

The Royal Borough of Kingston Upon Thames **Air Quality Annual Status Report for 2015**

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This report provides a detailed overview of air quality in Kingston during 2015. It has been produced to meet the requirements of the London Local Air Quality Management statutory process¹.

Contact details

Davide Pascarella
Environmental Protection Officer
&
Dave Trew
Environmental Protection Lead Officer

London Borough of Sutton
Kingston & Sutton Shared Environment Service
Tel: 020 8770 5557
ehadmin@kingston.gov.uk

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	Date¹
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 not to be exceeded more than 3 times a year	24 hour mean	31 Dec 2004

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

1. Air Quality Monitoring

1.1 Locations

Kingston Council operated two automatic monitoring stations in 2015:

- Both sites were kerbside sites: KT3 Sopwith Way and KT4 Tolworth Broadway both measuring NO₂ and PM₁₀;

In addition, Kingston Council undertook non-automatic monitoring at forty locations in 2015.

Table B. Details of Automatic Monitoring Sites for 2015

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQM A?	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
<i>KT3</i>	<i>Sopwith Way</i>	<i>518202</i>	<i>169673</i>	<i>Roadside</i>	<i>Y</i>	<i>12</i>	<i>6.3</i>	<i>1.6</i>	<i>NO₂, PM₁₀</i>	<i>Chemiluminescent; BAM</i>
<i>KT4</i>	<i>Tolworth Broadway</i>	<i>519706</i>	<i>165885</i>	<i>Roadside</i>	<i>Y</i>	<i>7</i>	<i>4.2</i>	<i>1.6</i>	<i>NO₂, PM₁₀</i>	<i>Chemiluminescent; BAM</i>

Table C. Details of Non-Automatic Monitoring Sites for 2015

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	517873	169084	Roadside	Y	15	1	2.5	NO ₂	N
2	17-19 Penrhyn Road	518078	168679	Roadside	Y	3	2	2.5	NO ₂	N
3	52 Portsmouth Road	517578	167708	Roadside	Y	5	2	2.5	NO ₂	N
4	88 Brighton Road	517583	167279	Kerbside	Y	4	0.5	2.5	NO ₂	N
5	Victoria Rd/Brighton Rd	517779	167150	Kerbside	Y	1	3	2.5	NO ₂	N
6	St. Mark's Hill/Ewell Rd	518413	167596	Roadside	Y	2.5	5	2.5	NO ₂	N
7	Victoria Road nr Surbiton Station	518039	167345	Roadside	Y	2	0.5	2.5	NO ₂	N
8	Upper Brighton Rd/Langley Rd	518326	166693	Roadside	Y	2.5	15	2.5	NO ₂	N
9	199 Douglas Road / Thornhill Road	518730	165791	Roadside	Y	5	0.5	2.5	NO ₂	N
10	Ewell Road nr jct Elgar Avenue	519415	166237	Roadside	Y	3	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)
11	53 Elgar Avenue	519659	166534	Kerbside	Y	6	0.5	2.5	NO ₂	N
12	136 Tolworth Broadway / Service Road	519710	165874	Roadside	Y	3	5	2.5	NO ₂	N
13	Sundial Ct. Roundabout, Tolworth	519806	165832	Roadside	Y	1.5	3	2.5	NO ₂	N
14	Kingston Rd near Station	519870	165649	Kerbside	Y	0.5	14	2.5	NO ₂	N
15	A240 Kingston Rd/Old Kingston Rd	520011	165513	Kerbside	Y	0.5	30	2.5	NO ₂	N
16	Hook Road South / Hunters Road	518118	165181	Roadside	Y	6	1	2.5	NO ₂	N
17	297 Hook Rd, St Paul's Primary School	518030	164770	Roadside	Y	2.5	4	2.5	NO ₂	N
18	Hook Centre	518009	164564	Kerbside	Y	0.5	4	2.5	NO ₂	N
19	Garrison Lane / Reynolds Ave	518215	163427	Kerbside	Y	5	0.5	2.5	NO ₂	N
20	353 Malden Rushett Crossroads	517254	161566	Roadside	Y	2	2.5	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)
21	Opp 148 Leatherhead Road	517695	163475	Roadside	Y	2	3	2.5	NO ₂	N
22	Hook Rise North / Tolworth Rec Centre	519659	165784	Roadside	Y	3	1.5	2.5	NO ₂	N
23	40 Fife Road	518162	169446	Kerbside	Y	4	1	2.5	NO ₂	N
24	14-16 Cromwell Road	518451	169490	Roadside	Y	2	2	2.5	NO ₂	N
25	Queen Elizabeth Rd/London Rd	518534	169379	Roadside	Y	2	4	2.5	NO ₂	N
26	Richmond Road / Kings Road	518177	170067	Roadside	Y	4	1.5	2.5	NO ₂	N
27	Fire Station, Richmond Road	517814	171445	Roadside	Y	12	1	2.5	NO ₂	N
28	41 Kingston Hill	519348	169921	Kerbside	Y	3	1	2.5	NO ₂	N
29	240 Kingston Vale nr Robin Hood Lane	521110	172036	Kerbside	Y	8	0.5	2.5	NO ₂	N
30	Coombe Hill School	520601	169861	Roadside	Y	2.5	10	2.5	NO ₂	N
31	248 Malden Road Near A3	521659	167418	Kerbside	Y	12	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)
32	South Lane	521260	166886	Kerbside	Y	7	2.5	2.5	NO ₂	N
33	96 Burlington Road	521874	168107	Kerbside	Y	4	2	2.5	NO ₂	N
34	66 New Malden High St/ HSBC	521443	168374	Roadside	Y	7	0.5	2.5	NO ₂	N
35	113-115 Clarence Avenue	520709	169266	Roadside	Y	4	1.5	2.5	NO ₂	N
36	38 Coombe Lane West Nr A3 Jn	520040	169636	Roadside	Y	3	2	2.5	NO ₂	N
37	51 Elm Rd	518653	169945	Kerbside	Y	1	7	2.5	NO ₂	N
38	Kingston Road (by Carpet Right)	520436	168451	Roadside	Y	15	2	2.5	NO ₂	N
39	Cambridge Rd/Gloucester Rd	519406	169088	Kerbside	Y	1	8	2.5	NO ₂	N
40	Cambridge Rd/Hawks Rd	519036	169234	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”, the details of which are described in Appendix A.

Table D. Annual Mean NO₂ 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 2015 % ^b	Annual Mean Concentration (µg m ⁻³)			
					2012	2013	2014	2015
KT3	Sopwith Way	Automatic	67	67	N/A	N/A	N/A	53.5^c
KT4	Tolworth Broadway	Automatic	65	65	N/A	N/A	N/A	48.5^c
1	Guildhall Complex	Diffusion tube	100	100	26.1	28.9	22.92 ^c	25.2
2	Penrhyn Rd (Nr County Hall)	Diffusion tube	100	100	41.6	43.8	41.95^c	44.5
3	Portsmouth Road	Diffusion tube	100	100	35.4	38.8	32.21 ^c	35.1
4	Brighton Road	Diffusion tube	100	100	32.4	34.6	27.7 ^c	28.6
5	Victoria Rd/Brighton Rd	Diffusion tube	100	100	27.2	40.6	37.6 ^c	40.6
6	St. Mark's Hill/Ewell Rd	Diffusion tube	100	100	23.3	42.8	39.2 ^c	40.8
7	Victoria Rd (Surbiton Station)	Diffusion tube	100	100	48	49	43.9^c	49.9
8	Upper Brighton Rd/Langley Rd	Diffusion tube	100	100	35.6	36	40.7^c	42.4
9	Douglas Rd/Thornhill Rd	Diffusion tube	100	100	27.4	29.8	22.7 ^c	25.7
10	Ewell Rd	Diffusion tube	100	100	51.9	52.8	47.1^c	48.6
11	Elgar Rd	Diffusion tube	100	100	32.8	32.6	27.5 ^c	28.8
12	Hook Rise N/Service Rd/Tolworth R'about	Diffusion tube	100	100	41.2	64.3	58.7^c	67.2
13	Tolworth Roundabout (Sundial Court)	Diffusion tube	100	100	77.4	77.4	75.3^c	72.2
14	Kingston Rd (nr Station)	Diffusion tube	100	100	28.5	41.8	56.3^c	62.4
15	Kingston Rd/Old Kingston Rd	Diffusion tube	100	100	27.2	28.1	45.8^c	42.8
16	Hook Rd S/Hunters Rd	Diffusion tube	100	100	38.7	41.7	40.3^c	43.4
17	Hook Rd (St Paul's Primary)	Diffusion tube	100	100	36	40.5	36.0 ^c	38.2

Site ID	Site Name	Site type	Valid data capture for monitoring period % ^a	Valid data capture 2015 % ^b	Annual Mean Concentration ($\mu\text{g m}^{-3}$)			
					2012	2013	2014	2015
18	Hook Centre	<i>Diffusion tube</i>	100	100	49.3	44.9	44.6 ^c	48.5
19	Garrison Ln/Reynolds Ave	<i>Diffusion tube</i>	100	100	31	30.8	26.2 ^c	27.4
20	Malden Rushett crossroads	<i>Diffusion tube</i>	100	100	42	49.3	32.5 ^c	36.9
21	Leatherhead Rd/Harrow Cl	<i>Diffusion tube</i>	100	100	38.6	57.1	34.7 ^c	37.9
22	Hook Rise N/Rec. Centre	<i>Diffusion tube</i>	100	100	39.9	42.1	50.4 ^c	52.6
23	Fife Rd area	<i>Diffusion tube</i>	100	100	34.9	38.8	33.4 ^c	35.6
24	Cromwell Rd	<i>Diffusion tube</i>	100	100	<u>89.3</u>	<u>118</u>	<u>94.0^c</u>	<u>94.0</u>
25	Queen Elizabeth Rd/London Rd	<i>Diffusion tube</i>	100	100	32.1	48.2	36.3 ^c	46.3
26	Richmond Rd/King's Rd	<i>Diffusion tube</i>	100	100	37.2	42.5	35.9 ^c	34.6
27	Richmond Rd/Horsley Drive	<i>Diffusion tube</i>	100	100	38.1	33.6	32.1 ^c	35.1
28	Kingston Hill/Wolverton Ave	<i>Diffusion tube</i>	100	100	47.6	52.6	54.4 ^c	57.4
29	Kingston Vale nr Robin Hood Lane	<i>Diffusion tube</i>	100	100	34.5	34.1	34.5 ^c	39.2
30	Coombe Hill School	<i>Diffusion tube</i>	100	100	34.1	37.8	37.9 ^c	40.7
31	Malden Rd Nr A3	<i>Diffusion tube</i>	100	100	34.4	36.7	37.8 ^c	45.2
32	South Lane south of A3	<i>Diffusion tube</i>	100	100	27.5	29.6	22.5 ^c	24.5
33	Burlington Road	<i>Diffusion tube</i>	100	100	38.9	45	35.0 ^c	41.9
34	New Malden High St	<i>Diffusion tube</i>	100	100	35.7	42.6	36.0 ^c	31.0
35	Clarence Ave	<i>Diffusion tube</i>	100	100	32.8	35.4	28.4 ^c	31.1
36	Coombe Lane West	<i>Diffusion tube</i>	100	100	38.7	38.5	34.0 ^c	39.1
37	Elm Rd	<i>Diffusion tube</i>	100	100	24.2	30.8	23.3 ^c	27.1
38	Kingston Rd by Carpet Right	<i>Diffusion tube</i>	100	100	35.5	32	30.5 ^c	31.4
39	Cambridge Rd/Gloucester Rd	<i>Diffusion tube</i>	100	100	26.9	44.3	48.4 ^c	49.9
40	Cambridge Rd/Hawks Rd	<i>Diffusion tube</i>	100	100	31.1	47.5	40.9 ^c	43.8

Notes: Exceedances of the NO₂ annual mean AQO of 40 $\mu\text{g m}^{-3}$ are shown in **bold**.

NO₂ annual means in excess of 60 $\mu\text{g m}^{-3}$, indicating a potential exceedance of the NO₂ 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 have been “annualised” in accordance with LLAQM Technical Guidance where valid data capture was less than 75%

Table B provides nitrogen dioxide monitoring results for 2015 measured at 2 continuous monitoring stations and at 40 diffusion tube locations.

The results from the two continuous monitoring sites exceeded the annual mean NO₂ objective of 40µg m⁻³.

The annual mean objective for NO₂ was also exceeded at 21 out of 40 of the diffusion tube locations are these are highlighted in bold in the table. The 4 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 94µg 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 2015, overall, levels of NO₂ have increased in the borough.

Table E. NO₂ Automatic Monitor Results: Comparison with 1-hour Mean Objective

Site ID	Valid data capture for monitoring period % ^a	Valid data capture 2015 % ^b	Number of Hourly Means > 200µg m ⁻³			
			2012	2013	2014	2015 ^c
<i>Sopwith Way(KT3)</i>	67	67	N/A	N/A	N/A	0 (151.8)
Tolworth Broadway (KT4)	65	65	N/A	N/A	N/A	0 (137.7)

Notes: Exceedances of the NO₂ short term AQO of 200µg 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 have been “annualised” in accordance with LLAQM Technical Guidance, where valid data capture was less than 75%

Table F. Annual Mean PM₁₀ Automatic Monitoring Results (µg m⁻³)

Site ID	Valid data capture for monitoring period % ^a	Valid data capture 2015 % ^b	Annual Mean Concentration (µg m ⁻³)			
			2012	2013	2014	2015 ^c
<i>Sopwith Way (KT3)</i>	73	73	-	-	-	21.3
Tolworth Broadway (KT4)	69	69	-	-	-	20.0

Notes: Exceedances of the PM₁₀ annual mean AQO of 40µg 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 have been “annualised” in accordance with LLAQM Technical Guidance, where valid data capture was less than 75%

Table G. PM₁₀ Automatic Monitor Results: Comparison with 24-Hour Mean Objective

Site ID	Valid data capture for monitoring period % ^a	Valid data capture 2015 % ^b	Number of Daily Means > 50µg m ⁻³			
			2012	2013	2014	2015 ^c
<i>Sopwith Way (KT3)</i>	<i>Automatic</i>	73	-	-	-	3 (34.3)
Tolworth Broadway (KT4)	<i>Automatic</i>	69	-	-	-	1 (34.4)

Notes: Exceedance of the PM₁₀ 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%

2. Action to Improve Air Quality

Commitment to Cleaner Air Borough Criteria

The Royal Borough of Kingston did not hold Cleaner Air Borough status in 2015. However, in 2016, it was agreed by 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 Royal Borough of Kingston’s progress against the Air Quality Action Plan, showing progress made this year. New projects which commenced in 2015 are shown at the bottom of the table.

Table K. Delivery of Air Quality Action Plan Measures

No.	Measure	Action	<p style="text-align: center;">Progress</p> <ul style="list-style-type: none"> • Emissions/Concentration data • Benefits • Negative impacts / Complaints 	Further information
1	Tree planting	To provide information to developers, contractors and the public on the selection for planting of tree species that have a positive impact on air quality. To use planning policies to promote such planting whenever situation and ground conditions are appropriate.	Air quality impact is Low. Officers have sought to keep up-to-date with latest research on air quality benefits from tree planting and to provide relevant advice to planning officers when required.	
2	Planning policies	To continue to develop planning policies to protect air quality through planning process	Officers have been applying the policies developed by the GLA when considering air quality during the planning process. This has included, where appropriate, the requirement to submit an Air Quality Assessment and developers have also been made aware of the requirements of the Low Emission Zone for Non-Road Mobile Machinery.	
3	Vehicle Emissions Testing Programme	To support and promote the continuation of a London wide vehicle emission testing programme in collaboration with other authorities	Completed	Project funding now ceased
4	Raise awareness of vehicle emissions testing	To actively seek to raise public awareness of programme for roadside testing of vehicles and its	Completed	Project funding now ceased

		implementation within the borough		
5	London Low Emission Zone	To support a London Low Emission Zone	London Low Emission Zone covers most, but not all, of the borough. Officers have sought to keep up-to-date with proposed changes and play an active role in consultations.	Issue of whole borough being covered has been raised
6	Low Emission Vehicles	To continue to seek the use of alternatively fuelled vehicles and to minimise vehicle emissions across the fleet of vehicles being used	No update	
7	Delivering road safety and air quality improvements	To use the most appropriate form of traffic calming and traffic management measures which have maximum road safety and air quality benefits with the least adverse effects on the quality of life of road users	No update	
8	Enforcing legislation on dust and smoke nuisance	To continue to enforce the provisions of the Environment Protection Act in relation to dust and smoke nuisance from building sites	Dust and smoke from construction sites is largely controlled by applying conditions when planning permission is granted. However, where complaints have been received, officers from Environmental Health have attended to enforce the provisions of the Environmental Protection Act and/or the Clean Air Act.	
9	Use of planning conditions to control dust from construction/ demolition sites	To impose standard planning conditions where appropriate in relation to large scale demolition and construction sites to minimise particle and dust nuisance during and on completion of a development	Standard planning conditions have been developed and these have been applied where appropriate. Officers have made developers aware of the Supplementary Planning Guidance produced by the GLA on Controlling Dust and Emissions from Construction and Demolition Sites.	
10	Regulation of installations requiring environmental permit	To continue to regularly inspect or cause to be inspected all part B industrial processes and vapour recovery systems in petrol stations	Inspections of part B processes were carried out according to the frequency required by the Environmental Permitting Regulations. At the end of 2015, there were 38 installations within the borough holding an Environmental Permit and regulated by the local authority.	
11	Working with bus	To continue to work in partnership	Officers from the Highways and Transport Division have	

	service providers and implementing bus priority measures	with London Buses and Surrey County Council for better services and provide bus priority whenever possible on highways	attended regional meetings to discuss the provision of bus services within the borough and to seek improvements.	
12	Cycling Strategy	To implement the Cycling Strategy for the Royal Borough of Kingston	RBK succeeded in securing £30 million funding through the mini-Holland programme. The Go Cycle programme has started on delivering the first route between Surbiton and Kingston with the first phase of the improvements along Portsmouth Road being completed. The Council also delivered adult cycle training, cycle maintenance courses and several Dr Bike sessions. It also hosts a regular Women on Wheels event to enable women to gain confidence when cycling. A Brompton Bike hire dock was also launched at Surbiton Station.	
13	Walking Strategy	To approve and adopt the walking strategy by spring 2006.	Completed	
14	Travel to Schools	To implement Walking Bus programmes where appropriate and to continue to participate in the Safer Routes to School project	RBK has been working with schools across the borough to encourage greater use of sustainable modes of transport for the school journey and has supported a Junior Travel Ambassador programme. By the end of 2015, the mode share for cycling and scooting to school was 3% and 7% respectively (based on hands up survey at a sample of schools). However, more indicated that they would like to cycle/scoot to school. There is collaboration between officers within Sustainable Transport, Highways and Parking on identifying safe routes to school and working with schools with particular issues to resolve the problems.	
15	Travel Plans	To continue to promote green travel plans with a wide range of organisations across the borough	RBK has hosted a Sustainable Transport Roadshow, at which, the benefits of sustainable transport have been promoted. This has provided the Council an opportunity to engage with businesses and communities to promote walking and cycling.	
16	Car sharing	To promote car sharing to businesses,	No update	

		schools and other organisations in Kingston upon Thames as part of their travel plans		
17	Promote Healthy Living with Kingston Primary Trust	To continue to promote healthy living in partnership with the Kingston Primary Trust through such initiatives such as Walking for Health	Changed to working with Public Health	Public Health and its responsibilities transferred to local government in 2013.
18	Devote resources to Action Plan implementation	Establish an officer working to compile the annual review and monitor corporate implementation of the AQAP and performance against action targets	In 2015, a Shared Environment Service was created between Royal Borough of Kingston and London Borough of Sutton. The Shared Service commenced in November 2015 and officers were subsequently appointed to posts. An officer who will have responsibility for implementing the Air Quality Action Plan and reporting performance will begin in 2016.	

Appendix A Details of Monitoring Site QA/QC

A.1 Automatic Monitoring Sites

The Council's monitoring stations are included within the London Air Quality Network and QA/QC standards are delivered accordingly. This is considered close, if not equivalent, to the AURN standard.

PM₁₀ Monitoring Adjustment

The monitoring data for the Royal Borough of Kingston upon Thames is part of the London Air Quality Network, managed by ERG (Environmental Research Group). Where an instrument is not reference equivalent, adjustment is carried out as part of the validation process.

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 0.88 for the year 2015 (based on 27 studies) has been derived from the national bias adjustment calculator dated June 2016.

National Diffusion Tube Bias Adjustment Factor Spreadsheet				Spreadsheet Version Number: 06/16						
Follow the steps below in the correct order to show the results of relevant co-location studies								This spreadsheet will be updated at the end of September 2016		
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods								Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet		
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet								This spreadsheet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.		
The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.								Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.		
Step 1:		Step 2:		Step 3:		Step 4:				
Select the Laboratory that Analyses Your Tubes from the Drop-Down List		Select a Preparation Method from the Drop-Down List		Select a Year from the Drop-Down List		Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor ² shown in blue at the foot of the final column.				
If a laboratory is not shown, we have no data for this laboratory.		If a preparation method is not shown, we have no data for this method at this laboratory.		If a year is not shown, we have no data.		If you have your own co-location study then see footnote ¹ . If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@uk.bureauveritas.com or 0800 0327953				
Analysed By	Method	Year	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m ³)	Automatic Monitor Mean Conc. (Cm) (µg/m ³)	Bias (B)	Tube Precision ¹	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2015		Overall Factor ² (27 studies)				Use	0.88	

Royal Borough of Kingston upon Thames did not conduct any co-location studies in 2015, so it was not possible to calculate a local adjustment factor. As a result, the national adjustment factor (0.88) 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 NO₂ 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 NO₂ 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 2015 for 100% of samples submitted by Gradko were deemed satisfactory.

The laboratory has also achieved a "good" precision result for 2015. 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 NO₂ at KT4

Site	Site Type	Annual Mean (µg/m³)	Period Mean (µg/m³)	Ratio
Kensington and Chelsea North Ken	Urban Background	31.7	30.2	1.05
London Greenwich Eltham	Suburban	18.6	19.1	0.97
Richmond Upon-Thames-Ntl Physical Lab	Background	19.1	18.7	1.02
			Average	1.01

Annualisation for NO₂ at KT3

Site	Site Type	Annual Mean (µg/m ³)	Period Mean (µg/m ³)	Ratio
KC1 Kensington and Chelsea North Ken	Urban Background	31.7	30.1	1.05
London Greenwich Eltham	Suburban	18.6	18.1	1.03
Richmond Upon-Thames-Ntl Physical Lab	Background	19.1	19.0	1.00
Average				1.03

Annualisation for PM10 at KT4

Site	Site Type	Annual Mean (µg/m ³)	Period Mean (µg/m ³)	Ratio
London N. Kensington	Urban Background	15.64	15.84	0.99
Westminster - Horseferry Road	Urban Background	16.84	20.18	0.83
Average				0.91

Annualisation for PM10 at KT3

Site	Site Type	Annual Mean (µg/m ³)	Period Mean (µg/m ³)	Ratio
London N. Kensington	Urban Background	15.64	17.31	0.99
Westminster - Horseferry Road	Urban Background	16.84	17.81	0.94
Average				0.97

Appendix B Full Monthly Diffusion Tube Results for 2015

Table N. NO₂ Diffusion Tube Results

Site ID	Site Name	Valid data capture for monitoring period % ^a	Valid data capture 2015 % ^b	Annual Mean NO ₂												Annual mean – raw data	Annual mean – bias adjusted
				Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec		
1	Guildhall Complex	100	100	36.38	43.22	33.74	29.53	30.08	16.52	18.62	20.85	31.66	31.66	28.42	22.60	28.61	25.17
2	Penrhyn Rd (Nr County Hall)	100	100	65.22	74.28	45.85	48.94	49.61	35.94	44.72	43.35	56.52	56.52	45.11	40.46	50.54	44.48
3	Portsmouth Road	100	100	45.90	54.32	63.12	36.80	28.67	23.86	32.24	31.94	40.26	40.26	40.02	41.11	39.87	35.09
4	Brighton Road	100	100	47.12	50.42	32.21	32.07	23.48	19.08	23.43	23.16	38.73	38.73	33.70	27.37	32.46	28.56
5	Victoria Rd/Brighton Rd	100	100	56.29	66.46	52.82	56.10	38.92	30.75	39.35	35.65	48.92	48.92	45.89	33.40	46.12	40.59
6	St. Mark's Hill/Ewell Rd	100	100	59.14	64.14	60.17	43.77	35.65	36.32	41.22	37.44	47.45	47.45	38.23	44.74	46.31	40.75
7	Victoria Rd (Surbiton Station)	100	100	73.35	77.68	71.57	65.43	45.78	50.76	47.34	40.06	54.37	54.37	46.05	53.99	56.73	49.92

Site ID	Site Name	Valid data capture for monitoring period % ^a	Valid data capture 2015 % ^b	Annual Mean NO ₂														Annual mean – raw data	Annual mean – bias adjusted
				Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec				
8	Upper Brighton Rd/Langley Rd	100	100	60.82	65.72	59.02	42.81	45.46	29.45	41.91	40.30	52.76	52.76	41.19	46.53	48.23	42.44		
9	Douglas Rd/Thornhill Rd	100	100	40.86	45.47	37.33	27.85	20.54	16.71	18.66	20.97	32.62	32.62	29.66	26.73	29.17	25.67		
10	Ewell Rd	100	100	61.23	79.02	72.27	55.07	51.10	36.48	46.79	45.10	54.97	54.97	48.06	57.79	55.24	48.61		
11	Elgar Rd	100	100	41.55	53.46	36.37	29.89	26.82	21.65	23.19	23.63	36.91	36.91	33.18	29.41	32.75	28.82		
12	Hook Rise N/Service Rd/Tolworth R'about	100	100	101.15	107.64	86.66	81.66	57.38	47.88	74.92	65.77	76.96	76.96	67.57	71.60	76.35	67.18		
13	Tolworth Roundabout	100	100	87.76	106.30	76.36	81.14	75.51	60.88	88.34	78.78	87.64	87.64	80.38	74.10	82.07	72.22		
14	Kingston Rd	100	100	81.43	107.27	85.89	67.35	49.11	46.04	65.67	54.38	85.88	85.88	64.76	57.28	70.91	62.40		
15	Kingston Rd/Old Kingston Rd	100	100	48.52	77.26	61.19	49.90	38.22	30.82	48.31	39.38	45.42	45.42	48.11	50.88	48.62	42.79		

Site ID	Site Name	Valid data capture for monitoring period % ^a	Valid data capture 2015 % ^b	Annual Mean NO ₂														Annual mean – raw data	Annual mean – bias adjusted
				Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec				
16	Hook Rd S/Hunters Rd	100	100	53.81	71.46	66.31	50.15	35.91	30.25	41.34	38.80	51.87	51.87	47.12	53.03	49.33	43.41		
17	Hook Rd (St Paul's Primary)	100	100	60.37	53.34	57.48	41.33	24.77	30.82	37.72	36.77	46.41	46.41	43.60	41.66	43.39	38.18		
18	Hook Centre	100	100	73.67	82.75	68.62	50.47	42.96	40.09	52.52	48.18	49.52	49.52	53.92	49.65	55.16	48.54		
19	Garrison Ln/Reynolds Ave	100	100	38.09	54.01	42.12	30.28	25.47	16.52	23.18	20.88	34.17	34.17	28.77	26.45	31.18	27.44		
20	Malden Rushett crossroads	100	100	51.38	54.74	52.36	38.27	34.70	28.67	38.59	36.99	44.60	44.60	37.48	40.72	41.92	36.89		
21	Leatherhead Rd/Harrow Cl	100	100	58.87	67.72	50.13	32.64	39.12	29.17	38.33	36.20	43.76	43.76	39.84	37.88	43.12	37.94		
22	Hook Rise N/Rec. Centre	100	100	91.99	86.01	74.12	44.92	32.43	35.71	55.73	54.93	54.57	54.57	59.17	72.67	59.73	52.57		
23	Fife Rd area	100	100	46.42	56.56	49.86	48.51	53.96	25.79	25.68	27.69	43.29	43.29	32.24	30.83	40.34	35.50		
24	Cromwell Rd	100	100	136.53	138.35	135.90	75.16	102.90	83.88	97.64	93.17	110.18	110.18	94.82	102.66	106.78	93.97		

Site ID	Site Name	Valid data capture for monitoring period % ^a	Valid data capture 2015 % ^b	Annual Mean NO ₂														Annual mean – raw data	Annual mean – bias adjusted
				Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec				
25	Queen Elizabeth Rd/London Rd	100	100	64.18	78.03	63.44	50.94	49.93	35.02	42.39	47.21	52.23	52.23	47.01	48.70	52.61	46.30		
26	Richmond Rd/King's Rd	100	100	45.96	68.03	52.61	24.92	29.12	26.93	34.10	31.82	41.60	41.60	40.59	34.41	39.31	34.59		
27	Richmond Rd/Horsley Drive	100	100	49.33	64.12	54.08	35.91	30.21	27.19	31.03	31.26	41.22	41.22	38.09	34.60	39.86	35.07		
28	Kingston Hill/Wolverton Ave	100	100	90.94	94.99	92.41	42.43	57.11	38.78	56.86	60.64	61.24	61.24	59.34	66.43	65.20	57.38		
29	Kingston Vale nr Robin Hood Lane	100	100	39.47	63.45	60.10	54.12	39.50	33.58	36.24	32.92	46.80	46.80	37.47	43.91	44.53	39.19		
30	Coombe Hill School	100	100	60.42	63.64	60.55	46.83	36.74	39.29	26.22	35.33	47.23	47.23	42.11	48.78	46.20	40.65		
31	Malden Rd Nr A3	100	100	67.79	81.08	62.91	43.00	40.78	39.36	45.24	42.98	49.03	49.03	49.74	45.75	51.39	45.22		
32	South Lane south of A3	100	100	40.10	50.59	28.11	27.22	24.19	15.80	18.39	20.07	28.01	28.01	27.24	26.48	27.85	24.51		

Site ID	Site Name	Valid data capture for monitoring period % ^a	Valid data capture 2015 % ^b	Annual Mean NO ₂														Annual mean – raw data	Annual mean – bias adjusted
				Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec				
33	Burlington Road	100	100	68.72	68.27	55.87	36.73	39.37	30.89	46.70	41.29	45.09	45.09	47.66	45.47	47.60	41.88		
34	New Malden High St	100	100	54.21	67.18	54.27	27.28	37.58	27.46	33.93	36.82	1.80	1.80	40.43	39.31	35.17	30.95		
35	Clarence Ave	100	100	52.18	50.95	45.89	32.96	26.63	21.23	27.04	27.71	36.62	36.62	33.18	33.50	35.38	31.13		
36	Coombe Lane West	100	100	65.12	58.09	53.25	46.89	39.25	34.48	33.77	34.06	43.71	43.71	39.52	41.10	44.41	39.08		
37	Elm Rd	100	100	44.63	50.77	40.26	27.02	24.13	17.12	21.79	22.13	31.49	31.49	30.58	27.68	30.76	27.07		
38	Kingston Rd by Carpet Right	100	100	49.05	34.60	53.20	40.25	28.81	25.14	28.14	32.99	36.86	36.86	35.06	27.59	35.71	31.43		
39	Cambridge Rd/Gloucester Rd	100	100	70.06	76.19	67.46	56.99	52.06	36.59	46.89	48.26	64.61	64.61	49.72	46.26	56.64	49.85		
40	Cambridge Rd/Hawks Rd	100	100	72.03	60.94	57.94	51.87	52.26	29.73	42.35	46.44	46.79	46.79	41.69	48.34	49.76	43.79		

Exceedance of the NO₂ 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%