planning application for this development was refused on many grounds including air quality and was resubmitted at the end of February 2008. The application is therefore currently being considered.

The Addenbrookes hospital site is being extended and use on the current site is being intensified. Approximately 215,000 m² of additional clinical facilities and R&D facilities are planned, as well as a hotel, conferencing facilities and additional retail and food outlets. The air quality assessment for the development itself is adequate although the impact of additional traffic on the roads network and the knock-on effect on air quality has not yet been satisfactorily assessed or sufficient mitigation measures proposed.

3.2 East Cambridgeshire District Council

New Part A Processes

No new Part A processes have commenced operation in the previous year since the 2007 Progress Report.

New Part B Processes

No new Part B processes have commenced operation in the previous year since the 2007 Progress Report.

New Retail Developments.

No new relevant retail developments since the 2006 USA have taken place.

New Road Schemes

No New relevant road schemes since the 2006 USA have taken place.

New Mineral Developments

No new mineral developments have been approved since the 2006 USA.

New Landfill Developments

No new landfill sites have been approved since the 2006 USA.

Mixed Use Development

No relevant mixed-use developments have been approved in since the 2006 USA.

Air Traffic

There have not been any new air traffic related developments in 2007 but in 2008, NATS (National Air Traffic Services), operating under a licence from the Civil Aviation Authority, has proposed changes to the locations of the holds for Stansted and Luton Airports, where aircraft queue at busy times for their clearance to land. The airports currently share two holds but under the proposals Luton would have one and Stansted two dedicated holds. NATS state that the new proposal means greater efficiency and reduced environmental impact compared to the current arrangement. One of the holds for Stansted Airport crosses the southern part of East Cambridgeshire, from Brinkley to Ashley.

The consultation period is being undertaken in spring 2008. NATS have already undertaken analysis into the potential effects of similar proposals on local air quality at Heathrow and London City where local Air Quality Management Areas (AQMAs) exist that could be affected by the

changing airspace designs. This analysis has shown that the proposed changes will have a negligible impact on the local air quality. NATS state that no local air quality analysis has been undertaken for Luton or Stansted because there are no AQMAs in the vicinity of the changes. However, as the proposals have similar characteristics at all four airports, NATS have advised that the conclusions from the Heathrow and London City analysis can be inferred for these airports also.

3.3 Fenland District Council

New Part A Processes

Several existing poultry activities have fallen within the Pollution Prevention and Control Regime during 2007/08 and have applied for a permit to operate. These include:

- Henlow Poultry Farm
- Hooks Drove Poultry Farm
- Fovargue Poultry Farm

New Part B Processes

One new process has been permitted and considered, in terms of air quality, to be insignificant (Respraying of road vehicles: rural location). Whilst two processes have closed (Roadstone Coating and Bulk Cement)

New Retail Developments

There have been no relevant retail developments.

New Road Schemes

As the Nene Waterfront development progresses there will be significant road changes within the Wisbech NO2 AQMA. This will be part of the regionally important Nene Waterfront Regeneration Project, which is detailed below. The development will heavily impact upon the significant junctions of the Lynn Road roundabout and Lynn Road/ Mount Pleasant Road. Traffic projections have been studied by Bureau Veritas (formerly Casella) and modeled. It is suggested that the air quality will not worsen in the long term.

New Minerals Development

There have been no relevant mineral developments within the District.

New Landfill Development

There have been no new landfill developments within the District

New Mixed Use Development

As stated in the road scheme section, the Nene Waterfront development is now under development. This project funded by EEDA, English Partnerships, European Regional Development fund and the Fenland District and Cambridgeshire County Councils, aims to regenerate the centre of Wisbech.

The development is characterised by a five zone approach consisting of the following:

Zone 1

This zone shall include a mix of residential accommodation and a new link road from De Havilland Road to Chase Street. The precise form and layout of the residential development will depend upon the outcome of detailed ground investigations and the proposed remediation strategy.

Zone 2

It is envisaged that this zone shall include a mix of residential, leisure (Class D2), cafe/restaurant (Class A3), and employment (B1a, b, c) uses. It may also contain an element of small scale retail (Class A1). Residential above ground floor cafe/restaurant/leisure uses ('vertical' mixed-use buildings) will be particularly encouraged on the waterfront. It is likely that residential will be predominantly flats, although houses of an urban character and density will also be appropriate. It is considered that the northern part of the zone would be particularly suited to the accommodation of marina/port related leisure and employment uses.

Zone 3

This zone should include for a mixed residential and leisure/retail/cafe/restaurant/ commercial (Class D2, A1, A2, A3, B1) uses. It is envisaged that such uses will be accommodated within the ground floors of the buildings associated with the proposed town square. In addition the zone should include for the provision of an open space designed to accommodate a Local Area for Play (LAP). The LAP could be provided to the east of the zone (rather than on the river front) so that it is accessible to residents from the wider regeneration area.

Zones 4a and b

These zones shall include a mix of existing uses (in existing buildings) along with new buildings accommodating residential and retail/cafe/restaurant/leisure (Class D2, A1, A2 and A3) uses. Vertical mixing uses will be encouraged.

Zone 5

It is likely that the existing uses will remain, although there may be long term potential for future redevelopment for a mix of uses. Such future development will be encouraged. In addition developers advancing residential proposals will be expected to include for 13% of total housing units as affordable.

Further information regarding the development including progress to date can be found at:

www.nenewaterfront.co.uk

3.4 Huntingdonshire District Council

New Part A Processes

6 new A1 sites have been permitted and they are all for poultry farms:

H Baker & Son Ltd, Graftham.

Hook 2 Sisters Ltd, Gallery Hill Farm Poultry Unit, Hemifngford Grey.

Blackwell Poultry Farm, Tilbrook.

Hook 2 Sisters Ltd, Overcote Farm Poultry Unit, Needingworth.

Hook 2 Sisters Ltd, Somersham Road Poultry Unit, St Ives.

Moy Park Ltd, Somersham Poultry farm, Somersham.

Their impacts on local air quality are considered to be negligible.

New Part B Processes

Eight new dry cleaning activities have been permitted but these are considered insignificant in terms of their effect on the local air quality.

New Retail Developments

No relevant retail developments have been permitted since the USA.

New Road Schemes

There have been no new road schemes permitted since the USA. Proposals for the re-routing of the A14 from Brampton to Bar Hill continue to be considered and a preferred route option has been announced by the Highways Agency. The preferred route will significantly reduce concentrations of traffic related pollutants in Huntingdon and Fenstanton.

New Minerals Development

There were no relevant mineral developments within the District in 2007.

New Landfill Development

There have been no new landfill developments within the district in the last twelve months.

New Mixed Use Development

There have been no major mixed use developments approved during the last twelve months.

3.5 South Cambridgeshire District Council

New Part A Processes

No new Part A processes have been authorised since the last review in 2006/07.

Cemex have been granted a variation of their existing permit to burn Climafuel as part of their cement making process. Consultation raised concerns that emissions of PM_{2.5} may increase owing to the use of this fuel and therefore in-stack monitoring of PM₁₀ and PM_{2.5} is being required by the Environment Agency for a minimum of two years. The Decision Document also included an improvement condition requiring the operator to update the air dispersion modelling for the installation to account for recent changes in the process. This will be considered in the next Review and Assessment but the PM₁₀ standard is not thought to be at risk at this location.

New Part B Processes

Four new Part B Processes have been permitted since the last Progress Report. These are:

- 1 bulk cement process
- 2 respraying of road vehicle processes
- 1 surface degreasing process.

Each of the new processes will be inspected as required under the PPC Regulations and will be included in future review and assessment work. However, given the size of the operations and Permit conditions, it is not thought that they will have a significant impact on the local air quality.

New Retail Developments

There have been no new retail developments in the district over the previous twelve months.

New Road Schemes

No new road schemes have been completed since the last report.

New Mineral Developments

There have been no new mineral developments since the last review.

New Landfill Developments

There have been no new landfill developments within the district in the last twelve months.

Mixed Use Development

South Cambridgeshire District Council is within the eastern region growth area and is therefore subject to a significant amount of new mixed-use development. All applications received are screened to ensure that any impacts on air quality are identified and mitigated as far as possible. Whilst applications are awaited for most of the growth area schemes, work is continuing in supplying information for the production of environmental statements and assessments.

The application for the Northstowe development was submitted to the Council in December 2007. This application relates to the redevelopment of 605 hectares of land previously used as the Oakington Airfield. The development is to comprise highway link improvements, a core area containing retail and businesses and approximately 9500 new homes to include associated open spaces and parkland.

The development will cover an area of approximately 605 Hectares with 22,800m² floorspace set aside for hotels and indoor leisure facilities, 49,500m² floorspace for A1, A2, A3, A4 and A5 retail use and 156,000 m² floorspace set aside for B1, B2, B8 and *sui generis* industrial and commercial uses.

An air quality impact assessment has been submitted by the developer with the application and its conclusions will inform the decision making process. It is thought likely that there will be an impact on local air quality but discussions are still taking place to determine its significance.

The potential for significant impact is magnified by the proximity to the development of the A14 corridor, subject of an AQMA for NO₂ and PM₁₀. It is the location of these transport links that led to the identification of the proposed site for development. Improvements to the road network are proposed by the Highways Agency, but may not be brought forward prior to commencement of development. In-depth negotiations are currently underway to determine the exact nature of the impact of both projects and to phase development accordingly to mitigate pressure on the highway and ensure that current service levels are maintained.

In addition, an outline planning application was submitted in 2007 for the development of Upper Cambourne. This is to include up to 950 dwellings, a community centre, open space and play areas. Owing to the recent improvements on the local network A428, it is thought that traffic movements will not cause a significant impact.

4. Partnership Working

The close working relationship that has developed through the Air Quality Working Group (partnership of the five District Councils and the County Council) has enabled a countywide approach to be taken towards air quality and for measures to be incorporated into transport programmes and plans. This is particularly important given the continuing rise in traffic combined with the future population growth, which could exacerbate existing problems of air pollution.

The Group is aware that increased traffic growth and future population growth planned for the County, particularly in the Cambridge sub-region together with the outcomes of Review and Assessment processes may make it necessary to declare Air Quality Management Areas elsewhere in the county for one or more pollutants. It is also aware that assumptions about improved vehicle technology leading to a drop in emissions over the coming years were optimistic as air pollution levels have not fallen where traffic counts show that the numbers of vehicle movements remain unchanged. In addition, vehicle use continues to rise across the county.

5. Air Quality Management Areas

Cambridge City Council currently have an AQMA for annual mean NO₂ covering much of the city area.

Fenland District Council currently has four AQMAs. Two, located in Wisbech, are for contraventions of the 15-minute mean SO₂ objective and the PM₁₀ daily mean objective. The third, also in Wisbech, is for exceedence of the NO₂ annual mean. The fourth is in Whittlesey and is for the 15-minute mean SO₂ objective.

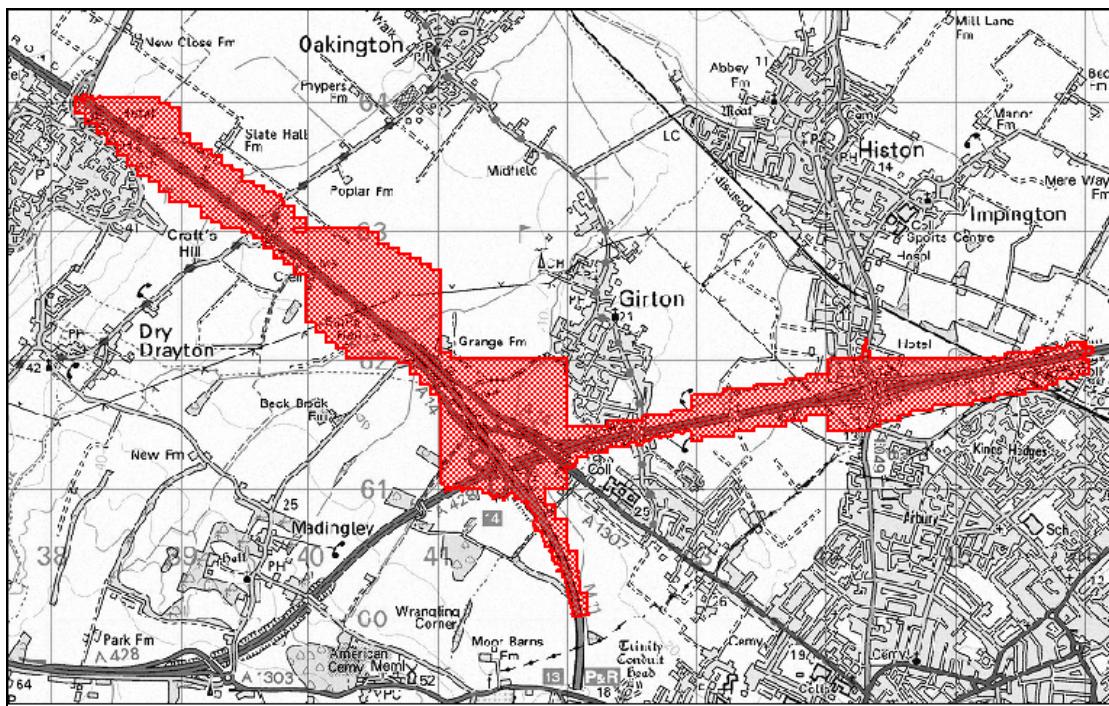
Huntingdonshire District Council currently has four AQMAs for annual mean NO₂. Three of these are located in parts of Huntingdon, Brampton and St Neots. The fourth includes relevant receptors close to the A14 between the Hemingford's and Fenstanton. All four AQMAs were subject to a Further Assessment, the findings of which were reported to defra in February 2007. The Further Assessment recommended amending three of the AQMAs and these amendments were made in October 2007.

The air quality monitoring programme in South Cambridgeshire has been continuing in accordance with the strategy drawn up from previous Air Quality Management work, which has highlighted a risk of exceedence of the Air Quality Objectives for annual mean NO₂ and 24 hour mean PM₁₀ in locations close to the A14. A detailed assessment for NO₂ was completed in January 2007 and recommended that an Air Quality Management Area be declared as defined in Figure 46, consultation on the detailed assessment finished in April 2007 with official declaration of the Air Quality Management Area taking place in July 2007.

Figure 45. Air Quality Management Areas

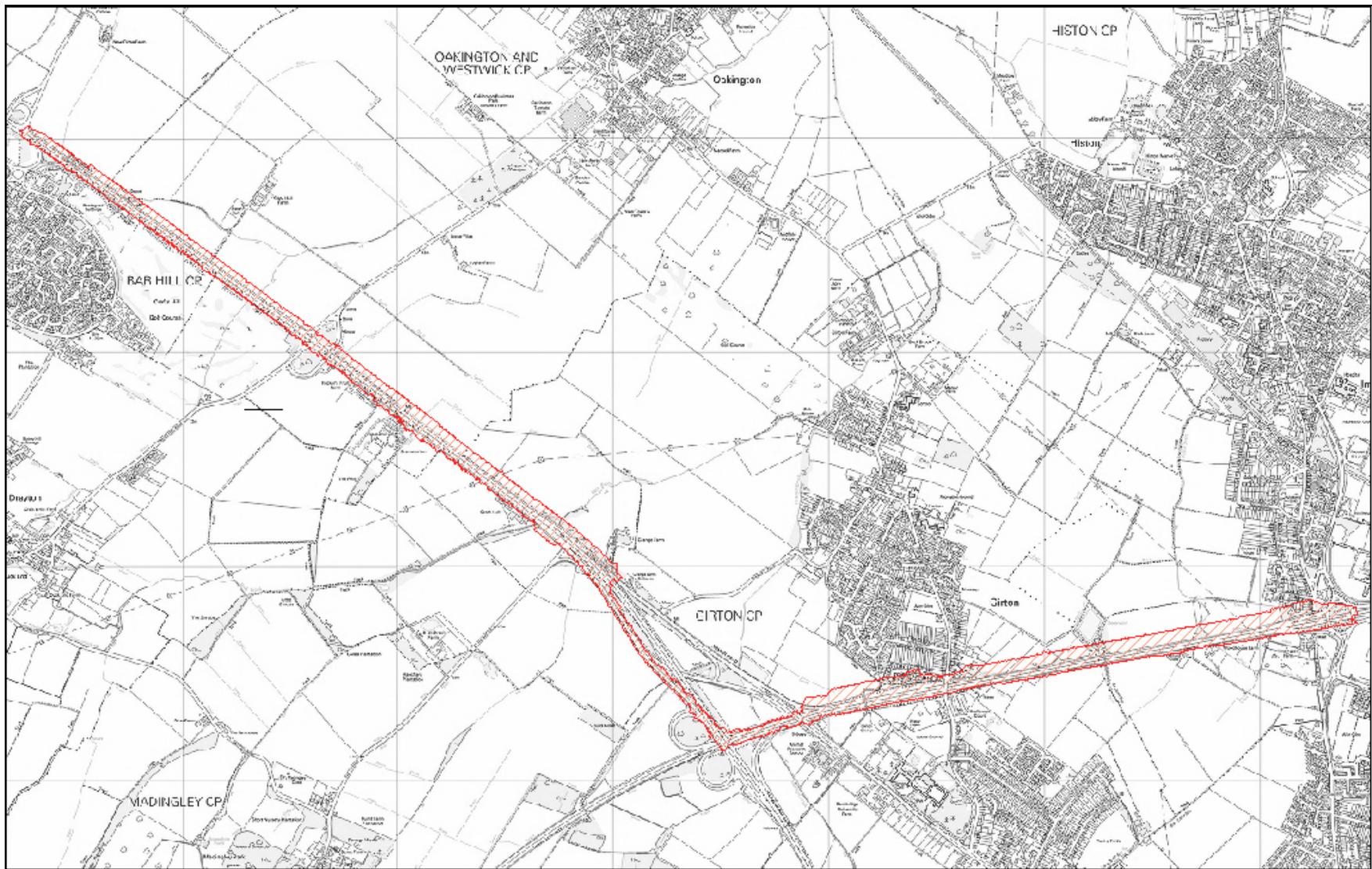
<i>Location</i>		<i>Pollutant</i>	<i>AQMA declared</i>
Cambridge City	Centre	NO ₂	2004
Huntingdonshire	Huntingdon	NO ₂	2005
	St Neots	NO ₂	2005
	Brampton	NO ₂	2006
	A14 Hemingford to Fenstanton	NO ₂	2006
Fenland	Wisbech	NO ₂	2006
	Wisbech	SO ₂	2003
	Wisbech	PM ₁₀	2003
	Whittlesey	SO ₂	2006
South Cambridgeshire	A14 Bar Hill to Milton	NO ₂	2007
	A14 Bar Hill to Impington	PM ₁₀	2008

Figure 46. Air Quality Management Area (Conc. NO₂ > 39 µg/m³)



In addition, a detailed assessment of PM₁₀ was carried out in December 2007. The assessment recommended declaration of a second Air Quality Management Area along a stretch of the A14 between Histon and Bar Hill, as defined in Figure 47, below. The consultation process began in March 2008.

Figure 47. Proposed Air Quality Management Area (Conc. PM₁₀ > 50µg/m³)



6. Action Plans

Cambridge City Council developed a preliminary Action Plan which was fully incorporated into the new Local Transport Plan for Cambridgeshire in 2006. Primarily there are two commitments:

- Firstly there is a commitment to keep traffic levels steady at the outer and inner radial cordons. This will allow improvements in vehicle emissions over the plan period to contribute to improving ambient air quality.
- Secondly, a more proactive approach has been made towards improving the bus fleet within Cambridge through a 'Quality Bus Partnership'. Traffic movements are already strictly controlled in the core area, within the inner ring road, by rising bollards. Taxis and PSVs require a transponder to enter and exit some areas, which allows for some measure of control over those vehicles using central Cambridge.

Fenland District Council developed an action plan for Wisbech SO₂ and PM₁₀ in 2002. The Environment Agency is completing its requirements under the action plan by way of the improvement plan at HL foods which includes the installation of turbo scrubbers on the exhausts of the boiler plant.

Huntingdonshire District Council and South Cambridgeshire District Council both currently have AQMAs but have not completed their Action Plans. They are in the process of developing a joint action plan in conjunction with Cambridge City Council. The rationale behind the decision to develop it jointly is that all three councils share the A14 corridor and its associated NO₂ problems. Also all three councils share a common approach to the assessment of air quality and are accustomed to joint reporting. An Air Quality Grant was approved by defra, in 2007, to enable the three Councils to commission an updated detailed emissions inventory to be developed to assist the development of the Action Plan.

7. Planning and Policies

Cambridge City

Core Traffic Scheme measures, designed to reduce traffic levels and improve the management and reliability of bus services, have been dovetailed with highway works associated with retail redevelopment projects. Monitoring is now being undertaken to establish if further measures will be required once traffic patterns have stabilised following the opening of the new retail development.

A Bus Partnership Co-ordinator has been appointed by the County Council to oversee the development, implementation, monitoring and review of the Quality Bus Partnership. This requires bus operators to show year on year reductions in their vehicle emissions to retain their bus stop parking permits and transponders to operate rising bollard closure points. There is also a requirement to switch off engines when using bus layover bays.

The County Council has adopted the City Council licensing standards as the minimum requirement for all taxis applying for and using transponders to enter the City.

Joint Action Planning – City, Huntingdonshire and South Cambridgeshire

Cambridge City, Huntingdonshire District and South Cambridgeshire District Councils are proposing a Joint Action Plan to tackle air quality problems along the A14. A workshop with relevant officers from the County Council and Highways Agency established who needs to be involved with developing proposals.

An Emissions Inventory for the area has been commissioned to establish baseline emissions and provide a detailed database to enable modelling to be undertaken with local data.

Planning and Policies

The Regional Spatial Strategy (RSS) for the East of England will establish the broad development strategy for the region, and provide a framework within which local development documents can be prepared for the period to 2021. The process for production began in Autumn 2001 and publication of the final East of England Plan is expected in spring 2008. The scale of housing growth required is significantly greater than that experienced in recent years with most growth being concentrated in the Cambridge sub-region at locations around Cambridge City and in a new settlement at Northstowe in South Cambridgeshire District. These locations have been chosen not

only to help minimise environmental impact and reduce travel distance into Cambridge but also for their suitability to be served by sustainable transport networks.

Local Development Frameworks (LDFs) set out the Local Planning Authority's policies and proposals for the development and use of land in their area over a period of at least ten years. LDFs have to take into account national and regional planning policies. Local Development Plan documents are at various stages of development

8. Transport Plans and Strategies

Work to produce a Long Term Transport Strategy (LTTS) for Cambridgeshire commenced in 2005 and is being taken forward through the Transport Innovation Fund. This has demonstrated that a package of measures will be required to meet the transport needs of the county to 2021, including improvements to public transport, the highway network, walking and cycling facilities and more stringent demand management measures than are currently in place. It is estimated that the proposed measures will lead to a 10% reduction in congestion and result in reduced levels of CO₂. An extensive programme of public consultation is being undertaken to gather feedback on the proposals.

A Business Case for the proposals has been submitted to government for funding of capital works. A timetable for implementation is dependent upon government processes and decisions as to the funding. However, there is potential to begin certain measures such as Park and Ride improvements, Real Time Bus Information and cycling improvements. The introduction of major elements, such as segregated busways, can only take place after public consultation and completion of government processes leading to approval. If it was decided to introduce congestion charging, this would only be considered after the key elements of the supporting measures – such as improved public transport and the walking and cycling measures – had been introduced.