South Bucks
District Council

AIR QUALITY PROGRESS REPORT

April 2007

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Contents

Executive Summary

The Environment Act 1995 requires Local Authorities to periodically review and assess local air quality against the air quality objectives contained in the Air Quality Regulations.

The initial round of review and assessment for South Bucks District Council identified that the whole District would meet all of the National Air Quality Strategy Objectives.

The second round of review and assessment was undertaken during 2003/2004. The initial stage of the second round of air quality review and assessment involved an updating and screening assessment to review sources of National Air Quality Strategy pollutants in the District. This assessment for South Bucks, which was completed in May 2003 identified that further, more detailed assessment, would be required for the annual mean NO_2 concentrations associated with road traffic emissions.

A Detailed Assessment of air quality was undertaken for nitrogen dioxide emissions from road traffic and additionally, particulate matter (PM_{10}) emissions were also assessed as areas of highest concentrations were predicted to be similar. A Detailed Assessment was undertaken in April 2004 for the following locations:

- M40 Junctions 1 to 3;
- A40 A40/M40 convergence, Junction 1 roundabout, to the border of Chiltern and at Wycombe End;
- A4020 South of M40 Junction 1; and
- M4 Junction 4B to 5 and Junction 7 to 8.

The Detailed Assessment concluded:

- No exceedences are predicted at sensitive receptors in relation to annual mean or 24-hour mean PM_{10} concentrations for 2004. Widescale exceedences are shown on the basis of the provisional 2010 objectives.
- The Council should consider declaring an AQMA in relation to NO_2 annual mean concentrations in the following areas;
  - To the north of the M4 in the Oaks Stubbs Lane area in Dorney
  - To the south of the M4 where the B3026 crosses the motorway
  - Cherry Orchard Farm to the east of the M25
  - At Gerrard's Cross where the A40 crosses the M25
- Modeled concentrations are close to the objectives at sensitive receptors in the following locations. Additional diffusion tube monitoring should be

introduced to provide further clarity as to the levels of NO_2 at residential property façades in these areas;
- Sutton End Cottage to the north of the M4
- Victoria Crescent to the west of the M25
- Wooburn Green Lane to the north of the M40
- Coldharbour Farm Cottages to the west of the M25

As the result of the findings of the Detailed Assessment of air quality in the District, an Air Quality Management Area (AQMA) was therefore declared for corridors along the M25, M40 and M4 motorways in October 2005.

This report provides the latest nitrogen dioxide and PM_{10} monitoring results from the air quality monitoring station at Gerrards Cross and from the nitrogen dioxide diffusion tube monitoring carried out across the District. The results from the air quality monitoring station show that the nitrogen dioxide annual mean objective was met at this location. PM_{10} concentrations also met the air quality objectives in 2006 at this location. The diffusion tube monitoring shows no exceedences of the annual mean concentration of nitrogen dioxide in 2006, once the bias correction factor is applied. The highest annual mean nitrogen dioxide level was measured at the air quality monitoring station at Gerrards Cross.

1.0 Background to Air Quality Review and Assessment

The Environment Act 1995 requires Local Authorities to periodically review and assess local air quality against the objectives set in Air Quality Regulations. In areas where an air quality objective is predicted not to be met by the required date, Local Authorities are required to establish Air Quality Management Areas and implement Air Quality Action Plans to improve air quality. The Council designated an Air Quality Management Area for corridors along the M4, M40 and M25 on the 1st of October 2005 following a second round of air quality review and assessment that identified that locations in close proximity to the motorways in the District were likely to exceed the annual mean nitrogen dioxide objective level.

The Council has produced an air quality action plan which is at the final draft stage. The plan contains a series of measures designed to improve air quality within the designated air quality management area.

1.1 Role of Progress Reports

The overall aims of the Progress Report should be to:

- Report progress on implementing Local Air Quality Management (LAQM); and
- Report progress in achieving, or in many cases maintaining, concentrations below the air quality objectives.

This Progress Report is intended to ensure continuity in the Local Air Quality Management process. Its objective is to provide an annual review and update on air quality issues, including developments that might be significant to air quality and the results of monitoring. Any significant changes can then be acted upon immediately by proceeding to a Detailed Assessment, rather than waiting for the next full round of review and assessment.

The benefits to Local Authorities of producing a Progress Report are set out in Box 1.1 of the Progress Report Guidance. They include:

- providing a readily accessible source of up to date information on air quality, which may be useful to the Local Authority when dealing with enquiries from members of the public, developers carrying out environmental assessments, and to assist in other areas such as transport and land use planning.
- retaining the profile of LAQM within the Local Authority including the retention of officers with a knowledge of air quality issues.
- Helping to get maximum value from the air quality monitoring carried out by the Local Authority.

This document forms the Progress Report for South Bucks District Council. In writing this report the Council has had regard to the Government's published guidance contained in Progress Report Guidance LAQM.PRG(03)5.

1.2 Air Quality Objectives

The Environment Act 1995 required the Secretary of State for the Environment to produce a National Air Quality Strategy, setting air quality standards and objectives for specified pollutants.

The National Air Quality Strategy was published in 1997, with a revision being made in 2000 and an addendum in 2003. The strategy required Local Authorities to review and assess air quality in their areas with regard to objectives set for seven pollutants.

The objectives set for the seven pollutants were based on the levels at which no significant risk to health was posed. The Expert Panel on Air Quality Standards (EPAQS) developed the health-based standards from medical and scientific evidence.

The most recent version of the National Air Quality Strategy was published in 2000 with an addendum being published in 2003. The following table, Table 1 shows the current objectives levels set.

Table 1.1 Air Quality Strategy 2000 objectives and the objectives in the 2003 Addendum prescribed in regulations for the purpose of local air quality management (for England).

Pollutant	Objective	Concentration measured as	Date to be achieved by
Benzene	16.25 μg/m^3 (5 ppb)	Running annual mean	31 December 2003
Benzene	5 μg/m^3 (1.54 ppb)	Annual average	31 December 2010
1,3-butadiene	2.25 μg/m^3 (1 ppb)	Running annual mean	31 December 2003
Carbon monoxide	10 mg/m^3 (8.6 ppb)*	Maximum daily running 8-hour mean	31 December 2003
Lead	0.5 μg/m^3	Annual mean	31 December 2004
	0.25 μg/m^3	Annual mean	31 December 2008
Nitrogen dioxide	200 μg/m^3 (105 ppb) not to be exceeded more than 18 times a year	1-hour mean	31 December 2005

Sulphur dioxide	40 μg/m^3 (21 ppb)	Annual mean	31 December 2005
	350 μg/m^3 (132 ppb) not to be exceeded more than 24 times a year	1-hour mean	31 December 2004
	125 μg/m^3 (47 ppb) not to be exceeded more than 3 times a year	24-hour mean	31 December 2004
	226 μg/m^3 (100 ppb) not to be exceeded more than 35 times a year	15-minute mean	31 December 2005
Particles (PM_{10})	50 μg/m^3 not to be exceeded more than 35 times a year	24-hour mean	31 December 2004
Particles (PM_{10}) **	40 μg/m^3 (21 ppb)	Annual mean	31 December 2004
	50 μg/m^3 not to be exceeded more than 7 times a year	24-hour mean	31 December 2010
*** More stringent objective**	40 μg/m^3 Set in addendum 2003	Annual mean	31 December 2010
**** New objectives**	Not currently included in regulations for LAQM		

1.3 Conclusions of the Previous Review and Assessment

The first round of air quality review and assessment is split up into three stages of increasing complexity. South Bucks District Council undertook all three stages in 2000 and reported the findings of each stage in a Complete Review and Assessment. The initial stage of assessment, stage 1, involved a screening of existing and proposed potential significant pollution sources within the South Bucks. This first stage showed that national action would mean that NAQS air quality objects would be achieved on time for 1-3-butadiene and lead. It was highlighted that further investigation would be required for the NAQS objectives for benzene, carbon monoxide, nitrogen dioxide, PM_{10}, and sulphur

dioxide. The objectives and standards set for the different pollutants can be seen in Table 1, section 2.2.

Stage 2 involved a further investigation of the pollutants established in stage 1. In this stage some initial modelling of monitoring data and source data was undertaken to determine whether there were likely to be exceedences in the target years. This stage found that air quality in South Bucks were not likely to exceed the objective set for benzene, carbon monoxide and sulphur dioxide, however, further assessment would be required for nitrogen dioxide and PM_{10}. A third stage of review and assessment was therefore undertaken.

Stage 3 involved a detailed assessment of current and future air quality in relation to nitrogen dioxide and PM_{10}. The assessment involved the use of monitoring data and mathematical modelling. The results of the analysis identified that South Bucks was predicted to exceed the National Air Quality Strategy Objective for annual mean nitrogen dioxide but that these locations were not areas of relevant public exposure. DEFRA accepted the findings of South Bucks District Council, that an Air Quality management Area was not required at this stage.

The National Air Quality Strategy requires a system of periodic review and assessment. A second round of assessment is a more streamlined process consisting of an updating and screening assessment and then a detailed assessment if the initial process indicates that one or more National Air Quality Strategy Objective may be breached.

The initial Updating and Screening Assessment reviews sources of National Air Quality Strategy pollutants and identifies those pollutants where further, more detailed assessment is required.

The Updating and Screening Assessment for South Bucks identified that the main issue for SBDC to address in terms of local air quality, would be annual mean concentrations of NO_2 associated with road traffic emissions. It was considered that on the basis of PM_{10} concentrations monitored at Gerrard's Cross real time air quality monitoring station, which could almost be considered as a worst-case monitoring location within the District, that PM_{10} concentrations would fall within the 2004 objective limits. However, as a Detailed Assessment of NO_2 was proposed for road traffic sources, and based on uncertainties in the Stage 3 modeling, as a precautionary measure, it was felt appropriate to assess PM_{10} emissions from these same sources.

The Detailed Assessment developed further the information gathered and the conclusions reached in the Updating & Screening Assessment and involved the use of more sophisticated modeling and monitoring techniques. The Updating and Screening Assessment concluded that the following areas would require a Detailed Assessment:

- M40 Junctions 1 to 3;
- A40 A40/M40 convergence, Junction 1 roundabout, to the border of Chiltern and at Wycombe End;
- A4020 South of M40 Junction 1; and
- M4 Junction 4B to 5 and Junction 7 to 8.

The Detailed Assessment concluded:

- No exceedences are predicted at sensitive receptors in relation to annual mean or 24-hour mean PM_{10} concentrations for 2004. Widescale exceedences are shown on the basis of the provisional 2010 objectives.
- The Council should consider declaring an AQMA in relation to NO_2 annual mean concentrations in the following areas;
  - To the north of the M4 in the Oaks Stubbs Lane area in Dorney
  - To the south of the M4 where the B3026 crosses the motorway
  - Cherry Orchard Farm to the east of the M25
  - At Gerrard's Cross where the A40 crosses the M25
- Modeled concentrations are close to the objectives at sensitive receptors in the following locations. Additional diffusion tube monitoring should be introduced to provide further clarity as to the levels of NO_2 at residential property façades in these areas;
  - Sutton End Cottage to the north of the M4
  - Victoria Crescent to the west of the M25
  - Wooburn Green Lane to the north of the M40
  - Coldharbour Farm Cottages to the west of the M25

As the result of the findings of the Detailed Assessment of air quality in the District an Air Quality Management Area (AQMA) was therefore declared for corridors along the M25, M40 and M4 motorways in October 2005.

The National Air Quality Strategy requires all Local Authorities who have designated an AQMA to undertake a further assessment of air quality with in the AQMA. This further assessment is intended to refine the outcomes of the earlier stages of review and assessment. This further review can provide a final checking or clarification of the results from Detailed Assessment, and an opportunity for further refinement of both monitoring and modelling data. As part of this further review, a local authority is required to consider the cost effectiveness and feasibility of different abatement options, and to consider the extent to which air quality improvements are required as part of the further review process. The further review and assessment for South Bucks District Council will be undertaken before the end of September 2005.

The National Air Quality Strategy also requires those Local Authorities who have designated an Air Quality Management Area to produce an Action Plan identifying measures that will be taken to improve air quality in the District

and, in particular, improve air quality so that all of the National Air Quality Objectives are achieved.

South Bucks District Council has been working with the other District Council's in Buckinghamshire, Buckinghamshire County Council, Milton Keynes Council and the Strategic Health Authority/Primary Care Trust on the development of a Bucks and Milton Keynes Air Quality Strategy. The Strategy was formally adopted in 2005.

This Strategy will form the basis of an Air Quality Action Plan developing action areas and objectives for improving air quality within the District. South Bucks District Council Air Quality Action Plan will be submitted by the end of 2007.

2.0 New Monitoring Results

This section provides a summary of the air quality monitoring results obtained during 2006.

Continuous monitoring of nitrogen dioxide and PM_{10} is carried out at the air quality monitoring station located close to the M25 and Oxford Road, Gerrards Cross. The station is classified as a roadside monitoring site, which is approximately 20 metres from the kerb of Oxford Road and 50 metres from the M25. The station location is marked on the map in Figure 2.1. The station is part of the 'Calibration Club' national monitoring network. Nitrogen dioxide is monitored using a Signal Ambirak chemiluminescent NOx analyser and PM_{10} using an R&P TEOM analyzer. The analysers are housed in a secure air-conditioned cabin. Wind speed and direction are also monitored. The analysers are serviced every six months and QA/QC audits are also carried out by Netcen every six months which involves checking the NOx analyser linearity, NOx converter efficiency and comparing the site cylinders with audit cylinders. K0 confirmation check is carried out on the TEOM. The station is visited every two weeks by Council officers in accordance with the Council's written procedure and the results recorded in the site log. At the same time the NOx analyser is calibrated, using calibration gas, and the analyzer filters changed. The data from the station is collected via a GSM modem. Data management is carried out by Netcen who validate and ratify the raw data and provide the Council with written reports of the results on a quarterly basis. Three nitrogen dioxide diffusion tubes have been collocated with the monitoring station since 2002 to enable the bias adjustment factor for the diffusion tubes to be calculated. The collocation is undertaken by The Royal Borough of Windsor and Maidenhead for their own tube bias calculations.

Figure 2.1: **Location of the Gerrards Cross Air Quality Monitoring Station**

2.1 Nitrogen Dioxide Monitoring

2.1.1 Results from the Air Quality Monitoring Station (AQMS)

Data is available for the whole of 2006, but at the time of writing, the data from September 2006 onwards is unratified.

A summary of the NO_2 concentrations monitored between 01January 2006 and 31 December 2006 at the Gerrards Cross monitoring station are presented in Table 2.2 below. Please note that data from October 2006 until December 2006 has not been ratified. Data capture for nitrogen dioxide during 2006 was 85.8%. Data for 2006 shows that the maximum 1-hour mean concentration recorded by the analyzer was 164μgm^{-3} and the annual mean was 38 μgm^{-3}.

Table 2.1: Hourly and Annual Mean Nitrogen Dioxide Concentrations in μgm^{-3} for 2006.

SOUTH BUCKS GERRARDS CROSS
01 January to 31 December 2006

These data are provisional from 01/10/2006 and may be subject to further quality control

POLLUTANT	NO_X	NO	NO_2
Number Very High	-	-	0
Number High	-	-	0
Number Moderate	-	-	0
Number Low	-	-	7512
Maximum 15-minute mean	1278 µg m^{-3}	739 µg m^{-3}	185 µg m^{-3}
Maximum hourly mean	1010 µg m^{-3}	554 µg m^{-3}	164 µg m^{-3}
Maximum running 8-hour mean	652 µg m^{-3}	402 µg m^{-3}	117 µg m^{-3}
Maximum running 24-hour mean	486 µg m^{-3}	295 µg m^{-3}	93 µg m^{-3}
Maximum daily mean	466 µg m^{-3}	283 µg m^{-3}	80 µg m^{-3}
Average	97 µg m^{-3}	39 µg m^{-3}	38 µg m^{-3}
Data capture	85.8 %	85.8 %	85.8 %

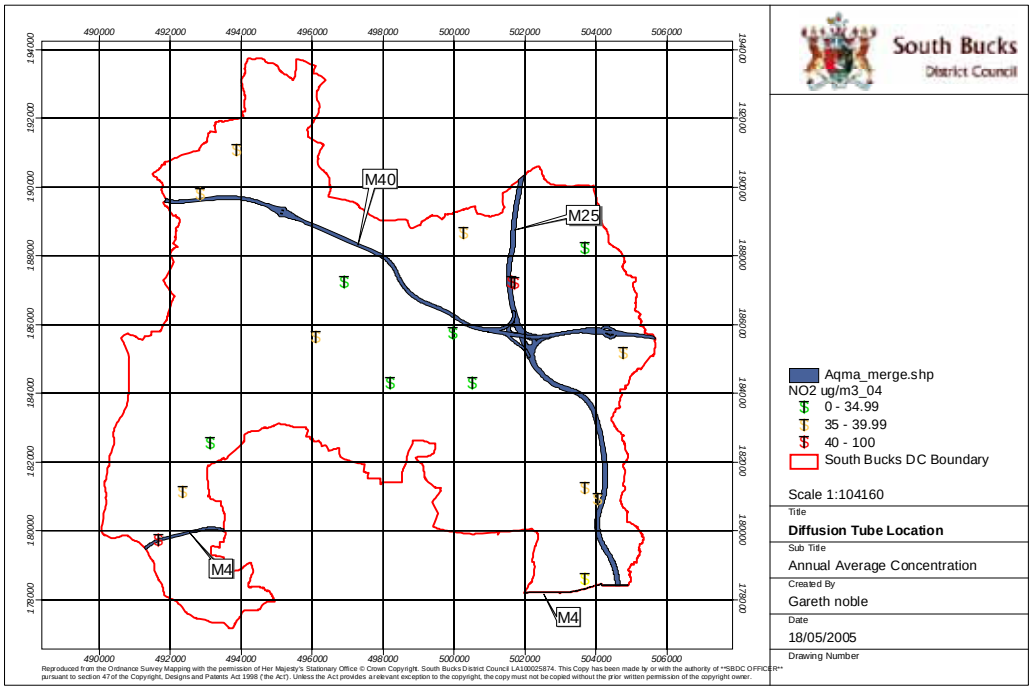
All mass units are at 20'C and 1013mb
NO_X mass units are NO_X as NO_2

Monitoring data from the Air Quality Monitoring Station (AQMS) in Gerrards Cross shows that at this location during 2006, the air quality objectives for nitrogen dioxide was marginally exceeded were met.

2.1.2 Diffusion Tube Monitoring Sites

Nitrogen dioxide is measured in South Bucks District Council using diffusion tubes at 18 sites. The tubes are supplied and analysed by Bureau Veritas and prepared by using 10% v/v TEA in water methodology. Bureau Veritas is a UKAS accredited laboratory. Figure 2.5 shows the location of the diffusion tube monitoring sites in the District. There have been no changes in the locations of the diffusion tubes since the detailed assessment was completed.

Figure 2.2 Nitrogen Dioxide Diffusion Tube location



2.1.2.1 Bias Adjustment of Diffusion Tube Data

As a result of the considerable difference in the performance of tubes prepared by different laboratories, Technical Guidance LAQM.TG(03)4 recommends that a bias adjustment factor is determined and applied to the data. LAQM.TG(03) gives a method for this which involves the co-location of three diffusion tubes with a chemiluminescent NOx analyser. The minimum period for which this should be carried out is 9 months. The guidance on the Air Quality Review and Assessment website at www.uwe.ac.uk/aqm/review recommends that authorities use the results of their own co-location study, with those available from as many other sites as possible, to obtain an overall bias adjustment factor to apply to their tubes. A compilation of bias adjustment factors produced by Air Quality Consultants Ltd for DEFRA is available on the website for this purpose.

South Bucks District Council did not undertake a co-location study on their AQMS during 2006, but have applied to DEFRA for grant funding to undertake a co-location during 2007-8. Therefore, bias correction was undertaken using a bias correction factor obtained from the Air Quality Review and Assessment website (http://www.uwe.ac.uk/aqm/review/diffusiontube300307.xls) which was based on a number of local co-location studies. The relevant factor was 0.87.

The raw and bias adjusted data for 2006 is shown in Table 2.7.

2.1.3 Estimating Annual Nitrogen Dioxide Concentrations to 2010

Technical Guidance LAQM.TG(03)4 advises that an adjustment factor should be utilized to estimate annual average concentrations to 2010 from 2006 data. Estimated concentrations for 2010 are shown in Table 2.7.

The predictions show falling NO_2 levels to 2010 so that all sites comfortable meet the present objective by that date.

Table 2.4 Nitrogen Dioxide Passive Diffusion Tube Monitoring Results 2006

			Grid Reference		*SI Unit ug/m3*												*Average ug/m3*	*Converted via Casella lab conversion factor for 2006(0.87)*
					J	*F*	*M*	*A*	*M*	*J*	*J*	*A*	*S*	*O*	*N*	*D*		
1	Iver, Old Slade Lane	Kerbside (and 100m adjacent M4)	503.679	178.566	50	45	45	33	29	32	29	20	39	27	38	43	35.83	31.18
2	Iver, Victoria Cres	Kerbside (and 100m adjacent M25)	504.056	180.901	50	46	45	32	36	52	38	16	42	26	38	32	37.75	32.84
3	Iver;High Street	Kerbside	503.688	181.229	43	44	40	39	35	46	17	24	B	14	30	42	34.00	29.58
4	New Denham, Oxford Rd	Kerbside	504.754	185.138	50	43	43	47	38	46	38	24	25	31	45	29	38.25	33.28
5	Denham Green, Nightingale way	Kerbside	503.678	188.192	36	32	27	24	23	20	21	16	B	16	31	25	24.64	21.43
6	GX Tatling End	Kerbside A40 (and 50m adjacent M25)	501.717	187.175	46	56	58	39	48	42	39	38	58	23	42	44	44.42	38.64
7	GX, Packhorse Rd	Kerbside	500.259	188.613	45	39	39	36	37	37	33	26	27	25	38	42	35.53	30.74
8	Fulmer Village	Kerbside	499.954	185.727	34	34	29	23	26	36	30	20	23	17	21	23	26.33	22.91
9	Wexham Black Park	Kerbside	500.518	184.244	27	24	23	19	19	26	19	13	18	16	15	16	19.58	17.04
10	Stoke Poges, Bells Hill	Kerbside	498.201	184.266	37	40	31	26	30	32	21	25	32	24	24	32	29.50	25.67
11	Hedgerley Village	Kerbside	496.895	187.215	24	25	36	19	18	21	17	11	22	14	17	25	20.75	18.05
12	Farnham Common Beaconsfield Rd	Kerbside	496.095	185.599	37	44	20	17	24	42	48	36	16	29	38	19	30.83	26.83
13	Beac Station Rd	Kerbside	493.873	191.040	55	52	45	48	41	43	44	36	36	30	46	47	43.58	37.92
14	Beac A40	Kerbside (and 75m adjacent M40)	492.857	189.77	35	40	38	<1	36	40	32	27	26	20	27	32	32.09	27.92
15	Burnham, high street	Kerbside	493.136	182.503	38	40	32	24	26	29	24	20	32	A	28	A	29.30	25.49
16	Taplow,police station	Kerbside A4	491.668	181.187	47	51	38	33	34	45	34	31	32	24	33	36	36.50	31.76
17	Dorn.M4	Kerbside (and 10m adjacent M4)	491.672	179.697	49	62	52	48	51	51	42	50	53	32	26	48	47.00	40.89
18	Air Quality Monitoring Station GX	Kerbside (Adjacent M25)			57	62	68	67	56	52	34	41	53	29	45	41	50.42	43.86

A=Tube not returned by client

B=Sample tube damaged

C=Sample tube contaminated

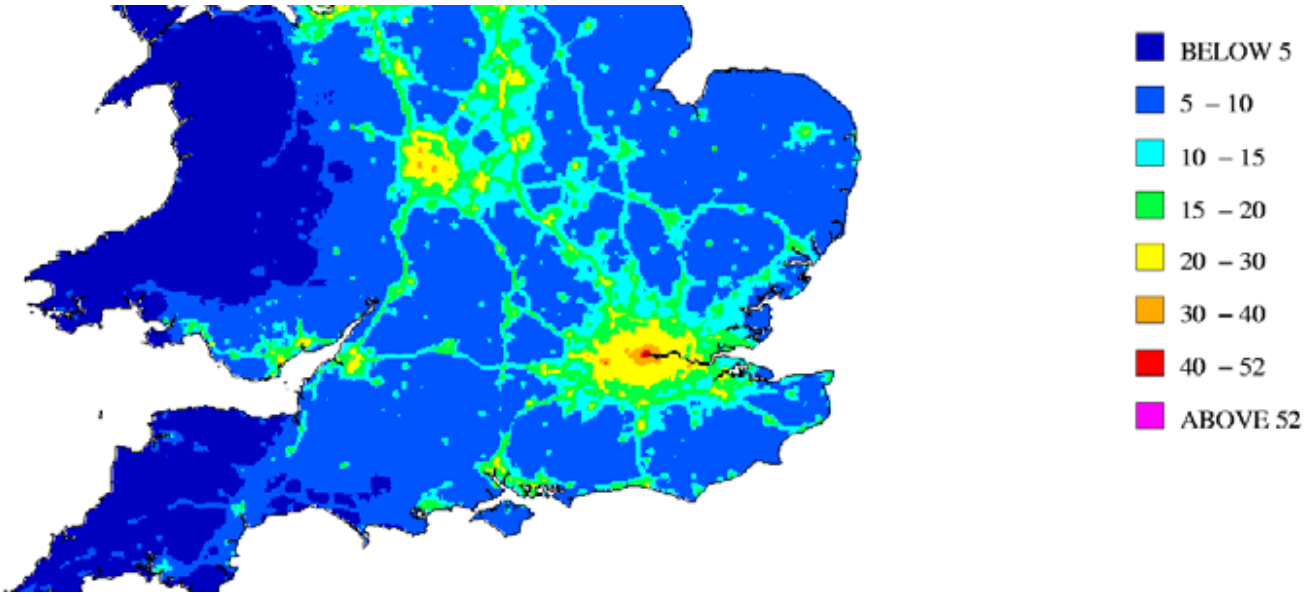
D=Sample lost during analysis

Table 2.5 Predicted NO_2 Values for 2010

Tube Location	2006 Corrected Values (μgm^{-3})	2010 Predicted Values (μgm^{-3})
Iver, Old Slade Lane	27.55	23.43
Iver, Victoria Cres	29.22	24.85
Iver;High Street	24	20.41
New Denham, Oxford Rd	29.65	25.22
Denham Green, Nightingale way	17.11	14.55
GX Tatling End	35.31	30.03
GX, Packhorse Rd	27.48	23.37
Fulmer Village	20.45	17.39
Wexham Black Park	15.08	12.83
Stoke Poges, Bells Hill	22.98	19.54
Hedgerley Village	16.31	13.87
Farnham Common Beaconsfield Rd	24.14	20.53
Beac Station Rd	33.93	28.86
Beac A40	23.06	19.61
Burnham, high street	18.49	15.73
Taplow,police station	28.35	24.11
Dorn.M4	37.34	31.76
Air Quality Monitoring Station GX	39.73	33.79

2.2

Figure 2.3 Estimated Annual Mean NO_2 Concentration (2010 μgm^{-3})



2.2 PM_{10} Monitoring

A summary of the PM_{10} concentrations monitored during 2006 at the Gerrards Cross station is presented in Table 2.3. Data capture for PM_{10} during 2006 was 88.2%. Technical Guidance LAQM.TG(03)4 advises that for data collected using a TEOM, then a default factor of 1.3 should be applied to the data to estimate the gravimetric concentration to compare against the air quality objectives. The annual mean for 2006 measured using the TEOM was 20μgm^{-3}, or 26μgm^{-3} when converted to the gravimetric equivalent. During 2006 there were nine days when the TEOM monitor measured 24-hour concentrations greater than 50μgm^{-3}. This is within the National Air Quality Standard objective limits. Using the approach in Box 8.6 of Technical Guidance LAQM.TG(03)4, the annual mean and 24-hour exceedences were calculated for 2010 and compared to the objectives. In 2010, the annual mean is predicted to be 21.33μgm^{-3}, so is above the provisional objective of 20μgm^{-3}

Table 2.6: PM_{10} Concentrations for 2006

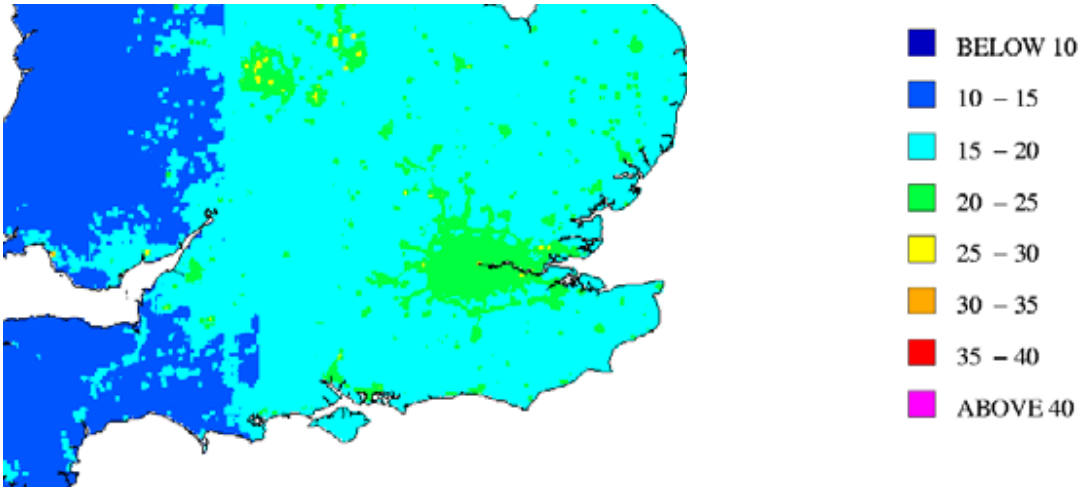
SOUTH BUCKS GERRARDS CROSS
01 January to 31 December 2006

These data are provisional from 01/10/2006 and may be subject to further quality control

POLLUTANT	PM_{10}+	PM_{10}*+
Number Very High	0	-
Number High	0	-
Number Moderate	0	-
Number Low	7672	-
Maximum 15-minute mean	280 µg m^{-3}	364 µg m^{-3}
Maximum hourly mean	115 µg m^{-3}	150 µg m^{-3}
Maximum running 8-hour mean	78 µg m^{-3}	102 µg m^{-3}
Maximum running 24-hour mean	48 µg m^{-3}	63 µg m^{-3}
Maximum daily mean	45 µg m^{-3}	59 µg m^{-3}
Average	20 µg m^{-3}	26 µg m^{-3}
Data capture	88.2 %	88.2 %

* PM_{10} indicative gravimetris equivalent using factor of 1.3
+ PM_{10} as measured by a TEOM
All mass units are at 20'C and 1013mb

Figure 2.4 Estimated Annual Mean PM_{10} Concentration 2010 (μgm^{-3})



2.3 Monitoring of Benzene

South Bucks District Council monitor benzene via diffusion tubes exposed at 5 locations across the District. In 2004 the annual mean benzene concentrations were less than 0.5ppb at all locations. Benzene concentrations monitored at these sites are therefore considerably lower than the LAQM objective levels set for benzene.

Figure 2.5 Estimated Annual Mean Background Benzene Concentration, 2010 (μgm^{-3})

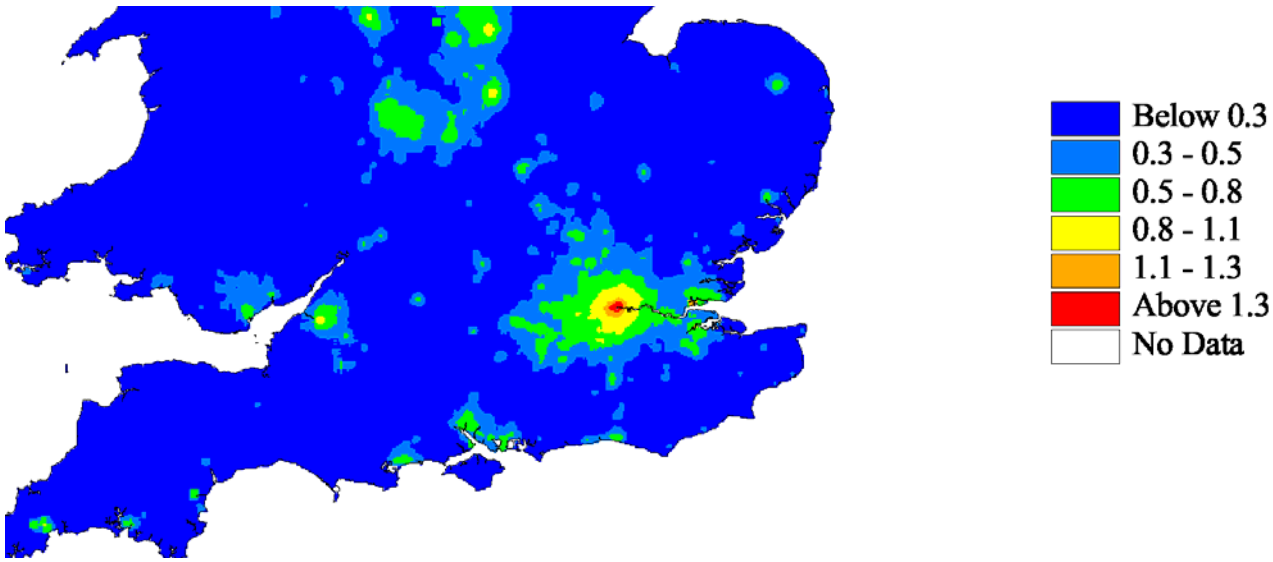


Table 2.7 Benzene Tube Data for the South Bucks District for 2006

	January	February	March	April	May	June	July	August	September	October	November	December	Average
Langley	1.2	0.9	0.7	0.5	0.3	0.2	0.7	0.6	0.6	0.8	0.8	0.5	0.65
Predicted 2007	1.15	0.86	0.67	0.48	0.29	0.19	0.67	0.58	0.58	0.77	0.77	0.48	0.62
Predicted 2008	1.11	0.83	0.65	0.46	0.28	0.19	0.65	0.56	0.56	0.74	0.74	0.46	0.60
Predicted 2009	1.08	0.81	0.63	0.45	0.27	0.18	0.63	0.54	0.54	0.72	0.72	0.45	0.58
Predicted 2010	1.05	0.79	0.61	0.44	0.26	0.18	0.61	0.53	0.53	0.70	0.70	0.44	0.57
Gerrards Cross	1.20	0.60	0.70	0.60	0.50	0.10	0.80	0.50	0.50	0.50	0.80	0.80	0.63
Predicted 2007	1.15	0.58	0.67	0.58	0.48	0.10	0.77	0.48	0.48	0.48	0.77	0.77	0.61
Predicted 2008	1.11	0.56	0.65	0.56	0.46	0.09	0.74	0.46	0.46	0.46	0.74	0.74	0.59
Predicted 2009	1.08	0.54	0.63	0.54	0.45	0.09	0.72	0.45	0.45	0.45	0.72	0.72	0.57
Predicted 2010	1.05	0.53	0.61	0.53	0.44	0.09	0.70	0.44	0.44	0.44	0.70	0.70	0.56
Mount Hill	1.00	B	0.50	0.50	0.60	0.10	0.60	0.50	0.50	0.10	0.80	0.40	0.47
Predicted 2007	0.96	N/A	0.48	0.48	0.58	0.10	0.58	0.48	0.48	0.10	0.77	0.38	0.45
Predicted 2008	0.93	N/A	0.46	0.46	0.56	0.09	0.56	0.46	0.46	0.09	0.74	0.37	0.43
Predicted 2009	0.90	N/A	0.45	0.45	0.54	0.09	0.54	0.45	0.45	0.09	0.72	0.36	0.42
Predicted 2010	0.79	N/A	0.39	0.39	0.47	0.08	0.47	0.39	0.39	0.08	0.63	0.32	0.37
South Drive	1.10	1.00	0.60	A	0.60	0.20	0.60	D	0.30	B	0.80	0.80	0.50
Predicted 2007	1.06	0.96	0.58	N/A	0.58	0.19	0.58	N/A	0.29	N/A	0.77	0.77	0.48
Predicted 2008	1.02	0.93	0.56	N/A	0.56	0.19	0.56	N/A	0.28	N/A	0.74	0.74	0.46
Predicted 2009	0.99	0.90	0.54	N/A	0.54	0.18	0.54	N/A	0.27	N/A	0.72	0.72	0.45
Predicted 2010	0.87	0.79	0.47	N/A	0.47	0.16	0.47	N/A	0.24	N/A	0.63	0.63	0.39
Nashdom lane	0.90	0.60	0.50	A	0.60	0.10	0.60	0.20	<0.1	0.60	0.60	0.50	0.43
Predicted 2007	0.86	0.58	0.48	N/A	0.58	0.10	0.58	0.19	N/A	0.58	0.58	0.48	0.42
Predicted 2008	0.83	0.56	0.46	N/A	0.56	0.09	0.56	0.19	N/A	0.56	0.56	0.46	0.40
Predicted 2009	0.81	0.54	0.45	N/A	0.54	0.09	0.54	0.18	N/A	0.54	0.54	0.45	0.39
Predicted 2010	0.71	0.47	0.39	N/A	0.47	0.08	0.47	0.16	N/A	0.47	0.47	0.39	0.34

2.3 Monitoring of Other Pollutants

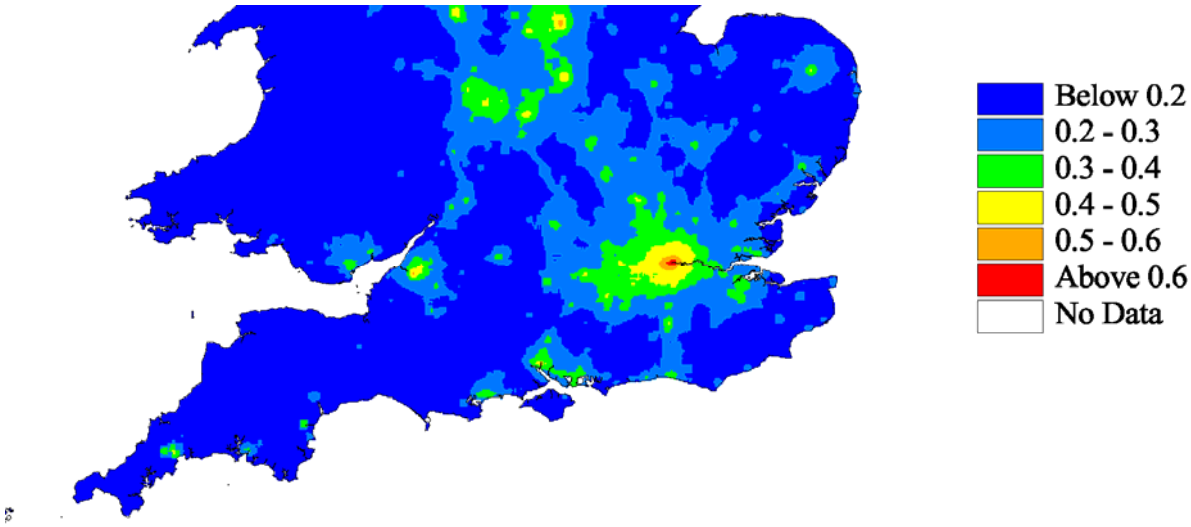
2.3.1 Carbon Monoxide

Carbon monoxide is not monitored in South Bucks District. The 2006 Updating and Screening Assessment identified no significant road sources South Bucks in CO. There are no significant industrial sources of CO in the district.

CO is measured at nearby Hillingdon where the maximum daily running 8 hour mean for 2006 was 1.9 mgm^{-3}. This is substantially below the objective of $10mgm^{-3}$.

Figure 2.5, downloaded from http://www.airquality.co.uk/archive/laqm/tools/aq_maps_2001.pdf, is a background map showing estimated annual mean CO concentrations in 2001. The South Bucks area is in the range of 0.3- 0.5 mgm^{-3}

Figure 2.6 Estimated Annual Mean Background CO concentration 2001 (mgm^{-3})



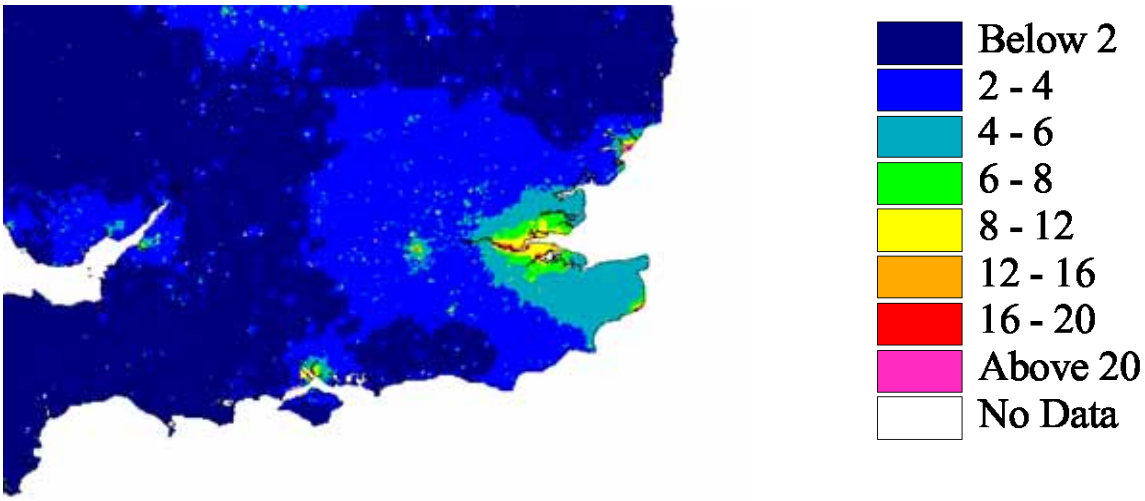
2.3.2 Sulphur Dioxide

The Updating and Screening Assessment 2006 for South Bucks shows that there are no significant sources of SO_2 within the district. The nearest significant sources were found in Slough Borough Council and modelling of these sources in the Phase 1 Review and Assessment predicted ambient concentrations below the Air Quality Objectives in South Bucks. No detailed assessment was required.

In general, ambient levels of SO_2 are falling, due to the introduction of Low Sulphur vehicle fuels, and the introduction of fuel gas desulphurisation at power

stations. Figure 2.6, downloaded from http://www.airquality.co.uk/archive/laqm/tools/aq_maps_2001.pdf shows estimated Annual Mean background SO_2 concentrations for 2001. SO_2 levels in South Bucks are in the range 2-6 μgm^{-3} against an Air Quality Objective of 40 μgm^{-3}.

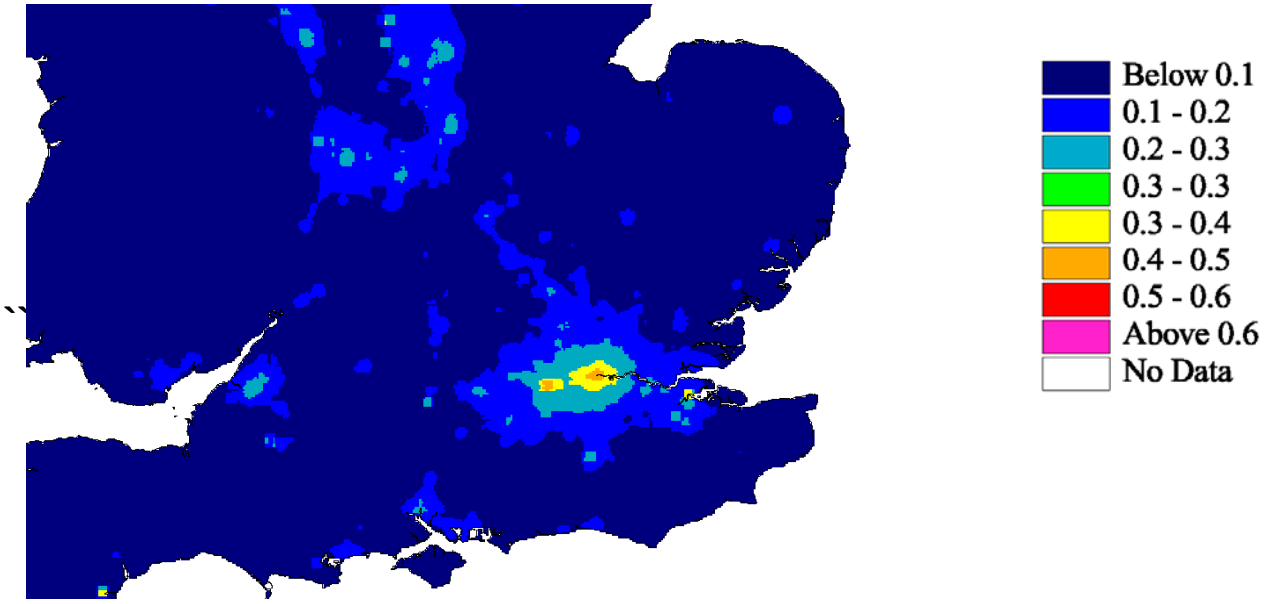
Figure 2.7 Estimated Annual Mean background SO_2 Concentration 2001 (μgm^{-3})



2.3.3 1,3-Butadiene

The phase 1 and 2 Review and Assessments identified no significant sources of 1,3-butadiene in the South Bucks district. The 2006 USA estimated the maximum annual mean background concentration of 0.28 μgm^{-3} against an Air Quality Objective of 2.25 μgm^{-3}. Figure 2.7, downloaded from http://www.airquality.co.uk/archive/laqm/tools/aq_maps_2001.pdf, is a background map showing estimated annual mean 1,3-butadiene concentrations in 2003. The South Bucks area is in the range of 0.3- 0.5 μgm^{-3}. National level measurements and modeling assessments carried out by Defra have shown that policy measures already in place should reduce of 1,3-butadiene to ensure compliance with the respective standards and objectives, even at busy roadside locations.

Figure 2.8 Estimated Annual Mean background 1,3-Butadiene Concentration 2003 (µgm^{-3})



2.3.4 Lead

There are no industrial sources of lead emissions in South Bucks District. Phase 1 and 2 of the Review and Assessment process indicated that the risk of exceeding the Air Quality Objective was negligible and that no further assessment was required. Nationally urban lead levels have fallen significantly since the introduction of lead free petrol.

3.0 New Developments – Industrial Processes

3.1 Part A1 Industrial Processes

There are no new Part A1 industrial processes operating within South Bucks District Council since the Updating and Screening Assessment was undertaken in May 2003. One A1 process, Taplow Paper Mill, has closed down.

3.2 Part A2 Industrial Processes

There are no Part A2 industrial processes operating within South Bucks District Council.

3.3 Part B Industrial Processes

No new Part B industrial processes have been authorised in South Bucks District Council since the Updating and Screening Assessment was undertaken in May 2003. Six dry cleaning establishments have also been authorized under part B. Two waste oil burners have ceased operating in the district and one new one has been authorised.

3.4 Landfill, Quarrying and Mineral Processes

There are no new landfill sites established in South Bucks District Council since May 2003 when the Updating and Screening Assessment was produced and none of the landfill sites have closed.

Planning permission has recently been granted for a new quarry in the New Denham area of the district. The planning consent requires the operator to submit a dust mitigation strategy to be approved by the District Council.

3.5 Industrial Process Closures

Titus Tool Company, who were permitted to operate a scheduled process (Melting and Producing Zinc and its Alloys) ceased manufacturing in the UK in 2006. No other major industrial processes have closed since the Updating and Screening Assessment was completed in May 2003.

4 New Developments – Transport

4.1 New Road Developments

No new roads have been constructed or proposed since the Updating and Screening Assessment in May 2003 or Detailed Assessment in April 2004.

No roads have been identified for which updated traffic data has revealed that the annual average daily traffic flow (AADTF) is significantly higher (25% or more) than previously thought.
No roads have been identified which have AADTF greater than 10,000 vehicles per day, but which were omitted from the Updating and Screening Assessment or Detailed Assessment.

4.2 Significant Changes to Existing Roads

4.3.1 Road Layout Changes and Roadworks

There are no new road layouts or roadworks in South Bucks which are thought to give rise to a significant change in traffic levels or emissions.

4.3.2 Significant Changes to Annual Average Daily Traffic Flow (AADTF)

No roads have been identified with annual average daily traffic flow (AADTF) greater than 10,000 vehicles per day, which have experienced large increases (greater than 25% or more) in traffic flow since the Updating and Screening Assessment or Detailed Assessment.

4.3.3 Other Public Exposure to Vehicle Emissions

Local Authorities are required to consider whether there are any of the following in their area, whether new since the last Assessment, or newly identified:

1. Narrow congested streets meeting the following criteria:
- Residential properties within 5 metres of the kerb
- Average traffic speeds of 50kph or less
- The carriageway is less than 10 metres wide, and
- AADTF is greater than 10,000 vehicles per day

2. Busy streets where people may spend 1 hour or more close to traffic (most likely streets with shops, bars, cafes etc), meeting the following criteria:
- Public exposure for 1 hour or more within 5 metres of the kerb
- AADTF is greater than 10,000 vehicles per day

There are no new, or newly identified streets meeting these criteria since the previous Assessments.

4.4 Other Transport Sources

As well road vehicles, public exposure to emissions from planes, buses, trains and ships must also be considered.

4.4.1 Trains

There has been no changes in the train services through South Bucks District Council since the Updating and Screening Assessment was undertaken in May 2003.

4.4.2 Airports

Construction work is continuing on Terminal 5 at Heathrow Airport in the London Borough of Hillingdon. Work was underway prior to the Updating and Screening Assessment and Detailed Assessment and the impact of the Airport and its extensions is not considered to have significantly changed since these assessments were undertaken.

4.4.3 Bus stations

There are no bus stations within South Bucks District Council.

4.4.4 Shipping

South Bucks District Council is inland and therefore there are no emissions from coastal shipping.

5 New Developments – Residential, Commercial, Public

There have been no new housing, commercial or public developments in South Bucks during 2006, which are likely to have an impact on air quality, for example as a result of significantly changed traffic flows. A new motorway service station has been proposed in the Beaconsfield area, however, it is not yet clear when this will be built.

6 Conclusions and Recommendations

The results from the continuous monitoring station at Gerrards Cross show the annual mean and 24-hour mean PM_{10} objectives were not exceeded in 2006. However, in 2010 the annual mean objective is likely to be exceeded. As the 2010 objectives are still provisional, South Bucks District Council are not required to undertake a Detailed Assessment for PM_{10} in 2010 at this stage. The NO_2 data from the station shows that the 2006 objectives were met in Gerrards Cross. This confirms the conclusions of the Detailed Assessment undertaken in April 2004, which identified that there would be relevant exposure close to the motorways within the District.

The latest diffusion tube monitoring results show that the NO_2 annual mean objective was not exceeded in 2006 at locations close to busy roads and motorways. However, the levels were sufficiently close to the objective levels that the declaration of the Air Quality Management Area may be considered justified for the time being.

Since the Updating and Screening Assessment in 2003 and Detailed Assessment in 2004 there have been no significant changes in emission sources.

A Draft Air Quality Action Plan was written in 2006, and this is currently under review, in consultation with our various partners and stakeholders. It should be submitted to Defra by the end of 2007. The Bucks and Milton Keynes Air Quality Strategy forms the basis for the Action Plan for South Bucks.

7 References

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