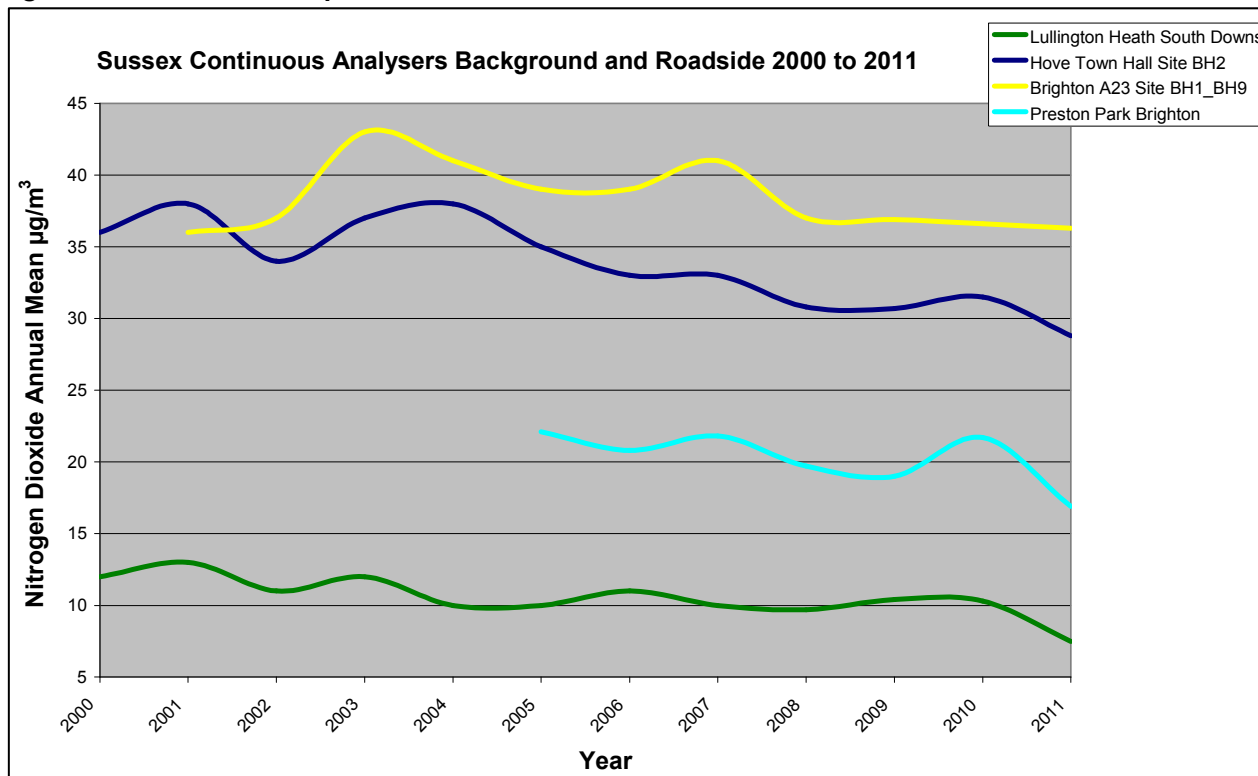


# Brighton Air Quality Progress Report Briefing May 2012

## 1. Continuous Analyser Nitrogen Dioxide Results at Background and Roadside

Continuous Nitrogen Dioxide (NO<sub>2</sub>) monitoring over the past decade in Brighton points to an improvement outside of the city centre. A number of monitors outside of the densest built environment record lower concentrations of NO<sub>2</sub>, Figure 1. In combination with source reductions in lead, benzene and carbon monoxide it is likely that where many people live the air inhaled is more healthy than ten or twenty years ago.

Figure 1 Continuous Analysers



## 2. Diffusion Tube Results at Façade and Background

In contrast to relatively spacious sites, close to roadways in the city centre diffusion tube monitors continue to record levels up to twice the long-term legal level for NO<sub>2</sub> (40 µg/m<sup>3</sup>). In 2011 the majority of city centre monitors indicated a slight improvement compared with 2010, Figure 2, Figure 3 and Table 1. However these declines do not match the more substantial improvements recorded at suburban and background sites away from narrow urban roads. In central Brighton streets there is little change in ambient levels of NO<sub>2</sub> since 2009 and an increase is recorded when we compare 2011 results with 2008. There is little change in NO<sub>2</sub> compared to concentrations recorded ten years ago. In accordance with national research it is acknowledged that emissions of oxides of nitrogen from many road vehicles have not improved. Emission performance of the internal combustion engine can be compromised by the historical urban centre. Narrow street ways are also less favourable for dispersion of emissions and entrainment of fresher ventilation. We know that some local road links carry a majority of diesel vehicles. Diesel engines have higher emissions of NO and NO<sub>2</sub> compared with modern petrol and gas alternatives.

Figure 2 Select Diffusion Tube Indicators used for Local Transport Plan 2

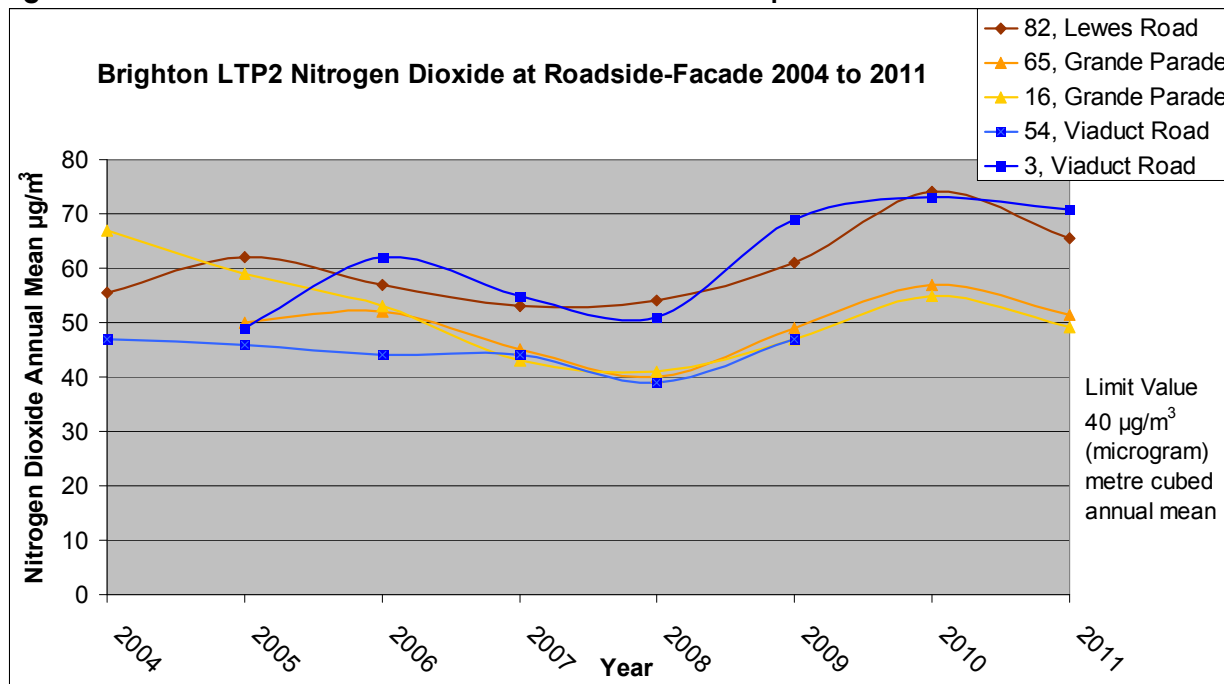


Figure 3 City Centre Diffusion Tubes with records 2005 to 2011

Central Brighton Façade Diffusion Tubes 2005 to 2011

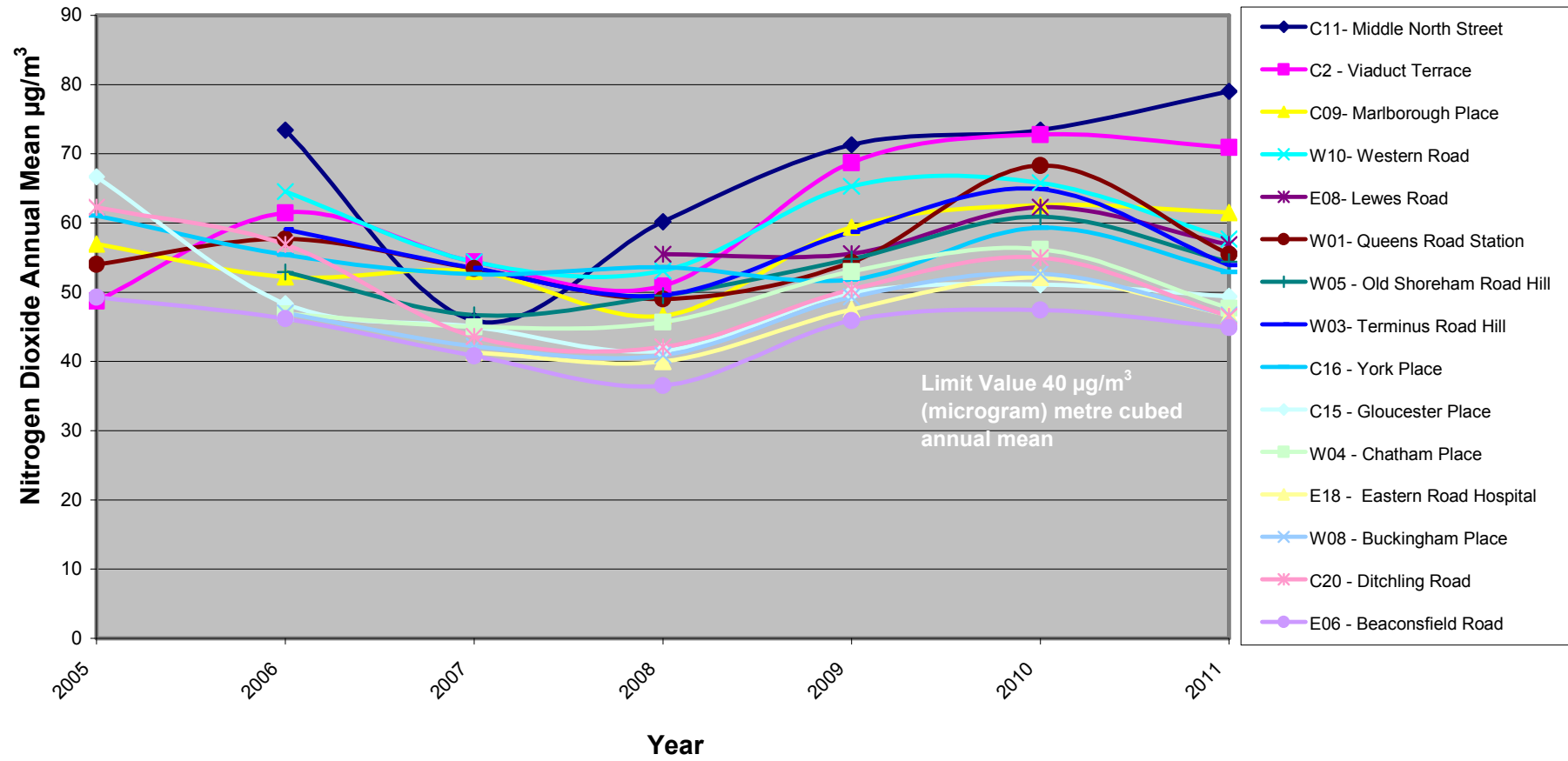


Figure 4 Roadside Brighton Diffusion tubes since records began

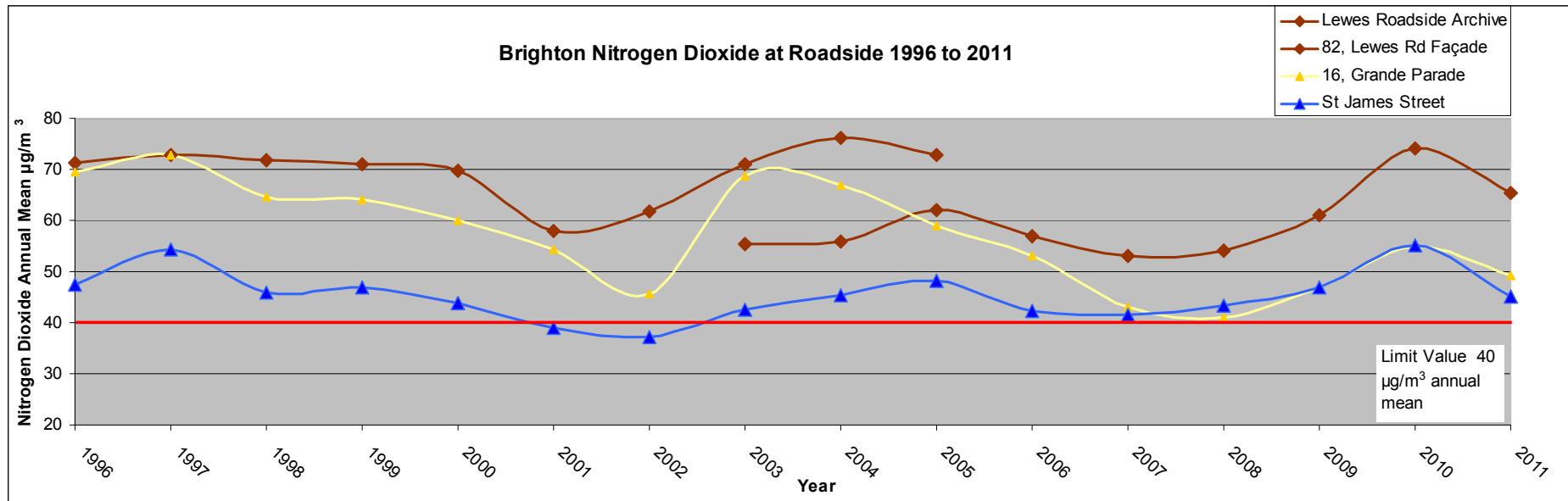


Figure 4 shows results from the longest term monitors positioned on the facades of buildings adjacent to city centre roads. A number of these sites show similar levels compared with ten years ago. Table 1 shows the 2011 league table of Brighton and Hove diffusion tube results compared to background concentrations (at the bottom of the list). Sixty-three out of sixty-five tubes return a report for 2011. Forty-six monitors indicate NO<sub>2</sub> concentration above the limit value last year. The majority of these monitors are positioned along the same transport corridors; therefore we are monitoring one or two areas of pollution rather than many separate ones. The area above the limit value is smaller than thought when the Air Quality Management Area was declared in 2008. In recent years the monitoring strategy has targeted central areas to improve understanding of priority locations for air quality and the majority of sample returns refer to this area.

Table 1 League Table of Brighton Hove Portslade and Rottingdean Nitrogen Dioxide Diffusion Tube results ranked by 2011 returns

DT Number	Code	Site Description	Type	2007	2008	2009	2010	2011	Months
DT 77	C11	Middle North Street	F	45.9	60.2	71.5	73.4	<b>79.0</b>	7*
DT 24	C21	Viaduct Terrace	F	54.4	50.9	68.7	72.8	<b>70.9</b>	12
New	C04	Lower North Street near East Street	F			New	69.5	<b>65.9</b>	7*
DT 30	E08	Lewes Road South of Vogue	F	52.6	53.9	60.7	74.0	<b>65.5</b>	12
New	C18	Oxford Street near London Road	F			New	76.6	<b>65.4</b>	12
DT 09	C09	Marlborough Place	F	53	46.6	59.4	62.6	<b>61.5</b>	12
New	C25	New England Road near Argyle	F			New	63.6	<b>58.0</b>	12
DT 76	W10	Western Road (West of Churchill Sq)	F	54.4	53.1	65.3	65.8	<b>57.7</b>	12
DT04a	C12	Queens Road north of Clock Tower	F			49.7	67.7	<b>55.8</b>	12
DT 05	W01	Queens Road south of Station	F	53.4	49	54.3	68.3	<b>55.5</b>	12
DT 74	W05	East Old Shoreham Road Hill climb	F	46.7	49.5	54.8	60.9	<b>54.4</b>	12
DT 06	W03	Terminus Road Hill Climb	F	53.5	49.6	58.7	64.9	<b>53.9</b>	12
DT 17	C23	London Road near Preston Circus	F		48	56.4	58.3	<b>53.6</b>	12
DT 11	C16	York Place	F	52.6	53.6	51.8	59.3	<b>52.9</b>	11*
DT 68a	C13	Lower Dyke Road near North Street	F			37.8	69.5	<b>52.7</b>	8*
DT 16	C24	New England Road	F		41.8	53.3	62.8	<b>51.9</b>	12
DT 08	E17	Grand Parade South	F	45.2	40.3	49.1	56.6	<b>51.4</b>	11
DT 58a	W19	Trafalgar Road, Portslade	F			57.9	59.2	<b>51.3</b>	11
New	C28	Frederick Place Central Brighton	F			New	51.6	<b>50.0</b>	12
DT 10	C15	Gloucester Place	F	45	41.5	49.9	51.1	<b>49.4</b>	12
DT 27a	C19	Oxford Street near Ditchling Rd	F			54.6	58.5	<b>49.3</b>	12
DT 38	E16	Grand Parade North	F	43.3	41.3	47.1	54.8	<b>49.2</b>	12
DT 32	E14	Lewes Road north of Vogue	F	38.9	40.9	47.1	52.5	<b>49.0</b>	12
New	E09	Lewes Road south of Vogue	F			New	53.4	<b>48.9</b>	11*
New	E23	High Street Rottingdean east side	F			New	53.7	<b>48.4</b>	12
DT 21	E02	Preston Road near Preston Drove	F			50.5	55.1	<b>48.2</b>	12
DT 73	W04	Chatham Place	F	45	45.7	53	56.2	<b>47.7</b>	12
DR 59a	W17	Wellington Rd, Portslade	F			52	57.8	<b>47.5</b>	12
DT 69	W08	Buckingham Place- Seven Dials	F	42.2	40.9	49.3	52.7	<b>46.7</b>	6*
DT 43	E18	Eastern Road near Hospital	F	41.3	40	47.5	52.1	<b>46.7</b>	11

DT 25	C20	Ditchling Road near Viaduct Terrace	F		42.1	50.4	55.0	<b>46.5</b>	12
DT 52	W21	Sackville Road near Neville Rd junction	F	35.4	31.9	38.6	56.2	<b>46.4</b>	11
DT 31	E12	Hollingdean Road	F	44.4	43.1	49.7	51.2	<b>46.4</b>	12
DT 02	W22	Kingsway Grand Hotel	R	44.2	42.3	42.5	43.9	<b>46.2</b>	6
New	E10	Lewes Road Vogue Gyratory east face	F			New	50.9	<b>45.9</b>	11
DT 40	C03	St James Street east	F	41.5	43.3	46.9	55.2	<b>45.1</b>	11
DT 57	W16	Wellington Rd - Basin Road junction	F			47	53.0	<b>45.0</b>	10
DT 22	E06	Beaconsfield Road	F	40.8	36.5	45.9	47.4	<b>44.9</b>	12
DT 79	E22	High Street Rottingdean west side	F			46	48.5	<b>44.0</b>	12
Move	E01	Preston Road north of Preston Circus	F			New	50.1	<b>43.8</b>	12
New	E11	Lewes Road Vogue Gyratory west face	F			New	49.8	<b>43.6</b>	11
DT 44	E19	Eastern Rd near Arundel Road	F	37.2	36	43.8	44.2	<b>41.7</b>	12
New	C27	Trafalgar Street Upper	F			New	48.9	<b>41.5</b>	12
DT 78	E21	High Street Rottingdean eastside	F			41.5	47.6	<b>40.9</b>	12
New	C02	Pool Coach Station	F			New	47.2	<b>40.3</b>	12
	E03-E05	Beaconsfield Road -Stamford Avenue	CL			New	41.5	<b>40.3</b>	12
DT 72a	W09	Montpelier Road near Western Road	R			39.9	48.0	38.6	12
New	W02	Surrey Street near Station	F			New	49.8	38.4	11
New	C14	West Street South of Clock Tower	F			New	46.9	38.3	12
DT 64	W07	Dyke Road Seven Dials	R			37.8	45.2	37.8	11
DT 61a	W15	Portland Road, Portslade near School	S			40.2	41.1	36.8	6*
DT 82	E13	Coombe Road near Lewes Road	F			New	39.4	36.6	12
DT 28a	C10	Portland Street near North Street	F			42.3	39.4	35.4	12
New	C01	East Street, Central Brighton	F			New	40.3	35.1	12
DT 86	C08	Pavilion North Gate	CL			New	38.2	34.6	9*
New	C26	Fleet Street	R			New	39.3	34.3	12
New	W11	Western Road near Holland Rd	F			New	40.5	34.2	11
DT 80	E20	Marina Way	R			35	37.8	33.3	11
New	W06	Old Shoreham Road top above hill climb	F			New	42.1	31.7	12
New	W20	Portsalde Old Village, South Street	R				30.2	29.4	12
DT 26	C22	Kingsbury Street (not a main road)	B	28.2	24.4	32.5	32.9	27.8	12
New	W18	Vale Park, Portslade	B			New	26.2	24.1	6*
Background Analysers		Preston Park, Brighton	B	21.8	19.7	19	21.7	16.9	
Background Analysers		Lullington Heath, Wealden South Downs		10	9.7	10.4	10.3	7.5	

NB: All diffusion tubes are bias corrected. A calculation has been made to adjust diffusion tubes with less than eleven out of twelve months of data – the calculation is based on the ratio between calendar months for example January and February monthly averages are higher than the annual average.

F = Façade R = Roadside CL = Co-Located with Continuous Analyser S = School B = Background not adjacent to a main road

### 3. Comment on Nitrogen Dioxide Levels

The problem of continued NO<sub>2</sub> pollution is similar to other small cities with historical centres as reported by the *Air Quality Bulletin* for York<sup>1</sup>, Oxford and Cambridge. At the 2010 open meeting of defra's (department environment food and rural affairs) air quality expert group evidence was presented that NO and NO<sub>2</sub> (NO<sub>x</sub>) emissions from diesel vehicles have not declined since the 1990s. Evidence from remote sensing of vehicle exhausts has shown that NO<sub>x</sub> emissions from newer diesel vehicles in urban environments has not changed in twenty-five years<sup>2</sup>.

### 4. Particulate Results

During 2011 PM<sub>10</sub> (Particulate Matter with aerodynamic diameter less than ten microns) has been monitored at Roadside on Beaconsfield Road adjacent to the A23. An eleven month mean was recorded from February to the end of December equal to **27.4 µg/m<sup>3</sup>**. This compares to an annual average limit value of 40 µg/m<sup>3</sup>. This report does not include the first six weeks of 2011. In just under eleven months there were 15 daily means greater than 50 µg/m<sup>3</sup>. Equivalent to 20 days for the full year which compares to an allowed number of 35 days for the calendar year + maximum margin of tolerance (35 days at 75 µg/m<sup>3</sup> for daily PM<sub>10</sub> limit value, 48 µg/m<sup>3</sup> for annual PM<sub>10</sub> limit value). Results are similar to other roadside sites in East Sussex and are slightly lower than those recorded over a similar period in Hastings and Eastbourne. At comparable roadside localities we would expect a slight increase in particulate matter to the east due to lower rainfall and greater proximity to continental Europe.

Defra's automatic urban and rural network includes a monitoring station in Preston Park, Brighton. 2011 results indicated PM<sub>2.5</sub> (Particulate Matter > than 2.5 microns) annual mean of 12 µg/m<sup>3</sup> at this site. The level compares to the EU target of 25 µg/m<sup>3</sup> as an annual mean<sup>3</sup>.

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<sup>1</sup> Air Quality Bulletin May 2012, Issue 73, Page 7

<sup>2</sup> Trends in NO<sub>x</sub> and NO<sub>2</sub> emissions and ambient measurements in the UK, March 2011

[http://uk-air.defra.gov.uk/reports/cat05/1103041401\\_110303\\_Draft\\_NOx\\_NO2\\_trends\\_report.pdf](http://uk-air.defra.gov.uk/reports/cat05/1103041401_110303_Draft_NOx_NO2_trends_report.pdf)

<sup>3</sup> European Air Quality Standards

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## July 2010 Press Release Time to get tough on air quality

Brighton & Hove City Council has released its second Air Quality Action Plan (AQAP) to the website.

The action plan includes a comprehensive set of measures and recommendations aimed at improving air quality in Brighton. It can be viewed on the council's website at: [www.\(insert link here\)](#).

Diffusion tube monitors in the city show an increase in outdoor Nitrogen Dioxide (NO<sub>2</sub>) concentrations during the past year (2010).

Monitoring records suggest that average Nitrogen Dioxide concentrations were higher in 2010 than in 2008 and higher than 2009 in some streets. The continuous analysers at Preston Park and at Hove Town Hall record a small increase in levels during 2010 compared to previous years.

Councillor Ian Davey, cabinet member for transport and the public realm, said: "This report shows how serious the problems with traffic related air pollution are in the city. Far from improving; air quality in some areas are clearly getting worse.

"Addressing the cause of these problems is a priority for this administration. We are delighted that the success of the bid to the government's Local Sustainable Transport Fund has given us £4 million to spend in the Lewes Road corridor which gives us an opportunity to make a quick start in one of the worst affected areas."

Together with external partnership and council funds, plus support from the local community, the Lewes Road Corridor project will be worth approximately £6 million over four years. Work is expected to begin this year.

The council is also linking air quality into the city's Local Transport Plan and has joined with Sussex partners to initiate a low emission strategy pilot to address the problem county-wide. This will promote initiatives such as electric vehicle use and contribute to local planning policies.

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<http://ec.europa.eu/environment/air/quality/standards.htm>



There has been progress in providing travel choice in the city; however a number of other measures require implementation if the EU and English limits for Nitrogen Dioxide are to be met.


Brighton & Hove's second Air Quality Action Plan follows a 12-week public consultation and includes reference to key documents published during the past year.

During 2010 concentrations remain above the NO<sub>2</sub> legal limit at worse-case roadside locations in Central Brighton and Portslade. A similar situation is recorded in many cities around Europe with published examples of increasing ambient NO<sub>2</sub>, including Cambridge to the north and Paris to the south. Since 2007 some local road links have shown evidence of a decline in total traffic tallies. However the increase in ambient NO<sub>2</sub> in Brighton & Hove is likely to be due to the following contributory factors:

- An ageing vehicle fleet on the road
- A higher proportion of diesel vehicles that show no real performance improvement in emissions of NO and NO<sub>2</sub>
- A higher proportion of older petrol vehicles with catalytic converters that perform less well with time
- Higher regional background Nitrogen Dioxide across South East England
- A higher domestic and commercial heating demand during the past two winters; 2009/2010 and 2010/11, and consequently a likely higher total emission from wood burning and gas fired central heating systems

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