

# HIGHWAYS ENGLAND AIR QUALITY MONITORING NETWORK

## Annual 2017 Network Report

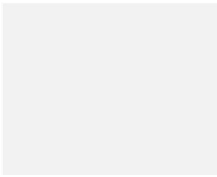
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**EC HARRIS**  
BUILT ASSET  
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## CONTACTS



**PAUL MANKTELOW**  
Principal Air Quality Consultant

dd +44 (0)113 3608276  
m +44 (0)7841 529481  
e Paul.Manktelow@arcadis.com

Arcadis.

1 Whitehall Riverside  
Leeds  
LS1 4BN  
United Kingdom

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Version	Date	Author	Changes
01	13.04.2018	Joe Shaw	Paul M Review
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## Introduction

Highways England are in the process of installing around 50 automatic monitoring stations across the Strategic Road Network. The purpose of the monitoring network is to gather real time air quality data, determine trends in pollutant concentrations and to provide Highways England an evidence base to inform future Policy decisions. The monitoring will also ensure that as schemes are planned and developed, Highways England are able to plan for and take account of air quality at an earlier stage, ensuring that the most suitable design and mitigation (if required) is implemented.

This report summarises the monitoring results obtained in 2017, when 31 of the stations were operational. Other stations are continuing to be installed, and it is anticipated that the full network will be operational in 2018.

The network of monitoring stations has been installed with Chemiluminescence analysers, which is the reference method for monitoring Nitrogen Oxides (used to determine concentrations of nitrogen dioxide (NO<sub>2</sub>)). NO<sub>2</sub> is associated with road traffic emissions and is the only pollutant in the UK that currently fails to meet statutory air quality limits alongside the Strategic Road Network (SRN).

The monitoring sites are operated and managed by Enviro Technology Services, and Arcadis are responsible for the management of the data. The site details for each of the monitoring stations are included in Appendix B.

## Air Quality Standards

The ambient air quality standards and objectives are given statutory backing in England through the Air Quality (England) Regulations 2000, the Air Quality (England) (Amendment) Regulations 2002. The Air Quality (Standards) Regulations 2010 transpose into English law the requirements of Directives 2008/50/EC on ambient air quality. The Air Quality Strategy (AQS) objectives/EU Limit Values for the protection of human health for NO<sub>2</sub> are presented in Table 1.

Table 1 – AQS Objectives for Nitrogen Dioxide

Pollutant	Concentration	Average Period	Compliance Date AQS Objective	Compliance Date EU Limit Value
NO <sub>2</sub>	40 µg/m <sup>3</sup>	annual mean	31 December 2005	1 January 2010
	200 µg/m <sup>3</sup>	1-hour mean (not to be exceeded more than 18 times per year)	31 December 2005	1 January 2010

## Monitoring Stations

The locations of the air quality monitoring stations are presented on Figure 1 in Appendix A. All of the stations are located adjacent to the SRN, with 12 stations located in close proximity to the M1, two next to the M3, three next to the M56, six next to the M6, one next to the M60, four next to the M62, two next to the A1M and one next to the A50.

## Results

Table 2 summarises the monitoring results for nitrogen dioxide (NO<sub>2</sub>) across the network throughout 2017.

Table 2 – Summary Year 2017 Results for the Monitoring Stations

Site ID	Date Commissioned	Site Type	2017 Annual Data Capture (%)	2017 Annual Mean NO <sub>2</sub> (µg m <sup>-3</sup> )	2017 No. of Hours NO <sub>2</sub> > 200 µg m <sup>-3</sup>
01_M1_J34-35SB_N	Mar 2016	Roadside	99.2	<b>49.6</b>	0
02_M1_J33-34SB_N	Mar 2016	Roadside	99.1	<b>70.8</b>	0
03_M1_J33-34SB_N	Mar 2016	Roadside	94.8	36.7	0
04_M1_J30-31NB_N	Mar 2016	Roadside	98.9	29.6	0
05_M1_J30-31SB_N	Mar 2016	Roadside	96.7	<b>60.9</b>	8
06_M1_J28-29SB_N	Mar 2016	Roadside	99.2	<b>43.1</b>	0
07_M1_J28-29NB_N	Feb 2016	Roadside	97.6	27.5	0
08_M1_J28-29SB_N	Mar 2016	Roadside	96.6	37.0	0
09_M1_J28-29SB_N	Mar 2016	Roadside	99.3	24.4	0
10_M1_J27-28SB_N	Mar 2016	Roadside	99.1	27.2	0
11_M1_J34_UrbSB_N	Oct 2016	Urban Background	93.6	26.7	0
12_M3_J4 EB_N	Mar 2016	Roadside	98.6	32.9	8
13_M3_BC WB_N**	Nov 2016	Roadside	91.0	<b>46.1</b>	0
14_M56_J4-3_NB_N	May 2017	Roadside	59.3 <sup>†</sup>	<b>48.9</b>	0
15_M56_J3-4 SB_N	May 2017	Roadside	57.0 <sup>†</sup>	<b>55.1</b>	0
16_M56_J3-2_NB_N	Jun 2017	Roadside	51.3 <sup>†</sup>	<b>51.2</b>	0
17_M1_J13-14NB_N	Mar 2016	Roadside	99.0	26.1	0
18 M6_J13-14 NB_N	Nov 2017	Roadside	11.2 <sup>†</sup>	24.8	0
19_M6_J6-7SB_NOP**	Nov 2017	Roadside	13.0 <sup>†</sup>	<b>45.5</b>	0
20_M62_J38_EB_N	Jun 2016	Roadside	96.7	27.4	0
21 M6 J16-17 NB_N	Mar 2017	Roadside	80.4	33	0
22 M6 J17-16 SB_N	Mar 2017	Roadside	73.5 <sup>†</sup>	39.5	0



23 M62 J9-8_WB_N	March 2017	Roadside	26.7 <sup>‡</sup>	30.7	0
24 M62 J8-9_EB_N	Feb 2017	Roadside	84.1	<b>42.5</b>	0
25 M60-J5-6_NB_N	Mar 2017	Roadside	74.3 <sup>‡</sup>	<b>48.5</b>	0
26 M6 J22-23 NB_N	Jan 2017	Roadside	92.4	36.2	0
27 M6 J23-22 SB_NO	Mar 2017	Roadside	77.1	39.0	2
30 A1M_J44-45_SB_N	Mar 2017	Roadside	78.1	35.8	0
39 A1M_J15-16_SB_NO	April 2017	Roadside	72.6 <sup>‡</sup>	34.2	0
40 M62_J28-29_WB_NO	Sept 2017	Roadside	23.7 <sup>‡</sup>	30.2	0
56 A50-B5030_NB_N	Jun 2017	Roadside	51.5 <sup>‡</sup>	<b>72.3</b>	1

Exceedances of AQS Objectives / EU Limit Values emphasised in **bold**.

\*\* Prolonged period of invalid calibrations, corresponding data has been calibrated according to most recent valid factor available.

<sup>‡</sup> Low annual data capture (below 75%)

The results presented in Table 2 demonstrate that across the 31 monitoring stations operational in 2017, exceedances of the annual mean NO<sub>2</sub> AQS objective / EU Limit Value (40 µg m<sup>-3</sup>) were recorded at 12 of the stations. It should be noted however that 11 of the 31 stations have data capture below the 75% criteria recommended by Defra, and so annual mean results for these should be treated with caution. Furthermore, there was a prolonged period of invalid calibrations for Site 13\_M3\_BC WB\_N and Site 19\_M6\_J6-7SB\_NOP (see Appendix B for more details) and the annual mean data for these sites should be treated with caution.

The results vary between monitoring stations due to many factors, including the traffic conditions and associated emissions of adjacent roads, the distance of the station from roadside, where the station is sited in relation to both emission sources and prevailing wind direction (i.e. proportion of time downwind of traffic emissions) and the background concentrations.

Stations 02\_M1\_J33-34SB\_N and 05\_M1\_J30-31SB\_N measured annual mean concentrations of 70.8 µg m<sup>-3</sup> and 60.9 µg m<sup>-3</sup> respectively, which are well in excess of the annual mean NO<sub>2</sub> AQS objective / EU Limit Value. These stations are located within 5m of the M1 and on the eastern side of the carriageway, which due to the prevailing wind direction is typically downwind of the motorway. Station 56 A50-B5030\_NB\_N measured an annual mean concentration of 72.3 µg m<sup>-3</sup> which again is well in excess of the annual mean NO<sub>2</sub> AQS objective / EU Limit Value. This station is located 4m away from the A50 northbound carriageway, but the annual mean should be treated with caution, as the annual data capture of the monitor was 51.5%.

Although annual mean concentrations over 60 µg m<sup>-3</sup> were monitored, which would suggest a risk of an exceedance of the hourly NO<sub>2</sub> AQS objective (according to Defra LAQM.TG(16)<sup>1</sup> guidance), the number of hours with concentrations above the 1-hour threshold of 200 µg m<sup>-3</sup> was well below the 1-hour AQS objective/EU Limit Value (18 permitted per year).

Stations 05\_M1\_J30-31SB\_N, 12\_M3\_J4 EB\_N, 27 M6 J23-22 SB\_NO and 56 A50-B5030\_NB\_N were the only sites to monitor occurrences of 1-hour mean NO<sub>2</sub> concentrations in excess of 200 µg m<sup>-3</sup>. Stations 05\_M1\_J30-31SB\_N and 12\_M3\_J4 EB\_N both showed eight occurrences, station 27 M6 J23-22 SB\_NO showed two and 56 A50-B5030\_NB\_N showed one.

<sup>1</sup> Defra (2016) Local Air Quality Management Technical Guidance (LAQM.TG16)

Station 09\_M1\_J28-29SB\_N which is located adjacent to the M1, monitored the lowest annual mean NO<sub>2</sub> concentration (24.4 µg m<sup>-3</sup>). It is located 133m from the M1 (and 7m from Sawpit Lane) and so emissions associated with the motorway will be well dispersed before reaching the station.

Site 18 M6\_J13-14 NB\_N monitored the second lowest annual average mean NO<sub>2</sub> concentration (24.8 m<sup>-3</sup>) across the network. Due to its close proximity to the M6 hard shoulder (15m) it would generally be expected to show higher concentrations, however the site has low annual data capture (11.2%) and so the annual mean should be treated with caution.

For further information on the annual mean monitoring results for NO<sub>x</sub>, NO and NO<sub>2</sub> recorded at each of the stations and the notable features observed, please refer to the site summary sheets included in Appendix B.

## Breakdowns and Services

The details of the services and breakdowns at each of the automatic monitoring stations are presented in Table 3.

Table 3 – Details of Services and Breakdowns

Site	Services	Any Significant Breakdowns (Y/N)	Details of Breakdowns
01_M1_J34-35SB_N	27 <sup>th</sup> – 28 <sup>th</sup> Feb and 19 <sup>th</sup> – 20 <sup>th</sup> September	N	
02_M1_J33-34SB_N	6 <sup>th</sup> – 7 <sup>th</sup> March and 19 <sup>th</sup> December	N	
03_M1_J33-34SB_N	27 <sup>th</sup> – 28 <sup>th</sup> March and 21 <sup>st</sup> September	Y	20 <sup>th</sup> February – 2 <sup>nd</sup> March and 22 <sup>nd</sup> – 27 <sup>th</sup> March no calibrated data due to analyser fault. 14 <sup>th</sup> – 15 <sup>th</sup> June no calibrated data due to analyser reset
04_M1_J30-31NB_N	20 <sup>th</sup> – 21 <sup>st</sup> February, 3 <sup>rd</sup> – 4 <sup>th</sup> and 19 <sup>th</sup> – 20 <sup>th</sup> September	Y	No data on 9 <sup>th</sup> October and 13 <sup>th</sup> December due to analyser fault
05_M1_J30-31SB_N	20 <sup>th</sup> – 21 <sup>st</sup> February and 19 <sup>th</sup> – 20 <sup>th</sup> September	Y	No calibrated data between 1 <sup>st</sup> and 3 <sup>rd</sup> January due to calibration issues
06_M1_J28-29SB_N	18 <sup>th</sup> – 19 <sup>th</sup> May and 13 <sup>th</sup> – 14 <sup>th</sup> November	N	
07_M1_J28-29NB_N	8 <sup>th</sup> – 9 <sup>th</sup> March and 28 <sup>th</sup> September	Y	No data 4 <sup>th</sup> -5 <sup>th</sup> October due to analyser fault
08_M1_J28-29SB_N	15 <sup>th</sup> May and 9 <sup>th</sup> November	Y	No data 21 <sup>st</sup> – 24 <sup>th</sup> May due to analyser fault
09_M1_J28-29SB_N	15 <sup>th</sup> – 16 <sup>th</sup> May and 9 <sup>th</sup> – 10 <sup>th</sup> September	N	
10_M1_J27-28SB_N	18 <sup>th</sup> – 19 <sup>th</sup> May and 16 <sup>th</sup> November	N	
11_M1_J34_UrbSB_N	29 <sup>th</sup> to 30 <sup>th</sup> March and 27 <sup>th</sup> September	Y	No data on 11 <sup>th</sup> January as analyser in span mode

12_M3_J4 EB_N	19 <sup>th</sup> April	Y	Limited data throughout end of October due to calibration issue
13_M3_BC WB_N	No Service due to site access issues	Y	No data 23 <sup>rd</sup> – 24 <sup>th</sup> April and 20 <sup>th</sup> – 21 <sup>st</sup> August due to analyser fault. No data from 5 <sup>th</sup> December due to issues at site
14_M56_J4-3_NB_N	14 <sup>th</sup> – 15 <sup>th</sup> November	Y	No data 20 <sup>th</sup> – 27 <sup>th</sup> May and 10 <sup>th</sup> June due to analyser error. No data 31 <sup>st</sup> May – 6 <sup>th</sup> June and 9 <sup>th</sup> – 10 <sup>th</sup> October due to analyser fault
15_M56_J3-4 SB_N	13 <sup>th</sup> – 14 <sup>th</sup> November	Y	No data 28 <sup>th</sup> May – 7 <sup>th</sup> June due to router issue. No data 22 <sup>nd</sup> – 30 <sup>th</sup> September due to analyser fault
16_M56_J3-2_NB_N	20 <sup>th</sup> – 21 <sup>st</sup> November	N	
17_M1_J13-14NB_N	23 <sup>rd</sup> – 24 <sup>th</sup> May and 7 <sup>th</sup> – 8 <sup>th</sup> November	N	
18 M6_J13-14 NB_N	Not due Maintenance Service until 2018	Y	No data 24 <sup>th</sup> – 30 <sup>th</sup> November due to analyser fault
19_M6_J6-7SB_NOP	Not due Maintenance Service until 2018	Y	No data 13 <sup>th</sup> December due to power issue
20_M62_J38_EB_N	22 <sup>nd</sup> – 23 <sup>rd</sup> June and 19 <sup>th</sup> December	Y	No data 2 <sup>nd</sup> – 5 <sup>th</sup> January due to power issue. 3 <sup>rd</sup> April and 27 <sup>th</sup> – 30 <sup>th</sup> May no data due to analyser fault
21 M6 J16-17 NB_N	5 <sup>th</sup> – 6 <sup>th</sup> October	Y	No data from 28 <sup>th</sup> May to 2 <sup>nd</sup> June and 4 <sup>th</sup> to 6 <sup>th</sup> July due to communication issues
22 M6 J17-16 SB_N	11 <sup>th</sup> – 12 <sup>th</sup> October	Y	No data 11 <sup>th</sup> to 12 <sup>th</sup> October due to routine maintenance service, 26 <sup>th</sup> to 30 <sup>th</sup> October due to server issue and 25 <sup>th</sup> to 27 <sup>th</sup> November due to analyser fault
23 M62 J9-8_WB_N	No Maintenance Service due to loss of power to station	Y	Multiple signal issues causing loss of data throughout the year. 8 <sup>th</sup> August to 21 <sup>st</sup> December no data due to loss of power to station
24 M62 J8-9_EB_N	19 <sup>th</sup> – 20 <sup>th</sup> June	Y	No data from 6 <sup>th</sup> to 11 <sup>th</sup> April due to analyser fault. No data from 25 <sup>th</sup> December to the end of the year
25 M60-J5-6_NB_N	7 <sup>th</sup> to 28 <sup>th</sup> December	Y	No data 22 <sup>nd</sup> to 24 <sup>th</sup> April due to communication issue and 29 <sup>th</sup> to 30 <sup>th</sup> August and 24 <sup>th</sup> to 26 <sup>th</sup> September due to power issue

26 M6 J22-23 NB_N	15 <sup>th</sup> – 16 <sup>th</sup> June	Y	No data between 4 <sup>th</sup> and 6 <sup>th</sup> July, 10 <sup>th</sup> October and 11 <sup>th</sup> October due to analyser fault.
27 M6 J23-22 SB_NO	2 <sup>nd</sup> – 3 <sup>rd</sup> October	Y	No data 26 <sup>th</sup> to 28 <sup>th</sup> May due to A/C fault, 31 <sup>st</sup> May to 2 <sup>nd</sup> June due to analyser fault and 10 <sup>th</sup> to 11 <sup>th</sup> June due to communication issue
30 A1M_J44-45_SB_N	11 <sup>th</sup> – 12 <sup>th</sup> September	Y	No data 26 <sup>th</sup> July to 7 <sup>th</sup> August due to analyser communication fault
39 A1M_J15-16_SB_NO	21 <sup>st</sup> – 22 <sup>nd</sup> September	Y	2 <sup>nd</sup> to 3 <sup>rd</sup> of May and 28 <sup>th</sup> to 29 <sup>th</sup> June no data due to communication issue
40 M62_J28-29_WB_N0	Not due Maintenance Service until 2018	Y	No data from 2 <sup>nd</sup> to 31 <sup>st</sup> December due to communication issue
56 A50-B5030_NB_N	Not due Maintenance Service until 2018	N	

## Summary

This report presents the monitoring results obtained across the Highways England National Air Quality Monitoring Network during 2017. A total of 31 stations were operational in 2017, and it is anticipated that around 50 stations will be in operation by 2018.

Out of 31 sites, 12 stations monitored exceedances of the annual mean NO<sub>2</sub> AQS objective, the highest of which were stations 02\_M1\_J33-34SB\_N, 05\_M1\_J30-31SB\_N and 56 A50-B5030\_NB\_N. Six of the 12 stations that monitored an exceedance had low annual data capture, mostly due to being commissioned later in the year, and so should be treated with caution.

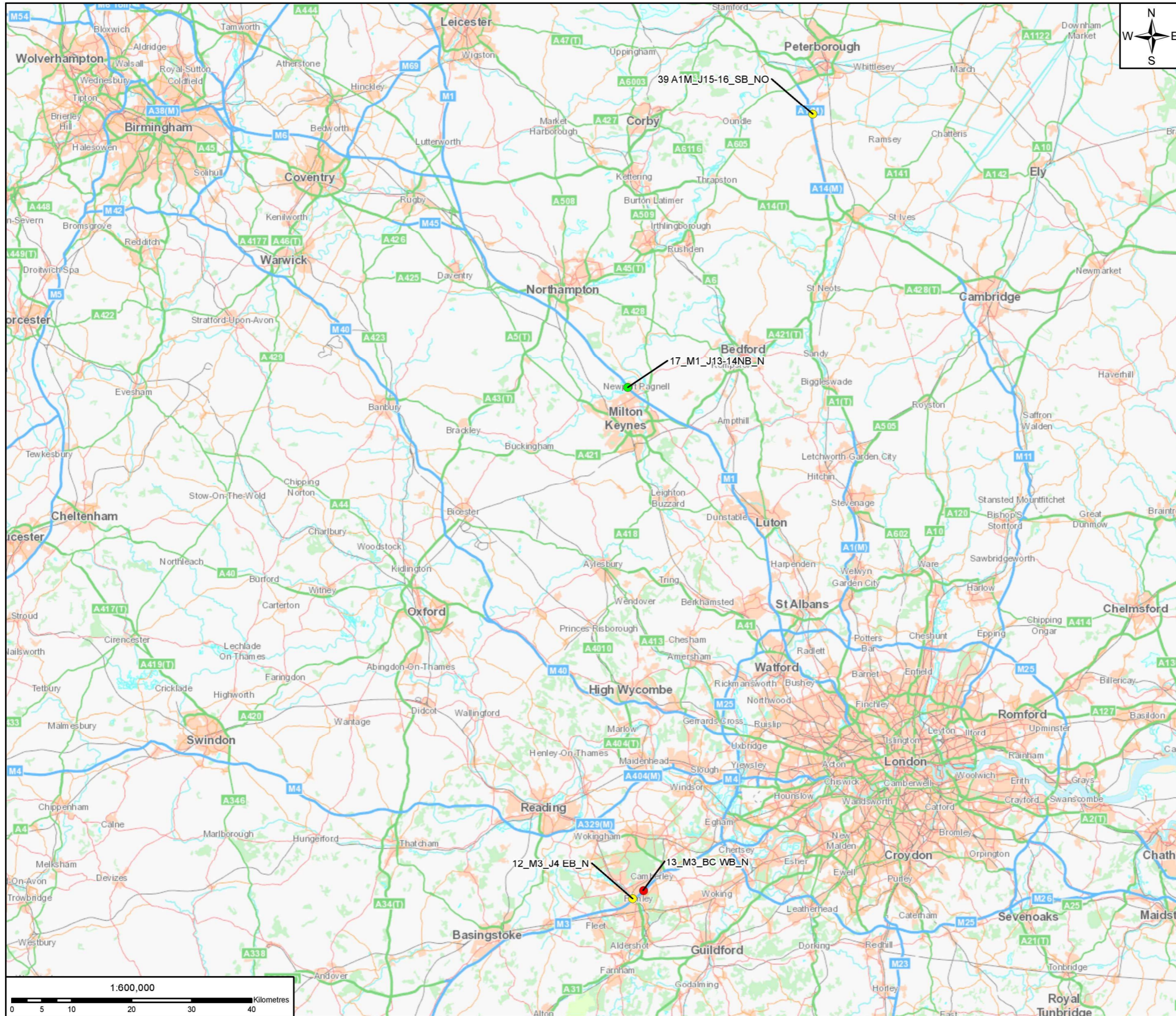
Data from all the monitoring stations shows features typical of roadside pollution, with concentrations resembling diurnal traffic flows. Neighbouring stations, for example on the M1 and on the same side of the carriageway, often showed similar weekday and monthly pollution profiles, as would be expected when influenced by the same road traffic sources.

**APPENDIX A**

**Air Quality Monitoring Locations**







**LEGEND**

- 2017 annual mean NO<sub>2</sub> (µg/m<sup>3</sup>) <32
- 2017 annual mean NO<sub>2</sub> (µg/m<sup>3</sup>) 32-36
- 2017 annual mean NO<sub>2</sub> (µg/m<sup>3</sup>) 36-40
- 2017 annual mean NO<sub>2</sub> (µg/m<sup>3</sup>) >40

**NOTES:**

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**Client**

**highways england**

**PROJECT: NATIONAL AIR QUALITY MONITORING PROJECT**

**Site**  
Leeds, Manchester, Birmingham & London UK

**Client**  
Highways England  
National Traffic Operations Centre  
3 Ridgeway  
Birmingham  
B32 1AF  
Telephone: 0300 123 5000  
www.highways.gov.uk

**ARCADIS** Design & Consultancy for natural and built assets

Registered office:  
Arcadis House  
34 York Way,  
London  
N1 9AB

Coordinating office:  
6th Floor, 401 Faraday Street  
Birchwood Park  
Warrington WA3 6GA  
Tel: 44 (0)1224 700800

www.arcadis.com

**TITLE:**

**HIGHWAYS ENGLAND NATIONAL AIR QUALITY MONITORING NETWORK LOCATIONS 2017**

Designed	MS	Date: 04MAY18	Signed
Drawn	MS	Date: 04MAY18	Signed
Checked	AH	Date: 04MAY18	Signed
Approved		Date: 04MAY18	Signed
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Original Size:	A3	Grid:	OS
Suitability Code:	S2	Project Number:	10010754

Suitability Description:

For Information

Drawing Number: **Page 2 of 2** Revision: **01**

## APPENDIX B

### Monitoring Site Summary Sheets

<b>Highways England National Air Quality Monitoring Network</b>			
<b>Site Details</b>			
<b>Site Name</b>	01_M1_J34-35SB_N		
<b>Date Commissioned</b>	March 2016		
<b>Environment Type</b>	Roadside		
<b>Easting / Northing</b>	438343/ 393080		
<b>Pollutants Measured</b>	NO, NO <sub>2</sub> , NO <sub>x</sub>		
<b>Met Station</b>	Yes		
<b>Inlet Height AGL (m)</b>	1.4		
<b>Location Description</b>	The monitoring station is located between Barber Road Wood, Rotherham and the M1 southbound carriageway between J34 and J35.		
<b>Distance from Road(s)</b>	Approximately 8m from M1 and 5m from Barber Wood Road.		
<b>Nearest Representative Exposure</b>	The station is expected to be representative of exposure at some properties on Kirkstead Road.		
<b>Recorded Operational Issues</b>	No calibrated data 27 <sup>th</sup> to 28 <sup>th</sup> February and 19 <sup>th</sup> to 20 <sup>th</sup> September due to routine maintenance service.		
<b>Pollutant Analysis</b>			
<b>Monitoring Period</b>	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
<b>Pollutant</b>	<b>NO</b>	<b>NO<sub>2</sub></b>	<b>NO<sub>x</sub> (as NO<sub>2</sub>)</b>
Mean ( $\mu\text{g m}^{-3}$ )	46.6	49.6	121.0
Number Hours > 200 $\mu\text{g m}^{-3}$		0	
Data Capture (%)	99.2%	99.2%	99.2%
<b>Diurnal Profile</b>			
<b>Data Comments</b>	Limited annual mean PM peak concentrations observed on Fridays compared to other weekdays (as higher inter-peak). High Thursday AM peak concentrations in January (consistent with site 02_M1_J33-34SB_N). Low Sunday AM concentrations in August (consistent with site 02).		

<b>Highways England National Air Quality Monitoring Network</b>			
<b>Site Details</b>			
<b>Site Name</b>	02_M1_J33-34SB_N		
<b>Date Commissioned</b>	March 2016		
<b>Environment Type</b>	Roadside		
<b>Easting / Northing</b>	440026 / 390745		
<b>Pollutants Measured</b>	NO, NO <sub>2</sub> , NO <sub>x</sub>		
<b>Met Station</b>	No		
<b>Inlet Height AGL (m)</b>	1.4		
<b>Location Description</b>	The monitoring station is located on Newburn Drive, Sheffield and adjacent to the M1 J34 southbound slip road.		
<b>Distance from Road(s)</b>	Approximately 2 m from M1 and 1m from Newburn Drive.		
<b>Nearest Representative Exposure</b>	There are properties located ~6m further back from M1 on Newburn Drive and Siemens Close.		
<b>Recorded Operational Issues</b>	No calibrated data 6 <sup>th</sup> to 7 <sup>th</sup> March and 19 <sup>th</sup> December due to routine maintenance service		
<b>Pollutant Analysis</b>			
<b>Monitoring Period</b>	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
<b>Pollutant</b>	<b>NO</b>	<b>NO<sub>2</sub></b>	<b>NO<sub>x</sub> (as NO<sub>2</sub>)</b>
Mean ( $\mu\text{g m}^{-3}$ )	105.1	70.8	231.9
Number Hours > 200 $\mu\text{g m}^{-3}$		0	
Data Capture (%)	99.1	99.1	99.1
<b>Diurnal Profile</b>			
<p>Mean NO<sub>2</sub> (<math>\mu\text{g}/\text{m}^3</math>)</p> <p>Hour of Day</p> <p>Legend: Sun (light green), Mon (orange), Tues (grey), Wed (yellow), Thurs (blue), Fri (dark blue), Sat (green)</p>			
<b>Data Comments</b>	Weekday PM peak concentrations more pronounced than AM peak based on annual mean concentrations. Less diurnal profile between AM and PM hours on Fridays, similar to observed at Site 01_M1_J34-35SB_N. Low Sunday AM concentrations in August (consistent with site 01).		

## Highways England National Air Quality Monitoring Network

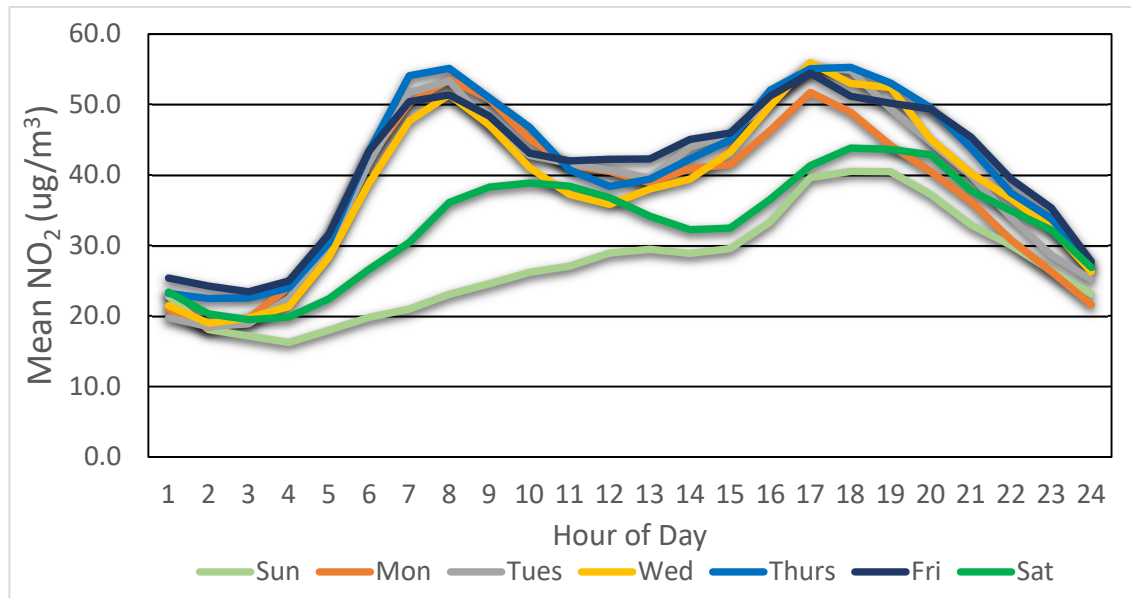
### Site Details

<b>Site Name</b>	03_M1_J33-34SB_N
<b>Date Commissioned</b>	March 2016
<b>Environment Type</b>	Roadside
<b>Easting / Northing</b>	441490 / 389404
<b>Pollutants Measured</b>	NO, NO <sub>2</sub> , NO <sub>x</sub>
<b>Met Station</b>	No
<b>Inlet Height AGL (m)</b>	2.8
<b>Location Description</b>	The monitoring station is located alongside the B6067, adjacent to the M1 southbound carriageway between Junction 33 and 34. The M1 is raised above the B6067 and monitoring station.
<b>Distance from Road(s)</b>	Approximately 13m from M1 and 3m from B6067.
<b>Nearest Representative Exposure</b>	Houses on Derwent Crescent are located within 13m of the M1 SB carriageway.
<b>Recorded Operational Issues</b>	No calibrated data 20 <sup>th</sup> February to 2 <sup>nd</sup> March and 22 <sup>nd</sup> to 27 <sup>th</sup> March due to analyser fault. No data 27 <sup>th</sup> to 28 <sup>th</sup> March and 21 <sup>st</sup> September due to routine maintenance service. No calibrated data 14 <sup>th</sup> to 15 <sup>th</sup> June due to analyser reset.

### Pollutant Analysis

<b>Monitoring Period</b>	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
<b>Pollutant</b>	<b>NO</b>	<b>NO<sub>2</sub></b>	<b>NO<sub>x</sub> (as NO<sub>2</sub>)</b>
Mean ( $\mu\text{g m}^{-3}$ )	24.6	36.7	74.4
Number Hours > 200 $\mu\text{g m}^{-3}$		0	
Data Capture (%)	94.8	94.8	94.8

### Diurnal Profile



<b>Data Comments</b>	Well defined annual average AM and PM peak concentrations on weekdays. January and April high Thursday AM peak concentrations (January consistent with site 02_M1_J33-34SB_N (AB5)). Thursday PM peak concentrations elevated in July (consistent with site 02).
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<b>Highways England National Air Quality Monitoring Network</b>			
<b>Site Details</b>			
Site Name	04_M1_J30-31NB_N		
Date Commissioned	March 2016		
Environment Type	Roadside		
Easting / Northing	447922 / 380183		
Pollutants Measured	NO, NO <sub>2</sub> , NO <sub>x</sub>		
Met Station	Yes		
Inlet Height AGL (m)	1.4		
Location Description	The monitoring station is located adjacent to the M1 northbound carriageway between Junction 30 and 31, at Woodall Service Station.		
Distance from Road(s)	Approximately 5m from M1.		
Nearest Relevant Exposure	No relevant exposure within vicinity of monitoring station.		
Recorded Operational Issues	No calibrated data 20th to 21st February, 3rd to 4 <sup>th</sup> and 19 <sup>th</sup> to 20 <sup>th</sup> September due to routine maintenance service. No data 9 <sup>th</sup> October and 13 <sup>th</sup> December due to analyser fault.		
<b>Pollutant Analysis</b>			
Monitoring Period	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
Pollutant	NO	NO <sub>2</sub>	NO <sub>x</sub> (as NO <sub>2</sub> )
Mean ( $\mu\text{g m}^{-3}$ )	20.8	29.6	61.4
Number Hours > 200 $\mu\text{g m}^{-3}$		0	
Data Capture (%)	98.9	98.9	98.9
<b>Diurnal Profile</b>			
<p>Mean NO<sub>2</sub> (<math>\mu\text{g}/\text{m}^3</math>)</p> <p>Hour of Day</p> <p>— Sun — Mon — Tues — Wed — Thurs — Fri — Sat</p>			
Data Comments	Limited annual mean AM peak concentrations on Wednesdays, and PM peak concentrations on Mondays compared to other weekdays. Thursday concentrations lower than other weekdays. May monthly mean concentrations elevated relative to other Spring and Summer months.		

<b>Highways England National Air Quality Monitoring Network</b>			
<b>Site Details</b>			
Site Name	05_M1_J30-31SB_N		
Date Commissioned	March 2016		
Environment Type	Roadside		
Easting / Northing	447929 / 379989		
Pollutants Measured	NO, NO <sub>2</sub> , NO <sub>x</sub>		
Met Station	No		
Inlet Height AGL (m)	1.4		
Location Description	The monitoring station is located adjacent to the M1 southbound carriageway between Junction 30 and 31, at Woodall Service Station.		
Distance from Road(s)	Approximately 5m from M1.		
Nearest Relevant Exposure	No relevant exposure within vicinity of monitoring station.		
Recorded Operational Issues	No calibrated data 1 <sup>st</sup> to 3 <sup>rd</sup> of January. No data 20 <sup>th</sup> to 21 <sup>st</sup> February and 19 <sup>th</sup> to 20 <sup>th</sup> September due to routine maintenance service. Negative readings 21 <sup>st</sup> to 26 <sup>th</sup> June.		
<b>Pollutant Analysis</b>			
Monitoring Period	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
Pollutant	NO	NO <sub>2</sub>	NO <sub>x</sub> (as NO <sub>2</sub> )
Mean ( $\mu\text{g m}^{-3}$ )	76.6	60.9	178.3
Number Hours > 200 $\mu\text{g m}^{-3}$		8	
Data Capture (%)	96.7	96.7	96.7
<b>Diurnal Profile</b>			
<p>Mean NO<sub>2</sub> (<math>\mu\text{g}/\text{m}^3</math>)</p> <p>Hour of Day</p> <p>— Sun — Mon — Tues — Wed — Thurs — Fri — Sat</p>			
Data Comments	Inter-peak annual mean concentrations higher on Fridays relative to other weekdays, with a less evident PM peak. Sunday annual mean PM peak concentrations similar to weekdays. April and May limited PM peak concentrations.		

<b>Highways England National Air Quality Monitoring Network</b>			
<b>Site Details</b>			
Site Name	06_M1_J28-29SB_N		
Date Commissioned	March 2016		
Environment Type	Roadside		
Easting / Northing	445255 / 356500		
Pollutants Measured	NO, NO <sub>2</sub> , NO <sub>x</sub>		
Met Station	No		
Inlet Height AGL (m)	2.6		
Location Description	The monitoring station is located adjacent to the M1 southbound exit slip road at J28, near Carter Lane East, Alfreton.		
Distance from Road(s)	Approximately 7m from M1 exit slip road.		
Nearest Relevant Exposure	There is relevant exposure at Carter Lane East, where residential properties are located ~11m from the M1 exit slip road.		
Recorded Operational Issues	No calibrated data 18 <sup>th</sup> to 19 <sup>th</sup> May and 13 <sup>th</sup> to 14 <sup>th</sup> November due to routine maintenance service.		
<b>Pollutant Analysis</b>			
Monitoring Period	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
Pollutant	<b>NO</b>	<b>NO<sub>2</sub></b>	<b>NO<sub>x</sub> (as NO<sub>2</sub>)</b>
Mean ( $\mu\text{g m}^{-3}$ )	37.7	43.1	100.8
Number Hours > 200 $\mu\text{g m}^{-3}$		0	
Data Capture (%)	99.2	99.2	99.2
<b>Diurnal Profile</b>			
Data Comments	Diurnal profile less evident on Fridays relative to other weekdays. Friday peak AM concentrations lower than other weekdays. High PM peak concentrations on Sundays in August and November which are similar to weekdays.		

<b>Highways England National Air Quality Monitoring Network</b>			
<b>Site Details</b>			
Site Name	07_M1_J28-29NB_N		
Date Commissioned	February 2016		
Environment Type	Roadside		
Easting / Northing	444855 / 360178		
Pollutants Measured	NO, NO <sub>2</sub> , NO <sub>x</sub>		
Met Station	No		
Inlet Height AGL (m)	1.4		
Location Description	Located adjacent to the M1 northbound carriageway between J28 and J29, near Tibshelf service station.		
Distance from Road(s)	Approximately 10m from M1 NB carriageway.		
Nearest Relevant Exposure	No relevant exposure in vicinity of station.		
Recorded Operational Issues	No calibrated data 8 <sup>th</sup> to 9 <sup>th</sup> March and 28 <sup>th</sup> September due to routine maintenance service. Negative readings between 6 <sup>th</sup> to 10 <sup>th</sup> July, and no data 4 <sup>th</sup> to 5 <sup>th</sup> October due to analyser fault.		
<b>Pollutant Analysis</b>			
Monitoring Period	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
Pollutant	NO	NO <sub>2</sub>	NO <sub>x</sub> (as NO <sub>2</sub> )
Mean (µg m <sup>-3</sup> )	23.7	27.5	63.8
Number Hours > 200 µg m <sup>-3</sup>		0	
Data Capture (%)	97.6	97.6	97.6
<b>Diurnal Profile</b>			
Data Comments	Annual mean Monday AM concentrations higher than other weekdays. Saturday and Sunday evening concentrations similar to weekdays. High monthly average concentration for May, similar to observed at Site 04_M1_J30-31NB_N (AB8). Elevated Sunday evening concentrations in August, September and October.		



<b>Highways England National Air Quality Monitoring Network</b>			
<b>Site Details</b>			
Site Name	08_M1_J28-29SB_N		
Date Commissioned	March 2016		
Environment Type	Roadside		
Easting / Northing	444915 / 361111		
Pollutants Measured	NO, NO <sub>2</sub> , NO <sub>x</sub>		
Met Station	No		
Inlet Height AGL (m)	1.4		
Location Description	Located adjacent to the M1 southbound carriageway between J28 and J29, near Saw Pit Lane, Tibshelf. DE55 5NG		
Distance from Road(s)	Approximately 28.7 m from M1, and 110m from Saw Pit Lane.		
Nearest Relevant Exposure	Nearest relevant exposure is on Saw Pit Lane, approximately 80m from M1.		
Recorded Operational Issues	No data on 15 <sup>th</sup> May and 9 <sup>th</sup> November due to routine maintenance service. No data 21 <sup>st</sup> to 24 <sup>th</sup> May due to analyser fault.		
<b>Pollutant Analysis</b>			
Monitoring Period	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
Pollutant	<b>NO</b>	<b>NO<sub>2</sub></b>	<b>NO<sub>x</sub> (as NO<sub>2</sub>)</b>
Mean ( $\mu\text{g m}^{-3}$ )	31.5	37.0	85.2
Number Hours > 200 $\mu\text{g m}^{-3}$		0	
Data Capture (%)	96.6	96.6	96.6
<b>Diurnal Profile</b>			
<p>The graph displays the diurnal profile of Mean NO<sub>2</sub> concentration in <math>\mu\text{g m}^{-3}</math> over a 24-hour period for each day of the week. The y-axis represents Mean NO<sub>2</sub> (<math>\mu\text{g m}^{-3}</math>) from 0.0 to 60.0. The x-axis represents the Hour of Day from 1 to 24. The legend indicates the days: Sun (light green), Mon (orange), Tues (grey), Wed (yellow), Thurs (blue), Fri (dark blue), and Sat (green). All days show a similar pattern with a morning peak (around 7-8 AM) and an evening peak (around 17-18 PM). Friday has the lowest peak concentrations, while Sunday shows a notable evening peak around 18-19 hours.</p>			
Data Comments	Friday AM and PM peak concentrations less evident than other weekdays, based on annual mean profile. Sunday evening concentrations similar to weekdays. Limited weekday diurnal profile observed in May. High Sunday PM concentration observed in July, August, October and November (October consistent with site 09_M1_J28-29SB_N).		

<b>Highways England National Air Quality Monitoring Network</b>			
<b>Site Details</b>			
Site Name	09_M1_J28-29SB_N		
Date Commissioned	March 2016		
Environment Type	Roadside		
Easting / Northing	445020 / 361097		
Pollutants Measured	NO, NO <sub>2</sub> , NO <sub>x</sub>		
Met Station	Yes		
Inlet Height AGL (m)	1.4		
Location Description	Located adjacent to the M1 southbound carriageway between J28 and J29, near Saw Pit Lane, Tibshelf. DE55 5NH		
Distance from Road(s)	Approximately 133 m from M1, and 9m from Saw Pit Lane.		
Nearest Relevant Exposure	Nearest relevant exposure is on Saw Pit Lane, approximately 80m from M1.		
Recorded Operational Issues	No data 15 <sup>th</sup> to 16 <sup>th</sup> May and 9 <sup>th</sup> to 10 <sup>th</sup> September due to routine maintenance service.		
<b>Pollutant Analysis</b>			
Monitoring Period	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
Pollutant	NO	NO <sub>2</sub>	NO <sub>x</sub> (as NO <sub>2</sub> )
Mean (µg m <sup>-3</sup> )	8.5	24.4	37.4
Number Hours > 200 µg m <sup>-3</sup>		0	
Data Capture (%)	99.3	99.3	99.3
<b>Diurnal Profile</b>			
Data Comments	Sunday annual mean evening concentrations elevated, but not as high as weekdays. October high Sunday PM peak concentrations consistent with Site 08_M1_J28-29SB_N. Elevated Thursday AM peak concentrations in January, April, May and August.		

<b>Highways England National Air Quality Monitoring Network</b>			
<b>Site Details</b>			
Site Name	10_M1_J27-28SB_N		
Date Commissioned	March 2016		
Environment Type	Roadside		
Easting / Northing	446494 / 355253		
Pollutants Measured	NO, NO <sub>2</sub> , NO <sub>x</sub>		
Met Station	No		
Inlet Height AGL (m)	2.8		
Location Description	Located adjacent to the M1 northbound carriageway between J27 and J28, near Kirkby Lane, Pinxton. NG16 6HW		
Distance from Road(s)	Approximately 14.4 m from M1, and 9.7m from Kirkby Lane.		
Nearest Relevant Exposure	Nearest relevant exposure is on Kirkby Lane, approximately 14m from M1.		
Recorded Operational Issues	No data 18 <sup>th</sup> to 19 <sup>th</sup> May and 16 <sup>th</sup> November due to routine maintenance service.		
<b>Pollutant Analysis</b>			
Monitoring Period	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
Pollutant	<b>NO</b>	<b>NO<sub>2</sub></b>	<b>NO<sub>x</sub> (as NO<sub>2</sub>)</b>
Mean ( $\mu\text{g m}^{-3}$ )	16.7	27.2	52.7
Number Hours > 200 $\mu\text{g m}^{-3}$		0	
Data Capture (%)	99.1	99.1	99.1
<b>Diurnal Profile</b>			
<p>The graph displays the diurnal profile of annual mean concentrations of Mean NO<sub>2</sub> (ug/m<sup>3</sup>) versus Hour of Day (1-24) for each day of the week (Sun-Sat). The y-axis ranges from 0.0 to 50.0 ug/m<sup>3</sup>. The x-axis ranges from 1 to 24 hours. The graph shows a clear diurnal cycle with peaks around 8-18 hours and troughs around 3-5 hours. Friday shows the highest peak concentration, reaching approximately 45 ug/m<sup>3</sup> at 17 hours. Other weekdays show similar patterns with peaks around 40-42 ug/m<sup>3</sup>. Weekends (Sun and Sat) show lower concentrations, with peaks around 30 ug/m<sup>3</sup>.</p>			
Data Comments	Diurnal profile of annual mean concentrations broadly similar on all weekdays, other than on Fridays which has the highest inter peak concentrations.		

<b>Highways England National Air Quality Monitoring Network</b>			
<b>Site Details</b>			
Site Name	11_M1_J34_UrbSB_N		
Date Commissioned	October 2016		
Environment Type	Urban Background		
Easting / Northing	440315 / 390780		
Pollutants Measured	NO, NO <sub>2</sub> , NO <sub>x</sub>		
Met Station	No		
Inlet Height AGL (m)	1.4		
Location Description	Located near M1 J34, in a residential area behind Harrowden Road, Sheffield. S9 1XF		
Distance from Road(s)	Approximately 270 m from M1, and 110m from Bawtry Road.		
Nearest Relevant Exposure	Representative of exposure at properties on Harrowden Road and Harrowden Court.		
Recorded Operational Issues	No data 11 <sup>th</sup> January as analyser in span mode. No data 29 <sup>th</sup> to 30 <sup>th</sup> March and 27 <sup>th</sup> September due to routine maintenance service.		
<b>Pollutant Analysis</b>			
Monitoring Period	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
Pollutant	NO	NO <sub>2</sub>	NO <sub>x</sub> (as NO <sub>2</sub> )
Mean (µg m <sup>-3</sup> )	9.6	26.7	41.3
Number Hours > 200 µg m <sup>-3</sup>		0	
Data Capture (%)	93.6	93.6	93.6
<b>Diurnal Profile</b>			
Data Comments	Annual mean diurnal profile similar for all weekdays, although Monday evening concentrations lower than other weekdays. January high Thursday AM peaks consistent with site 02_M1_J33-34SB_N.		

<b>Highways England National Air Quality Monitoring Network</b>			
<b>Site Details</b>			
<b>Site Name</b>	12_M3_J4 EB_N		
<b>Date Commissioned</b>	March 2016		
<b>Environment Type</b>	Roadside		
<b>Easting / Northing</b>	486576 / 158154		
<b>Pollutants Measured</b>	NO, NO <sub>2</sub> , NO <sub>x</sub>		
<b>Met Station</b>	Yes		
<b>Inlet Height AGL (m)</b>	1.4		
<b>Location Description</b>	Located in a compound near M3 J4, between the M3 northbound entry and exit slip roads, and M3 carriageway.		
<b>Distance from Road(s)</b>	Approximately 11.5 m from M3 carriageway.		
<b>Nearest Relevant Exposure</b>	No representative exposure near the monitoring station.		
<b>Recorded Operational Issues</b>	No calibrated data on 19 <sup>th</sup> April due to routine maintenance service. Limited data throughout end of October due to calibration issues.		
<b>Pollutant Analysis</b>			
<b>Monitoring Period</b>	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
<b>Pollutant</b>	<b>NO</b>	<b>NO<sub>2</sub></b>	<b>NO<sub>x</sub> (as NO<sub>2</sub>)</b>
Mean ( $\mu\text{g m}^{-3}$ )	24.9	32.9	71
Number Hours > 200 $\mu\text{g m}^{-3}$		8	
Data Capture (%)	98.6	98.6	98.6
<b>Diurnal Profile</b>			
<p>The graph displays the diurnal profile of Mean NO<sub>2</sub> concentration in <math>\mu\text{g}/\text{m}^3</math> over a 24-hour period for each day of the week. The y-axis ranges from 0.0 to 70.0 <math>\mu\text{g}/\text{m}^3</math> in increments of 10.0. The x-axis represents the hour of the day from 1 to 24. Each day is represented by a different colored line: Sun (light green), Mon (orange), Tues (grey), Wed (yellow), Thurs (blue), Fri (dark blue), and Sat (green). All days show a similar pattern with a morning peak (around 7-9 AM) and an evening peak (around 18-20 PM). Tuesday has the highest evening peak, reaching approximately 55 <math>\mu\text{g}/\text{m}^3</math>. Saturday has the lowest overall concentrations, with peaks around 35 <math>\mu\text{g}/\text{m}^3</math>.</p>			
<b>Data Comments</b>	<p>Annual mean concentrations show distinct AM and PM peaks, with high PM concentrations on Tuesdays. Elevated Sunday evening concentrations are observed in April and August. On Mondays in March, elevated AM peak concentrations are observed, consistent with site 13_M3_BC WB_N. In November elevated Friday PM peaks are observed, and in December elevated Tuesday AM peaks are observed (both are consistent with site 13).</p>		

<b>Highways England National Air Quality Monitoring Network</b>			
<b>Site Details</b>			
Site Name	13_M3_BC_WB_N		
Date Commissioned	November 2016		
Environment Type	Roadside		
Easting / Northing	488419 / 159486		
Pollutants Measured	NO, NO <sub>2</sub> , NO <sub>x</sub>		
Met Station	No		
Inlet Height AGL (m)	1.4		
Location Description	Located adjacent to M3 westbound carriageway, between J3 and J4. The site is located on Badgers Copse, Camberley.		
Distance from Road(s)	Approximately 7m from M3 carriageway.		
Nearest Relevant Exposure	Representative exposure on Badgers Copse, 17m from M3 carriageway.		
Recorded Operational Issues	No data 23 <sup>rd</sup> to 24 <sup>th</sup> April and 20 <sup>th</sup> to 21 <sup>st</sup> August due to analyser fault. No data from 5 <sup>th</sup> December due to issues at site. No valid calibrations from 28 <sup>th</sup> June to end of year; calibrations over this period are based on the calibration factor calculated on 28 <sup>th</sup> June and so July to December data should be treated with caution.		
<b>Pollutant Analysis</b>			
Monitoring Period	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
Pollutant	<b>NO</b>	<b>NO<sub>2</sub></b>	<b>NO<sub>x</sub> (as NO<sub>2</sub>)</b>
Mean ( $\mu\text{g m}^{-3}$ )	28.6	46.1	89.9
Number Hours > 200 $\mu\text{g m}^{-3}$		0	
Data Capture (%)	91	91	91
<b>Diurnal Profile</b>			
<p>The graph displays the diurnal profile of Mean NO<sub>2</sub> concentration in <math>\mu\text{g m}^{-3}</math> over a 24-hour period for each day of the week. The y-axis ranges from 0.0 to 80.0 <math>\mu\text{g m}^{-3}</math>. The x-axis represents the hour of the day from 1 to 24. The legend indicates: Sun (light green), Mon (orange), Tues (grey), Wed (yellow), Thurs (blue), Fri (dark blue), and Sat (green). All days show a similar pattern with a minimum around 3-4 AM and a maximum around 7-8 AM. Weekdays (Mon-Fri) reach higher peak concentrations (approx. 70-75 <math>\mu\text{g m}^{-3}</math>) than weekends (Sat-Sun, approx. 45-55 <math>\mu\text{g m}^{-3}</math>).</p>			
Data Comments	Annual mean concentrations show distinct AM and PM peaks. On Mondays in March, elevated AM peak concentrations are observed, consistent with site 12_M3_J4_EB_N. In November elevated Friday PM peaks are observed, and in December elevated Tuesday AM peaks are observed (both are consistent with site 12).		

<b>Highways England National Air Quality Monitoring Network</b>			
<b>Site Details</b>			
Site Name	14_M56_J4-3_NB_N		
Date Commissioned	May 2017		
Environment Type	Roadside		
Easting / Northing	381891 / 388209		
Pollutants Measured	NO, NO <sub>2</sub> , NO <sub>x</sub>		
Met Station	Yes		
Inlet Height AGL (m)	1.4		
Location Description	Located adjacent to the M56 northbound carriageway, between J3 and J4		
Distance from Road(s)	10m from M56 hard shoulder		
Nearest Relevant Exposure	Relevant exposure on Heybrook Road, ~80m from M56 northbound carriageway.		
Recorded Operational Issues	No calibrated data until 18th May 2017 as valid automatic calibrations were not set up until this date. No data 20 <sup>th</sup> and 27 <sup>th</sup> May and 10 <sup>th</sup> June due to analyser error. No data between 31 <sup>st</sup> May and 6 <sup>th</sup> June and 9 <sup>th</sup> to 10 <sup>th</sup> October due to analyser fault. No data on 14 <sup>th</sup> to 15 <sup>th</sup> November due to routine maintenance service		
<b>Pollutant Analysis</b>			
Monitoring Period	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
Pollutant	<b>NO</b>	<b>NO<sub>2</sub></b>	<b>NO<sub>x</sub> (as NO<sub>2</sub>)</b>
Mean (µg m <sup>-3</sup> )	51.7	48.9	128
Number Hours > 200 µg m <sup>-3</sup>		0	
Data Capture (%)	59.3	59.3	59.3
<b>Diurnal Profile</b>			
<p>Mean NO<sub>2</sub> (µg/m<sup>3</sup>)</p> <p>Hour of Day</p> <p>Legend: Sun (light green), Mon (orange), Tues (grey), Wed (yellow), Thurs (blue), Fri (dark blue), Sat (green)</p>			
Data Comments	Annual mean AM peak concentrations higher than PM peak concentrations on weekdays. Friday concentrations lower than other weekdays and similar to Sundays in the evening. In August, high Sunday PM concentrations are observed (similar to site 16_M56_J3-2_NB_N) and low Saturday concentrations.		

## Highways England National Air Quality Monitoring Network

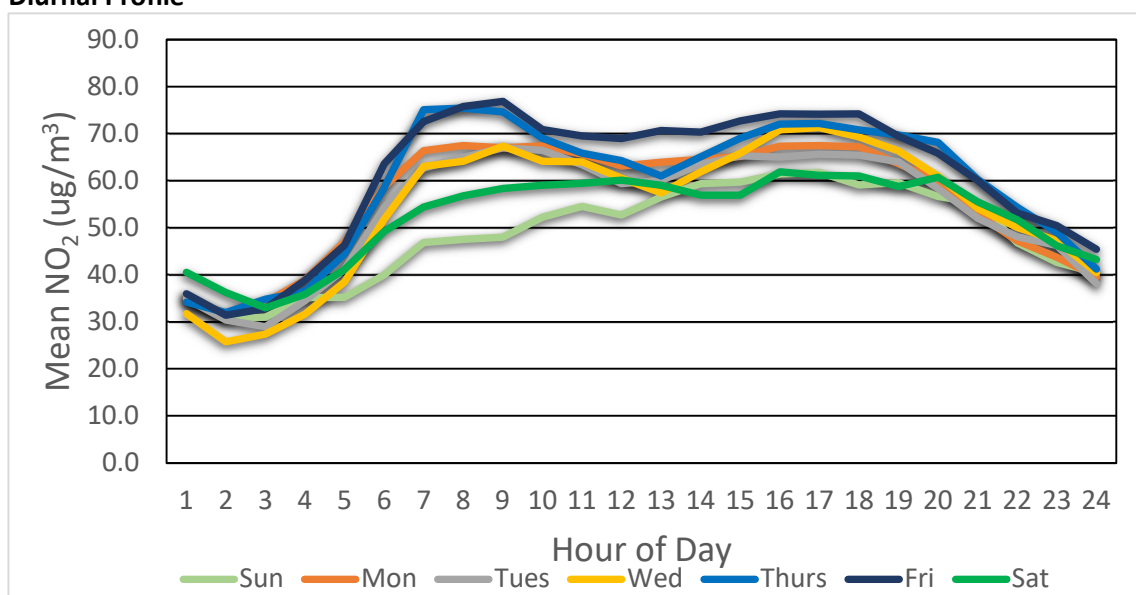
### Site Details

Site Name	15_M56_J3-4 SB_N
Date Commissioned	May 2017
Environment Type	Roadside
Easting / Northing	381915 / 388131
Pollutants Measured	NO, NO <sub>2</sub> , NO <sub>x</sub>
Met Station	No
Inlet Height AGL (m)	1.4
Location Description	Located adjacent to the M56 southbound carriageway, between J3 and J4
Distance from Road(s)	4.5m from M56 hard shoulder
Nearest Relevant Exposure	Relevant exposure on Greenwood Road, ~130m from M56 southbound carriageway.
Recorded Operational Issues	No calibrated data until 18th May 2017 as valid automatic calibrations were not set up until this date. No data between 28 <sup>th</sup> May and 7 <sup>th</sup> June due to router issue. No data from 22 <sup>nd</sup> to 30 <sup>th</sup> September due to analyser fault, and from 13 <sup>th</sup> to 14 <sup>th</sup> November due to routine maintenance service

### Pollutant Analysis

Monitoring Period	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
Pollutant	<b>NO</b>	<b>NO<sub>2</sub></b>	<b>NO<sub>x</sub> (as NO<sub>2</sub>)</b>
Mean ( $\mu\text{g m}^{-3}$ )	49.5	55.1	130.9
Number Hours > 200 $\mu\text{g m}^{-3}$		0	
Data Capture (%)	57.0	57.0	57.0

### Diurnal Profile



### Data Comments

Thursday and Friday annual mean AM concentrations higher than other weekdays, with high mid-afternoon (inter-peak) concentrations relative to other days.



<b>Highways England National Air Quality Monitoring Network</b>			
<b>Site Details</b>			
Site Name	16_M56_J3-2_NB_N		
Date Commissioned	June 2017		
Environment Type	Roadside		
Easting / Northing	382414 / 389029		
Pollutants Measured	NO, NO <sub>2</sub> , NO <sub>x</sub>		
Met Station	Yes		
Inlet Height AGL (m)	1.4		
Location Description	Located adjacent to M56 northbound carriageway between J3 and J2		
Distance from Road(s)	9.5m from M56 hard shoulder		
Nearest Relevant Exposure	No relevant exposure in the vicinity of the monitor		
Recorded Operational Issues	No calibrated data until 26th June 2017 as valid automatic calibrations were not set up until this date.		
<b>Pollutant Analysis</b>			
Monitoring Period	1 <sup>ST</sup> January to 31 <sup>st</sup> December 2017		
Pollutant	NO	NO <sub>2</sub>	NO <sub>x</sub> (as NO <sub>2</sub> )
Mean ( $\mu\text{g m}^{-3}$ )	50.9	51.2	129.2
Number Hours > 200 $\mu\text{g m}^{-3}$		0	
Data Capture (%)	51.6	51.6	51.6
<b>Diurnal Profile</b>			
<b>Data Comments</b>	Annual mean concentrations typically higher for AM period relative to PM period, with Sunday evening concentrations similar to weekdays. Elevated Sunday evening concentrations in August, similar to observed at site 14_M56_J4-3_NB_N. High Saturday concentrations in December, particularly in evening.		

<b>Highways England National Air Quality Monitoring Network</b>			
<b>Site Details</b>			
<b>Site Name</b>	17_M1_J13-14NB_N		
<b>Date Installed</b>	March 2016		
<b>Environment Type</b>	Roadside		
<b>Easting / Northing</b>	485741 / 243585		
<b>Pollutants Measured</b>	NO, NO <sub>2</sub> , NO <sub>x</sub>		
<b>Met Station</b>	No		
<b>Inlet Height AGL (m)</b>	1.4		
<b>Location Description</b>	Located adjacent to M1 northbound carriageway, between J13 and J14. The station is located in the grounds of Newport Pagnell Services M1.		
<b>Distance from Road(s)</b>	Approximately 18 m from M1 carriageway and 9 m from NB entry slip road.		
<b>Nearest Relevant Exposure</b>	No relevant exposure in vicinity of monitor.		
<b>Recorded Operational Issues</b>	No data 23 <sup>rd</sup> to 24 <sup>th</sup> May and 7 <sup>th</sup> to 8 <sup>th</sup> November due to routine maintenance service.		
<b>Pollutant Analysis</b>			
<b>Monitoring Period</b>	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
<b>Pollutant</b>	<b>NO</b>	<b>NO<sub>2</sub></b>	<b>NO<sub>x</sub> (as NO<sub>2</sub>)</b>
Mean ( $\mu\text{g m}^{-3}$ )	19.7	26.1	56.3
Number Hours > 200 $\mu\text{g m}^{-3}$		0	
Data Capture (%)	99.0	99.0	99.0
<b>Diurnal Profile</b>			
<p>Mean NO<sub>2</sub> (<math>\mu\text{g}/\text{m}^3</math>)</p> <p>Hour of Day</p> <p>— Sun — Mon — Tues — Wed — Thurs — Fri — Sat</p>			
<b>Data Comments</b>	Annual average weekday PM peak concentrations typically greater than AM peak concentrations, with Sunday evening concentrations similar to on weekdays. Elevated Thursday PM concentrations in January, March, April and November.		

<b>Highways England National Air Quality Monitoring Network</b>			
<b>Site Details</b>			
Site Name	18 M6_J13-14 NB_N		
Date Commissioned	November 2017		
Environment Type	Roadside		
Easting / Northing	389581 / 323992		
Pollutants Measured	NO, NO2, NOX		
Met Station	No		
Inlet Height AGL (m)	1.4		
Location Description	Located on the edge of a depot adjacent to the northbound carriageway of the M6		
Distance from Road(s)	Located approximately 15m away from the M6 hard shoulder		
Nearest Relevant Exposure	No relevant exposure in vicinity of monitor.		
Recorded Operational Issues	No calibrated data until 15th November 2017 as valid automatic calibrations were not set up until this date. No data 24th to 30th November due to analyser fault.		
<b>Pollutant Analysis</b>			
Monitoring Period	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
Pollutant	<b>NO</b>	<b>NO<sub>2</sub></b>	<b>NO<sub>x</sub> (as NO<sub>2</sub>)</b>
Mean ( $\mu\text{g m}^{-3}$ )	22.6	24.8	59.3
Number Hours > 200 $\mu\text{g m}^{-3}$		0	
Data Capture (%)	11.2	11.2	11.2
<b>Diurnal Profile</b>			
<b>Data Comments</b>	No annual diurnal profile evident, which is likely due to low annual data capture. Thursday concentrations similar to weekends, with highest concentrations occurring on Tuesdays.		

<b>Highways England National Air Quality Monitoring Network</b>			
<b>Site Details</b>			
Site Name	19_M6_J6-7SB_NOP		
Date Commissioned	November 2017		
Environment Type	Roadside		
Easting / Northing	389684 / 323792		
Pollutants Measured	NO, NO <sub>2</sub> , NO <sub>x</sub> , O <sub>3</sub> and PM <sub>10</sub>		
Met Station	No		
Inlet Height AGL (m)	1.4		
Location Description	Located adjacent to the M6 southbound carriageway in a depot.		
Distance from Road(s)	Approximately 15m from the M6 hard shoulder		
Nearest Relevant Exposure	No relevant exposure in the vicinity of the monitor.		
Recorded Operational Issues	No calibrated data until 14th November 2017 as valid automatic calibrations were not set up until this date. No data 13 <sup>th</sup> December due to power issue. No valid calibrations from 25 <sup>th</sup> November until end of year; calibrations for this period are based on the calibration factor calculated on 14 <sup>h</sup> November and so data should be treated with caution.		
<b>Pollutant Analysis</b>			
Monitoring Period	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
Pollutant	<b>NO</b>	<b>NO<sub>2</sub></b>	<b>NO<sub>x</sub> (as NO<sub>2</sub>)</b>
Mean (µg m <sup>-3</sup> )	48.7	45.5	120.2
Number Hours > 200 µg m <sup>-3</sup>		0	
Data Capture (%)	13.0	13.0	13.0
<b>Diurnal Profile</b>			
<p>The graph displays the diurnal profile of Mean NO<sub>2</sub> concentration (µg/m<sup>3</sup>) over a 24-hour period for each day of the week. The y-axis represents Mean NO<sub>2</sub> (µg/m<sup>3</sup>) from 0.0 to 80.0. The x-axis represents the Hour of Day from 1 to 24. The legend indicates the days: Sun (light green), Mon (orange), Tues (grey), Wed (yellow), Thurs (blue), Fri (dark blue), and Sat (green). All days show a similar trend: concentrations are lowest in the early morning (around 20-30 µg/m<sup>3</sup>), rise to a peak in the afternoon (around 60-70 µg/m<sup>3</sup>), and then decrease in the evening. Saturday concentrations are similar to weekdays from late morning onwards, although limited data is available to determine the long-term profile due to low data capture.</p>			
Data Comments	Saturday concentrations similar to weekdays from late morning onwards, although limited data available to determine long term profile due to low data capture.		

<b>Highways England National Air Quality Monitoring Network</b>			
<b>Site Details</b>			
Site Name	20_M62_J38_EB_N (M62 A63)		
Date Installed	June 2016		
Environment Type	Roadside		
Easting / Northing	486670 / 431346		
Pollutants Measured	NO, NO <sub>2</sub> , NO <sub>x</sub>		
Met Station	No		
Inlet Height AGL (m)	1.4		
Location Description	Located adjacent to M1 eastbound carriageway, at J38. The station is located near Stony Lane.		
Distance from Road(s)	Approximately 11 m from M62 EB carriageway and 28m from Stony Lane.		
Nearest Relevant Exposure	Nearest relevant exposure is located ~100m from the M62 eastbound carriageway.		
Recorded Operational Issues	2 <sup>nd</sup> to 5 <sup>th</sup> January no data due to power issue. 3 <sup>rd</sup> April and 27 <sup>th</sup> to 30 <sup>th</sup> May no data due to analyser fault. 22 <sup>nd</sup> to 23 <sup>rd</sup> June and 19 <sup>th</sup> December no data due to routine maintenance service.		
<b>Pollutant Analysis</b>			
Monitoring Period	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
Pollutant	NO	NO <sub>2</sub>	NO <sub>x</sub> (as NO <sub>2</sub> )
Mean ( $\mu\text{g m}^{-3}$ )	22.3	27.4	61.6
Number Hours > 200 $\mu\text{g m}^{-3}$		0	
Data Capture (%)	96.7	96.7	96.7
<b>Diurnal Profile</b>			
Data Comments	Based on the annual mean profile, AM and PM concentration peaks are observed on weekdays, with lower peak concentrations on Mondays compared to other weekdays.		

<b>Highways England National Air Quality Monitoring Network</b>			
<b>Site Details</b>			
<b>Site Name</b>	21 M6 J16-17 NB_N		
<b>Date Commissioned</b>	March 2017		
<b>Environment Type</b>	Roadside		
<b>Easting / Northing</b>	377585 / 359973		
<b>Pollutants Measured</b>	NO, NO <sub>x</sub> , NO <sub>2</sub>		
<b>Met Station</b>	No		
<b>Inlet Height AGL (m)</b>	1.4		
<b>Location Description</b>	Located adjacent to the M6 northbound carriageway between junction 16 and 17.		
<b>Distance from Road(s)</b>	14m from M6 hard shoulder		
<b>Nearest Relevant Exposure</b>	Nearest relevant exposure is ~ 22m from the M6 northbound carriageway on caravan park.		
<b>Recorded Operational Issues</b>	No calibrated data until 3 <sup>rd</sup> March 2017 as valid automatic calibrations were not set up until this date. No data from 28 <sup>th</sup> May to 2 <sup>nd</sup> June and from 4 <sup>th</sup> to 6 <sup>th</sup> July due to communication issues.		
<b>Pollutant Analysis</b>			
<b>Monitoring Period</b>	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
<b>Pollutant</b>	<b>NO</b>	<b>NO<sub>2</sub></b>	<b>NO<sub>x</sub> (as NO<sub>2</sub>)</b>
Mean ( $\mu\text{g m}^{-3}$ )	31.3	33	80.8
Number Hours > 200 $\mu\text{g m}^{-3}$		0	
Data Capture (%)	80.7	80.7	80.7
<b>Diurnal Profile</b>			
<b>Data Comments</b>	Highest weekday peak and PM concentrations are on Tuesday and Wednesday, based on annual mean profile. Annual mean Sunday evening concentrations are comparable to Monday, Thursday and Friday. Relatively low concentrations on Thursday afternoons in April and June.		

<b>Highways England National Air Quality Monitoring Network</b>			
<b>Site Details</b>			
<b>Site Name</b>	22 M6 J17-16 SB_N		
<b>Date Commissioned</b>	March 2017		
<b>Environment Type</b>	Roadside		
<b>Easting / Northing</b>	377640 / 359978		
<b>Pollutants Measured</b>	NO, NO <sub>x</sub> , NO <sub>2</sub>		
<b>Met Station</b>	Yes		
<b>Inlet Height AGL (m)</b>	1.4		
<b>Location Description</b>	Located adjacent to the M6 southbound carriageway between Junction 17 and 16.		
<b>Distance from Road(s)</b>	11m from M6 hard shoulder		
<b>Nearest Relevant Exposure</b>	Nearest relevant exposure is ~90m from M6 hard shoulder near Newcastle Road.		
<b>Recorded Operational Issues</b>	No calibrated data until 29 <sup>th</sup> March 2017 as valid automatic calibrations were not set up until this date. No data 11 <sup>th</sup> to 12 <sup>th</sup> October due to routine maintenance service. No data 26 <sup>th</sup> to 30 <sup>th</sup> of October due to server issue, and 25 <sup>th</sup> to 27 <sup>th</sup> November due to analyser fault.		
<b>Pollutant Analysis</b>			
<b>Monitoring Period</b>	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
<b>Pollutant</b>	<b>NO</b>	<b>NO<sub>2</sub></b>	<b>NO<sub>x</sub> (as NO<sub>2</sub>)</b>
Mean ( $\mu\text{g m}^{-3}$ )	39.4	39.5	99.8
Number Hours > 200 $\mu\text{g m}^{-3}$		0	
Data Capture (%)	73.5	73.5	73.5
<b>Diurnal Profile</b>			
<b>Data Comments</b>	Highest weekday concentrations are on Thursday and Friday, based on annual average profile.		

<b>Highways England National Air Quality Monitoring Network</b>			
<b>Site Details</b>			
<b>Site Name</b>	23 M62 J9-8_WB_N		
<b>Date Commissioned</b>	March 2017		
<b>Environment Type</b>	Roadside		
<b>Easting / Northing</b>	357483 / 391203		
<b>Pollutants Measured</b>	NO, NO <sub>x</sub> , NO <sub>2</sub>		
<b>Met Station</b>	Yes		
<b>Inlet Height AGL (m)</b>	1.4		
<b>Location Description</b>	Located adjacent to the M62 westbound carriageway between Junction 9 and 8.		
<b>Distance from Road(s)</b>	15m from M62 exit slip road		
<b>Nearest Relevant Exposure</b>	Nearest exposure is ~80m away on Butts Green		
<b>Recorded Operational Issues</b>	No calibrated data until 6th March 2017 as valid automatic calibrations were not set up until this date. Multiple signal issues causing loss of data throughout the year. 8 <sup>th</sup> August to 31 <sup>st</sup> December no data due to loss of power to station.		
<b>Pollutant Analysis</b>			
<b>Monitoring Period</b>	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
<b>Pollutant</b>	<b>NO</b>	<b>NO<sub>2</sub></b>	<b>NO<sub>x</sub> (as NO<sub>2</sub>)</b>
Mean ( $\mu\text{g m}^{-3}$ )	20.4	30.7	61.9
Number Hours > 200 $\mu\text{g m}^{-3}$		0	
Data Capture (%)	26.7	26.7	26.7
<b>Diurnal Profile</b>			
<b>Data Comments</b>	Highest peak concentrations are on Tuesday AM and Wednesday PM, based on annual mean profile. Based on the annual mean results, Saturday concentrations are greater in the late evening and early morning than throughout other times of day.		



<b>Highways England National Air Quality Monitoring Network</b>			
<b>Site Details</b>			
Site Name	24 M62 J8-9_EB_N		
Date Commissioned	February 2017		
Environment Type	Roadside		
Easting / Northing	357863 / 391368		
Pollutants Measured	NO, NO <sub>2</sub> , NO <sub>x</sub>		
Met Station	No		
Inlet Height AGL (m)	1.4		
Location Description	Located adjacent to M62 eastbound carriageway between junction 8 and 9.		
Distance from Road(s)	6m from M62 hard shoulder		
Nearest Relevant Exposure	No relevant exposure nearby.		
Recorded Operational Issues	No calibrated data until 13 <sup>th</sup> February 2017 as valid automatic calibrations were not set up until this date. No data 6 <sup>th</sup> to 11 <sup>th</sup> April due to analyser fault, and 19 <sup>th</sup> to 20 <sup>th</sup> June due to routine maintenance service. From December 25 <sup>th</sup> to end of year no data.		
<b>Pollutant Analysis</b>			
Monitoring Period	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
Pollutant	<b>NO</b>	<b>NO<sub>2</sub></b>	<b>NO<sub>x</sub> (as NO<sub>2</sub>)</b>
Mean ( $\mu\text{g m}^{-3}$ )	39.3	42.5	102.7
Number Hours > 200 $\mu\text{g m}^{-3}$		0	
Data Capture (%)	84.1	84.1	84.1
<b>Diurnal Profile</b>			
<b>Data Comments</b>	Concentrations higher on Tuesday and Wednesday relative to other weekdays, based on annual mean profile. AM weekday peak concentrations are greater than the PM peak, based on annual mean results. Weekday PM peak concentrations not evident in April and May.		

<b>Highways England National Air Quality Monitoring Network</b>			
<b>Site Details</b>			
Site Name	25 M60-J5-6_NB_N		
Date Commissioned	March 2017		
Environment Type	Roadside		
Easting / Northing	381542 / 390915		
Pollutants Measured	NO, NO <sub>x</sub> , NO <sub>2</sub>		
Met Station	Yes		
Inlet Height AGL (m)	1.4		
Location Description	Located adjacent to the M60 northbound carriageway between Junction 5 and 6.		
Distance from Road(s)	6m from M60 hard shoulder		
Nearest Relevant Exposure	Nearest relevant exposure on Fellpark Road ~30m from M60.		
Recorded Operational Issues	No calibrated data until 28 <sup>th</sup> March as valid automatic calibrations were not set up until this date. No data 22 <sup>nd</sup> to 24 <sup>th</sup> April due to communication issue. No data 29 <sup>th</sup> to 30 <sup>th</sup> August and 24 <sup>th</sup> to 26 <sup>th</sup> September due to power issue. No data 7 <sup>th</sup> to 28 <sup>th</sup> September routine maintenance service.		
<b>Pollutant Analysis</b>			
Monitoring Period	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
Pollutant	<b>NO</b>	<b>NO<sub>2</sub></b>	<b>NO<sub>x</sub> (as NO<sub>2</sub>)</b>
Mean (µg m <sup>-3</sup> )	49.8	48.5	124.8
Number Hours > 200 µg m <sup>-3</sup>		0	
Data Capture (%)	74.3	74.3	74.3
<b>Diurnal Profile</b>			
<p>Mean NO<sub>2</sub> (µg/m<sup>3</sup>)</p> <p>Hour of Day</p> <p>— Sun — Mon — Tues — Wed — Thurs — Fri — Sat</p>			
Data Comments	Based on annual mean profile, Friday PM peak concentrations are lower than other weekdays. Saturday concentrations similar to weekdays in August, September, November and December.		

<b>Highways England National Air Quality Monitoring Network</b>			
<b>Site Details</b>			
Site Name	26 M6 J22-23 NB_N		
Date Commissioned	January 2017		
Environment Type	Roadside		
Easting / Northing	359025 / 396378		
Pollutants Measured	NO, NO <sub>x</sub> , NO <sub>2</sub>		
Met Station	No		
Inlet Height AGL (m)	1.4		
Location Description	Located adjacent to the M6 northbound carriageway between J22 and J23		
Distance from Road(s)	13m from M6 hard shoulder		
Nearest Relevant Exposure	There is no relevant exposure in vicinity of monitor.		
Recorded Operational Issues	No calibrated data until 19th January 2017 as valid automatic calibrations were not set up until this date. No data between 4 <sup>th</sup> and 6 <sup>th</sup> July and 10 <sup>th</sup> of October and 11 <sup>th</sup> October due to analyser fault. No data 15 <sup>th</sup> to 16 <sup>th</sup> June due to routine maintenance service.		
<b>Pollutant Analysis</b>			
Monitoring Period	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
Pollutant	<b>NO</b>	<b>NO<sub>2</sub></b>	<b>NO<sub>x</sub> (as NO<sub>2</sub>)</b>
Mean ( $\mu\text{g m}^{-3}$ )	33.1	36.2	86.9
Number Hours > 200 $\mu\text{g m}^{-3}$		0	
Data Capture (%)	92.4	92.4	92.4
<b>Diurnal Profile</b>			
<p>The graph displays the diurnal profile of Mean NO<sub>2</sub> concentration in <math>\mu\text{g m}^{-3}</math> over a 24-hour period for each day of the week. The y-axis represents Mean NO<sub>2</sub> (<math>\mu\text{g m}^{-3}</math>) from 0.0 to 60.0. The x-axis represents the Hour of Day from 1 to 24. The legend indicates: Sun (light green), Mon (orange), Tues (grey), Wed (yellow), Thurs (blue), Fri (dark blue), Sat (green). The data shows a consistent diurnal pattern with peaks in the morning (around 8-10 AM) and secondary peaks in the late afternoon/evening (around 18-20 PM). Weekday concentrations are generally higher than weekend concentrations, with Friday showing the highest peak (around 50 <math>\mu\text{g m}^{-3}</math>) and Sunday showing the lowest (around 25 <math>\mu\text{g m}^{-3}</math>).</p>			
Data Comments	Annual mean profile shows weekday AM and PM peak concentrations with smaller PM peak on Mondays compared to other weekdays. Late Sunday evening concentrations are broadly similar to weekdays, based on annual mean profile. Elevated weekday concentrations on late evenings in March.		

<b>Highways England National Air Quality Monitoring Network</b>			
<b>Site Details</b>			
Site Name	27 M6 J23-22 SB_NO		
Date Commissioned	March 2017		
Environment Type	Roadside		
Easting / Northing	358994 / 396457		
Pollutants Measured	NO, NO <sub>x</sub> , NO <sub>2</sub> , O <sub>3</sub>		
Met Station	Yes		
Inlet Height AGL (m)	1.4		
Location Description	Adjacent to M6 southbound carriageway between J23 and J22		
Distance from Road(s)	17.5m from M6 hardshoulder		
Nearest Relevant Exposure	There is no relevant exposure in vicinity of monitor.		
Recorded Operational Issues	No calibrated data until 8 <sup>th</sup> March 2017 as valid automatic calibrations were not set up until this date. 26 <sup>th</sup> to 28 <sup>th</sup> May no data due to A/C fault. 31 <sup>st</sup> May to 2 <sup>nd</sup> June no data due to analyser fault. 10 <sup>th</sup> to 11 <sup>th</sup> June no data due to communication issue. 2 <sup>nd</sup> to 3 <sup>rd</sup> October no data due to routine maintenance service.		
<b>Pollutant Analysis</b>			
Monitoring Period	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
Pollutant	<b>NO</b>	<b>NO<sub>2</sub></b>	<b>NO<sub>x</sub> (as NO<sub>2</sub>)</b>
Mean ( $\mu\text{g m}^{-3}$ )	31.5	39.0	87.3
Number Hours > 200 $\mu\text{g m}^{-3}$		2	
Data Capture (%)	77.1	77.1	77.1
<b>Diurnal Profile</b>			
<p>The graph displays the diurnal profile of Mean NO<sub>2</sub> concentration in <math>\mu\text{g m}^{-3}</math> over a 24-hour period for each day of the week. The y-axis represents Mean NO<sub>2</sub> (<math>\mu\text{g m}^{-3}</math>) from 0.0 to 60.0. The x-axis represents the Hour of Day from 1 to 24. The legend identifies the days: Sun (light green), Mon (orange), Tues (grey), Wed (yellow), Thurs (blue), Fri (dark blue), and Sat (green). The data shows a clear diurnal cycle with peaks occurring between 7 and 19 hours. Weekday peaks (Wed, Thurs, Fri) reach approximately 50-55 <math>\mu\text{g m}^{-3}</math>, while weekend peaks (Sat, Sun) are lower, around 40-45 <math>\mu\text{g m}^{-3}</math>. Nighttime concentrations are consistently the lowest, around 20-30 <math>\mu\text{g m}^{-3}</math>.</p>			
Data Comments	Weekday AM and PM peak concentration most pronounced on Wednesday and Thursday, based on annual mean profile.		

<b>Highways England National Air Quality Monitoring Network</b>			
<b>Site Details</b>			
Site Name	30 A1M_J44-45_SB_N		
Date Commissioned	March 2017		
Environment Type	Roadside		
Easting / Northing	443124 / 440609		
Pollutants Measured	NO, NO <sub>x</sub> , NO <sub>2</sub>		
Met Station	Yes		
Inlet Height AGL (m)	1.4		
Location Description	Located adjacent to the A1M southbound carriageway between Junction 44 and 45		
Distance from Road(s)	14m to hard shoulder of southbound carriageway		
Nearest Relevant Exposure	No relevant exposure in vicinity of monitor.		
Recorded Operational Issues	No calibrated data until 7 <sup>th</sup> March 2017 as valid automatic calibrations were not set up until this date. 26 <sup>th</sup> July to 7 <sup>th</sup> August no data due to analyser communication fault. No data between 11 <sup>th</sup> and 12 <sup>th</sup> September due to routine maintenance service		
<b>Pollutant Analysis</b>			
Monitoring Period	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
Pollutant	<b>NO</b>	<b>NO<sub>2</sub></b>	<b>NO<sub>x</sub> (as NO<sub>2</sub>)</b>
Mean ( $\mu\text{g m}^{-3}$ )	33.4	35.8	87.0
Number Hours > 200 $\mu\text{g m}^{-3}$		0	
Data Capture (%)	78.1	78.1	78.1
<b>Diurnal Profile</b>			
<p>The graph displays the diurnal profile of Mean NO<sub>2</sub> concentration (in <math>\mu\text{g m}^{-3}</math>) for each day of the week. The y-axis represents Mean NO<sub>2</sub> concentration from 0.0 to 70.0. The x-axis represents the Hour of Day from 1 to 24. The legend indicates the days: Sun (light green), Mon (orange), Tues (grey), Wed (yellow), Thurs (blue), Fri (dark blue), and Sat (green). All days show a similar pattern with a minimum concentration around 03:00 and a maximum concentration between 08:00 and 18:00. Friday has the highest peak at approximately 60 <math>\mu\text{g m}^{-3}</math>, while Sunday and Monday have the lowest peaks at approximately 20 <math>\mu\text{g m}^{-3}</math>.</p>			
Data Comments	Based on annual mean profile, AM peak concentrations are very similar on all weekdays. Elevated Interpeak concentrations on Friday compared to other weekdays, and PM peak concentrations are greater on Thursday and Friday compared to other weekdays. PM peak concentrations are similar on Sunday to Monday, Tuesday and Wednesday.		

<b>Highways England National Air Quality Monitoring Network</b>			
<b>Site Details</b>			
<b>Site Name</b>	39 A1M_J15-16_SB_NO		
<b>Date Installed</b>	April 2017		
<b>Environment Type</b>	Roadside		
<b>Easting / Northing</b>	516580 / 289243		
<b>Pollutants Measured</b>	NO <sub>x</sub> , NO, NO <sub>2</sub> and O <sub>3</sub>		
<b>Met Station</b>	Yes		
<b>Inlet Height AGL (m)</b>	1.4		
<b>Location Description</b>	The site is located on a grass verge in between the A1M southbound carriageway to the west and the B1043 to the east.		
<b>Distance from Road(s)</b>	10m from A1M and 9m from B1043		
<b>Nearest Relevant Exposure</b>	Relevant exposure situated on Oak Road ~95m west of the monitoring site.		
<b>Recorded Operational Issues</b>	No data until 5 <sup>th</sup> of April as valid automatic calibrations were not set up until this date. No data from 2 <sup>nd</sup> to 3 <sup>rd</sup> May and 28 <sup>th</sup> to 29 <sup>th</sup> June due to communication issues. No data 21 <sup>st</sup> to 22 <sup>nd</sup> September due to routine maintenance service.		
<b>Pollutant Analysis</b>			
<b>Monitoring Period</b>	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
<b>Pollutant</b>	<b>NO</b>	<b>NO<sub>2</sub></b>	<b>NO<sub>x</sub> (as NO<sub>2</sub>)</b>
Mean ( $\mu\text{g m}^{-3}$ )	30.8	34.2	81.4
Number Hours > 200 $\mu\text{g m}^{-3}$		0	
Data Capture (%)	72.6	72.6	72.6
<b>Diurnal Profile</b>			
<b>Data Comments</b>	Friday PM concentrations higher than other weekdays, and Sunday evening concentrations similar to weekdays based on the annual mean profile. All weekdays show a similar AM peak profile.		

<b>Highways England National Air Quality Monitoring Network</b>			
<b>Site Details</b>			
Site Name	40 M62_J28-29_WB_NO		
Date Commissioned	September 2017		
Environment Type	Roadside		
Easting / Northing	430877 / 426496		
Pollutants Measured	NO, NO <sub>x</sub> , NO <sub>2</sub> and O <sub>3</sub>		
Met Station	Yes		
Inlet Height AGL (m)	1.4		
Location Description	Located adjacent to the M62 westbound carriageway between Junction 28 and 29		
Distance from Road(s)	20m to westbound carriageway hard shoulder		
Nearest Relevant Exposure	Colville Terrace, nearest properties ~25m from hard shoulder		
Recorded Operational Issues	No calibrated data until 6 <sup>th</sup> September 2017 as valid automatic calibrations were not set up until this date. No data from 2 <sup>nd</sup> December to 31 <sup>st</sup> December due to communication issue.		
<b>Pollutant Analysis</b>			
Monitoring Period	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
Pollutant	NO	NO <sub>2</sub>	NO <sub>x</sub> (as NO <sub>2</sub> )
Mean ( $\mu\text{g m}^{-3}$ )	19.1	30.2	59.5
Number Hours > 200 $\mu\text{g m}^{-3}$		0	
Data Capture (%)	23.7	23.7	23.7
<b>Diurnal Profile</b>			
Data Comments	Daily concentrations highest on Monday, Thursday and Friday based on annual mean profile. Late afternoon/early evening concentrations similar on weekends to Wednesday and Friday.		

<b>Highways England National Air Quality Monitoring Network</b>			
<b>Site Details</b>			
Site Name	56 A50-B5030_NB_N		
Date Commissioned	June 2017		
Environment Type	Roadside		
Easting / Northing	408554 / 334690		
Pollutants Measured	NO, NO <sub>x</sub> , NO <sub>2</sub>		
Met Station	No		
Inlet Height AGL (m)	1.4m		
Location Description	Located adjacent to A50 northbound carriageway		
Distance from Road(s)	4m from A50 northbound carriageway		
Nearest Relevant Exposure	Representative of exposure at some properties on Badgery Close and Greenacres Drive.		
Recorded Operational Issues	No calibrated data until 26 <sup>th</sup> June 2017 as valid automatic calibrations were not set up until this date.		
<b>Pollutant Analysis</b>			
Monitoring Period	1 <sup>st</sup> January to 31 <sup>st</sup> December 2017		
Pollutant	NO	NO <sub>2</sub>	NO <sub>x</sub> (as NO <sub>2</sub> )
Mean (µg m <sup>-3</sup> )	136.6	72.3	281.8
Number Hours > 200 µg m <sup>-3</sup>		1	
Data Capture (%)	51.5	51.5	51.5
<b>Diurnal Profile</b>			
Data Comments	Based on annual mean profile, PM peak concentrations greatest on Tuesday and Thursday, where they are also greater than AM peak concentrations. Weekday AM peak concentrations similar on all weekdays based on annual mean concentrations. In November and December, Saturday late afternoon / early evening concentrations similar to weekdays.		



Arcadis Consulting (UK) Limited

1 Whitehall Riverside  
Leeds  
LS1 4BN  
United Kingdom

[arcadis.com](http://arcadis.com)