The Royal Borough of Kingston upon Thames
Air Quality Annual Status Report for 2016

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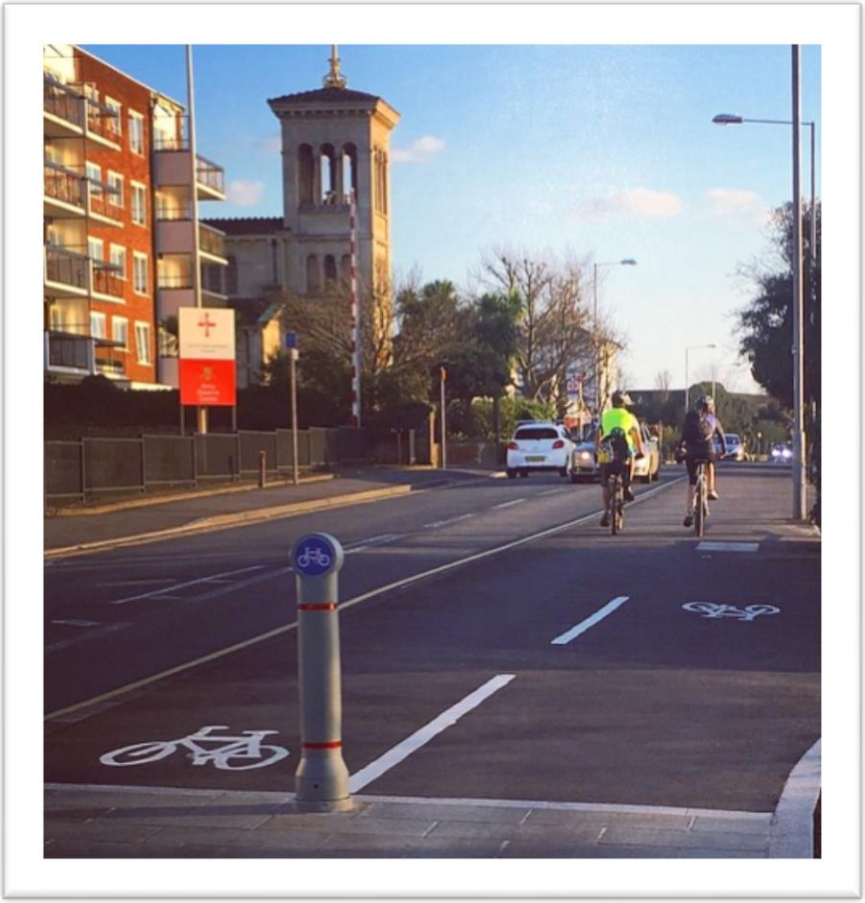

This report provides a detailed overview of air quality in Royal Borough of Kingston upon Thames during 2016. It has been produced to meet the requirements of the London Local Air Quality Management statutory process[1].

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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

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

1. Air Quality Monitoring

1.1 Locations

The Royal Borough of Kingston upon Thames (RBK) operated two automatic monitoring stations in 2016.

- Both sites were kerbside sites: KT3 Sopwith Way and KT4 Tolworth Broadway both measuring NO_2 and PM_{10};

KT3 was operational until July 2016 and KT4 was operational for the full year.

In addition, RBK undertook non-automatic monitoring at forty locations in 2016.

Table B. Details of Automatic Monitoring Sites for 2016

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
KT3	**Sopwith Way**	*518202*	*169673*	*Roadside*	*Y*	*12*	*6.3*	*1.6*	*NO_2, PM_{10}*	*Chemiluminescent; BAM*
KT4	**Tolworth Broadway**	*519706*	*165885*	*Roadside*	*Y*	*7*	*4.2*	*1.6*	*NO_2, PM_{10}*	*Chemiluminescent; BAM*

Table C. Details of Non-Automatic Monitoring Sites for 2016

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*
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*

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)
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*
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*

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)
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*
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*

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)
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*
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 2016 % [b]	Annual Mean Concentration (μg m^{-3})				
					2012	2013	2014	2015	2016
KT3	Sopwith Way	*Automatic*	*53*	*53*	N/A	N/A	N/A	***53.5*** [c]	***52.5*** [c]
KT4	Tolworth Broadway	*Automatic*	*62*	*62*	*N/A*	*N/A*	*N/A*	***48.5*** [c]	***50.7*** [c]
1	Guildhall Complex	*Diffusion tube*	100	100	26.1	28.9	22.92 [c]	25.2	25.0
2	17-19 Penrhyn Road	*Diffusion tube*	92	92	**41.6**	**43.8**	**41.95** [c]	**44.5**	**46.5**
3	Portsmouth Road	*Diffusion tube*	100	100	35.4	38.8	32.21 [c]	35.1	38.6
4	Brighton Road	*Diffusion tube*	92	92	32.4	34.6	27.7 [c]	28.6	32.9
5	Victoria Rd/Brighton Rd	*Diffusion tube*	100	100	27.2	**40.6**	37.6 [c]	**40.6**	**40.4**
6	St. Mark's Hill/Ewell Rd	*Diffusion tube*	100	100	23.3	**42.8**	39.2 [c]	**40.8**	**43.0**
7	Victoria Rd (Surbiton Station)	*Diffusion tube*	100	100	**48**	**49**	**43.9** [c]	**49.9**	**49.0**
8	Upper Brighton Rd/Langley Rd	*Diffusion tube*	100	100	35.6	36	**40.7** [c]	**42.4**	**42.0**
9	Douglas Rd/Thornhill Rd	*Diffusion tube*	100	100	27.4	29.8	22.7 [c]	25.7	27.0

Site ID	Site Name	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2016 % [b]	Annual Mean Concentration (µg m^{-3})				
					2012	2013	2014	2015	2016
10	Ewell Rd	*Diffusion tube*	100	100	**51.9**	**52.8**	**47.1** [c]	**48.6**	**48.6**
11	Elgar Rd	*Diffusion tube*	100	100	32.8	32.6	27.5 [c]	28.8	30.7
12	136 Tolworth Broadway	*Diffusion tube*	75	75	**41.2**	**64.3**	**58.7** [c]	**67.2**	**55.2**
13	Tolworth Roundabout	*Diffusion tube*	92	92	**77.4**	**77.4**	**75.3** [c]	**72.2**	**77.0**
14	Kingston Rd (near station)	*Diffusion tube*	100	100	28.5	**41.8**	**56.3** [c]	**62.4**	**59.7**
15	Kingston Rd/Old Kingston Rd	*Diffusion tube*	100	100	27.2	28.1	**45.8** [c]	**42.8**	**46.3**
16	Hook Rd S/Hunters Rd	*Diffusion tube*	100	100	38.7	**41.7**	**40.3** [c]	**43.4**	**45.6**
17	Hook Rd (St Paul's Primary)	*Diffusion tube*	92	92	36	**40.5**	36.0 [c]	38.2	39.7
18	Hook Centre	*Diffusion tube*	100	100	**49.3**	**44.9**	**44.6** [c]	**48.5**	**48.0**
19	Garrison Ln/Reynolds Ave	*Diffusion tube*	100	100	31	30.8	26.2 [c]	27.4	28.9
20	Malden Rushett crossroads	*Diffusion tube*	100	100	**42**	**49.3**	32.5 [c]	36.9	38.4
21	Leatherhead Rd/Harrow Cl	*Diffusion tube*	100	100	38.6	**57.1**	34.7 [c]	37.9	38.5
22	Hook Rise N/Rec. Centre	*Diffusion tube*	100	100	39.9	**42.1**	**50.4** [c]	**52.6**	**50.1**
23	40 Fife Road	*Diffusion tube*	100	100	34.9	38.8	33.4 [c]	35.6	34.7
24	14-16 Cromwell Road	*Diffusion tube*	100	100	**89.3**	**118**	**94.0** [c]	**94.0**	**90.6**

Site ID	Site Name	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2016 % [b]	Annual Mean Concentration (µg m^{-3})				
					2012	2013	2014	2015	2016
25	Queen Elizabeth Rd/London Rd	*Diffusion tube*	92	92	32.1	**48.2**	36.3 [c]	**46.3**	**45.6**
26	Richmond Rd/King's Rd	*Diffusion tube*	100	100	37.2	**42.5**	35.9 [c]	34.6	38.5
27	Richmond Rd/Horsley Drive	*Diffusion tube*	100	100	38.1	33.6	32.1 [c]	35.1	36.0
28	Kingston Hill/Wolverton Ave	*Diffusion tube*	100	100	**47.6**	**52.6**	**54.4** [c]	**57.4**	**53.7**
29	240 Kingston Vale near Robin Hood Lane	*Diffusion tube*	100	100	34.5	34.1	34.5 [c]	39.2	**41.4**
30	Coombe Hill School	*Diffusion tube*	92	92	34.1	37.8	37.9 [c]	**40.7**	**40.5**
31	248 Malden Road near A3	*Diffusion tube*	100	100	34.4	36.7	37.8 [c]	**45.2**	**45.6**
32	South Lane	*Diffusion tube*	100	100	27.5	29.6	22.5 [c]	24.5	27.6
33	Burlington Road	*Diffusion tube*	100	100	38.9	**45**	35.0 [c]	**41.9**	**42.9**
34	New Malden High St	*Diffusion tube*	100	100	35.7	**42.6**	36.0 [c]	31.0	**40.2**
35	Clarence Ave	*Diffusion tube*	100	100	32.8	35.4	28.4 [c]	31.1	32.6
36	Coombe Lane West	*Diffusion tube*	100	100	38.7	38.5	34.0 [c]	39.1	36.4
37	Elm Rd	*Diffusion tube*	92	92	24.2	30.8	23.3 [c]	27.1	28.4
38	Kingston Road (Carpet Right)	*Diffusion tube*	100	100	35.5	32	30.5 [c]	31.4	38.2

Site ID	Site Name	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2016 % [b]	Annual Mean Concentration (µg m^{-3})				
					2012	2013	2014	2015	2016
39	Cambridge Rd/Gloucester Rd	*Diffusion tube*	100	100	26.9	**44.3**	**48.4** [c]	**49.9**	**51.9**
40	Cambridge Rd/Hawks Rd	*Diffusion tube*	92	92	31.1	**47.5**	**40.9**[c]	**43.8**	**41.8**

Notes: Exceedance of the NO_2 annual mean AQO of 40 µgm^{-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

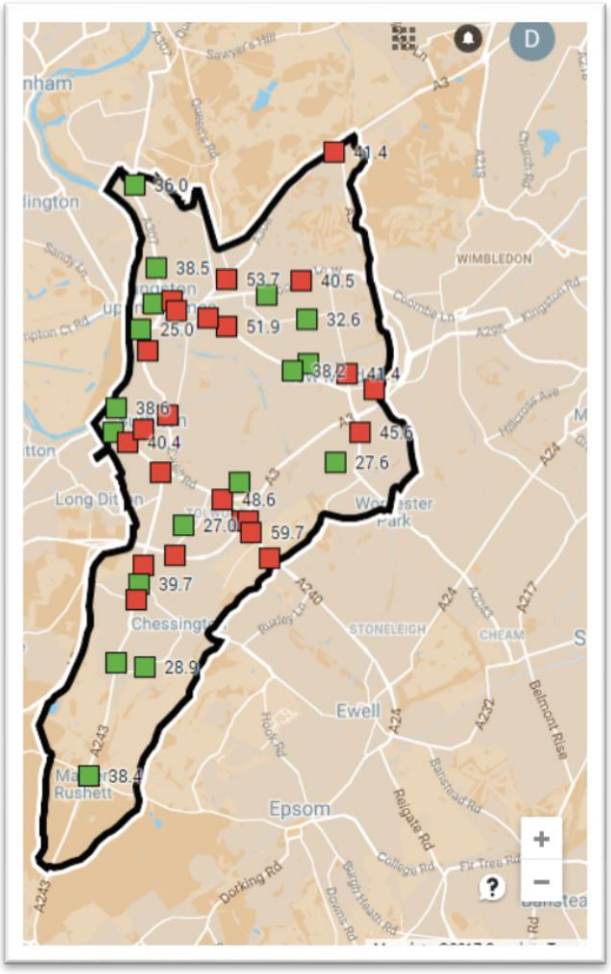
[b] data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

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

Table B provides NO_2 monitoring results for 2016 measured at 2 continuous monitoring stations and at 40 diffusion tube locations. The results from the two continuous monitoring sites exceeded the annual mean NO_2 objective of 40µg m^{-3}. The annual mean objective for NO_2 was also exceeded at 23 out of 40 of the diffusion tube locations and are highlighted in bold in the table. The 2 results that exceeded 60µg m^{-3} are also underlined to indicate that the hourly objective is potentially exceeded at these locations.

The highest concentration was 90.6µg m^{-3} that was recorded at a site on the A307 Cromwell Road, one of the busiest roads in the borough. Also all 4 results from diffusion tubes located along the A3 Malden Way exceeded the objective at the roadside. In 2016, overall, levels of NO_2 have increased in the borough.

Figure 1: Map of NO_2 diffusion tubes monitoring sites in the *Royal Borough of Kingston upon Thames* showing annual mean results from 2016.



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. The numbers adjacent to each square are the annual mean NO_2 concentrations for 2016.

Diffusion tubes (<40μg m^{-3})

Diffusion tubes (>40μg m^{-3})

Table D2. Calculation of NO_2 at relevant exposure receptors ($\mu g\ m^{-3}$)

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 2016	Background NO_2	NO_2 at relevant exposure receptor
2	17-19 Penrhyn Road	518067	168672	Roadside	3	2	5	**46.5**	25.89724	**42.1**
5	Victoria Rd/Brighton Rd	517765	167143	Kerbside	1	3	4	**40.4**	24.3761	36.9
6	St. Mark's Hill/Ewell Rd	518424	167604	Roadside	2.5	5	7.5	**43.0**	25.26571	39.2
7	Victoria Road nr Surbiton Station	518039	167346	Kerbside	2	0.5	2.5	**49.0**	25.26571	**42.2**
8	Upper Brighton Rd/Langley Rd	518336	166655	Roadside	2.5	2	4.5	**42.0**	25.03773	38.8
10	Ewell Road nr jct Elgar Avenue	519365	166230	Kerbside	4	0.5	4.5	**48.6**	26.14428	39.9
12	136 Tolworth Broadway / Service Road	519714	165886	Roadside	3	2	5	**55.2**	29.82544	**49.8**
13	Sundial Ct. Roundabout, Tolworth	519808	165873	Kerbside	1.5	1	2.5	**77.0**	29.82544	**68.3**
14	Kingston Rd near Station	519872	165692	Kerbside	14	0.5	14.5	**59.7**	29.82544	**40.1**

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 2016	Background NO_2	NO_2 at relevant exposure receptor
15	A240 Kingston Rd/Old Kingston Rd	520192	165264	Kerbside	30	0.5	30.5	**46.3**	23.1508	29.5
16	Hook Road South / Hunters Road	518087	165096	Kerbside	6	1	7	**45.6**	28.28073	38.8
18	Hook Centre	517991	164532	Kerbside	4	0.5	4.5	**48.0**	23.17247	38.4
22	Hook Rise North / Tolworth Rec Centre	518601	165270	Roadside	3	1.5	4.5	**50.1**	28.28073	**44.8**
24	14-16 Cromwell Road	518467	169509	Roadside	2	2	4	**90.6**	29.2504	**80.6**
25	Queen Elizabeth Rd/London Rd	518533	169348	Kerbside	4	0.5	4.5	**45.6**	26.98982	38.4
28	41 Kingston Hill	519353	169895	Kerbside	3	1	4	**53.7**	26.98982	**46.2**
29	240 Kingston Vale nr Robin Hood Lane	521107	172055	Kerbside	6	0.5	6.5	**41.4**	24.9285	33.9
30	Coombe Hill School	520611	169889	Roadside	10	2.5	12.5	**40.5**	24.58562	34.2
31	248 Malden Road Near A3	521651	167397	Kerbside	8	0.5	8.5	**45.6**	29.27969	37.4
33	96 Burlington Road	521873	168117	Roadside	3	1.5	4.5	**42.9**	28.18142	39.4

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 2016	Background NO_2	NO_2 at relevant exposure receptor
34	66 New Malden High St/ HSBC	521416	168373	Roadside	7	1.5	8.5	**40.2**	28.18142	35.6
39	Cambridge Rd/Gloucester Rd	519372	169098	Kerbside	1	8	9	**51.9**	26.98982	**40.9**
40	Cambridge Rd/Hawks Rd	519064	169244	Roadside	1.5	1.5	3	**41.8**	26.98982	39.5

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 8 exceedences 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 annual status report.

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 2016 % [b]	Number of Hourly Means > 200µg m^{-3}			
			2013	2014	2015	2016 [c]
Sopwith Way(KT3)	100	*53*	N/A	N/A	0 (151.8)	0 (138.5)
Tolworth Broadway (KT4)	62	*62*	N/A	*N/A*	*0 (137.7)*	*5 (132.6)*

Notes: Exceedance of the NO_2 short term AQO of 200 µgm^{-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 2016 % [b]	Annual Mean Concentration (µg m^{-3})			
			2013	2014	2015	2016 [c]
Sopwith Way (KT3)	*100*	*47*	-	-	21.3	21.3
Tolworth Broadway (KT4)	*93*	*93*	-	-	*20.0*	24.1

Notes: Exceedance of the PM_{10} annual mean AQO of 40 µgm^{-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 2016 % [b]	Number of Daily Means > 50µg m^{-3}			
			2013	2014	2015	2016 [c]
Sopwith Way (KT3)	*100*	*47*	-	-	3 (34.3)	4 (33.2)
Tolworth Broadway (KT4)	*93*	*93*	-	-	1 (34.4)	9

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 90% 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%

Table J. Commitment to Cleaner Air Borough Criteria

Theme	Criteria		Achieved (Y/N)	Evidence
1. Political leadership	***1.a***	Pledged to become a Cleaner Air for London Borough (at cabinet level) by taking significant action to improve local air quality and signing up to specific delivery targets.	Y	Approved at Adult and Children's Committee in March 2016 https://moderngov.kingston.gov.uk/mgAi.aspx?ID=28233
	1.b	Provided an up-to-date Air Quality Action Plan (AQAP), fully incorporated into LIP funding and core strategies.	*Y*	A revised Air Quality Action Plan was approved at Adult and Children's Committee in June 2016 and became effective from July 2016. A copy of the new Action Plan is available on the Council's website: https://www.kingston.gov.uk/downloads/download/565/kingston_air_quality_action_plan As part of the consultation on the development of the new Air Quality Action Plan, different stakeholders from across the Council were engaged including Highways and Transport to ensure that air quality is incorporated into future LIP objectives, and Development Control to ensure that air quality is included in planning policies. A Sustainable Transport Supplementary Planning Document was adopted in May 2013 which supports the links between transport and planning policies.
2. Taking action	**2.a**	Taken decisive action to address air pollution, especially where human exposure and vulnerability (e.g. schools, older people, hospitals etc) is highest.	*Y*	The LAEI confirms that the areas of highest air pollution within the borough are close to roads around Kingston Town Centre, the A3 and roads that link the two. The new Air Quality Action Plan includes an action to work with schools on their Travel Plans. To deliver this action, we are focussing attention on those schools that are in close proximity to roads with high traffic flows and/or where air pollution concentrations are highest.
	2.b	Developed plans for business engagement (including optimising deliveries and supply chain), retrofitting public buildings using the RE:FIT framework, integrating no engine idling awareness raising into the work of civil enforcement	*Y*	The Action Plan includes a number of measures which require working with businesses and the routes by which the businesses can be engaged have been identified. This includes working with businesses that apply for business permits and also through the Development Control process. An approach will also be made to engage with businesses within the Kingston Town Centre Business Improvement District and identify opportunities for delivering an air quality project.

Theme	Criteria		Achieved (Y/N)	Evidence
		officers, (etc etc)		
	2.c	Integrated transport and air quality, including by improving traffic flows on borough roads to reduce stop/start conditions	*Y*	Air quality is included as an objective within the LIP and an SPD to integrate transport and planning so as to promote sustainable transport modes has been adopted.
	2.d	Made additional resources available to improve local air quality, including by pooling its collective resources (s106 funding, LIPs, parking revenue, etc).	*Y*	LIP funding has been used to cover the costs of operating an air quality monitoring station within the borough. It is aimed to continue this monitoring using funds from a s106 obligation. A bid for funds from the DEFRA air quality grant was submitted but was not successful.
3. Leading by example	**3.a**	Invested sufficient resources to complement and drive action from others	Y	A full-time officer is employed within the Environmental Protection Team who has responsibility for air quality issues across both boroughs within a Shared Service.
	3.b	Maintained an appropriate monitoring network so that air quality impacts within the borough can be properly understood	*Y*	RBK has continued to operate an automatic monitoring station at Tolworth using funding from the LIP. Funding has also been secured for 2 permanent air quality monitoring stations which will be installed in 2017. Monitoring data is made publicly available on the LondonAir website. The borough also monitors at a further 40 locations using nitrogen dioxide diffusion tubes.
	3.c	Reduced emissions from council operations, including from buildings, vehicles and all activities.	*Y*	A programme to identify the scope for upgrading buildings in order to reduce energy usage was carried out in recent years. Most upgrades identified have now been completed. Council staff are able to make use of Car Club vehicles so as to deter staff from bringing their own vehicles to work. There is the potential to negotiate the provision of low emission vehicles within the Car Club.
	3.d	Adopted a procurement code which reduces emissions from its own and its suppliers activities, including from buildings and vehicles operated by and on their behalf (e.g. rubbish trucks).	*Y*	The Council has an Ethical Procurement Policy in place which includes the aim of minimising the environmental impact of transport and states a preference for the use of low emission vehicles. When procuring goods and services, tendering providers are asked to include details of their business' environmental policies.
4. Using the planning system	**4.a**	Fully implemented the Mayor's policies relating to air quality neutral, combined heat and power and biomass.	Y	Where appropriate, an Air Quality Assessment and/or Air Quality Neutral Assessment has been required to be submitted and approved in order for a planning application to gain planning consent. The Council's webpages include information for developers including links to the Supplementary Planning Guidance on

Theme	Criteria		Achieved (Y/N)	Evidence
				Controlling Dust and Emissions during Construction and Demolition as well as Low Emissions Strategy Guidance.
	4.b	Collected s106 from new developments to ensure air quality neutral development, ***where possible***	Y	Where appropriate, s106 contributions have been sought either to fund air quality actions or, more commonly, to secure implementation of a mitigation measure by the developer.
	4.c	Provided additional enforcement of construction and demolition guidance, with regular checks on medium and high risk building sites.	Y	The planning system is used to ensure that developers use best practices to minimise emissions during construction and demolition. Visits to construction sites have been carried out where complaints have been received about dust and/or noise. The borough is participating in a scheme across several boroughs within south London to carry out checks of Non-Road Mobile Machinery, to promote awareness of the requirements and to encourage registration on the database.
5. Integrating air quality into the public health system	**5**	Included air quality in the borough's Health and Wellbeing Strategy and/or the Joint Strategic Needs Assessment	Y	Discussions between officers within Environmental Health and Public Health have taken place to identify opportunities for joint-working. A paper was submitted to a Health Overview Panel with a recommendation that a Joint Strategic Needs Assessment of air quality within the borough be carried out.
6. Informing the public	**6.a**	Raised awareness about air quality locally	Y	The borough is a member of the airTEXT consortium and details of the pollution alert service have now been included on the Council's website.

2. Action to Improve Air Quality

Commitment to Cleaner Air Borough Criteria

RBK did not hold Cleaner Air Borough status in 2016. However, in March 2016, it was agreed by Adult & Children Committee members to work towards attaining Cleaner Air Borough status and to put in place steps towards meeting the required criteria.

2.1 Air Quality Action Plan Progress

Table K provides a brief summary of RBK's progress against its Air Quality Action Plan. The borough's Air Quality Action Plan was reviewed in 2015 and consultation took place on a new Action Plan

during the early part of 2016. In June 2016, the new Action Plan was approved by Members and it became effective in July 2016. Consequently, the progress outlined in the table below is against the measures included in the 2016 Action Plan.

Table K. Delivery of Air Quality Action Plan Measures

No.	Measure	Action	Progress	Further information
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	Discussions between officers from Highways & Transport and Pollution Control took place to gather data that will help prioritise the areas for action. The bus routes which pass through the identified Air Quality Focus Areas will be prioritised. In addition to attendance at regional meetings, officers will liaise with Transport for London on locations for rapid charging points within the borough.	
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.	
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 around Kingston station. As part of the Go Developments Programme, a consultation was carried out on improvements to part of the Ring Road in Kingston to gather opinion on potential improvements.	
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	

No.	Measure	Action	Progress	Further information
			raising the issue that the borough is not completely covered by the existing LEZ.	
6	Road Works	To investigate options for reducing the impact of road works on traffic flows including use of signs, CCTV and issuing penalties where roadworks overrun.	No progress - Medium term measure	
7	Air Quality in Council Policies	Ensure that air quality is a specific consideration when adopting Council policies.	Agreed that all committee reports from April 2017 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 20 separate locations within the borough at which an electric vehicle charging point is installed and these form part of the Source London network.	
9	Engine Idling	Deter engine idling while waiting with initial focus on schools and stations	Investigation into designs of No Engine Idling signs has taken place and work has begun to identify and engage schools to work with on tackling engine idling. Advice on reducing emissions when driving is available on the Council website and this includes recommendation to avoid unnecessary engine idling.	
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 and there are 10 Car Club bays available. In 2016, negotiations took place to secure Car Club bay provisions as part of 3 separate developments. 75 members of staff have registered as members for using the vehicles on work journeys to avoid travel to the workplace using their own vehicle.	
11	Freight Improvements	To improve freight access and loading /	No progress – Medium term measure	

No.	Measure	Action	Progress	Further information
		servicing arrangements at key locations in the borough		
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.	5 new cycle stands have been installed in on-street locations providing parking space for 10 bikes. In addition, 13 bike hangars have been installed in RBK housing estates which can accommodate a total of 78 bikes. Requests for on-street cycle parking can be made via the Council website and the Sustainable Transport Team will assess the site's suitability. Provision of cycle parking to London Plan standards is required within new developments as part of the development control process.	
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. A campaign promoting safe cycling at night was carried out in the Autumn which involved staff distributing advice and free bike lights at a number of strategic locations. Several cycle rides were organised for Council staff during the summer to encourage staff to cycle more and gain confidence.	
14	Cycle Network	Review the cycle network to address obstacles to continued movement and increase the number of segregated cycle lanes.	A new segregated cycle route along Portsmouth Road was opened in 2016 as part of the Go Cycle programme. Signage on London Cycle Network Route 75 has also been improved. A series of public consultations were carried out during 2016 as part of the Go Cycle programme to shape the designs of future improvements to the cycle network.	
15	Cycle Hire	Expand existing cycle-	There are currently 103 members	

No.	Measure	Action	Progress	Further information
		hire schemes.	of the Brompton cycle hire-scheme. In 2016, there were 811 days usage of the Brompton bikes in the scheme. A new Brompton bike dock was opened at Surbiton station in July 2016.	
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. Kingston Voluntary Action and Public Health hosted the Kingston Walking Festival, the first of its kind for the borough.	
17	School Travel Plans	Work with schools to better implement their travel plans to promote road safety and sustainable travel.	A baseline from which the borough will work has now been established. There are 66 schools within the borough with which the local authority can work on their Travel Plans. Currently, 20% of the schools have an active Travel Plan in place with 2 attaining gold, 5 silver and 6 bronze.	
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. A Workplace Travel Plan for a new supermarket development was submitted for approval in January 2017. A policy relating to business permit applications is still under discussion.	
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	

No.	Measure	Action	Progress	Further information
			Construction Management Plan that includes commitment to implement best practice measures.	
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. This sets out the Council's policies on tree management including street trees and trees within new developments. An aim of the strategy is to increase the planting of street trees to ensure that there is no net loss.	
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.	A programme to identify the scope for upgrading buildings in order to reduce energy usage was carried out in recent years. Most upgrades identified have now been completed. The emissions of NOx and particulates from energy sources in new developments is considered through the development control process and appropriate conditions are applied.	
22	Partnership Working with Public Health	Identify opportunities for joint working with Public Health including working jointly on campaigns.	Discussions with Public Health have taken place to identify opportunities for joint working and it was agreed to work together on implementing the recommendations from the Association of Directors of Public Health's Active Travel Manifesto. It was also agreed that a protocol on providing public health information on days when air pollution is elevated would be drafted. Officers from Pollution Control and Public Health worked together to draft a paper for submission to the Health Overview Panel in January 2017. This recommends that a Joint Strategic Needs Assessment of air quality within the borough be carried out.	
23	Partnership Working with Neighbouring Boroughs	Identify opportunities for joint working with neighbouring boroughs and working	RBK now operates a number of shared services with other London boroughs including a shared Environment Service and Highways	

No.	Measure	Action	Progress	Further information
		together on joint bids.	& Transport Service with the London Borough of Sutton. A joint bid for funds to undertake a study of traffic movements between Worcester Park and New Malden was submitted to DEFRA but was unsuccessful. 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 has also entered into discussions with the consortium of boroughs that run LoveCleanAir for its data to be included in the future. RBK is also a member of the airText consortium.	
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.	At the start of 2016, the borough operated 2 automatic air quality monitoring stations which were on hire. Although one of the monitoring stations closed in 2016, additional funding was secured to retain the other hired station. In addition, funding was secured to purchase and operate a further 2 automatic air quality monitoring stations. A procurement process was begun to appoint a contractor to supply and install the new stations which will become operational in 2017. Data from the automatic monitoring sites is publicly available on the LondonAir website. In addition, the borough operates a network of 40 diffusion tubes. A review of the network was begun and factsheets were created for each location that are provided in response to individual requests. Negotiations are underway for the data from the indicative monitors to be included on the LoveCleanAir website.	

3. Planning Update and Other New Sources of Emissions

Table L. Planning requirements met by planning applications in the Royal Borough of Kingston upon Thames in 2016

Condition	Number
Number of planning applications reviewed for air quality impacts	*24*
Number of planning applications required to monitor for construction dust	0*
Number of CHPs/Biomass boilers refused on air quality grounds	0
Number of CHPs/Biomass boilers subject to GLA emissions limits and/or other restrictions to reduce emissions	0
Number of AQ Neutral building and/or transport assessments undertaken	4
Number of AQ Neutral building and/or transport assessments not meeting the benchmark and so required to include additional mitigation	1
Number of planning applications with S106 agreements including other requirements to improve air quality	1
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.	9 NRMM conditions included 4 developments registered in 2016 but visits scheduled for 2017.

*This relates to continuous monitoring only

3.1 New or significantly changed industrial or other sources

For 2016 no new sources identified.

Appendix A Details of Monitoring Site QA/QC

A.1 Automatic Monitoring Sites

The Council's monitoring stations fall within the LAQN and QA/QC standards are delivered accordingly. This is considered close, if not equal to, AURN standard.

PM_{10} Monitoring Adjustment

The monitoring data for RBK is part of the London Air Quality Network, managed by ERG (Environmental Research Group). Where an instrument is not reference equivalent, as is the case with three of the five (four for PM10, one for PM2.5) PM instruments, adjustment is carried out in the validation process. For TEOM, a VCM correction has been applied.

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 of 0.94 for the year 2017 (based on 21 studies) has been derived from the national bias adjustment calculator dated April 2017 Version 2.

Diffusion Tube Bias Adjustment Factors 03/17 V2 Issue of the Spreadsheet							
				New (03/17 V2) Update			
Laboratory	Method	Year	Previous Number of Studies	No. Studies Added	Total No. of Studies	Factor	Change in Factor
Aberdeen Scientific Services	20% TEA in water	2016	1	0	1	0.86	0.00
Edinburgh Scientific Services	50% TEA in acetone	2016	1	0	1	0.87	0.00
ESG Didcot	20% TEA in water	2016	2	0	2	0.75	0.00
ESG Didcot	50% TEA in acetone	2016	30	0	30	0.77	0.00
ESG Glasgow	20% TEA in water	2016	1	0	1	0.79	0.00
ESG Glasgow	50% TEA in acetone	2016	1	0	1	0.78	0.00
Glasgow Scientific Services	20% TEA in water	2016	9	0	9	0.97	0.00
Gradko	20% TEA in water	2016	22	-1	21	0.94	-0.03
Gradko	50% TEA in acetone	2016	16	0	16	1.03	0.00
Lambeth Scientific Services	50% TEA in acetone	2016	1	0	1	0.94	0.00
Milton Keynes Council	20% TEA in water	2016	1	0	1	0.74	0.00
Northampton BC	20% TEA in water	2016	3	0	3	0.85	0.00
Somerset County Council	20% TEA in water	2016	3	0	3	0.88	0.00
Somerset County Council	50% TEA in acetone	2016	1	0	1	0.77	0.00
South Yorkshire Air Quality Samplers	50% TEA in acetone	2016	2	0	2	0.83	0.00
Staffordshire Scientific Services	20% TEA in water	2016	11	0	11	0.88	0.00
Tayside Scientific Services	20% TEA in water	2016	1	0	1	0.77	0.00
West Yorkshire Analytical Services	50% TEA in acetone	2016	7	0	7	0.75	0.00
Number of Studies Included			113	-1	112		

RBK did not conduct any co-location studies in 2016, so it was not possible to calculate a local adjustment factor. As a result, the national adjustment factor (0.94) 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.

Defra and the Devolved Administrations advise that diffusion tubes used for Local Air.

Quality Management should be obtained from laboratories that have demonstrated satisfactory performance in the AIR 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 2016 for 100% of samples submitted by Gradko were deemed satisfactory.

The laboratory has also achieved a "good" precision result for 2016. 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 M. Short-Term to Long-Term Monitoring Data Adjustment

Annualisation for NO_2 at KT3 (Sopwith Way)

Site	Site Type	Annual Mean ($\mu g/m^3$)	Period Mean ($\mu g/m^3$)	Ratio
Kensington and Chelsea North Ken (KC1)	Urban Background	34.7	32.8	**1.05**
London Greenwich Eltham (GR4)	Suburban	21.3	20.5	**1.04**
Richmond upon-Thames-Barnes Wetlands (RI2)	Suburban	25.5	23.9	**1.07**
			Average	**1.05**

Annualisation for NO_2 at KT4 (Tolworth Broadway)

Site	Site Type	Annual Mean (µg/m³)	Period Mean (µg/m³)	Ratio
Kensington and Chelsea North Ken (KC1)	Urban Background	34.7	40.3	**0.86**
London Greenwich Eltham (GR4)	Suburban	21.3	24.3	**0.87**
Richmond upon-Thames-Barnes Wetlands (RI2)	Suburban	25.5	29.5	**0.86**
			Average	**0.86**

Annualisation for PM10 at KT3 (Sopwith Way)

Site	Site Type	Annual Mean (µg/m³)	Period Mean (µg/m³)	Ratio
Kensington and Chelsea North Ken (KC1)	Urban Background	19.1	19.2	**0.99**
London Greenwich Eltham (GR4)	Suburban	18.2	17.5	**1.04**
Richmond upon-Thames-Barnes Wetlands (RI2)	Suburban	16.3	15.9	**1.02**
			Average	**1.016**

Appendix B Full Monthly Diffusion Tube Results for 2016

Table N. NO_2 Diffusion Tube Results

Site ID	Site Name	Valid data capture for monitoring period % [a]	Valid data capture 2016 % [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	22.2	26.8	31.8	28.7	25.3	23.8	16.9	16.8	24.6	29.7	39.3	33.6	26.6	25.0
2	Penrhyn Rd (Nr County Hall)	92	92	35.3	42.5	63.1	53.0	42.0	52.0	41.3	36.2	N/A	49.1	71.8	57.6	49.4	**46.5**
3	Portsmouth Road	100	100	38.3	39.3	50.2	43.4	37.0	33.5	34.2	32.2	39.4	41.6	56.1	48.2	41.1	38.6
4	Brighton Road	92	92	26.7	30.0	44.8	35.7	37.5	36.3	25.8	25.8	32.7	34.1	55.6	N/A	35.0	32.9
5	Victoria Rd/Brighton Rd	100	100	31.7	37.6	56.0	39.5	47.0	46.6	29.7	32.3	36.1	47.8	65.0	46.5	43.0	**40.4**
6	St. Mark's Hill/Ewell Rd	100	100	35.6	44.5	62.0	46.7	42.2	41.2	36.5	34.4	42.9	44.0	64.3	54.5	45.7	**43.0**
7	Victoria Rd (Surbiton Station)	100	100	40.0	46.9	71.7	64.9	51.6	51.8	38.0	38.6	43.0	52.7	77.5	48.4	52.1	**49.0**

Site ID	Site Name	Valid data capture for monitoring period % [a]	Valid data capture 2016 % [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
8	Upper Brighton Rd/Langley Rd	100	100	33.9	43.8	57.7	47.5	39.5	40.9	36.8	34.6	38.5	45.8	67.6	49.1	44.6	**42.0**
9	Douglas Rd/Thornhill Rd	100	100	24.0	26.9	39.2	29.7	25.0	22.5	19.6	19.6	26.4	33.3	41.1	37.3	28.7	27.0
10	Ewell Rd	100	100	42.5	44.7	66.5	51.6	47.6	50.4	42.1	38.7	46.5	50.4	76.3	63.3	51.7	**48.6**
11	Elgar Rd	100	100	25.8	31.4	43.7	34.7	32.7	27.9	20.5	21.5	29.9	34.6	47.8	41.9	32.7	30.7
12	Hook Rise N/Service Rd	75	75	N/A	57.4	92.3	65.1	56.7	57.8	3.0	49.1	N/A	61.0	86.3	N/A	58.8	**55.2**
13	Tolworth Roundabout	92	92		67.9	101.7	90.9	84.3	71.4	70.8	64.4	66.3	68.4	128.9	85.6	81.9	**77.0**
14	Kingston Rd	100	100	44.5	56.9	92.1	57.2	65.5	76.0	43.7	45.6	62.7	56.0	88.7	73.6	63.5	**59.7**
15	Kingston Rd/Old Kingston Rd	100	100	38.2	41.9	65.0	46.1	47.3	41.3	32.9	42.5	56.0	52.1	71.4	56.6	49.3	**46.3**
16	Hook Rd S/Hunters Rd	100	100	32.8	40.4	65.0	47.5	46.7	47.9	37.0	35.7	50.1	51.2	68.6	58.8	48.5	**45.6**
17	Hook Rd (St Paul's Primary)	92	92	36.4	39.2	55.9	46.3	34.5	40.9	38.0	32.4	26.3	49.3	64.9	N/A	42.2	39.7

Site ID	Site Name	Valid data capture for monitoring period % [a]	Valid data capture 2016 % [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
18	Hook Centre	100	100	44.3	45.2	73.3	52.4	47.3	49.1	27.3	39.1	48.1	50.5	74.2	61.5	51.0	**48.0**
19	Garrison Ln/Reynolds Ave	100	100	20.6	28.7	39.3	31.6	26.4	25.1	22.1	24.2	29.2	37.1	46.0	38.5	30.7	28.9
20	Malden Rushett crossroads	100	100	26.6	38.9	53.4	40.4	40.4	40.2	34.7	34.1	37.5	44.0	55.3	45.1	40.9	38.4
21	Leatherhead Rd/Harrow Cl	100	100	31.4	38.3	51.9	45.5	39.6	42.7	30.9	32.6	41.1	41.3	55.4	40.9	41.0	38.5
22	Hook Rise N/Rec. Centre	100	100	45.4	61.1	74.9	50.8	41.3	37.1	40.6	44.1	53.0	48.3	79.0	64.2	53.3	**50.1**
23	Fife Rd area	100	100	31.1	35.9	46.4	39.2	34.8	30.8	24.4	28.3	35.6	39.8	56.1	40.9	36.9	34.7
24	Cromwell Rd	100	100	85.5	100.2	127.0	90.8	87.6	68.6	90.4	79.6	91.3	73.1	166.8	96.0	96.4	**90.6**
25	Queen Elizabeth Rd/London Rd	92	92	47.8	48.9	62.2	49.7	N/A	40.9	37.5	38.0	46.0	46.7	60.1	55.9	48.5	**45.6**
26	Richmond Rd/King's Rd	100	100	38.2	36.1	47.4	38.7	40.0	38.2	30.2	28.5	40.2	44.4	62.8	47.5	41.0	38.5

Site ID	Site Name	Valid data capture for monitoring period % [a]	Valid data capture 2016 % [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
27	Richmond Rd/Horsley Drive	100	100	34.6	38.3	49.6	35.7	27.8	36.7	28.8	25.2	38.0	43.9	54.7	46.8	38.3	36.0
28	Kingston Hill/Wolverton Ave	100	100	50.2	52.5	78.5	54.9	57.7	58.0	49.5	41.4	52.4	51.9	73.1	64.8	57.1	**53.7**
29	Kingston Vale nr Robin Hood Lane	100	100	34.8	48.5	57.7	42.4	46.3	45.9	36.5	32.7	33.8	40.8	60.7	48.3	44.0	**41.4**
30	Coombe Hill School	92	92	36.0	41.2	56.8	43.7	39.0	39.5	31.3	33.5	N/A	44.7	60.5	48.4	43.1	**40.5**
31	Malden Rd Nr A3	100	100	39.6	41.4	67.0	54.0	44.6	46.5	39.2	35.3	46.1	47.8	66.4	54.6	48.5	**45.6**
32	South Lane south of A3	100	100	19.9	31.1	40.9	29.6	26.5	25.1	19.5	19.3	25.7	30.0	46.7	38.3	29.4	27.6
33	Burlington Road	100	100	33.7	47.4	56.8	45.5	35.1	39.4	36.9	35.4	46.1	47.8	64.2	59.1	45.6	**42.9**
34	New Malden High St	100	100	38.6	44.5	52.5	38.5	41.2	36.3	32.6	31.1	41.9	41.6	57.4	56.3	42.7	**40.2**
35	Clarence Ave	100	100	28.8	31.9	43.9	33.9	30.9	30.3	25.1	21.6	31.2	38.2	54.6	46.4	34.7	32.6

Site ID	Site Name	Valid data capture for monitoring period % [a]	Valid data capture 2016 % [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
36	Coombe Lane West	100	100	28.6	41.7	47.1	39.5	37.2	34.5	30.9	27.6	34.8	38.3	57.0	46.8	38.7	36.4
37	Elm Rd	92	92	25.7	32.4	40.8	29.4	28.7	23.1	19.2	20.1	26.8	N/A	45.9	40.1	30.2	28.4
38	Kingston Rd by Carpet Right	100	100	27.9	33.8	49.7	40.7	46.4	45.1	29.5	31.5	40.2	42.3	54.0	46.1	40.6	38.2
39	Cambridge Rd/Gloucester Rd	100	100	42.7	49.4	74.8	53.0	53.8	53.9	41.4	45.0	45.9	60.0	76.3	66.4	55.2	**51.9**
40	Cambridge Rd/Hawks Rd	92	92	45.2	46.4	57.5	N/A	42.0	40.0	42.6	37.2	50.0	46.3	69.4	57.4	44.5	**41.8**

Exceedance of the NO_2 annual mean AQO of 40 μgm^{-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%