The Royal Borough of Kingston upon Thames
Air Quality Annual Status Report for 2018

Date of publication: *July 2019*

This report provides a detailed overview of air quality in Royal Borough of Kingston upon Thames during 2018. It has been produced to meet the requirements of the London Local Air Quality Management statutory process[1].

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[1] LLAQM Policy and Technical Guidance 2016 (LLAQM.TG(16)). https://www.london.gov.uk/what-we-do/environment/pollution-and-air-quality/working-boroughs

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Abbreviations

AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQO	Air Quality Objective
BEB	Buildings Emission Benchmark
CAB	Cleaner Air Borough
CAZ	Central Activity Zone
EV	Electric Vehicle
GLA	Greater London Authority
LAEI	London Atmospheric Emissions Inventory
LAQM	Local Air Quality Management
LLAQM	London Local Air Quality Management
NRMM	Non-Road Mobile Machinery
PM_{10}	Particulate matter less than 10 micron in diameter
$PM_{2.5}$	Particulate matter less than 2.5 micron in diameter
TEB	Transport Emissions Benchmark
TfL	Transport for London

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Table A. Summary of National Air Quality Standards and Objectives

Pollutant	Objective (UK)	Averaging Period	Date[1]
Nitrogen dioxide - NO_2	200 μg m^{-3} not to be exceeded more than 18 times a year	1-hour mean	31 Dec 2005
	40 μg m^{-3}	Annual mean	31 Dec 2005
Particles - PM_{10}	50 μg m^{-3} not to be exceeded more than 35 times a year	24-hour mean	31 Dec 2004
	40 μg m^{-3}	Annual mean	31 Dec 2004
Particles - $PM_{2.5}$	25 μg m^{-3}	Annual mean	2020
	Target of 15% reduction in concentration at urban background locations	3 year mean	Between 2010 and 2020
Sulphur Dioxide (SO_2)	266 μg m^{-3} not to be exceeded more than 35 times a year	15 minute mean	31 Dec 2005
	350 μg m^{-3} not to be exceeded more than 24 times a year	1 hour mean	31 Dec 2004
	125 μg m^{-3} mot to be exceeded more than 3 times a year	24 hour mean	31 Dec 2004

Note: [1] by which to be achieved by and maintained thereafter

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1. Air Quality Monitoring

1.1 Locations

The Royal Borough of Kingston upon Thames (RBK) operated three automatic monitoring stations in 2018.

- The site was a Roadside site: KT4-Tolworth Broadway, measuring NO_2 and PM_{10};
- The site was a Roadside site (From the 12 March 2018): KT5- Cromwell Road, measuring NO2 and PM10;
- The site was a Roadside site (From the 12 March 2018): KT6- Kingston Vale, measuring NO2 and PM10.

In addition, RBK undertook non-automatic monitoring at forty locations in 2018.

Table B. Details of Automatic Monitoring Sites for 2018

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA ?	Distance from monitoring site to relevant exposure (m)	Distance to kerb of nearest road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Monitoring technique
KT4	Tolworth Broadway	*519706*	*165885*	*Road side*	*Y*	*7*	*4.2*	*1.6*	*NO_2, PM_{10}*	*Chemiluminescent; BAM*
KT5	Cromwell Road	*518562*	*169519*	*Road side*	*Y*	*3*	*2.68*	*1.6*	*NO_2, PM_{10}*	*Chemiluminescent; BAM*
KT6	Kingston Vale	*521251*	*172166*	*Road side*	*y*	*10*	*3*	*1.6*	*NO_2, PM_{10}*	*Chemiluminescent; BAM*

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Table C. Details of Non-Automatic Monitoring Sites for 2018

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA?	Distance from monitoring site to relevant exposure (m)	Distance to kerb of nearest road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Tube co-located with an automatic monitor? (Y/N)
1	Guildhall Complex	517951	169029	Kerbside	Y	15	1	*2.5*	*NO_2*	*N*
2	17-19 Penrhyn Road	518067	168672	Roadside	Y	3	2	*2.5*	*NO_2*	*N*
3	52 Portsmouth Road	517565	167715	Roadside	Y	5	2	*2.5*	*NO_2*	*N*
4	88 Brighton Road	517532	167296	Kerbside	Y	4	0.5	*2.5*	*NO_2*	*N*
5	Victoria Rd/Brighton Rd	517765	167143	Kerbside	Y	1	3	*2.5*	*NO_2*	*N*
6	St. Mark's Hill/Ewell Rd	518424	167604	Roadside	Y	2.5	5	*2.5*	*NO_2*	*N*
7	Victoria Road near Surbiton Station	518039	167346	Kerbside	Y	2	0.5	*2.5*	*NO_2*	*N*
8	Upper Brighton Rd/Langley Rd	518336	166655	Roadside	Y	2.5	2	*2.5*	*NO_2*	*N*

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Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA?	Distance from monitoring site to relevant exposure (m)	Distance to kerb of nearest road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Tube co-located with an automatic monitor? (Y/N)
9	199 Douglas Road / Thornhill Road	518737	165768	Kerbside	Y	3	0.5	*2.5*	NO_2	*N*
10	Ewell Road near jct Elgar Avenue	519365	166230	Kerbside	Y	4	0.5	*2.5*	NO_2	*N*
11	53 Elgar Avenue	519664	166505	Kerbside	Y	6	0.5	*2.5*	NO_2	*N*
12	136 Tolworth Broadway / Service Road	519714	165886	Roadside	Y	3	2	*2.5*	NO_2	*N*
13	Tolworth Roundabout (Sundial Court)	519808	165873	Kerbside	Y	1.5	1	*2.5*	NO_2	*N*
14	Kingston Rd (near station)	519872	165692	Kerbside	Y	14	0.5	*2.5*	NO_2	*N*
15	A240 Kingston Rd/Old Kingston Rd	520192	165264	Kerbside	Y	30	0.5	*2.5*	NO_2	*N*
16	Hook Road South / Hunters Road	518087	165096	Kerbside	Y	6	1	*2.5*	NO_2	*N*

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Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA?	Distance from monitoring site to relevant exposure (m)	Distance to kerb of nearest road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Tube co-located with an automatic monitor? (Y/N)
17	Hook Rd (St Paul's Primary)	518026	164785	Roadside	Y	2.5	2	*2.5*	NO_2	*N*
18	Hook Centre	517991	164532	Kerbside	Y	4	0.5	*2.5*	NO_2	*N*
19	Garrison Lane / Reynolds Ave	518155	163395	Kerbside	Y	5	0.5	*2.5*	NO_2	*N*
20	353 Malden Rushett Crossroads	517256	161578	Roadside	Y	2	2.5	*2.5*	NO_2	*N*
21	Opposite 148 Leatherhead Road	517683	163465	Roadside	Y	2	3	*2.5*	NO_2	*N*
22	Hook Rise North / Tolworth Rec Centre	518601	165270	Roadside	Y	3	1.5	*2.5*	NO_2	*N*
23	40 Fife Road	518147	169455	Kerbside	Y	4	0.5	*2.5*	NO_2	*N*
24	14-16 Cromwell Road	518467	169509	Roadside	Y	2	2	*2.5*	NO_2	*N*
25	Queen Elizabeth Rd/London Rd	518533	169348	Kerbside	Y	4	0.5	*2.5*	NO_2	*N*
26	Richmond Road / Kings Road	518199	170056	Roadside	Y	4	1.5	*2.5*	NO_2	*N*

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Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA?	Distance from monitoring site to relevant exposure (m)	Distance to kerb of nearest road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Tube co-located with an automatic monitor? (Y/N)
27	Fire Station, Richmond Road	517800	171423	Roadside	Y	12	1	*2.5*	NO_2	*N*
28	41 Kingston Hill	519353	169895	Kerbside	Y	3	1	*2.5*	NO_2	*N*
29	240 Kingston Vale near Robin Hood Lane	521107	172055	Kerbside	Y	6	0.5	*2.5*	NO_2	*N*
30	Coombe Hill School	520611	169889	Roadside	Y	10	2.5	*2.5*	NO_2	*N*
31	248 Malden Road near A3	521651	167397	Kerbside	Y	8	0.5	*2.5*	NO_2	*N*
32	South Lane	521252	166877	Kerbside	Y	7	0.5	2.5	NO_2	N
33	96 Burlington Road	521873	168117	Roadside	Y	3	1.5	*2.5*	NO_2	*N*
34	66 New Malden High St	521416	168373	Roadside	Y	7	1.5	*2.5*	NO_2	*N*
35	113-115 Clarence Avenue	520708	169258	Roadside	Y	4	1.0	*2.5*	NO_2	*N*
36	38 Coombe Lane West near A3 junction	520047	169651	Roadside	Y	3	2	*2.5*	NO_2	*N*

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Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA?	Distance from monitoring site to relevant exposure (m)	Distance to kerb of nearest road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Tube co-located with an automatic monitor? (Y/N)
37	51 Elm Rd	520764	169525	Kerbside	Y	6	0.5	*2.5*	*NO_2*	*N*
38	Kingston Road (Carpet Right)	520503	168388	Roadside	Y	15	2	*2.5*	*NO_2*	*N*
39	Cambridge Rd/Gloucester Rd	519372	169098	Kerbside	Y	1	8	*2.5*	*NO_2*	*N*
40	Cambridge Rd/Hawks Rd	519064	169244	Roadside	Y	1.5	1.5	*2.5*	*NO_2*	*N*

1.2 Comparison of Monitoring Results with AQOs

The results presented are after adjustments for "annualisation" and for distance to a location of relevant public exposure, the details of which are described in Appendix A.

Table D1. Annual Mean NO_2 Ratified and Bias-adjusted Monitoring Results (µg m^{-3})

Site ID	Site Name	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2018 % [b]	Annual Mean Concentration (µg m^{-3})					
					2013	2014	2015	2016	2017	2018
KT4	Tolworth Broadway	*Automatic*	*95*	*95*	N/A	N/A	**48.5[c]**	**50.7[c]**	**48.9**	**44**
KT5	Cromwell Road	*Automatic*	*98*	*73*	N/A	N/A	N/A	N/A	N/A	**57[c]**

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Site ID	Site Name	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2018 % [b]	Annual Mean Concentration (µg m^{-3})					
					2013	2014	2015	2016	2017	2018
KT6	Kingston Vale	*Automatic*	*98*	*79*	N/A	N/A	N/A	N/A	N/A	36
1	Guildhall Complex	*Diffusion tube*	100	100	28.9	22.92[c]	25.2	25.0	21.6	21.6
2	17-19 Penrhyn Road	*Diffusion tube*	100	100	**43.8**	**41.95**[c]	**44.5**	**46.5**	**40.3**	**44.0**
3	Portsmouth Road	*Diffusion tube*	100	100	38.8	32.21[c]	35.1	38.6	34.6	30.7
4	Brighton Road	*Diffusion tube*	83	92	34.6	27.7[c]	28.6	32.9	26.5	27.5
5	Victoria Rd/Brighton Rd	*Diffusion tube*	100	100	**40.6**	37.6[c]	**40.6**	**40.4**	35.8	36.9
6	St. Mark's Hill/Ewell Rd	*Diffusion tube*	100	100	**42.8**	39.2[c]	**40.8**	**43.0**	37.5	36.4
7	Victoria Rd (Surbiton Station)	*Diffusion tube*	100	100	**49**	**43.9**[c]	**49.9**	**49.0**	**44.3**	**43.5**
8	Upper Brighton Rd/Langley Rd	*Diffusion tube*	92	92	36	**40.7**[c]	**42.4**	**42.0**	38.1	37.6
9	Douglas Rd/Thornhill Rd	*Diffusion tube*	100	100	29.8	22.7[c]	25.7	27.0	24.7	22.2
10	Ewell Rd	*Diffusion tube*	100	100	**52.8**	**47.1**[c]	**48.6**	**48.6**	**45.7**	38.1
11	Elgar Rd	*Diffusion tube*	100	100	32.6	27.5[c]	28.8	30.7	26.7	26.1
12	136 Tolworth Broadway	*Diffusion tube*	92	92	**64.3**	**58.7**[c]	**67.2**	**55.2**	**51.3**	**43.8**
13	Tolworth Roundabout	*Diffusion tube*	100	100	**77.4**	**75.3**[c]	**72.2**	**77.0**	**72.2**	**65.1**
14	Kingston Rd (near station)	*Diffusion tube*	100	100	**41.8**	**56.3**[c]	**62.4**	**59.7**	**54.3**	**41.6**

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Site ID	Site Name	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2018 % [b]	Annual Mean Concentration (µg m^{-3})					
					2013	2014	2015	2016	2017	2018
15	Kingston Rd/Old Kingston Rd	*Diffusion tube*	92	92	28.1	**45.8** [c]	**42.8**	**46.3**	**46.4**	**41.0**
16	Hook Rd S/Hunters Rd	*Diffusion tube*	100	100	**41.7**	**40.3** [c]	**43.4**	**45.6**	**40.6**	38.4
17	Hook Rd (St Paul's Primary)	*Diffusion tube*	100	100	**40.5**	36.0 [c]	38.2	39.7	36.0	37.0
18	Hook Centre	*Diffusion tube*	100	100	**44.9**	**44.6** [c]	**48.5**	**48.0**	**46.4**	**42.7**
19	Garrison Ln/Reynolds Ave	*Diffusion tube*	100	100	30.8	26.2 [c]	27.4	28.9	27.3	29.5
20	Malden Rushett crossroads	*Diffusion tube*	100	100	**49.3**	32.5 [c]	36.9	38.4	36.4	34.9
21	Leatherhead Rd/Harrow Cl	*Diffusion tube*	100	100	**57.1**	34.7 [c]	37.9	38.5	35.1	36.0
22	Hook Rise N/Rec. Centre	*Diffusion tube*	100	100	**42.1**	**50.4** [c]	**52.6**	**50.1**	**54.6**	**44.8**
23	40 Fife Road	*Diffusion tube*	100	100	38.8	33.4 [c]	35.6	34.7	31.1	39.6
24	14-16 Cromwell Road	*Diffusion tube*	100	100	**118**	**94.0** [c]	**94.0**	**90.6**	**84.5**	**75.9**
25	Queen Elizabeth Rd/London Rd	*Diffusion tube*	100	100	**48.2**	36.3 [c]	**46.3**	**45.6**	**43.1**	**40.0**
26	Richmond Rd/King's Rd	*Diffusion tube*	100	100	**42.5**	35.9 [c]	34.6	38.5	35.5	34.7
27	Richmond Rd/Horsley Drive	*Diffusion tube*	100	100	33.6	32.1 [c]	35.1	36.0	31.6	34.8
28	Kingston Hill/Wolverton Ave	*Diffusion tube*	100	100	**52.6**	**54.4** [c]	**57.4**	**53.7**	**51.0**	**49.6**

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Site ID	Site Name	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2018 % [b]	Annual Mean Concentration (µg m^{-3})					
					2013	2014	2015	2016	2017	2018
29	240 Kingston Vale near Robin Hood Lane	*Diffusion tube*	100	100	34.1	34.5 [c]	39.2	**41.4**	34.7	31.5
30	Coombe Hill School	*Diffusion tube*	100	100	37.8	37.9 [c]	**40.7**	**40.5**	39.0	38.9
31	248 Malden Road near A3	*Diffusion tube*	100	100	36.7	37.8 [c]	**45.2**	**45.6**	**41.9**	38.6
32	South Lane	*Diffusion tube*	100	100	29.6	22.5 [c]	24.5	27.6	25.0	27.1
33	Burlington Road	*Diffusion tube*	100	100	**45**	35.0 [c]	**41.9**	**42.9**	**40.3**	38.9
34	New Malden High St	*Diffusion tube*	100	100	**42.6**	36.0 [c]	31.0	**40.2**	35.7	37.6
35	Clarence Ave	*Diffusion tube*	100	100	35.4	28.4 [c]	31.1	32.6	29.9	30.7
36	Coombe Lane West	*Diffusion tube*	100	100	38.5	34.0 [c]	39.1	36.4	35.0	32.2
37	Elm Rd	*Diffusion tube*	100	100	30.8	23.3 [c]	27.1	28.4	28.3	26.0
38	Kingston Road (Carpet Right)	*Diffusion tube*	100	100	32	30.5 [c]	31.4	38.2	32.9	36.1
39	Cambridge Rd/Gloucester Rd	*Diffusion tube*	92	92	**44.3**	**48.4** [c]	**49.9**	**51.9**	**48.3**	**46.8**
40	Cambridge Rd/Hawks Rd	*Diffusion tube*	92	92	**47.5**	**40.9**[c]	**43.8**	**41.8**	**43.6**	**42.3**

Notes: Exceedance of the NO_2 annual mean AQO of 40 µg m^{-3} are shown in **bold**.

NO_2 annual means in excess of 60 µg m^{-3}, indicating a potential exceedance of the NO_2 hourly mean AQS objective are shown in bold and underlined.

[a] data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

[b] data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

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[c] Means have been "annualised" in accordance with LLAQM Technical Guidance, where valid data capture was less than 75%

Table D1 provides NO_2 monitoring results for 2018 measured at 3 continuous monitoring stations and at 40 diffusion tube locations. The results from two continuous monitoring sites exceeded the annual mean NO_2 objective of 40µg m^{-3}. The two sites are Tolworth Broadway (44µg m^{-3}) and Cromwell Road (57µg m^{-3}). The annual mean objective for NO_2 was also exceeded at 13 out of 40 of the diffusion tube locations and these are highlighted in bold in the table. In 2017 the number of exceedances recorded were 17 and, in 2016, there were 23. Therefore, there has been a reduction in the number of locations where exceedances occur.

The 2 results that exceeded 60µg m^{-3} are also underlined to indicate that the hourly objective is potentially exceeded at these locations (Cromwell Road and Tolworth Roundabout).

The highest concentration was 75.9µg m^{-3} that was recorded at a site on the A307 Cromwell Road, one of the busiest roads in the borough. Also all results from diffusion tubes located along A240 Kingston Road and the A3 exceeded the objective at the roadside. In 2018, overall, levels of NO_2 have decreased in the borough between 1 and 2 µg m^{-3}.

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Figure 1: Map of NO_2 diffusion tubes monitoring sites in the *Royal Borough of Kingston upon Thames* showing annual mean results from 2018.

Legend

On this map, the squares represent NO_2 diffusion tubes. The EU limit value for annual mean NO_2 is 40μg m^{-3}. All monitoring sites that recorded NO_2 concentrations above this level are coloured in red and all that are below this level are coloured in green.

Diffusion tubes (<40μg m^{-3})

Diffusion tubes (>40μg m^{-3})

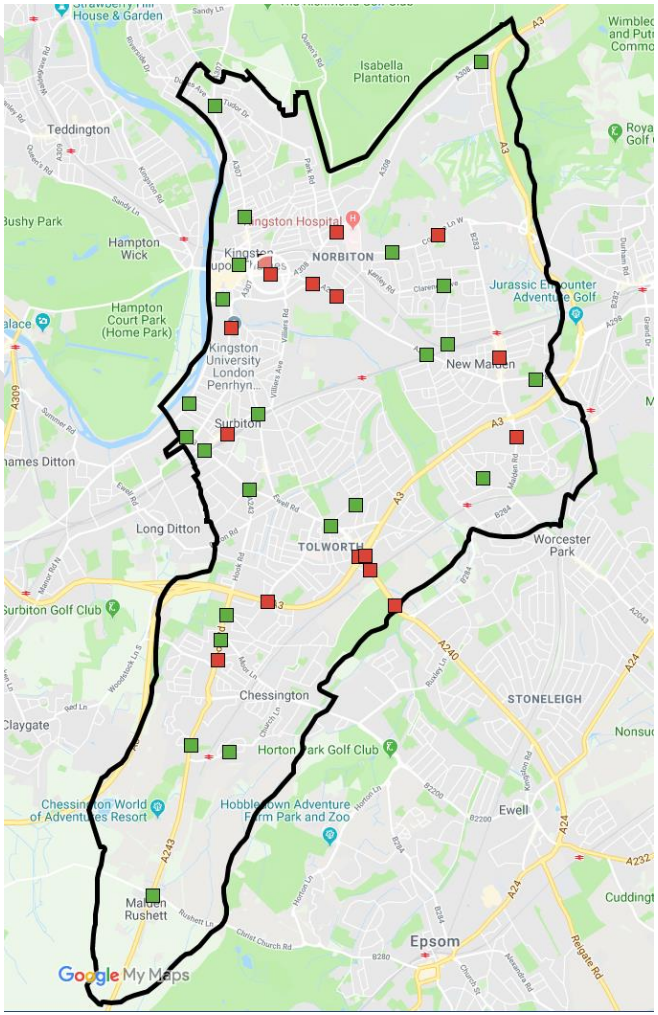

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Table D2. Calculation of NO2 at relevant exposure receptors (μg m-3)

The results presented in the table below are after adjustments for distance to a location of relevant public exposure. To estimate the concentration at the nearest receptor, the procedure specified in LLAQM.TG(16) has been applied to all monitoring locations that record an annual mean concentration above the NO2 annual objective of 40μg/m3 . The calculation has been applied also to monitoring locations that record an annual mean concentration that is within 10% of the NO2 annual objective of 40μg/m3 (i.e. above 36μg/m3), to account for the inherent uncertainty in diffusion tube monitoring concentration data.

Site ID	Site Name	X (m)	Y (m)	Site Type	Distance from monitoring site to relevant exposure	Distance to kerb of nearest road (N/A if not applicable)	Distance from kerb to relevant exposure	NO_2 Results 2018	Background NO_2	NO_2 at relevant exposure receptor
KT4	*Tolworth Broadway*	519706	165885	*Roadside*	*7*	*4.2*	11.2	44	24.0373	*38.4*
KT5	*Cromwell Road*	*518562*	*169519*	*Roadside*	3	2.7	5.7	57	24.5125	***50.9***
KT6	*Kingston Vale*	*521251*	*172166*	*Roadside*	10	3	13	36	18.6165	*29.4*
2	*17-19 Penrhyn Road*	*518067*	*168672*	*Roadside*	3	2	5	40.0	19.7004	35.6
5	*Victoria Rd/BrightonRd*	*517765*	*167143*	*Kerbside*	1	3	4	36.9	20.2219	35.7
6	*St. Mark's Hill/Ewell Rd*	*518424*	*167604*	*Roadside*	2.5	5	7.5	36.4	19.5826	34.4
7	*Victoria Road nr Surbiton Station*	*518039*	*167346*	*Kerbside*	2	0.5	2.5	43.5	17.6824	36.2

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Site ID	Site Name	X (m)	Y (m)	Site Type	Distance from monitoring site to relevant exposure	Distance to kerb of nearest road (N/A if not applicable)	Distance from kerb to relevant exposure	NO_2 Results 2018	Background NO_2	NO_2 at relevant exposure receptor
8	*Upper Brighton Rd/Langley Rd*	*518336*	*166655*	*Roadside*	2.5	2	4.5	37.6	17.6824	33.8
10	*Ewell Road nr jct Elgar Avenue*	*519365*	*166230*	*Kerbside*	4	0.5	4.5	38.1	23.0098	32.2
12	*136 Tolworth Broadway / Service Road*	*519714*	*165886*	*Roadside*	3	2	5	43.8	23.5406	39.5
13	*Sundial Ct. Roundabout, Tolworth*	*519808*	*165873*	*Kerbside*	1.5	1	2.5	65.1	23.5406	**57.4**
14	*Kingston Rd near Station*	*519872*	*165692*	*Kerbside*	14	0.5	14.5	41.6	23.5406	30.8
15	*A240 Kingston Rd/Old Kingston Rd*	*520192*	*165264*	*Kerbside*	30	0.5	30.5	41.0	16.6600	23.3
16	*Hook Road South / Hunters Road*	*518087*	*165096*	*Kerbside*	6	1	7	38.4	19.0542	30.8
17	*Hook Rd (St Paul's Primary)*	*518026*	*164785*	*Roadside*	2.5	2	4.5	37.0	19.0542	33.6
18	*Hook Centre*	*517991*	*164532*	*Kerbside*	4	0.5	4.5	42.7	19.0542	33.5

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Site ID	Site Name	X (m)	Y (m)	Site Type	Distance from monitoring site to relevant exposure	Distance to kerb of nearest road (N/A if not applicable)	Distance from kerb to relevant exposure	NO_2 Results 2018	Background NO_2	NO_2 at relevant exposure receptor
22	*Hook Rise North / RecCentre*	*518601*	*165270*	*Roadside*	3	1.5	4.5	44.8	17.6624	38.3
23	*40 Fife Road*	*518147*	*169455*	*Kerbside*	4	0.5	4.5	39.6	20.8857	32.3
24	*14-16 Cromwell Road*	*518467*	*169509*	*Roadside*	2	2	4	75.9	22.5691	**55.2**
25	*Queen Elizabeth Rd/London Rd*	*518533*	*169348*	*Kerbside*	4	0.5	4.5	40.0	20.8238	32.5
28	*41 Kingston Hill*	*519353*	*169895*	*Kerbside*	3	1	4	49.6	23.8969	35.5
30	*Coombe Hill School*	*520611*	*169889*	*Roadside*	10	2.5	12.5	38.9	19.8468	31.3
31	*248 Malden Road Near A3*	*521651*	*167397*	*Kerbside*	8	0.5	8.5	30.6	19.4294	29.1
33	*96 Burlington Road*	*521873*	*168117*	*Roadside*	3	1.5	4.5	36.4	24.0898	33.4
34	*New Malden High St*	*521416*	*168373*	*Roadside*	7	1.5	8.5	37.6	24.1173	32.5
38	*Kingston Road (Carpet Right)*	*520503*	*168388*	*Roadside*	15	2	17	36.1	20.9752	28.5
39	*Cambridge Rd/Gloucester Rd*	*519372*	*169098*	*Kerbside*	1	8	9	46.8	20.8238	**45.7**

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Site ID	Site Name	X (m)	Y (m)	Site Type	Distance from monitoring site to relevant exposure	Distance to kerb of nearest road (N/A if not applicable)	Distance from kerb to relevant exposure	NO_2 Results 2018	Background NO_2	NO_2 at relevant exposure receptor
40	*Cambridge Rd/Hawks Rd*	*519064*	*169244*	*Roadside*	1.5	1.5	3	42.3	20.8238	39.0

The calculations have been carried out in accordance with LLAQM Technical Guidance in order to provide information on the concentrations at which relevant exposure occurs. The data shows that there are still 4 exceedances of the annual mean objective at areas of relevant exposure and these are primarily at locations adjacent to busy roads in and around Kingston town centre and Tolworth. These have already been identified in the previous ASR. The KT4 Tolworth Broadway automatic monitoring site result shows no exceedance (38.4 $\mu g\ m^{-3}$) at the relevant exposure receptor in contrast in 2017 was exceeding (41.8 $\mu g\ m^{-3}$).

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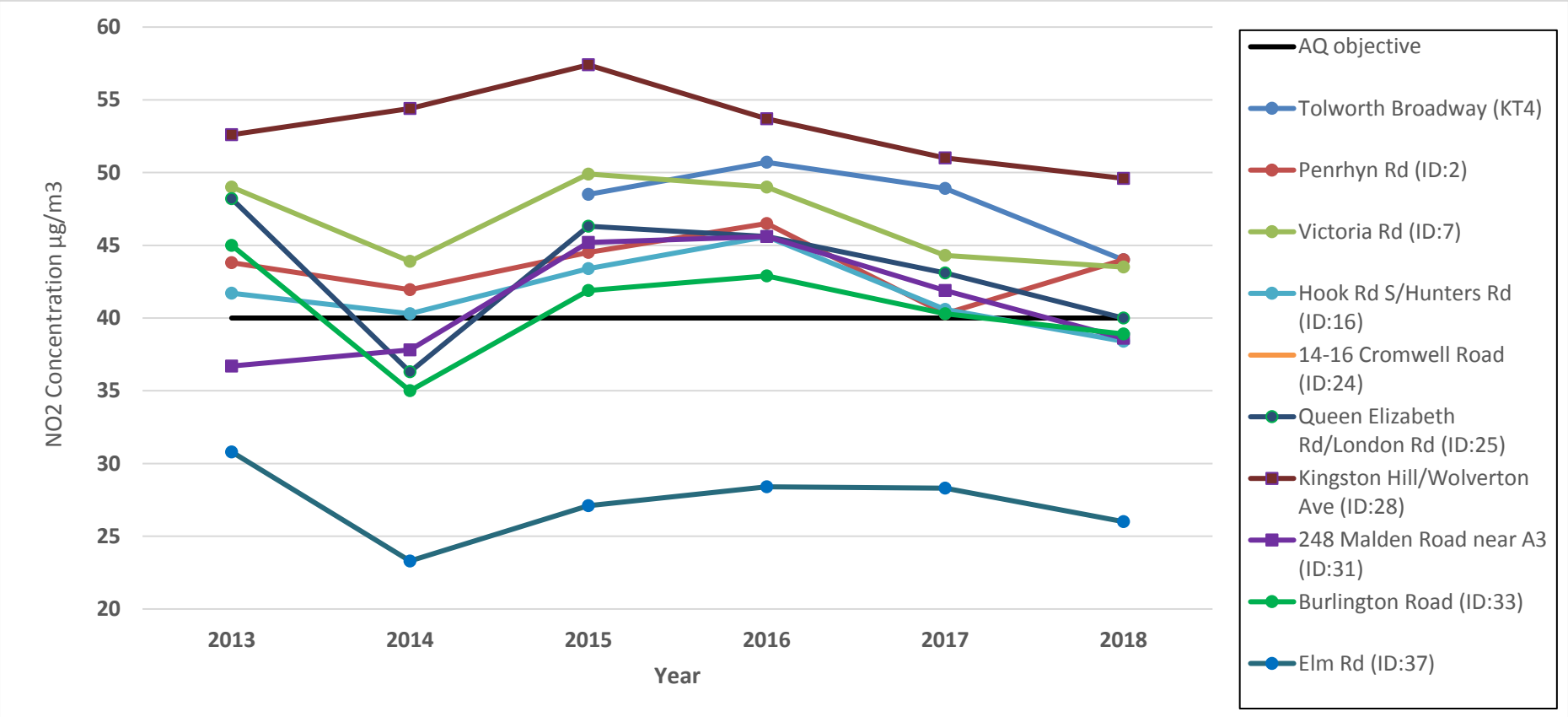
Trends in Annual Mean Nitrogen Dioxide Concentrations (NO_2) measured at Diffusion Tube long term Monitoring Sites and at the automatic monitoring station



The graph above shows the trend in annual mean nitrogen dioxide (NO_2) concentrations at one continuous monitoring site and at nine diffusion tube sites between 2013 and 2018. This shows that overall concentrations have been on a slight downward trend in the last six years. The graph shows also a decrease in NO_2 annual mean concentrations from 2017 to 2018 reducing the number of locations exceeding the Air Quality objective from 8 to 5.

NO_2 annual mean levels can fluctuate from one year to the next due to meteorological conditions and as consequence the long term trend should be considered. This graph has included only the results where a noticeable trend is evident.

Table E. NO_2 Automatic Monitor Results: Comparison with 1-hour Mean Objective

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2018 % [b]	Number of Hourly Means > 200 µg m^{-3}						
			2012	2013	2014	2015	2016	2017	2018
Tolworth Broadway (KT4)	*95*	*95*	*N/A*	*N/A*	*N/A*	0 (137.7)	5 (132.6)	8	*0*
Cromwell Road (KT5)	*98*	*73*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	1 (158.4)
Kingston Vale (KT6)	*98*	*79*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	0 (102.1)

Notes: Exceedance of the NO_2 short term AQO of 200 µg m^{-3} over the permitted 18 days per year are shown in **bold**.

[a] data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

[b] data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

Table F. Annual Mean PM_{10} Automatic Monitoring Results (µg m^{-3})

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2018 % [b]	Annual Mean Concentration (µg m^{-3})						
			2012	2013	2014	2015	2016	2017	2018
Tolworth Broadway (KT4)	*97*	*97*	-	-	-	*20.0*	24	23	23

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Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2018 % [b]	Annual Mean Concentration (µg m^{-3})						
			2012	2013	2014	2015	2016	2017	2018
Cromwell Road (KT5)	*96*	*70*	-	-	-	-	-	-	30[c]
Kingston Vale (KT6)	*99*	*79*	-	-	-	-	-	-	22

Notes: Exceedance of the PM_{10} annual mean AQO of 40 µg m^{-3} are shown in **bold**.

[a] data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

[b] data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

Table G. PM_{10} Automatic Monitor Results: Comparison with 24-Hour Mean Objective

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2018 % [b]	Number of Daily Means > 50 µg m^{-3}						
			2012	2013	2014	2015	2016	2017	2018
Tolworth Broadway (KT4)	*97*	*97*	-	-	-	1	9	6	*2*
Cromwell Road (KT5)	*96*	*70*	-	-	-	-	-	-	15 (50)[c]
Kingston Vale (KT6)	*99*	*79*	-	-	-	-	-	-	2 (35)

Notes: Exceedance of the PM_{10} short term AQO of 50 µg m^{-3} over the permitted 35 days per year or where the 90.4th percentile exceeds 50 µg m^{-3} are shown in **bold**.
Where the period of valid data is less than 85% of a full year, the 90.4th percentile is shown in brackets after the number of exceedances.

[a] data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

[b] data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

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2. Action to Improve Air Quality

2.1 Air Quality Action Plan Progress

Table J provides a brief summary of Royal Borough of Kingston upon Thames' progress against the Air Quality Action Plan, showing progress made this year. New projects which commenced in 2018 are shown at the bottom of the table.

Table J. Delivery of Air Quality Action Plan Measures

No.	Measure	Action	Progress
1	Bus Priority Measures	To review bus routes to identify opportunities for bus priority measures prioritising those which suffer from excessive delays	Officers from the Highways and Transport Division have attended regional meetings to raise awareness of the locations which would benefit from bus priority measures.
2	Low Emission Busses and Taxis	Work with partners to support the introduction of low emission vehicles and supporting infrastructure prioritising areas of poorest air quality	The borough continued to lobby key partners, in particular TfL and London Buses regarding the need to support the introduction of low emission vehicles and infrastructure prioritising areas of poorest air quality. For example, through the TfL consultation on the new Mayor's Transport Strategy, we raised the issue that outer London boroughs including Kingston would benefit from the same level of investment in cleaner buses as in inner /central London so have requested an even roll out of new clean buses across the entire London area. An air quality monitoring station was installed in Cromwell Road and the monitoring data collected will be used to support the case for cleaner buses to operate out of the nearby bus station. Officers from the borough continue to raise these matters with TfL and London Buses through regular liaison meetings.
3	Bus / Rail Service Improvements	To identify opportunities for and secure improvements to bus/rail services within the borough	Officers from the Highways and Transport Division have attended regional meetings to discuss issues with the routes and services within the borough and to identify potential improvements.

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No.	Measure	Action	Progress
			In 2017 and 2018, we liaised with key partners such as South Western Railway, TfL, London Buses and the train operators to lobby for various rail/bus improvements connected with matters including rail franchise renewals. Borough officers are continuing to work with South Western Railway and other partners to bring about significant improvements to Chessington South Station. The work is due for completion in summer 2019. The work includes improvements for disabled and elderly people, installation of new security measures, interchange arrangements improved and new landscaping etc.
4	Kingston One-way System	To review the design of the one-way system and/or introduce a lower speed limit and retime the traffic signals	Although this is a longer term measure, the opportunities for review can arise as part of proposed redevelopments taking place around the One-Way system. In 2017, construction began on a Go Cycle scheme at Kingston station to upgrade the public space, offer better connectivity between different modes of transport, improve road safety and transform the cycle facilities. The scheme won an architecture and design award for projects that aim to improve the health and wellbeing of Londoners. The traffic signals and timings on the one way system around Kingston Town Centre have been updated as part of the Wheatfield Way Go Cycle project. A 20 mph speed limit has also recently been introduced on the one way system in Kingston Town Centre along Wheatfield Way and Clarence Street.
5	London Low Emission Zone	To lobby for extension of London Low Emission Zone (LEZ) to cover more/all of the borough.	The London Low Emission Zone covers most, but not all, of the borough. Officers have provided responses to TfL consultations on the Ultra-Low Emission Zone raising the issue that the borough is not completely covered by the existing LEZ. A bid for funding was submitted to DEFRA at the end of 2017 to allow an assessment of the air quality impacts on the areas of the borough outside of the LEZ and to carry out a study into ways of implementing a self-funding low emission zone within one area. However, the bid was unsuccessful.
6	Road Works	To investigate options for reducing the impact of road works on traffic flows	Penalties for overrunning roadworks are being applied using Section 74 of the New Roads and Streetworks Act 1991. With all major projects, conditions are

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No.	Measure	Action	Progress
		including use of signs, CCTV and issuing penalties where roadworks overrun.	imposed to ensure information to road users is clear, and well in advance of the works starting. This includes the use of Variable Message Signs. All points raised from this action are already carried out by Streetworks coordinators on all jobs. Also: - Where possible collaborative working is suggested and carried out. - Advanced notice is requested for jobs involving Traffic lights when deemed necessary. - For Major works, site meetings are held and additional measures are suggested by both the area inspectors and coordinators, which may include variable message signs and adjustments to the proposed Traffic Management. - We currently do not have the option or manpower for the use of CCTV monitoring. Introduce scheme to issue fixed penalty notices where roadworks over run timescales detailed in Permit to Work: - There is already a process within the operation of streetworks to deal with works that overrun. This is the Section 74 overrun charges. These are picked up by the area inspector and charges are calculated accordingly. (The charges depend on duration, Road classification and amount of signage/plant) - FPNS are not used for overruns. - In some cases works overrun for legitimate engineering difficulties, in which case the streetworks team are contacted by the works promoter and an agreement is reached for a suitable extension. These sites are monitored by the area inspector.

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No.	Measure	Action	Progress
			If a job continually needs extensions and the inspectors monitoring of the site shows that it is not due to any engineering difficulties, a Section 74 overrun may apply.
7	Air Quality in Council Policies	Ensure that air quality is a specific consideration when adopting Council policies.	Agreed that, from April 2017, all committee reports will include details of the Air Quality implications of any proposed policy changes and the means by which negative impacts will be mitigated.
8	Low Emission Vehicles	Promote the benefits of low emission vehicles to residents and businesses and increase awareness of the availability of electric vehicle charging infrastructure.	There are 24 separate locations within the borough at which an electric vehicle charging point is installed and these form part of the Source London network which is an increase of 4 compared to the previous year. Transport for London has installed 2 rapid charging points within the borough and the local authority continues to be involved in discussions to assess additional locations. The Council webpage inks to www.zapmap.co.uk the interactive map to find existing charging points.
9	Engine Idling	Deter engine idling while waiting with initial focus on schools and stations	Agreement was reached on the design of No Engine Idling signs and a number were ordered for installation in 2018. Work began to engage schools on the issues of parents switching off their vehicle engines if waiting during school pick-up / drop-off. Advice on reducing emissions when driving is available on the Council website and this includes recommendation to avoid unnecessary engine idling. - 2 no idling campaigns in 2018 at Castle Hill Primary School and Robin Hood Primary & Nursery School - In 2018 we have installed 45 ‘no idling’ signage around Kingston at locations close to a number of primary and junior schools and close to areas where idling complaints were received previously. - A campaign tailored for Kingston is now being developed, working with colleagues in Parking, Communications, Sustainable Transport and Pollution Control

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No.	Measure	Action	Progress
10	Car Clubs	To increase the availability of Car Club vehicles and to promote an uptake in membership as an alternative to car ownership.	ZipCar is the borough provider. Members of staff within the Council are encouraged to register as members for using the vehicles on work journeys so as to avoid travel to the workplace using their own motor vehicle and: - Car club details included on borough website - 15 Number of Car Club bays provided within the borough and details of operators - 2942 Number of registered Car Club members in the borough - Additional details about Car Club provision for Council staff: Use by staff has doubled in 12 months but has remained about 70 members for three years
11	Freight Improvements	To improve freight access and loading / servicing arrangements at key locations in the borough	No progress – Medium term measure
12	Cycle Parking	To improve cycle parking provision throughout the borough at: transport hubs, Council buildings, other public sector organisation's sites, workplace, residential and leisure locations.	In terms of cycle hangars in Local Authority housing estates, we have installed a total 51 bike hangars since October 2014. Each bike hangar securely stores six bikes. 10 of these hangers were installed between January-December 2018. - % of council sites that have cycle stands and cycle parking in place: 1316 bicycle stands (number of physical stands) 3067 bicycle parking capacity (capacity at bicycle stands) - Details of cycle parking provision Kingston University (KU): Number of cycle parking spaces at Kingston University – 1,265 Number of members of the Kingston University Bike User Group (BUG) - 104 Number of members of Love to Ride (Unicycle programme) - 20 Number of miles travelled by Love to Ride Unicycle – 9,666 Number of KU E Bikes - 18 Number of users of KU E Bikes Scheme – 1,010 over the period (total from start of scheme in October 2017 to December 2018 1,343) Number of kilometres travelled by KU E Bikes – 14,549.23km over the period
13	Support and Encourage Cycling	Implement measures to support and encourage cycling.	A cycle loan scheme allowing people who live, work or study in the borough to loan a bike for free for 1 month is available. Officers work with all 32 state-funded primary schools to deliver cycle training. The Go Cycle sustainable travel team have been working to promote an uptake in

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No.	Measure	Action	Progress
			cycling including organising a series of events throughout Bike Week in June. In addition, borough officers delivered a project aimed at encouraging more women and refugees to cycle through provision of training and support. Several cycle rides were also organised for Council staff during the summer to encourage staff to cycle more and gain confidence. - In 2018, number of led commuter rides held and number of attendees: 57 Level 3 cycle sessions to 45 unique individuals - Number of Dr Bike / bike maintenance courses / cycle marking events held: 6 Maintenance courses, 11 Dr Bikes, Bike marking unknown - Number of people receiving cycle training and whether child or adult 2209 children, 339 adults - Bike Citizens We purchased "fins" to attach smartphones to bike handlebars to aid navigation in route and connections to the Bike Citizen app. All were distributed at Go Cycle Events and public doctor bikes. Following evaluation of the benefits this was discontinued.
14	Cycle Network	Review the cycle network to address obstacles to continued movement and increase the number of segregated cycle lanes.	Number of cycle routes where improvements carried out and types of changes delivered: The Go Cycle programme is comprised of a number of separate projects, all of which are funded by TfL. Every Go Cycle project provides new segregated cycle lanes, along with pedestrian improvements new shared crossings. The following 3 Go Cycle projects have been completed: Portsmouth Road Surbiton to Kingston Kingston High Street The following 5 Go Cycle projects are currently under construction : Wheatfield Way Kingston Station Kingston to Kingston Vale

No.	Measure	Action	Progress
			New Malden to Raynes Park Penrhyn Road One of the most significant schemes being delivered by the Go Cycle programme is the New Malden to Raynes Park project. We began construction on this project last year and we plan to complete the scheme in the summer. The project crosses over into the London Borough of Merton and we have worked closely with them to design and deliver the scheme. It is therefore a prime example of "work with neighbouring boroughs "and a 'joint project delivered that improves sustainable transport across borough boundaries'. - The counts show a 59% increase across the day (7am-7pm), a 76% to 104% increase in the peak hour (8am-9am) and a 39% to 50% increase on Saturdays across the three count locations. (Source: Cycling in Kingston Annual Report 2019) Through Go Cycle and the Mayor of London Healthy Street initiative now encompassed in the GoCycle programme the borough is seeking to create new walking and cycling routes to improve road safety for everyone, upgrade public spaces and relieve the pressure on the borough's transport network. Providing 26km of segregated cycle lanes across the borough through the Go Cycle programme, with 12km installed since 2016 and the scheme due to complete by 2021. Analysis of the use of cycle lanes completed in the GoCycle programme has seen the number of users increase by over 90% at peak times, and around 59% during off peak times between 2016 and 2018. Satisfaction of users has also increased with regards to clean air (58% in 2016 to 69% in 2018) and better environment (66% to 81%).

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No.	Measure	Action	Progress
			Further information regarding the Go Cycle programme can be found at the following link : https://www.kingston.gov.uk/go
15	Cycle Hire	Expand existing cycle-hire schemes.	There are currently 188 active members of the Brompton cycle hire-scheme which is an increase of 48 compared to the previous year. In 2018, there were 2546 days usage of the Brompton bikes in the scheme, more than 3 times the number in 2016. - Maximum percentage utilisation was 36% in July 2018, minimum % usage was 9% in December 2018.
16	Walking Network	Improve the Strategic Walking Network and seek to improve pedestrian connectivity across barriers such as major junctions, busy roads and railway lines.	A series of walking routes within the borough have been made available to download on the Council website. The Sustainable Transport team and Public Health have worked together on a joint initiative to encourage walking and a number of free led walks of between 30 and 60 minutes duration were held led by qualified walk leaders. The Council also worked to promote the Kingston Trails project which was developed by Kingston University as self-guided walks around the borough. In February 2017, a £2 million project was approved to improve parks and pavements across the borough which will include resurfacing, additional benches and tree planting. The Sustainable Transport team is working with Public Health and Sports and Leisure to develop a bid for funding for a Beats the Streets programme in the borough. This would be subject to securing funding from external sources.
17	School Travel Plans	Work with schools to better implement their travel plans to promote road safety and sustainable travel.	There are 66 schools within the borough with which the local authority can work on their Travel Plans and the borough has continued to seek to engage schools. However, in 2018 there was no increase on the previous year with 20% of the schools having an active Travel Plan in place. Of these, 3 attained gold, 1 silver and 6 bronze. We are also working with a further 6 schools on their accreditation this year

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No.	Measure	Action	Progress
18	Workplace Travel Plans	Require businesses allocated parking permits to develop Travel Plans to support their employees in using sustainable transport modes.	Workplace Travel Plans have been secured as a planning condition where appropriate. The Council is currently piloting the Workplace Travel Scorecard which is an initiative to help businesses assess workplace travel, identify areas for improvement and implement changes.
19	Using Planning Conditions to Mitigate Poor Air Quality	To require major new developments to mitigate the impact of poor air quality by securing improvements through planning conditions	Standard planning conditions have been developed and these have been applied where appropriate. The Supplementary Planning Guidance produced by the GLA on Controlling Dust and Emissions from Construction and Demolition Sites is available on the website and larger developments are required by condition to submit a Construction Management Plan that includes commitment to implement best practice measures including compliance with the Low Emission Zone for Non-Road Mobile Machinery.
20	Increase Tree Planting and Use of Green Barriers	Increase use of trees, green screens, green walls, etc where appropriate to help reduce public exposure to poor air quality.	A Tree Strategy for the borough was approved in 2015 and covers the period up to 2021. The Council has recognised the importance of trees both environmentally and for quality of life and we are planting more trees across the borough, providing care for them and ensuring they remain healthy and safe. We planted 527 street trees last winter and worked with local volunteers to plant more than 1,000 further saplings in our parks. We have already increased the number of street trees across the borough by over 500 and will plant more than 2,000 extra trees in parks and streets by 2022. We will be planting a minimum of another 500 street trees in remaining vacant pits and in suitable grass verges this coming winter and are looking at species that help to reduce pollutants. With our contractors and friends groups, we will look to access funding and facilitate more planting for parks and open spaces, in addition to the work being done through our Community Parks Programme which will add extra trees in around new and improved playground facilities over the year.

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No.	Measure	Action	Progress
21	Reduce Emissions from Buildings' Energy Use	Reduce emissions of NOx and particulates by ensuring appropriate choice of energy provision in developments and promoting improvements to energy efficiency.	The emissions of NOx and particulates from energy sources in new developments is considered through the development control process and appropriate conditions are applied. See Table K below for further details.
22	Partnership Working with Public Health	Identify opportunities for joint working with Public Health including working jointly on campaigns.	Officers from Pollution Control and Public Health collaborated on a paper which was presented to the Health Overview Panel in 2017 and subsequently, officers have been working together on a report on Air Quality which was published in 2018. A cross-party Working Group was established which is attended by officers from Environmental Health and Public Health so that a coordinated approach was adopted. Discussions with Public Health have taken place to identify opportunities for joint working. It was agreed to work together on implementing the recommendations from the Association of Directors of Public Health's Active Travel Manifesto and the NICE recommendations. Ways to promote AirTEXT more extensively and especially among more vulnerable groups were explored and by end of 2018, the number of subscribers in Kingston was 97. Annual Public Health Report: Clearing the Air - Public Health have used the 2018 Annual Public Health Report [APHR] on 'Clearing the Air' to drive multi-sector stakeholder engagement to improve population health outcomes. Public Health are working alongside many local partners and stakeholders with a part to play in reducing the impact of air pollution and clearing the air of Kingston, whilst also improving the health and wellbeing of the community. The Council and Kingston University collaborated on a Clearing the Air launch event in June 2018 - a discussion workshop which helped ensure the annual report would reach its key audiences and raised the profile of air quality as a local public health and policy issue in Kingston. The event generated discussion with

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No.	Measure	Action	Progress
			local partners about what further action to take and preparation for funding bids to develop new air quality projects. Street Play and Playing Out Public Health have been working with Highways and Transport colleagues to scope the Street Play Manifesto approach and take this forward in the borough both within policy and operationally through community engagement. We are working on an easy to use procedure for residents to follow to set up play streets as well as a process for evaluating applications for street play. The project will be seeking committee agreement for Temporary Play Street Orders (TPSOs), and we will be asking Neighbourhood Committees to promote street play at a localities level, launching in late June with a view to the first recurring playstreets to be live from late Autumn 2019 Malden Manor Community Project Currently Public Health partners Sustrans have Places for People funding until November 2019 to provide the project at Malden Manor. Over the course of project delivery, this has resulted in a number of health initiatives that also drive a shift to cleaner transport options, including women's and children's bike clubs, play opportunities, cycling safety and maintenance lessons and guided rides and walks. The project has developed opportunities for increased activity in the Hogsmill Open Space, including securing GLA funding (with some match funding from RBK Public Health) to delivery an 'activity and nature trail' through the space. In addition, the Sustrans project has developed the opportunity for the realisation of a 'Community Hub' space at Malden Manor Station. This location will potentially provide a springboard for further 'active travel' initiatives. Malden

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No.	Measure	Action	Progress
			Manor has also been highlighted as a potential location to trial the Street Play approach later this year. Complementing this project, Public Health have been working with colleagues to explore changes to the physical space around the Malden Manor roundabout and parade. RBK and Sustrans are currently delivering a 'Co-Design' feasibility study with local residents to explore how the street environment can be improved in Malden Manor. We await the outcomes from engagement which will inform the feasibility study, but any changes will be designed with improving air quality in mind.
23	Partnership Working with Neighbouring Boroughs	Identify opportunities for joint working with neighbouring boroughs and working together on joint bids.	RBK now operates a number of shared services with other London boroughs including a shared Environment Service and Highways & Transport Service with the London Borough of Sutton. RBK has secured agreement to participate in a project with other boroughs in south London to monitor construction sites and provide advice about Non-Road Mobile Machinery. RBK is now part of the consortium that operates the LoveCleanAir website and its data is now included on the site. RBK is also a member of the AirTEXT consortium which includes boroughs across London.
24	Air Quality Monitoring and Awareness Raising	Monitor air quality and make the data publicly available. Raise awareness of air pollution including use of air pollution alerts.	Two new automatic monitoring stations which monitor both nitrogen dioxide and PM10 were purchased and installed in 2017 with data from the 2 new stations starting to be collected in 2018. Together with a monitoring station that is on hire, automatic monitoring is now carried out at 3 separate locations. Data from the automatic monitoring sites is publicly available on the LoveCleanAir website. Data from the indicative monitors are now included on the LoveCleanAir website. Officers from RBK have created a working relationship with Kingston University so that collaborative projects and research can be carried out in future that can help raise awareness of the impacts of air pollution.

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3. Planning Update and Other New Sources of Emissions

Table K. Planning requirements met by planning applications in the Royal Borough of Kingston in 2018

Action	Number	Notes
a) Number of planning applications where an air quality impact assessment was reviewed for air quality impacts	*4*	
b) Number of planning applications required to monitor for construction dust	0	A condition requiring submission of a Construction Management Plan has been recommended on 14 planning applications. None have been asked to carry out continuous dust monitoring.
c) Number of CHPs/Biomass boilers refused on air quality grounds	0	
d) Number of CHPs/Biomass boilers subject to GLA emissions limits and/or other restrictions to reduce emissions	0	
e) Number of developments required to install Ultra-Low NO_x boilers	1	
f) Number of developments where an AQ Neutral building and/or transport assessments undertaken	4	
g) Number of developments where the AQ Neutral building and/or transport assessments not meeting the benchmark and so required to include additional mitigation	2	
h) Number of planning applications with S106 agreements including other requirements to improve air quality	0	
Number of planning applications with CIL payments that include a contribution to improve air quality	0	
NRMM: Greater London (excluding Central Activity Zone and Canary Wharf) Number of conditions related to NRMM included. Number of developments registered and compliant. Please include confirmation that you have checked that the development has been registered at www.nrmm.london and that all NRMM used on-site is compliant with Stage IIIA of the Directive and/or exemptions to the policy.	12 NRMM informative conditions were requested along with the construction method statement conditions	Sites Audited in 2018: 6

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		<table><tr><td>Compliant</td><td>1</td></tr><tr><td>Non-Compliant</td><td>2</td></tr><tr><td>Self-Compliant</td><td>0</td></tr><tr><td>Cold Engaged</td><td>2</td></tr><tr><td>Not Cold Engaged</td><td>1</td></tr><tr><td>Non-Registration</td><td>2</td></tr><tr><td>Total Visits</td><td>3</td></tr></table>

3.1 New or significantly changed industrial or other sources

For 2018 no new sources have been identified.

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Appendix A Details of Monitoring Site QA/QC

A.1 Automatic Monitoring Sites

The Council's monitoring stations form part of the London Air Quality Network and QA/QC standards are delivered accordingly. These are considered close, if not equivalent to, the AURN standard.

PM_{10} Monitoring Adjustment

The monitoring stations in the Royal Borough of Kingston are part of the London Air Quality Network and the data is collected and managed (including ratification) by ERG (Environmental Research Group).

A.2 Diffusion Tube Quality Assurance / Quality Control

The diffusion tubes are supplied and analysed by Gradko utilising the 20% triethanolamine (TEA) in water preparation method. A bias adjustment factor of 0.93 for the year 2017 (based on 30 studies) has been derived from the national bias adjustment calculator dated March 2019.

Diffusion Tube Bias Adjustment Factors 03/19 Issue of the Spreadsheet				
			New (03/19) Factor	
Laboratory	Method	Year	No. of Studies	Factor
Aberdeen Scientific Services	20% TEA in water	2018	7	0.81
Edinburgh Scientific Services	50% TEA in acetone	2018	2	0.96
Glasgow Scientific Services	20% TEA in water	2018	9	0.86
Gradko	20% TEA in water	2018	30	0.93
Gradko	50% TEA in acetone	2018	8	0.92
Lambeth Scientific Services	50% TEA in acetone	2018	7	1.03
Milton Keynes Council	20% TEA in water	2018	4	0.77
SOCOTEC Didcot	20% TEA in water	2018	2	0.74
SOCOTEC Didcot	50% TEA in acetone	2018	21	0.76
SOCOTEC Glasgow	20% TEA in water	2018	1	0.95
SOCOTEC Glasgow	50% TEA in acetone	2018	1	0.98
Somerset County Council	20% TEA in water	2018	3	0.89
South Yorkshire Air Quality Samplers	50% TEA in acetone	2018	4	0.95
Staffordshire Scientific Services	20% TEA in water	2018	13	0.87
Tayside Scientific Services	20% TEA in water	2018	5	0.80
West Yorkshire Analytical Services	50% TEA in acetone	2018	8	0.80
Number of Studies Included			**125**	

Royal Borough of Kingston did not conduct any co-location studies in 2018, so it was not possible to calculate a local adjustment factor. As a result, the national adjustment factor of 0.93 is applied to diffusion tube monitoring results in this report.

Gradko International Ltd is a UKAS accredited laboratory and participates in laboratory performance and proficiency testing schemes. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO_2 concentrations reported are of a high calibre. The lab follows the procedures set out in the Harmonisation Practical Guidance. Gradko previously participated in the Workplace Analysis Scheme for Proficiency (WASP) for NO_2 diffusion tube analysis

and the Annual Field Inter Comparison Exercise. In April 2014, a new scheme, AIR PT13, was introduced. This is an independent analytical proficiency-testing (PT) scheme, operated by LGC Standards and supported by the Health and Safety Laboratory (HSL). AIR PT combines two long running PT schemes: LGC Standards STACKS PT scheme and HSL WASP PT scheme.

Laboratory performance in AIR PT is also assessed, by the National Physical Laboratory (NPL), alongside laboratory data from the monthly NPL Field Intercomparison Exercise carried out at Marylebone Road, central London. A laboratory is assessed and given a 'z' score. A score of 2 or less indicates satisfactory laboratory performance.

Gradko International Ltd's performance for 2018 for 100% of samples submitted by Gradko were deemed satisfactory.

The laboratory has also achieved a "good" precision result for 2018. Tubes are considered to have "good" precision where the coefficient of variation of duplicate or triplicate diffusion tubes for eight or more periods during the year is less than 20%, and the average CV of all monitoring periods is less than 10%.

A.3 Adjustments to the Ratified Monitoring Data

Short-term to Long-term Data Adjustment

Table L. Short-Term to Long-Term Monitoring Data Adjustment

Annualisation for NO_2 at KT5- Cromwell Road

Site	Site Type	Annual Mean ($\mu g/m^3$)	Period Mean ($\mu g/m^3$)	Ratio
London Greenwich Eltham (GR4)	Suburban	16.5	15.4	**1.07**
Wandsworth - Wandsworth Town Hall	Urban Background	38.4	37.7	**1.02**
Richmond upon-Thames-Barnes Wetlands (RI2)	Suburban	20.4	19.6	**1.04**
			Average	**1.043**

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Annualisation for PM10 at at KT5- Cromwell Road

Site	Site Type	Annual Mean ($\mu g/m^3$)	Period Mean ($\mu g/m^3$)	Ratio
Lambeth - Streatham Green (LB6)	Suburban	20.5	20.2	**1.01**
Richmond upon-Thames-Barnes Wetlands (RI2)	Suburban	14.5	14.4	**1.02**
Hillingdon – Harlington (LH0)	Urban Background	15.4	15.4	**1.00**
			Average	**1.01**

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Appendix B Full Monthly Diffusion Tube Results for 2018

Table M. NO_2 Diffusion Tube Results

Site ID	Site Name	Valid data capture for monitoring period % [a]	Valid data capture 2018 % [b]	Annual Mean NO_2													
				Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual mean – raw data	Annual mean – bias adjusted
1	Guildhall Complex	100	100	22.92	29.75	30.14	22.99	16.71	20.60	17.73	17.96	20.06	27.22	30.02	23.27	23.28	21.6
2	Penrhyn Rd (Nr County Hall)	100	100	43.14	46.70	49.80	48.85	52.88	43.64	46.12	42.30	47.91	53.70	51.29	41.76	47.34	**44.0**
3	Portsmouth Road	100	100	34.53	23.00	40.99	34.75	30.22	34.10	29.44	28.02	28.84	36.83	39.25	36.40	33.03	30.7
4	Brighton Road	100	83		35.65	35.87	27.21	28.62	28.98	24.54	22.03	28.45		34.43	30.42	29.62	27.5
5	Victoria Rd/Brighton Rd	100	100	36.41	41.32	45.49	39.49	46.23	47.37	37.19	31.84	32.50	44.63	41.34	32.76	39.71	36.9
6	St. Mark's Hill/Ewell Rd	100	100	35.04	46.07	43.90	37.30	39.63	41.14	40.74	31.35	37.80	36.95	42.39	37.38	39.14	36.4

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Site ID	Site Name	Valid data capture for monitoring period % [a]	Valid data capture 2018 % [b]	Annual Mean NO_2													
				Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual mean – raw data	Annual mean – bias adjusted
7	Victoria Rd (Surbiton Station)	100	100	34.67	51.25	63.53	46.61	48.26	48.05	41.20	36.82	42.63	51.86	52.25	44.51	46.80	**43.5**
8	Upper Brighton Rd/Langley Rd	100	92	-	40.75	44.93	39.93	41.62	41.47	39.03	32.73	40.56	45.14	43.06	35.75	40.45	37.6
9	Douglas Rd/Thornhill Rd	100	100	27.40	31.03	28.91	20.82	16.20	19.03	19.54	19.41	24.09	26.50	24.72	28.19	23.82	22.2
10	Ewell Rd	100	100	40.67	41.10	48.64	41.09	39.42	45.30	37.42	33.71	39.18	39.72	42.09	42.76	40.93	38.1
11	Elgar Rd	100	100	28.93	37.47	33.50	28.53	27.80	26.32	22.50	20.96	24.28	29.17	28.67	28.36	28.04	26.1
12	Hook Rise N/Service Rd	100	92	48.41	37.49	55.69	50.40	-	49.79	51.42	42.47	48.95	40.05	46.84	46.02	47.05	**43.8**
13	Tolworth Roundabout	100	100	67.47	90.01	73.28	69.78	73.77	74.51	76.96	62.55	62.11	63.41	67.96	57.68	69.96	**65.1**
14	Kingston Rd	100	100	49.42	54.55	62.58	41.67	42.85	51.74	43.05	35.48	38.82	39.68	42.76	33.59	44.68	**41.6**

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Site ID	Site Name	Valid data capture for monitoring period % [a]	Valid data capture 2018 % [b]	Annual Mean NO_2													
				Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual mean – raw data	Annual mean – bias adjusted
15	Kingston Rd/Old Kingston Rd	100	92	42.69	46.85	40.24	43.85	43.99	39.02	-	43.67	53.76	48.35	40.04	42.51	44.09	**41.0**
16	Hook Rd S/Hunters Rd	100	100	40.17	44.52	42.66	40.91	45.66	36.23	41.10	38.28	43.16	47.81	38.94	36.63	41.34	38.4
17	Hook Rd (St Paul's Primary)	100	100	39.77	49.00	51.29	40.58	34.77	33.30	36.09	33.36	39.56	40.74	38.31	40.35	39.76	37.0
18	Hook Centre	100	100	40.77	51.34	35.10	47.33	44.99	39.08	47.83	44.76	49.48	53.71	48.50	48.04	45.91	**42.7**
19	Garrison Ln/Reynolds Ave	100	100	30.59	32.91	42.86	28.07	26.21	26.03	40.20	26.92	28.24	34.23	32.41	31.67	31.69	29.5
20	Malden Rushett crossroads	100	100	35.68	40.69	41.76	36.64	37.05	37.46	37.48	35.80	38.27	40.52	35.81	33.66	37.57	34.9
21	Leatherhead Rd/Harrow Cl	100	100	35.60	38.44	60.96	34.83	39.36	36.60	47.08	33.90	38.76	36.42	30.92	32.29	38.76	36.0
22	Hook Rise N/Rec. Centre	100	100	56.46	51.59	48.83	57.03	37.92	38.14	27.84	45.64	57.34	50.58	51.91	54.82	48.18	**44.8**

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Site ID	Site Name	Valid data capture for monitoring period % [a]	Valid data capture 2018 % [b]	Annual Mean NO_2													
				Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual mean – raw data	Annual mean – bias adjusted
23	Fife Rd area	100	100	31.35	39.05	85.84	34.35	29.77	34.41	91.20	27.92	28.92	36.72	36.71	34.10	42.53	39.6
24	Cromwell Rd	100	100	93.40	89.14	53.24	94.77	79.09	77.54	34.49	86.90	102.70	101.18	82.36	84.73	81.63	**75.9**
25	Queen Elizabeth Rd/London Rd	100	100	46.15	58.77	45.65	42.16	39.48	44.16	33.88	37.63	42.54	44.76	43.80	37.70	43.06	**40.0**
26	Richmond Rd/King's Rd	100	100	35.32	42.13	39.79	38.99	36.59	35.15	29.20	27.84	33.28	45.18	45.97	38.00	37.28	34.7
27	Richmond Rd/Horsley Drive	100	100	34.99	47.97	67.33	33.55	27.96	27.30	51.08	27.93	33.48	34.89	32.97	30.06	37.46	34.8
28	Kingston Hill/Wolverton Ave	100	100	56.87	57.58	49.04	53.87	60.86	53.93	30.80	48.18	57.98	55.20	56.64	58.84	53.32	**49.6**
29	Kingston Vale nr Robin Hood Lane	100	100	37.54	41.74	21.96	34.09	36.88	37.30	34.11	28.14	34.89	34.29	32.65	33.23	33.90	31.5
30	Coombe Hill School	100	100	46.08	48.72	57.62	37.46	38.32	36.97	38.65	27.30	45.54	37.94	42.81	44.91	41.86	38.9

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Site ID	Site Name	Valid data capture for monitoring period % [a]	Valid data capture 2018 % [b]	Annual Mean NO_2													
				Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual mean – raw data	Annual mean – bias adjusted
31	Malden Rd Nr A3	100	100	43.70	51.51	32.21	47.31	47.08	44.16	19.83	36.49	40.55	44.48	45.94	44.76	41.50	38.6
32	South Lane south of A3	100	100	29.94	35.40	50.02	23.85	24.10	18.78	39.12	19.92	24.99	25.28	29.75	28.00	29.10	27.1
33	Burlington Road	100	100	37.70	46.76	51.63	44.21	41.19	39.96	33.66	38.82	37.85	46.82	40.82	42.79	41.85	38.9
34	New Malden High St	100	100	33.36	45.19	43.68	41.85	37.38	35.82	54.95	31.57	36.34	42.76	44.63	38.09	40.47	37.6
35	Clarence Ave	100	100	35.85	43.79	42.09	31.99	31.79	26.23	21.78	22.67	27.93	34.55	39.26	37.58	32.96	30.7
36	Coombe Lane West	100	100	39.57	41.66	34.41	32.78	32.77	32.13	29.10	29.78	34.98	38.69	32.89	36.92	34.64	32.2
37	Elm Rd	100	100	32.55	33.99	39.56	27.14	23.25	20.56	19.89	20.37	23.68	31.02	34.01	28.95	27.91	26.0
38	Kingston Rd by Carpet Right	100	100	37.10	48.78	57.25	32.59	36.58	40.79	32.91	29.19	30.94	43.92	39.53	36.00	38.80	36.1
39	Cambridge Rd/Gloucester Rd	100	92	49.78	55.76	51.67	52.98	52.09	-	52.54	43.08	49.88	48.22	55.20	41.78	50.27	**46.8**

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Site ID	Site Name	Valid data capture for monitoring period % [a]	Valid data capture 2018 % [b]	Annual Mean NO_2													
				Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual mean – raw data	Annual mean – bias adjusted
40	Cambridge Rd/Hawks Rd	100	92	49.20	48.74	53.21	46.87	40.83	40.02	46.44	39.77	-	43.55	49.17	42.49	45.48	**42.3**

Exceedance of the NO_2 annual mean AQO of 40 µg m^{-3} are shown in **bold**.

[a] Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

[b] Data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

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