

THE PLANNING ACT 2008

**M4 (JUNCTIONS 3 TO 12) (SMART MOTORWAY) DEVELOPMENT CONSENT
ORDER APPLICATION**

TR010019

Issue Specific Hearing - Environment - Air Quality

**Appendix B - Note on agreed position between Highways
England and LB of Hillingdon relating to AURN
monitoring data**

Deadline VII - 17 February 2016

Analysis of Hillingdon AURN Monitoring Data (1997 - 2015)

1. This note has been jointly prepared and agreed by Highways England and the London Borough of Hillingdon.
2. This note provides information on trends in annual mean nitrogen dioxide (NO₂) monitoring data for the Hillingdon AURN monitoring station.
3. The site has been monitoring NO_x and NO₂ concentrations since 1997 and the annual mean concentrations for the 19 years between 1997 and 2015 (inclusive) are presented in Table 1, together with data capture rates for each year.

Table 1 Annual Average NO₂ Concentrations (1997 – 2015)

Year	Annual Average NO ₂ Concentrations (µg/m ³)	% Data Capture Rate
1997	58.8	96.9
1998	50.9	75.1
1999	50.2	44.6
2000	47.7	97.6
2001	46.2	96.2
2002	45.2	96.7
2003	53.7	82.6
2004	47.2	97.6
2005	45.5	93.6
2006	48.7	94.3
2007	45.1	97.9
2008	50.7	83.1
2009	54.0	91.3
2010	53.6	93.9
2011	55.2	97.6
2012	57.2	97.3
2013	52.3	99.0
2014	57.1	97.0
2015	51.9	99.1

74% of the hourly values for 2015 have been ratified, so the annual mean concentration in the final ratified data set may be slightly different.

4. The results in Table 1 show:
 - Generally higher concentrations in the period from 2009 to 2015 than in the period 2000 to 2008;
 - No trend (up or down) over the last 7 years; and
 - Changes in annual mean concentrations of a few microgrammes per cubic metre (µg/m³) from year-to-year.

5. During this time period (1997-2015) the emissions of nitrogen oxides from motor vehicles have had to meet increasingly stringent standards:

- Euro 2/II from 1996
- Euro 3/III from 2000
- Euro 4/IV from 2005
- Euro 5/V from 2009
- Euro 6/VI from 2014

(The years cited are the earliest in the requirements for cars, for different categories and types the standards are phased in over about 2 years.¹)

6. The analysis presented within note focuses its attention on the last 5 years' worth of monitoring data as it is most representative of the current traffic fleet (volume and composition).

Further Analysis of Last 5 Years' Data

7. Highways England has undertaken further month-by-month analysis to help identify possible reasons for the variations in annual concentrations over the last 5 years and their influence on the annual averages.

8. Table 2 presents the NO₂ annual averages for the last 5 years (2011 to 2015). These numbers are also shown in Figure 1.

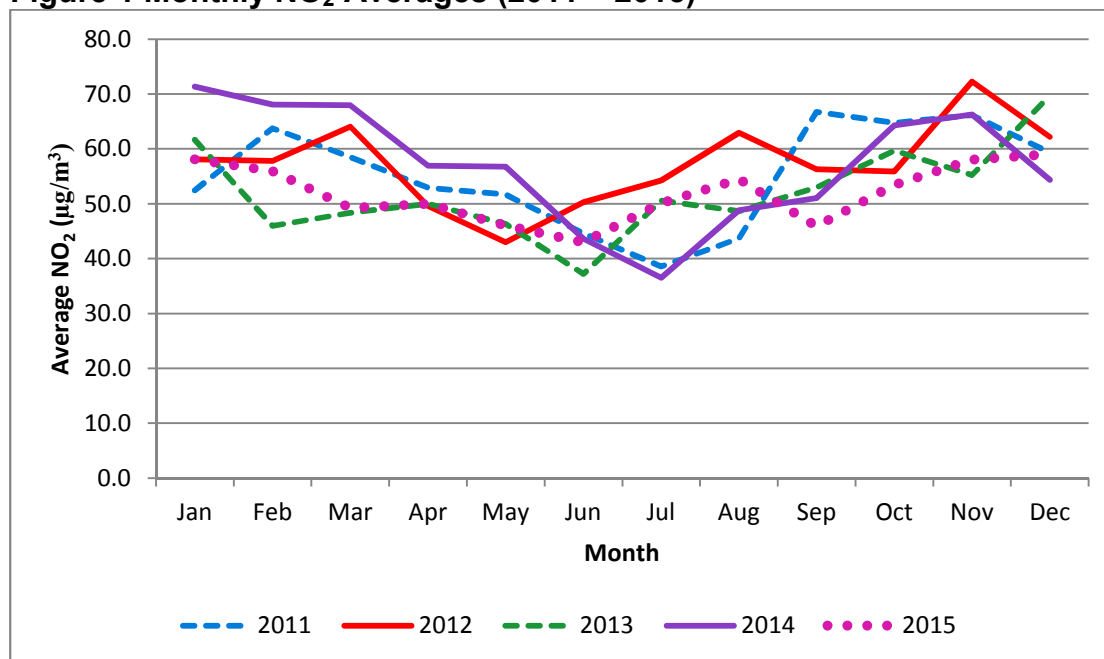
Table 2 Monthly NO₂ Averages (2011 – 2015)

Month	Year				
	2011	2012	2013	2014	2015
Jan	52.4	58.1	61.7	71.3	58.1
Feb	63.8	57.8	46.0	68.0	55.9
Mar	58.5	64.1	48.3	68.0	49.2
Apr	52.9	49.6	50.0	56.9	50.0
May	51.7	43.0	46.3	56.8	46.0
Jun	44.6	50.3	37.2	43.6	43.0
Jul	38.6	54.2	50.6	36.5	50.1
Aug	43.7	62.9	48.6	48.8	54.5
Sep	66.7	56.3	53.0	51.0	45.9
Oct	64.7	55.9	59.7	64.3	53.4
Nov	66.2	72.3	55.2	66.3	58.1
Dec	59.3	62.2	69.7	54.4	59.1
Traffic	151,367	171,881	163,456	159,549	n/a

Traffic flows on the M4 (Count ID 16012) <http://www.dft.gov.uk/traffic-counts/cp.php?la=Hillingdon#16012>

¹ https://en.wikipedia.org/wiki/European_emission_standards

Figure 1 Monthly NO₂ Averages (2011 – 2015)



9. The results in Figure 1 show:

- Concentrations are the highest in the winter months and lowest in the summer months and this consistent with national monitoring;
- In 2012 the NO₂ concentrations in the summer months (May to August) are higher than in all other years and not in keeping with the summer patterns seen in the other years;
 - this increase is possibly attributable to increased traffic associated with the Olympic Games which used the M4 as an access route for the Olympic Venues; and
 - a review of DfT traffic statistics (Count ID 16012)² for the corresponding section of the M4 adjacent to the Hillingdon AURN monitoring station, indicates notable increase of approximately 20,000 additional vehicles in 2012 compared to 2011.
- The averages for the summer months in 2013 were notably lower than in 2012 and back in line with the prevailing summer trends; and
- The higher annual average concentrations seen in 2014 are influenced by higher monthly averages between January and May, relative to the measured NO₂ concentrations seen in other years. From July onward to the end of the 2014 the monthly trends are consistent with the monthly trends monitored in the other 4 years;
 - a review of the meteorological data from Heathrow for 2011 to 2015 has established a consistent distribution of wind direction and speeds over the 5 years and does not explain the reason for the elevated concentrations in 2014;
 - a review of the traffic information for this section of the M4 shows no discernible changes in flow or speed which could account for the elevated concentrations between January and May; and

² <http://www.dft.gov.uk/traffic-counts/cp.php?la=Hillingdon#16012>

- the air quality monitoring data from Hounslow's Brentford air quality station, located between the A4 (Great West Road) and M4 did not show the elevated trend seen between January and May at the Hillingdon AURN monitoring station.

In conclusion:

- The monitoring data collected at Hillingdon AURN monitoring station shows no trend (up or down), in terms of the annual average, over the last 7 years, , which covers the more recent time periods which is the most representative of the current traffic fleet composition.

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