



AREA PANEL 5
6 October 2004

Report of Director of Corporate Services

Air Quality at Five Lamps

SUPPORTING INFORMATION

1.1 Issue

Concerns were raised on the increase in stationary traffic around the Five Lamps junction and the effect this was having on air quality. It was suggested that air quality monitoring was needed as a matter of urgency.

1.2 Background

Nitrogen dioxide is the main pollutant associated with traffic congestion.

This report compares nitrogen dioxide levels obtained in 2002 with those obtained in 2003 (i.e. 'before' and 'after' the junction changes were made).

Two air quality monitors, which measure nitrogen dioxide, have been located at the junction since the beginning of 2002. The key points that have been considered are:

- 1) Did air quality deteriorate in 2003, compared with 2002?
- 2) If so, can this deterioration be attributed to increased congestion as a result of the junction changes?

1.3 Nitrogen Dioxide Monitoring at Five Lamps

There are two 'diffusion tube' monitors located at Five Lamps, one at the southern end of Duffield Rd as it enters the junction, the other where Belper Rd joins Duffield Rd

The tubes are deployed for a period of 4 weeks at a time, during which they absorb nitrogen dioxide from the air. They are then sent away for independent analysis and replaced with fresh tubes for the next 4-week period. The data obtained therefore represents an average of the nitrogen dioxide levels during the 4-week period in question. The government's air quality objective is for annual average levels of nitrogen dioxide to be less than $40\mu\text{g}/\text{m}^3$ and so the figures in this report are given as annual averages.

Firstly, it is important to note that these monitors are fairly primitive devices and are best suited to measuring long-term trends in pollution rather than specific levels over short periods. Their accuracy is about plus/minus 15%.

Secondly, the government advises that, due to annual variations in the weather (which have a substantial impact on pollution levels) it is often inappropriate to draw firm conclusions from a single years data.

For both reasons, we therefore need to treat the data that we get from diffusion tubes with caution.

1.4 Comparison of 2002 and 2003 Data

The figures obtained from the monitors are as follows:

	Duffield Rd Annual mean NO₂ (µg/m³)	Belper Rd Annual mean NO₂ (µg/m³)
2002	38.5	30.8
2003	43.5	30.3
% change	13% up in 2003	1.6% down in 2003

The data shows that nitrogen dioxide levels substantially increased at Duffield Road and slightly decreased at Belper Road monitoring sites.

1.5 Was this deterioration associated with the junction changes?

To investigate this, the pollution levels obtained for the 2 monitors at Five Lamps have been compared with results from other similar monitors (of which there are approximately 70) elsewhere in the city – mainly in our air quality management areas. In theory, if the percentage increases at Five Lamps were greater than measured elsewhere in the city over the same period, this would indicate that the junction changes are a major cause of the deterioration in air quality.

In 2002, the annual average nitrogen dioxide levels recorded at other monitoring sites was 35.9µg/m³. In 2003, the annual average was 40µg/m³, which is an increase of 11.4 %.

Comparing the data at Five Lamps with other sites, it appears that the increase in nitrogen dioxide levels measured at Duffield Rd was fairly consistent with the increase experienced elsewhere in the city. The decrease at Belper Road is, however, out of step with other sites. In conclusion, there is little evidence to support the theory that the deterioration in air quality measured at Five Lamps in 2003 can be attributed to the junction changes.

The government has attributed the poor air quality in 2003 (which was experienced not just in Derby but also throughout the rest of the country), to the prolonged hot and dry conditions that prevailed in the summer. It is anticipated that the wet and windy conditions we have experienced this year will have the opposite effect. When the figures for 2004 are available, if requested by the Area Panel, they can be reported to a future meeting.

PROPOSED ACTION

- 2.1 Taking on board the guidance received from the government and the percentage errors that are inherent in monitoring of this type, it is important that we continue monitoring at Five Lamps to establish for certain whether or not there has been a disproportionate impact on air quality following the junction changes.

(Should residents wish to view the data in more detail, copies of the report that was submitted to Council Cabinet on 28 September are available).

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Background papers: None
List of appendices: None