

London Borough of Wandsworth

Air Quality Annual Status Report for 2020

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This report provides a detailed overview of air quality in the London Borough of Wandsworth during 2020. It has been produced to meet the requirements of the London Local Air Quality Management (LLAQM) statutory process¹.

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¹ LLAQM Policy and Technical Guidance 2019 (LLAQM.TG(19))

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Abbreviations

Abbreviation	Description
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQO	Air Quality Objective
BEB	Buildings Emission Benchmark
CAB	Cleaner Air Borough
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
NO ₂	Nitrogen Dioxide

Table A. Summary of National Air Quality Standards and Objectives

Pollutant	Standard / 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
Nitrogen dioxide (NO ₂)	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
Particles (PM ₁₀)	40 µg m ⁻³	Annual mean	31 Dec 2004
Particles (PM _{2.5})	25 µg m ⁻³	Annual mean	2020
Particles (PM _{2.5})	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
Sulphur dioxide (SO ₂)	350 µg m ⁻³ not to be exceeded more than 24 times a year	1-hour mean	31 Dec 2004
Sulphur dioxide (SO ₂)	125 µg m ⁻³ not to be exceeded more than 3 times a year	24-hour mean	31 Dec 2004

Notes:

(1) Date by which to be achieved by and maintained thereafter

1. Air Quality Monitoring

The latest monitoring results for 2020 confirm that air pollution in the London Borough of Wandsworth still exceeds the Government Air Quality objectives, and therefore there is still a need for Wandsworth to be designated as an AQMA and to pursue improvements in air quality. In 2020 Wandsworth operated seven automatic air quality monitoring sites and a diffusion tube network covering 42 locations around the borough.

All data from the automatic monitoring analysers undergoes quality assurance and quality control (QA/QC) procedures to ensure that the data is of a high quality. The standards of QA/QC at the London Air Quality Network (LAQN) sites are similar to those of the

government's national Automatic Urban and Rural Network (AURN) sites. All data has traceability to national standards and operational procedures are defined for the London Air Quality Network (LAQN). For quality assurance purposes, all continuous analysers are manually checked and calibrated every two weeks, serviced every six months and audited by an independent auditor (National Physical Laboratory) every six months. With data ratification being undertaken by Environmental Research Group – Imperial College London (ERG).

Wandsworth Council also undertakes non-automatic monitoring of nitrogen dioxide (NO₂) using diffusion tubes (Figure 1), this provides a comprehensive coverage of all hotspots including most main roads and town centres throughout the borough. All sites are kept under constant review and a few will be amended or moved, often in response to requests for more relevant monitoring during the year. Diffusion tubes offer a relatively inexpensive means of gauging NO₂ concentrations at a number of locations across the borough. The results provide monthly NO₂ averages and can be used to compare measured concentrations with the annual mean NO₂ objective following annualisation. The accuracy of diffusion tube data is improved by comparing results with automatic monitoring data and a bias adjusted applied based on calculation of a national bias adjustment factor.

1.1 Locations

Table B. Details of Automatic Monitoring Sites for 2020

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
WA2	Wandsworth Town Hall	525779	174662	Urban background	Y	22	22	4.85	NO ₂ , O ₃	Chemiluminescent
WA7	Putney High Street	524035	175334	Kerbside	Y	1	0.5	1.75	NO ₂ , PM ₁₀	Chemiluminescent; TEOM
WA8	Putney High Street facade	524032	175335	Roadside	Y	1	1	4.85	NO ₂	Chemiluminescent
WA9	Felsham Road, Putney	524044	175495	Urban background	Y	4.8m from Felsham road	1	2.75	NO ₂ , PM ₁₀	Chemiluminescent; TEOM
WAA	Thessaly Road, Battersea	529137	177249	Roadside	Y	7.5m from Battersea Park road kerb	1	1.75	NO ₂ , PM ₁₀	Chemiluminescent; TEOM
WAB	Tooting High Street	527567	171628	Roadside	Y	2	2	1.75	NO ₂ , PM ₁₀	Chemiluminescent; TEOM
WAC	Lavender Hill, Clapham Junction	527430	175454	Roadside	Y	8m from Lavender Hill kerb	1	1.75	NO ₂ , PM ₁₀	Chemiluminescent; TEOM

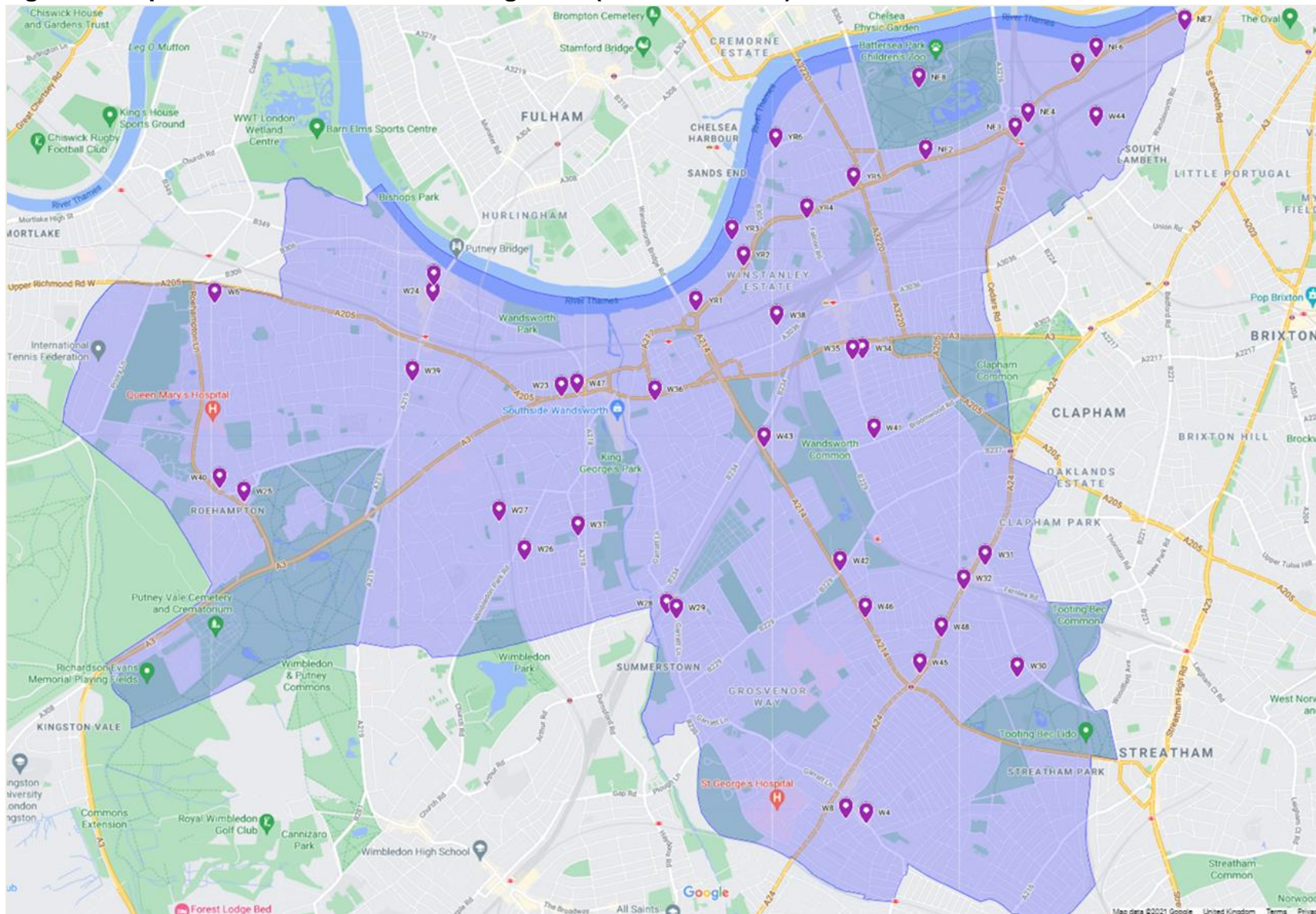
Table C. Details of Non-Automatic Monitoring Sites for 2020

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)
Across borough										
W23	37 West Hill , Wandsworth Town	525111	174619	Roadside	Y	2.20	3.02	2.52	NO ₂	No
W24	Putney sign (Mac Donald's), Putney	524045	175366	Roadside	Y	2.35	2.35	2.3	NO ₂	N
W21 W22	Felsham Road tube 1 & tube 2 , Putney	524044	175495	Urban Background	Y	4.8	1	3.35	NO ₂	Y
W6	21 Daylesford Avenue , Putney	522270	175307	Urban Background	Y	11	2.4	2.85	NO ₂	N
W25	Roehampton Church School (Roehampton Ln)	522542	173700	Roadside	Y	0.86	0.53	2.25	NO ₂	N
W26	Replingham Road (corner of Heythrope street), Southfield	524847	173282	Kerbside	Y	2.54	0.62	2.37	NO ₂	N
W27	68-70 Sutherland Grove (opposite St. Cecilia's school), Southfield	524633	173594	Urban Background	Y	2.00	0.65	2.83	NO ₂	N
W28	61 Summerley Street , Earlsfield	526011	172869	Urban background	Y	2.06	0.60	2.36	NO ₂	N
W29	Junction Skelbrook Street / Garratt Lane , Earlsfield	526099	172833	Roadside	Y	0.70	3.29	2.27	NO ₂	N
W4	108 Mitcham Road , Tooting Broadway	527688	171204	Kerbside	Y	3	0.6	2.65	NO ₂	N
W8	50 Bickely Street , Tooting Broadway	527524	171239	Urban Background	Y	2.97	1.85	2.8	NO ₂	N
W30	11B Elmbourne Road , Balham	528900	172431	Urban Background	Y	4.50	0.50	2.56	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)
W31	Junction Hildreth Street / Bedford Hill, Balham	528607	173333	Kerbside	Y	1.44	3.64	2.21	NO ₂	N
W32	2-3 Balham High Road, Balham	528436	173133	Kerbside	Y	4.40	0.71	2.30	NO ₂	N
W34	46 Shelgate Road, Northcote	527569	174986	Urban Background	Y	2.14	0.40	2.38	NO ₂	N
W35	47 Northcote Road, Northcote	527487	174981	Kerbside	Y	4.21	0.49	2.37	NO ₂	N
W36	St. Anne's Hill, Fairfield	525875	174616	Urban Background	Y	2.73	0.89	2.38	NO ₂	N
W37	302A Merton Rd, Southfields	525278	173483	Roadside	Y	3.35	3.35	2.33	NO ₂	N
W38	High View School, Plough Terrace, Fairfield	526863	175239	Kerbside	Y	0.45	0.45	2.42	NO ₂	N
Nine Elm										
NE2	Chesterton School, Latchmere	528043	176618	Roadside	Y	2.85	2.85	2.20	NO ₂	N
NE3	Queenstown Road, Queenstown	528771	176819	Kerbside	Y	1.05	1.05	2.30	NO ₂	N
NE4	Lockington Road, Battersea	528871	176943	Urban Background	Y	1.22	0.69	2.37	NO ₂	N
NE5	Kirtling Street, Queenstown	529265	177353	Kerbside	Y	0.50	0.50	2.35	NO ₂	N
NE6	Nine Elms Lane, Queenstown	529413	177486	Kerbside	Y	0.53	0.53	2.40	NO ₂	N
NE7	1 Nine Elms, Parry Street, Queenstown	530129	177727	Roadside	Y	0.5	0.5	2.35	NO ₂	N
NE8	Battersea park, Queenstown	528023	177176	Urban Background	Y	420	420	2.37	NO ₂	N
York Road										

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)
YR1	Trafalgar House, St Mary's Park	526201	175340	Kerbside	Y	0.84	0.84	2.30	NO ₂	N
YR2	Royal Academy of Dance, St Mary's Park	526581	175731	Kerbside	Y	0.70	0.70	2.26	NO ₂	N
YR3	Cotton Row, St Mary's Park	526480	175930	Urban background	Y	160m from York road	160m from York road	2.34	NO ₂	N
YR4	York road, corner with Falcon Road, Latchmere	527086	176119	Kerbside	Y	0.75	0.75	2.25	NO ₂	N
YR5	256 Battersea Park Road	527109	176022	Kerbside	Y	0.63	0.63	2.32	NO ₂	N
YR6	31-32 Battersea Square	526817	176686	Kerbside	Y	0.44	0.44	2.35	NO ₂	N
New Locations since January 2020										
W39	Carlton Dr/ Putney Hill Putney, SW15 6BQ	523898	174717	Kerbside	Y	18	0.5	2.2	NO ₂	N
W40	Roehampton High St. Roehampton, SW15 4HL	522343	173805	Kerbside	Y	13	0.5	2.2	NO ₂	N
W41	Northcote Rd/Broomwood Rd Battersea, SW11 6RE	527675	174339	Kerbside	Y	2	0.7	2.2	NO ₂	N
W42	Bellevue Rd/ Trinity Rd Bellevue Rd, SW17 7E0	527426	173249	Roadside	Y	10	1.1	2.2	NO ₂	N
W43	Trinity Rd Fitzhugh Grove SW18 3SA	526783	174250	Roadside	Y	18	2	2.2	NO ₂	N
W44	Thessaly Rd Marsh House SW8 4JJ	529425	176920	Roadside	Y	26	1.5	2.2	NO ₂	N
W45	A24 Wimbledon Sewing Machines SW17 7BA	528096	172439	Roadside	Y	21	2.5	2.2	NO ₂	N
W46	Trinity Rd SW17 7HL	527639	172882	Kerbside	Y	11	0.8	2.2	NO ₂	N
W47	West Hill Wandsworth, SW18 1RB	525243	174643	Kerbside	Y	5	0.7	2.2	NO ₂	N
W48	Balham High Rd Balham, SW17 7BS	528263	172735	Kerbside	Y	22	0.5	2.2	NO ₂	N

Figure 1. Map of Non-Automatic Monitoring Sites (Diffusion tubes).



1.2 Comparison of Monitoring Results with AQOs

The results presented are after bias adjustment using the national bias adjustment factor (refer to Appendix A2 for details). Annualisation was not required at any site in the main Wandsworth diffusion network in 2020, as all sites achieved a data capture rate of 75% or higher. Where the annual mean is 10% of, or above, the $40\mu\text{g m}^{-3}$ AQO relevant exposure has been calculated, refer to Table N, Appendix A for corrected data. All data presented in Table D has not been corrected for distance and represent a worst case picture.

Table D. Annual Mean NO₂ Ratified and Bias-adjusted Monitoring Results

Site ID	Site type	Valid data capture for monitoring period % ^a	Valid data capture 2020 % ^b	Annual Mean Concentration ($\mu\text{g m}^{-3}$)						
				2014 ^c	2015 ^c	2016 ^c	2017 ^c	2018 ^c	2019 ^c	2020 ^c
WA2 (Wandsworth Town Hall)	Automatic	100	99	43	36	43	40	38	41	30
WA7 (Putney High Street)	Automatic	100	97	123	123	124	76	68	69	58
WA8 (Putney High Street first floor)	Automatic	100	87	95	96	110	60	62	66	53
WA9 (Felsham Road)	Automatic	100	94	41	40	45	31	35	35	26
WAA (Thessaly Road, Battersea)	Automatic	100	97	47	40	40	33	33 ^c	32	27
WAB (Tooting High Street)	Automatic	100	72	not open	60	59	55	53	50	35 ^c
WAC (Lavender Hill Clapham Junction)	Automatic	100	96	not open	not open	46	43	42	37 ^c	31
W23 (37 West Hill)	Diffusion tube	100	92	not open	not open	not open	57	55	49	39

Site ID	Site type	Valid data capture for monitoring period % ^a	Valid data capture 2020 % ^b	Annual Mean Concentration ($\mu\text{g m}^{-3}$)						
				2014 ^c	2015 ^c	2016 ^c	2017 ^c	2018 ^c	2019 ^c	2020 ^c
W24 (Putney Sign Mac Donald's)	Diffusion tube	100	100	not open	not open	not open	63	55	59	49
W21 & W22 (Felsham road, tube 1 & 2)	Diffusion tube	100	92	40	35	41	28	32	30	23
W6 (21 Daylesford Avenue)	Diffusion tube	100	92	26	24	28	23	23	23 ^c	16
W25 (Roehampton Church School)	Diffusion tube	100	92	not open	not open	not open	32	29	27	20
W26 (Replingham Road)	Diffusion tube	100	92	not open	not open	not open	31	30	31 ^c	21
W27 (68-70 Sutherland Grove)	Diffusion tube	100	92	not open	not open	not open	24	25	23	16
W28 (61 Summerley street)	Diffusion tube	100	75	not open	not open	not open	27	28	27	20
W29 (Junction Skelbrook St./Garratt L)	Diffusion tube	100	100	not open	not open	not open	31	32	31	21
W4 (108 Mitcham road)	Diffusion tube	100	92	96	79	80	66	64	62	51
W8 (50 Bickely street)	Diffusion tube	100	100	36	33	35	31	31	28	22
W30 (11B Elmbourne road)	Diffusion tube	100	75	not open	not open	not open	33	31	29	21
W31 (Junction Hildreth St./Bedford Hill)	Diffusion tube	100	100	not open	not open	not open	39	39	36	26
W32 (2-3 Balham High road)	Diffusion tube	100	83	not open	not open	not open	46	44	39	31
W34 (46 Shelgate road)	Diffusion tube	100	92	not open	not open	not open	31	30	31	21
W35 (47 Northcote road)	Diffusion tube	100	100	not open	not open	not open	34	35	32	24
W36 (St Anne's Hill)	Diffusion tube	100	100	not open	not open	not open	39	33	31	23

Site ID	Site type	Valid data capture for monitoring period % ^a	Valid data capture 2020 % ^b	Annual Mean Concentration ($\mu\text{g m}^{-3}$)						
				2014 ^c	2015 ^c	2016 ^c	2017 ^c	2018 ^c	2019 ^c	2020 ^c
W37 (302A Merton Rd)	Diffusion tube	100	100	not open	not open	not open	not open	37	37	27
W38 (High View School)	Diffusion tube	100	92	not open	not open	not open	not open	32	29	22
NE2 (Chesterton School)	Diffusion tube	100	75	not open	not open	not open	not open	35	34	24
NE3 (Queenstown Road)	Diffusion tube	100	100	not open	not open	not open	not open	<u>63</u>	59	42
NE4 (Lockington Road)	Diffusion tube	100	100	not open	not open	not open	36	34	31	24
NE5 (Kirtling Street)	Diffusion tube	100	83	not open	not open	not open	not open	46	39	29
NE6 (Nine Elms Lane)	Diffusion tube	100	100	not open	not open	not open	not open	54	48	40
NE7 (1 Nine Elms, Parry)	Diffusion tube	100	100	not open	not open	not open	not open	49	47	34
NE8 (Battersea park)	Diffusion tube	100	100	not open	not open	not open	not open	24 ^c	20	15
YR1 (Trafalgar House)	Diffusion tube	100	100	not open	not open	not open	not open	53	44	34
YR2 (Royal Academy of Dance)	Diffusion tube	100	83	not open	not open	not open	not open	75	57	37
YR3 (Cotton Row)	Diffusion tube	100	83	not open	not open	not open	not open	31	29	24
YR4 (York road, corner with Falcon Road)	Diffusion tube	100	100	not open	not open	not open	not open	49	49	38
YR5 (256 Battersea Park Road)	Diffusion tube	100	100	not open	not open	not open	not open	<u>73</u>	<u>70</u>	52
YR6 (31-32 Battersea Square)	Diffusion tube	100	92	not open	not open	not open	not open	44	43	32
W39 Carlton Dr/ Putney Hill (Putney, SW15 6BQ)	Diffusion tube	100	100	not open	not open	not open	not open	not open	not open	29

Site ID	Site type	Valid data capture for monitoring period % ^a	Valid data capture 2020 % ^b	Annual Mean Concentration ($\mu\text{g m}^{-3}$)						
				2014 ^c	2015 ^c	2016 ^c	2017 ^c	2018 ^c	2019 ^c	2020 ^c
W40 Roehampton High St. (Roehampton, SW15 4HL)	Diffusion tube	100	83	not open	not open	not open	not open	not open	not open	25
W41 Northcote /Broomwood Rd (Battersea, SW11 6RE)	Diffusion tube	100	100	not open	not open	not open	not open	not open	not open	25
W42 Bellevue Rd/ Trinity Rd (Bellevue Rd, SW17 7E0)	Diffusion tube	100	100	not open	not open	not open	not open	not open	not open	48
W43 Trinity Rd (Fitzhugh Grove SW18 3SA)	Diffusion tube	100	100	not open	not open	not open	not open	not open	not open	28
W44 Thessaly Rd (Marsh House SW8 4JJ)	Diffusion tube	100	92	not open	not open	not open	not open	not open	not open	21
W45 A24 Wimbledon (Sewing Machines SW17 7BA)	Diffusion tube	100	100	not open	not open	not open	not open	not open	not open	31
W46 Trinity Rd (SW17 7HL)	Diffusion tube	100	75	not open	not open	not open	not open	not open	not open	38
W47 West Hill (Wandsworth, SW18 1RB)	Diffusion tube	100	92	not open	not open	not open	not open	not open	not open	58
W48 Balham High Rd (Balham, SW17 7BS)	Diffusion tube	100	100	not open	not open	not open	not open	not open	not open	27

Notes:

Exceedance of the NO₂ annual mean AQO of 40 $\mu\text{g m}^{-3}$ are shown in bold (orange). The NO₂ annual mean in excess of 60 $\mu\text{g m}^{-3}$ (in red), indicating a potential exceedance of the NO₂ hourly mean AQS objective are shown in bold and underlined. Means for diffusion tubes have been corrected for bias.

(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) All means have been “annualised” in accordance with LLAQM Technical Guidance if valid data capture for the calendar year is less than 75% and greater than 33%.

Figure 2: Map of NO₂ diffusion tubes monitoring sites in the London borough of Wandsworth showing annual mean results from 2020.

Legend

On this map, the squares represent NO₂ diffusion tubes and ID. The annual mean objective NO₂ is 40µg m⁻³. All monitoring sites that recorded NO₂ 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)

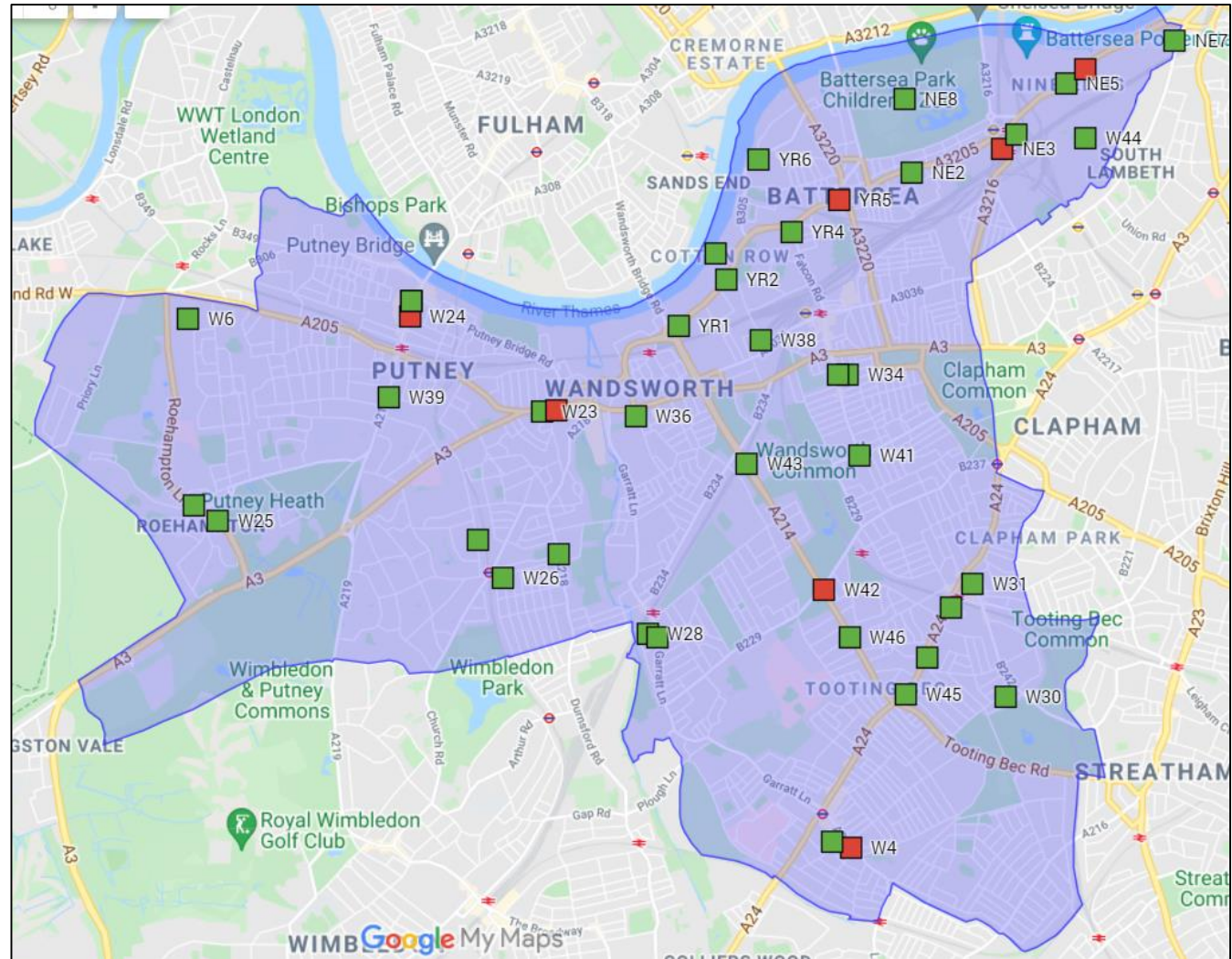


Table D shows the NO₂ diffusion tube monitoring results, with bias corrected values for each year from 2014 to 2020 (Note – see Table O for the uncorrected monthly data for 2020).

The results in bold and coloured coded in orange indicate an exceedance of the annual mean Air Quality Objective (AQO) of 40 µg m⁻³ and the results underlined and coloured coded in red indicate an NO₂ annual mean in excess of 60 µg m⁻³ highlighting a potential exceedance of the NO₂ hourly mean Air Quality Objective.

All data from the automatic monitoring stations have been fully ratified. Data capture rate of at least 75% was achieved at all nitrogen dioxide diffusion tube sites and automatic monitoring stations in 2020 except for:

- WAB (Tooting High Street) automatic monitoring station: 72% annual data capture rate.

Consequently, it has been necessary to annualise the result of this site in accordance with the procedure described in LAQM TG (19). A nationally derived bias adjustment factor of 0.82 was used for all diffusion tubes data. Bias Corrected (0.82) as per diffusion Tube Bias Factor 03/21 (see Table L for details).

The distance correction calculations for diffusion tubes are presented in Appendix C, Table N. Nitrogen dioxide concentration reduces rapidly with distance from the kerbside, the data in Table N shows what effect distance has on a roadside/kerbside measurement.

By correcting for distance 20% more sites are predicted to achieve compliance at the nearest sensitive receptor, that is the NO₂ concentration is predicted to be below the AQO of 40 µg m⁻³ at the façade of the nearest residential property.

Automatic Monitoring Site data

Annual mean NO₂ concentrations measured at all the automatic monitoring stations have constantly decreased since 2016, and more generally over the 7-year period (2014-2020) for which data have been reported.

A progressive NO₂ reduction has been recorded since 2016 at the automatic monitoring stations of WAB (Tooting High Street), WAC (Lavender Hill, Clapham Junction) and WA9 (Felsham Road, Putney). In 2020 for the first time WAB (Tooting High Street) has met the annual mean objective of 40 µg m⁻³.

In Putney High Street (at both WA7 and WA8 automatic monitoring stations) significant reductions were evident since 2019, however the automatics monitoring stations have still recorded data above the annual mean objective of 40 µg m⁻³.

At WA2 (Wandsworth Town Hall) and WAA (Thessaly Road, Battersea) significant reductions were recorded in 2020, below the national objectives. The automatic monitoring station data are further described in Figure 3. The red line indicates the Air Quality objective limit of 40 µg m⁻³.

Table E provides the results from the automatic monitoring stations for NO₂ for the 1-hour mean objective of 200 µg m⁻³. In 2020, for the first time the hourly objective was met at all sites, in contrast with 2019 where this standard was exceeded at WA8 Putney High Street first floor.

However, all results for 2020 need to be treated with caution due to the COVID-19 pandemic which affected traffic patterns and in turn pollution levels.

Diffusion Tube Data Analysis

The diffusion tube locations network was reviewed at the beginning of 2017 with the introduction of new locations. Some monitoring locations were removed having undertaken sufficient monitoring to establish a long-term trend. In 2018, diffusion tubes along York Road and the Nine Elms areas were added. Diffusion tube locations were reviewed at the end of 2019, and new 10 locations were included. In 2020 the diffusion tube network consisted of 42 monitoring locations across Wandsworth.

The data capture for 2020 for all sites was very good (93.5%). No site recorded a data capture of less than 75%, so annualising in line with DEFRA guidance, TG (19) was not required.

The results in bold (orange/red) indicate an exceedance of the annual mean objective of $40 \mu\text{g m}^{-3}$ and the results in bold and underlined (red) indicate NO_2 annual means in excess of $60 \mu\text{g m}^{-3}$ indicating a potential exceedance of the NO_2 hourly mean AQS objective.

The results from the 2020 monitoring (Table D) show that the objective of $40 \mu\text{g m}^{-3}$ was exceeded at 7 which is 17% of the monitoring sites. This is quite a significant reduction from the 11 sites exceeding in 2019.

The $40 \mu\text{g m}^{-3}$ annual mean objective was exceeded at:

- **W24** -Putney High Street $49 \mu\text{g m}^{-3}$
- **W4** -Mitcham road $51 \mu\text{g m}^{-3}$
- **NE3** - Queenstown Road $42 \mu\text{g m}^{-3}$
- **NE6** -Nine Elms Lane $40 \mu\text{g m}^{-3}$
- **YR5** -Battersea Park Road, $52 \mu\text{g m}^{-3}$
- **W42** -Bellevue Rd/Trinity Rd $48 \mu\text{g m}^{-3}$
- **W47** -West Hill $58 \mu\text{g m}^{-3}$

After distance correction for nearest façade, the annual mean objective is exceeded at 5 sites, down from 11 in 2019. None exceed the annual mean concentration of $60 \mu\text{g m}^{-3}$, which as advised, indicates that the 1 hour-mean objective may also have been exceeded.

All sites, have recorded a reduction of nitrogen dioxide concentrations. This is exceptionally good news and is the most significant percentage decrease we have seen in the last 7 years. However, all results in 2020 need to be treated with caution due to the COVID-19 pandemic which affected traffic patterns and in turn pollution levels.

For the first time, none of these sites exceeded an annual mean of $60 \mu\text{g m}^{-3}$ which indicates that the 1 hour-mean objective may also have been exceeded. In 2019 sites at Mitcham Road (Site ID: W4) and Battersea Park Road (Site ID: YR5) were among the two sites exceeding an annual mean of $60 \mu\text{g m}^{-3}$, concentrations fell below this threshold in 2020 indicating that an exceedance of the 1 hour-mean objective was unlikely to have occurred at these locations.

However, as we are all aware, 2020, was far from a normal year. Whilst reductions are welcomed they may be short lived. All reductions in monitored 2020 NO_2 results must be viewed in light of lockdowns during the COVID-19 pandemic and resultant effects on traffic fleet, volume and mix. If there is any upside to the COVID-19 pandemic, it must be the significant reduction in measured NO_2 , which seems to apply to Wandsworth, London and the UK. This is good news. We now need to try and retain gains made. It follows on from the most significant percentage decrease in the last 20 years.

The source of pollution in town centres remains road traffic and construction sites, it is essential that bold measures are taken to remove the dirtiest vehicles and reduce vehicle numbers to relieve congestion. The borough Air Quality Action Plan outlines a range of measures that are being undertaken to reduce transport based emissions, progress updates for 2020 are provided in Table H.

Between 2017 and 2020, the majority of the existing diffusion tube locations have showed a reduction in the annual mean NO₂ concentrations. The diffusion tubes exceeded the annual mean NO₂ air quality objective (40 µg m⁻³) at busy roadside locations, but met the objective at all urban background locations and at other less busy roadside locations.

The overall monitoring results for the Borough show that NO₂ concentrations exceeded the UK annual mean objective (as it has done for each year since 2005), and improvements are still required. As the greatest exceedences occur in town centres and along arterial routes through the borough Clean Air Zones supported by other transport related measures such as lobbying TfL for cleaner buses quicker, and encouraging behaviour change of drivers towards more sustainable and lower emission vehicles is key in tackling air pollution.

The main decreases in 2020 are borough wide, on most main roads in Wandsworth together with town centres. This follows on from decreases in most town centres annually from 2016. Contributory factors are likely to be COVID19. An upward trend in levels of NO₂ in 2021 is looking likely although it is still too early to be absolutely sure.

There has been strong encouragement for modal shift to more sustainable forms of transport in Wandsworth throughout 2020 – both through air quality initiatives and the declaration of the Climate Change emergency and Climate Change/Air Quality summits in 2020. Post COVID-19, re-assignment of street space in favour of walking and cycling is being prioritised. This could be the real game changer, reducing the number of vehicles on the road as well as cleaning up the fleet.

The overall monitoring results for the Borough therefore show that NO₂ concentrations still exceeded the UK annual mean objective (as it has done for each year since 2002).

Figure 3. Trends in Annual Mean Nitrogen Dioxide Concentrations (NO₂) measured at the automatic monitoring stations (µg m⁻³)

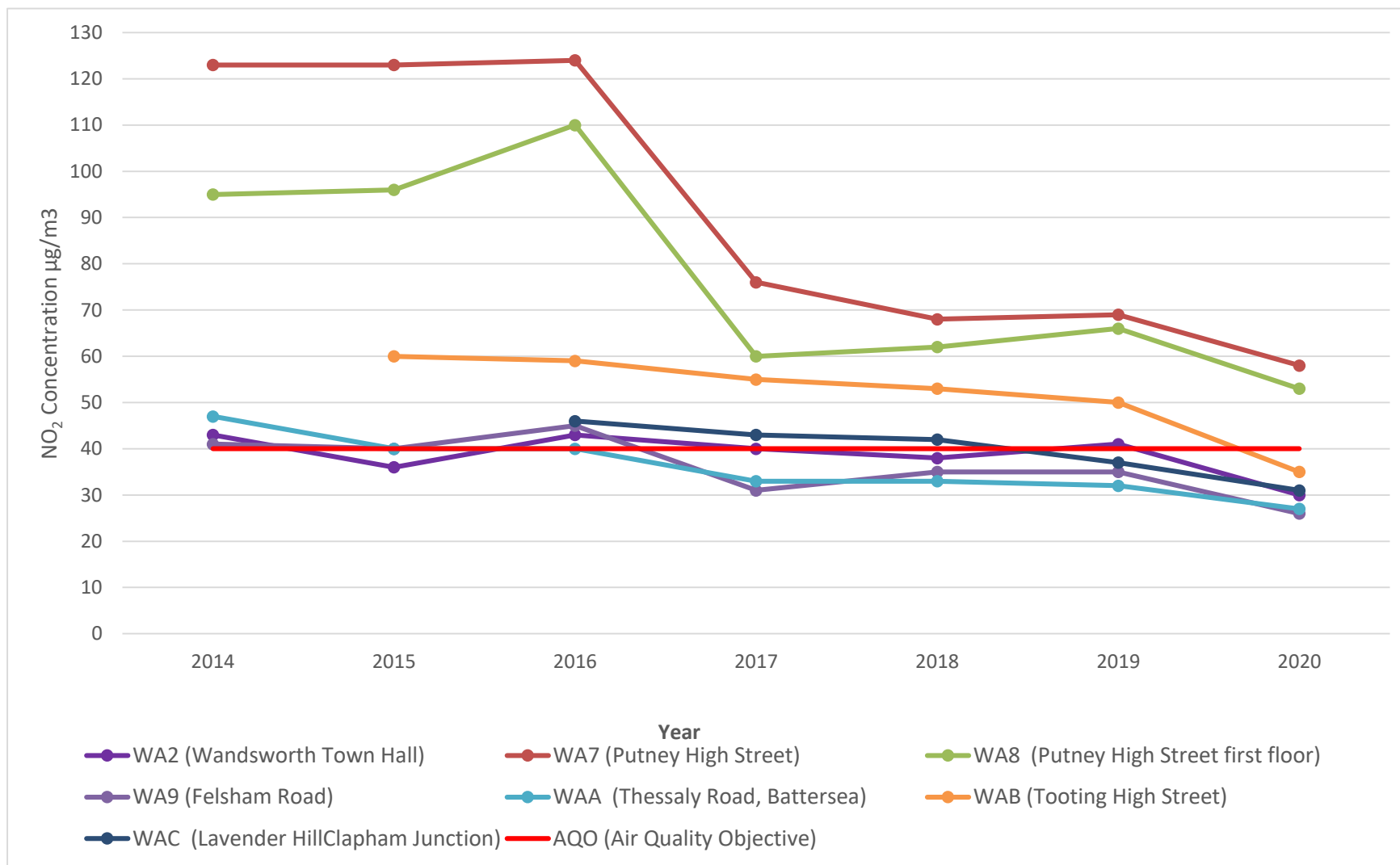


Figure 4. Long trends in Annual Mean Nitrogen Dioxide Concentrations (NO₂) measured with Diffusion Tubes (µg m⁻³)

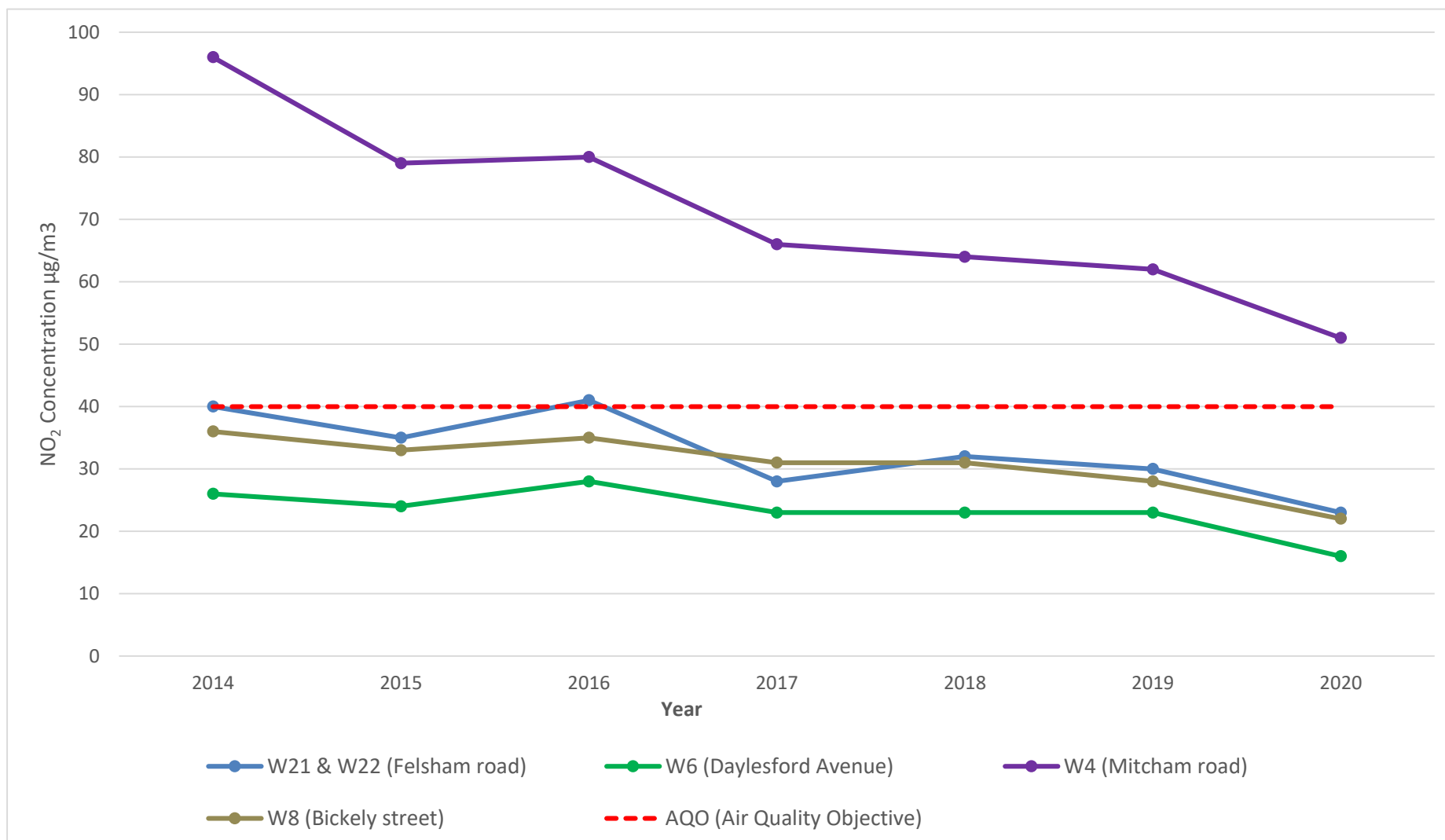


Table E. NO₂ Automatic Monitoring Results: Comparison with 1-hour Mean Objective, Number of 1-Hour Means > 200 µg m⁻³

Site ID	Valid data capture for monitoring period % ^a	Valid data capture 2020 % ^b	Number of Hourly Means > 200 µg m ⁻³							
			2014 ^c	2015 ^c	2016 ^c	2017 ^c	2018 ^c	2019 ^c	2020 ^c	
WA2 Wandsworth Town Hall	100	99	0 (124.4)	0 (108.1)	0	0	0	0	0	0
WA7 Putney High Street	100	97	1537	1443	1248	76 (247)	26	11	4	4
WA8 Putney High Street first floor	100	87	505	329	403	9	5	19	1	1
WA9 Felsham Road; Putney	100	94	0 (132.7)	0 (104)	45	7 (179)	0	0	0	0
WAA Thessaly Road, Battersea	100	97	1	0 (113.6)	1	0 (98)	0 (0.97)	0	8	8
WAB Tooting High Street	100	72	not open	9	2	0	2	3	0 (104)	0 (104)
WAC Lavender Hill - Clapham Junction	100	96	not open	not open	23	0	0	0	0	0

Notes:

Results are presented as the number of 1-hour periods where concentrations greater than 200 µg m⁻³ have been recorded.

Exceedance of the NO₂ short term AQO of 200 µg m⁻³ over the permitted 18 hours per year are shown in **bold**.

If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

(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%)

All data from the automatic monitoring stations have been fully ratified. All data capture at all monitoring stations are in excess of 75% at all monitoring stations, except at the WAB (Tooting High Street) site, where the data capture rate was 72%.

Exceedances of the hourly mean objective limit were observed at three automatic monitoring stations, but the number of exceedances were less than 18 of the $200 \mu\text{g m}^{-3}$ permitted hours per year. The air quality objective was met at all seven air quality sites for the first time.

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

Site ID	Valid data capture for monitoring period % ^a	Valid data capture 2020% ^b	Annual Mean Concentration (µg m ⁻³)						
			2014 ^c	2015 ^c	2016 ^c	2017 ^c	2018 ^c	2019 ^c	2020 ^c
WA7 Putney High Street	100	94	24	25	21	21	25	22	19
WA9 Felsham Road	100	96	20	18	18	17	17	18	16
WAA Thessaly Road	100	99	28	27	32	27	25	23	25
WAB Tooting High Street	100	89	N/A	25	24	23	23	23	21
WAC Lavender Hill - Clapham Junction	100	90	N/A	N/A	18	20	21	20 ^c	19

Notes

The annual mean concentrations are presented as µg m⁻³.

Exceedances of the PM₁₀ annual mean AQO of 40 µg m⁻³ are shown in **bold**.

All means have been “annualised” in accordance with LLAQM Technical Guidance, if valid data capture is less than 75% and more than 33%.

(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%).

PROVISIONAL DATA: The 2020 data downloaded on the 15 May 2019 were provisional and not been fully ratified but any further changes are likely to be minor. This was due to COVID-19 related delays at Imperial College London. Data will be ratified shortly but not in time to be included in this report. Ratified PM₁₀ data will be reported for these sites in the 2022 Annual Status Report.

Data capture rates for all five sites (both automatic monitoring stations and diffusion tubes) were well above 75%.

Since 2014, the annual mean objective for PM₁₀ have been met at all monitoring stations. However, the measured concentrations at Thessaly Road (WAA) and Tooting High Street (WAB) exceed the recommended World Health Organisation (WHO) guideline of 20 µgm⁻³.

PM₁₀ is proving very difficult to reduce further. Over the 7 year period from 2014 – 2020 it has gone up and down slightly one year to the next but a slight downward trend overall has been achieved. This is encouraging, however we cannot get complacent and it is essential to continue monitoring the trends.

It is particularly significant to note that no decline was recorded at Thessaly Road (WAA) site in 2020, despite reduced traffic due to COVID-19. In March 2020 work began on the Southern footway of Battersea Park Road to improve public realm and install TfL's Cycle Superhighway. The works involved cutting and there were non-road mobile machinery in close proximity to the air quality monitor station. Investigations and site visits were undertaken by the construction site compliance officer for Nine Elms. Measures, such as an enclosed cutting unit, increased damping down and screening were implemented, however the close proximity of machinery to the air quality monitor and the increase in traffic due to traffic management in place caused an unavoidable elevation of pollution readings compared to 2019.

It should be noted that all five sites meet the UK/EU limit value (40 µgm⁻³) for PM₁₀. However, modelling indicates there are some exceedences of PM₁₀ on some sections of major roads within the borough.

The annual mean PM₁₀ results are further illustrated by Figure 5. The red line indicates the air quality objective of no more than 40 µg m⁻³.

Figure 5. Trends in Annual Mean PM₁₀ Concentrations measured at the Continuous Monitoring Sites ($\mu\text{g m}^{-3}$)

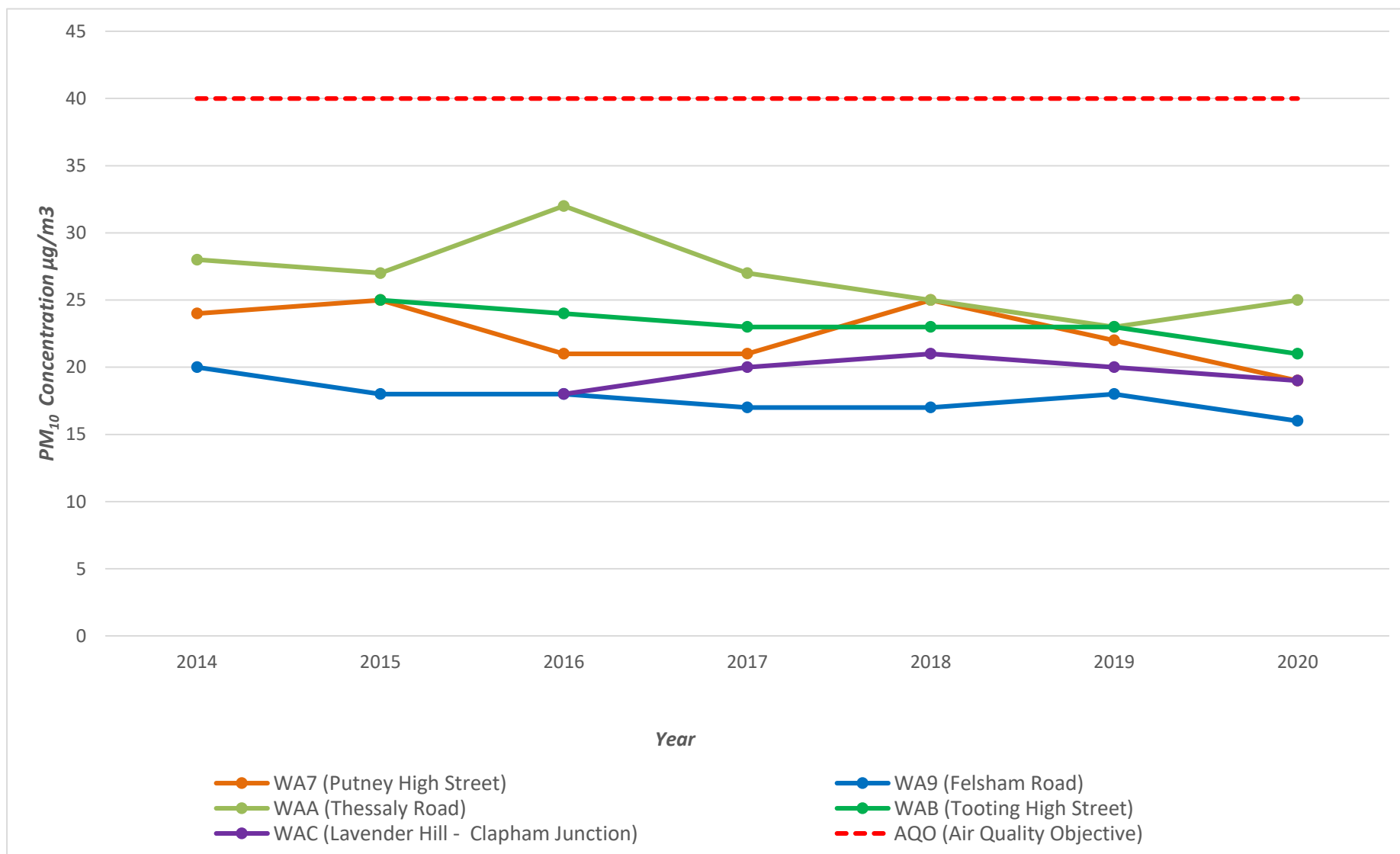


Table G. PM₁₀ Automatic Monitoring Results: Comparison with 24-Hour Mean Objective, Number of PM₁₀ 24-Hour Means > 50 µg m⁻³

Site ID	Valid data capture for monitoring period % ^a	Valid data capture 2020% ^b	Number of Daily Means > 50 µg m ⁻³						
			2014 ^c	2015 ^c	2016 ^c	2017 ^c	2018 ^c	2019 ^c	2020 ^c
WA7 Putney High Street	100	94	5	10	4	2	3	9	2
WA9 Felsham Road	100	96	2(31)	4(21.2)	6	5	1	5	2
WAA Thessaly Road Battersea	100	99	28	16	43	16	10	14	23
WAB Tooting High Street	100	89	N/A	10	11	11	3	9	4
WAC Lavender Hill - Clapham Junction	100	90	N/A	N/A	1 (27.5)	4	3	2	5

Notes

Exceedances of the PM₁₀ 24-hour mean objective (50 µg m⁻³ over the permitted 35 days per year) are shown in **bold**.

Where the period of valid data is less than 85% of a full year, the 90.4th percentile is provided in brackets.

(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%).

PROVISIONAL DATA: The 2020 data downloaded on the 15 May 2019 were provisional and not been fully ratified but any further changes are likely to be minor. This was due to COVID-19 related delays at Imperial College London. Data will be ratified shortly but not in time to be included in this report. Ratified PM₁₀ data will be reported for these sites in the 2022 Annual Status Report.

Table G provides the comparison with the 24-hour mean objective for PM₁₀. The objective of no more than 35 days exceeding 50 µgm⁻³ was met at each site for all years since 2017. However, all sites exceeded this daily standard at least once for all years reported. Overall, in 2020 the number of days exceeding the daily standard remains relatively low at all sites except for Thessaly

Road (WAA) in Battersea with 23 days exceeding $50 \mu\text{g m}^{-3}$. Again, levels are going up and down year on year so vigilance is required.

Elevated PM_{10} levels can result from episodes, which are often the result of local combined with imported transboundary conditions from elsewhere in the UK and Europe.

2. Impact of COVID-19 upon LAQM

The impact of COVID-19 on health and the response necessary to limit its transmission has been unprecedented in modern times. With such drastic changes to transport and travel, there are opportunities to consider the impact on air quality at a local, regional and national level. As we return to a 'new normal' there is also an opportunity to learn from this terrible experience, and to help shape future policy over the coming years to tackle poor air quality.

Unfortunately, the pandemic has pushed air quality concerns down the agenda as national and local policymakers grapple with immediate healthcare and economic impacts. Important measures like Clean Air Zones (CAZs) have lost what priority they had, sometimes on the grounds that air quality has improved this year as a by-product of restrictions to control the spread of the virus. However, this is a temporary phase and not a solution. We cannot forget that the tragic death of nine-year-old Ella Adoo-Kissi-Debrah who lived near the South Circular Road in Lewisham, South-East London. Ella died in 2013 following an asthma attack and has become the first person in the UK to have air pollution listed as a cause of death.

Takeaway messages:

1. The pandemic does not lessen the need for action on air quality:

A number of cities (including Leeds, Bristol, Sheffield and Greater Manchester) have either delayed the implementation of Clean Air Zones or cancelled their plans on the grounds that these measures were not immediately necessary.

2. Greater home-working is not the answer to cleaner air:

A number of commentators have argued that a longer-term uptake of remote working is the solution to improve air quality in cities. London is the city that has seen the highest levels of home-working during the pandemic, with over half of workers being able to work from home and many continuing to do so. Despite this, London's NO₂ concentrations are back to normal exceedances. Research has shown that people who work from home are more likely to use their car for other purposes, such as leisure or shopping. It has also been suggested that more people spending more time at home as a result of remote working could worsen air quality because energy consumption overall increases.

3. We need to disincentivise car and other vehicle usage to improve air quality:

What 2020 does show, is that human-made air pollution generated by traffic can be cut if behaviour changes, and that behaviours will not change without policy action. While it is clear that reducing vehicle usage to levels seen in April is not achievable any time soon, policies such as charging zones contribute to making driving less attractive, particularly for the most polluting vehicles. For example, the Ultra Low Emission Zone in London led to a 44 % decrease in NO₂ concentrations between February 2017 and February 2020 — more than five times the national average reduction.

4. Reducing car usage does not affect all pollutants equally:

While NO₂ concentrations did fall with the reduction in traffic in most cities and large towns, PM_{2.5} did not. This is because of the differing sources of PM_{2.5}. Action on traffic alone will not be enough to improve PM air quality.

Key Focus:

- Encourage people to return to, and swap to, public transport once the pandemic is under control. The implementation of charging Clean Air Zones will only be successful if people have alternatives to private vehicles.
- Expanding public transport usage must be at the core of long-term strategies for cleaner air, which need to work hard to rebuild habits and confidence eroded by the pandemic.
- Evaluate temporary active travel measures introduced during the pandemic and implement them if they are shown to be effective.
- Encouraging people to change behaviour, that should be made permanent.
- Move away from the reliance on private vehicles.
- Better understand our pollutants at a local and national level, in Particulates especially.

Whilst COVID-19 had devastating effects on the people, the NHS and the economy of the UK it presented the AQ community with an unprecedented opportunity to monitor real life pollution levels when vehicle movements were restricted and traffic volumes reduced, sometimes significantly.

We decided as a borough that air quality monitoring was a priority and as far as possible, we maintained all monitoring networks throughout lockdowns in Wandsworth. We believe this data will contribute to many different areas of work and research including health and policy making.

The first lockdown in mid-March – April 2020 saw significant decreases in both traffic and NO₂ in Wandsworth, London and the UK. Following restrictions and lockdowns in 2020/21 were less significant in terms of volumes of traffic or reductions in air pollution and have not been included in this section.

The many variables affecting air pollution such as temperature, weather, wind direction and local conditions make it very difficult and not always accurate to compare one year's data with the next. April/May 2020 was warmer and drier than average which may impact results. In addition to weather, there are a number of unknown variables that may or may not have affected these measurements, these include a potential increase in delivery vehicles during this period and the increase use of residential boilers.

However, monitored data does provide an 'indication' of local changes in air quality. NO₂ is almost entirely linked to combustion and a more reliable local indicator, as drop off with distance from source is well established. Particulates however, exist in the environment with many incidents or episodes of pollution being caused globally or nationally. They also travel long distances and around 40% of measured pollutant is made up of background from various global sources.

In the London Borough of Wandsworth we compared March-April 2019 to March-April 2020 at both our automatic air quality monitoring stations for NO₂ and PM₁₀ and along our NO₂ diffusion tube network. Our laboratory, Gradko, was closed throughout April due to distancing restrictions, so exposed tubes were changed and collected in line with the DEFRA calendar, then refrigerated and returned within date for analysis at the end of May.

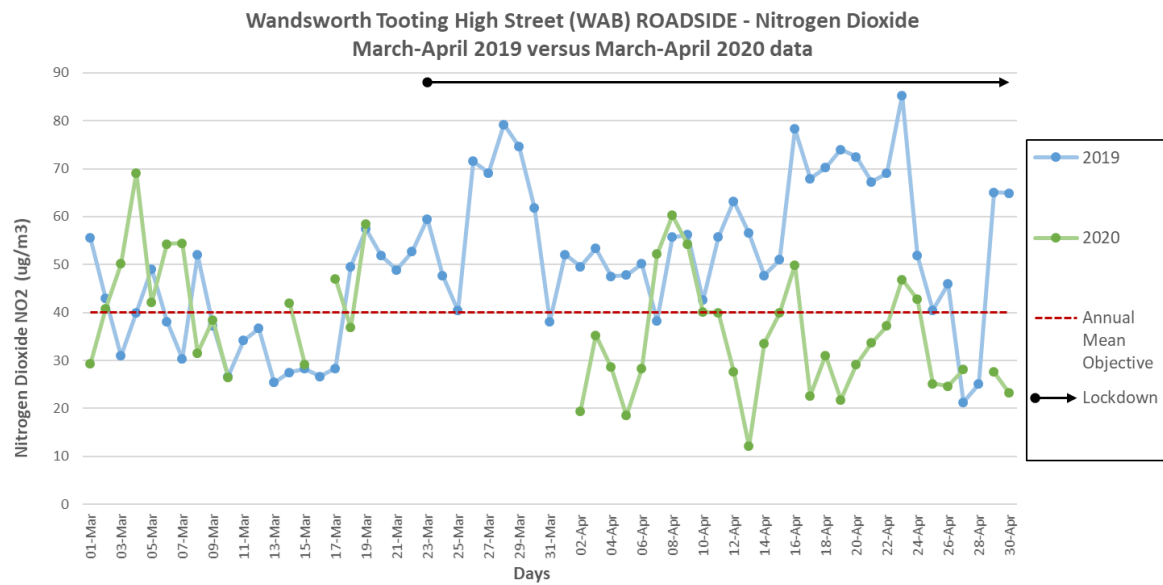
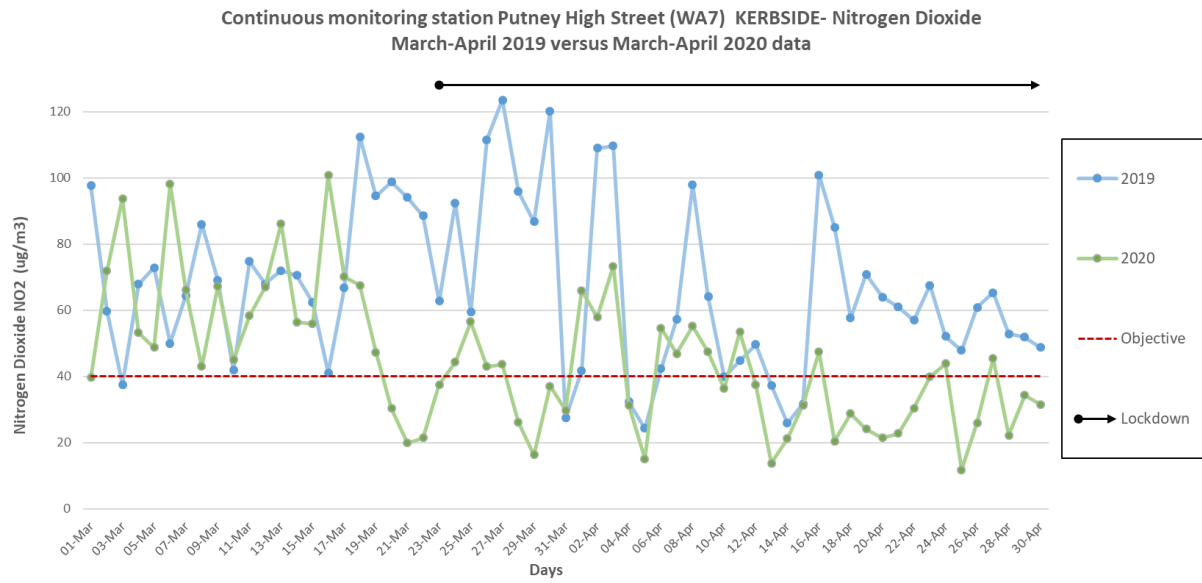
The headline measurements show:

- **An average of 25% decrease in NO₂** when compared **March-April 2019 to March-April 2020** daily mean results recorded at Wandsworth continuous monitoring stations.
- **An average of 26% NO₂ daily mean average decrease** when compared **pre-lockdown** data (March 1st-23rd 2020) and **lockdown** (24th March-30th April 2020) data recorded at Wandsworth continuous monitoring stations.
- **20% decrease in NO₂** when compared **March-April 2019 to March-April 2020** monthly mean results recorded at 32 diffusion tube locations.
- **17% NO₂ monthly mean average decrease** when compared **pre-lockdown** data (January-February 2020) and **lockdown** (March-April 2020) data recorded at 32 diffusion tube locations.
- No definitive overall reduction in **PM₁₀** when compared pre-lockdown data with the lockdown data, this is likely due to 'episodes' blown over from the continent. It is not uncommon to see escalated particulates at this time of the year. These episodes are showed in the charts as peaks (Particle pollution episodes are a regular feature of springtime over Western Europe. They occur when the wind direction becomes easterly and air pollution builds up across the continent and the UK).
- Data was calculated for all sites and both pollutants – NO₂ and PM₁₀. We have not included all data here but would like to include a few charts which indicate the above.

- **Automated monitoring sites**

The following charts relate to our automated monitoring sites and compare 2019 to 2020 data (NO₂) during the period of lockdown.

- Nitrogen Dioxide (NO₂):

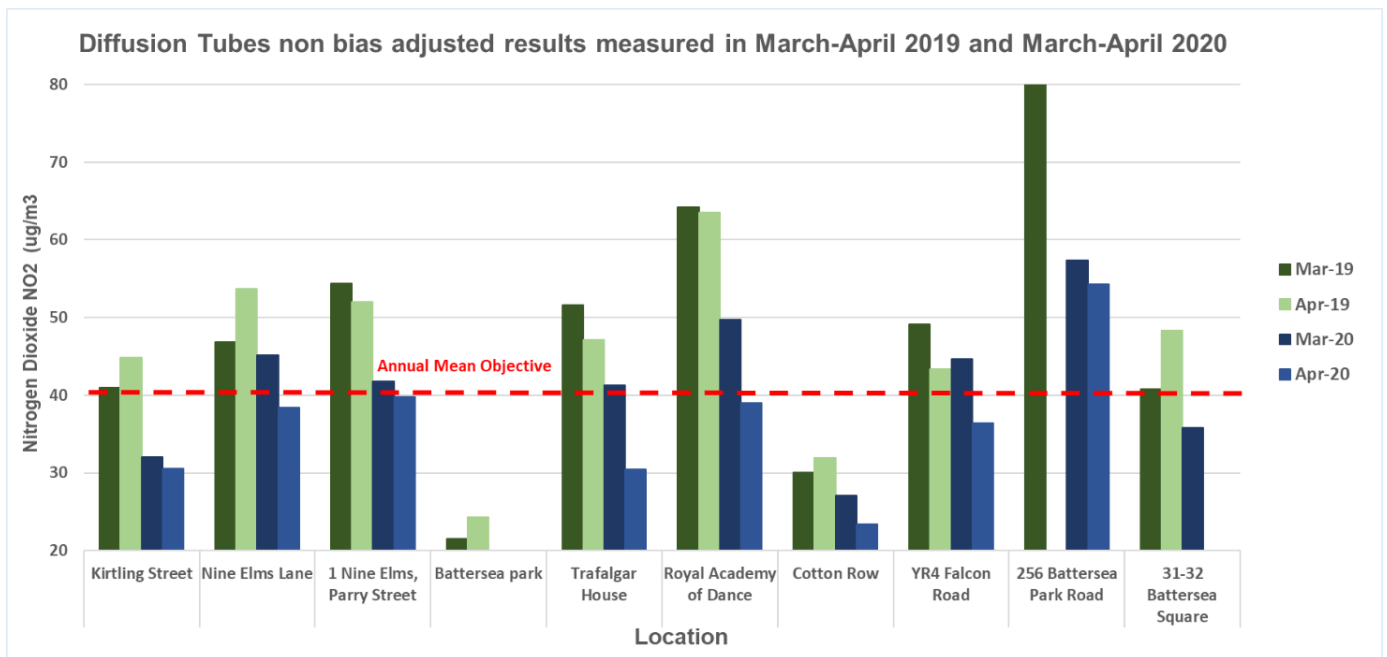


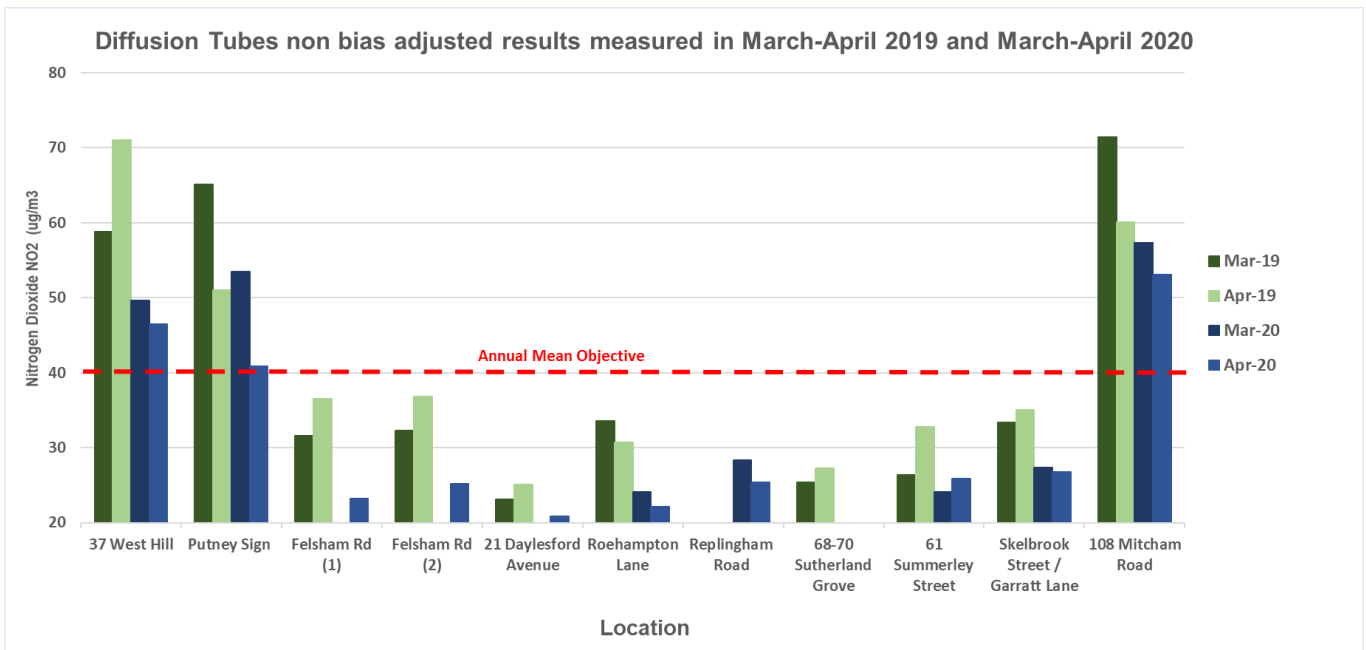
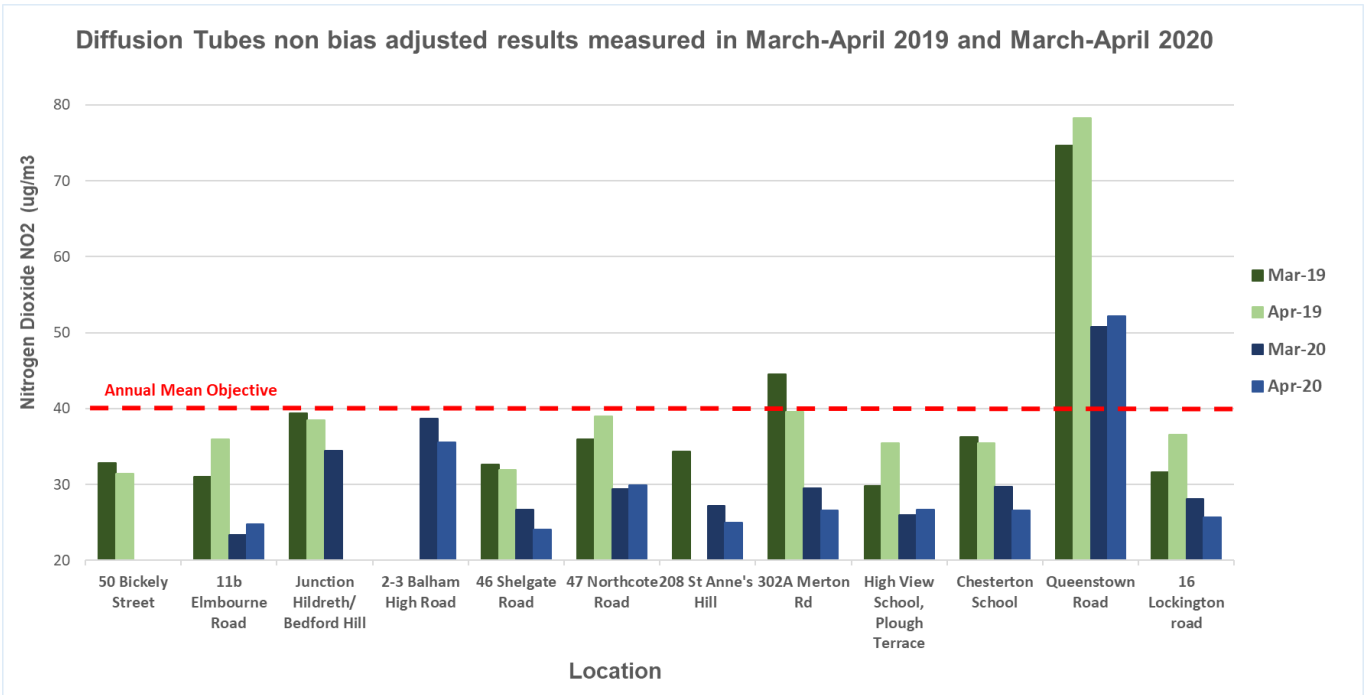
- Diffusion Tube Results

The diffusion tube data provides a detailed local picture of the lockdown impact on restricting vehicle movements have had on localised pollution in the borough at 32 monitoring locations.

The following charts relate to our diffusion tube sites and compare 2019 to 2020 data during the period of lockdown.

The monthly mean results between January to April 2019 show that the objective of $40 \mu\text{g m}^{-3}$ was exceeded for a total of 11 monitored locations. In contrast for the same period in 2020 the objective of $40 \mu\text{g m}^{-3}$ was exceeded at 18 monitored locations.



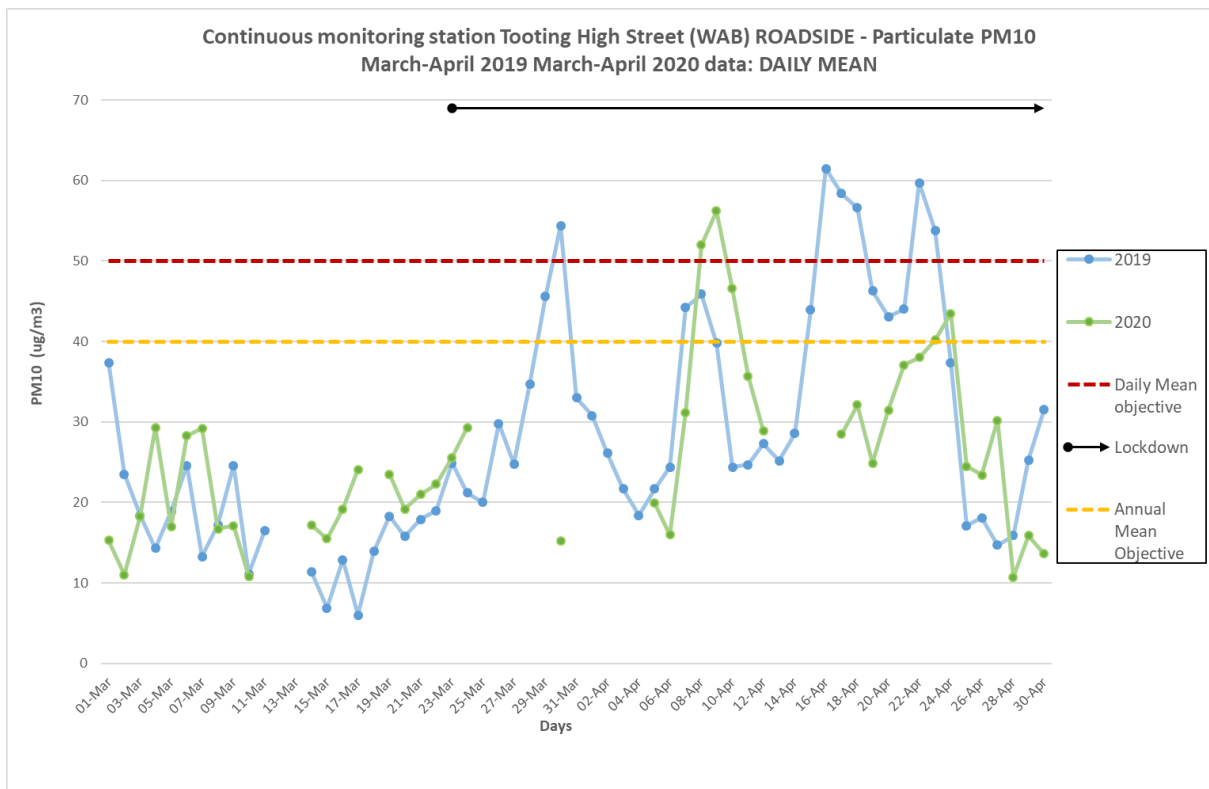
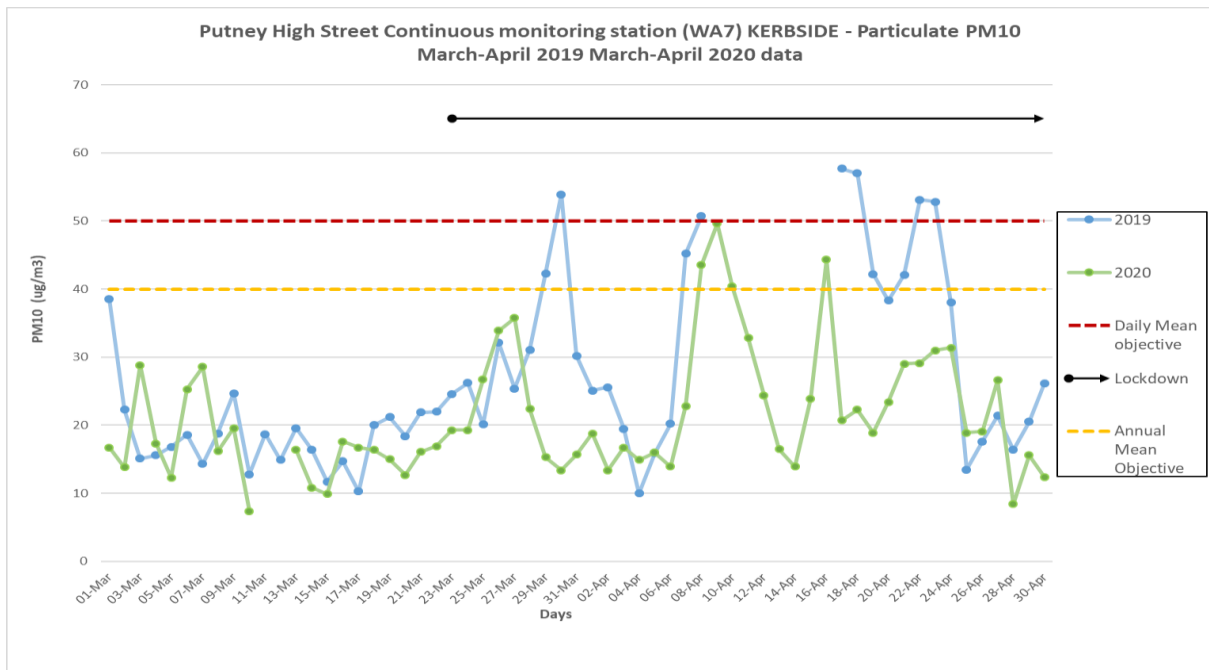


- **Particulate PM₁₀ Results:**

The results indicate that:

- There was no definitive overall reduction in **PM₁₀** when compared pre-lockdown with the lockdown, this is likely due to 'episodes' blown over from the continent. These episodes are showed in the charts as peaks.

PROVISIONAL DATA: The PM₁₀ data for 2020 were provisional and not been fully ratified. This was due to COVID-19 related delays at Imperial College London. Data will be ratified shortly but not in time to be included in this report.



COVID had an immediate impact on travel choice and demand, with a large fall in travel by all modes and particularly public transport. There was then a period when certain types of trips rebounded well past their previous norms – including cycling and home deliveries. Significant investment in temporary walking and cycling infrastructure occurred in order to motivate a public discouraged from using public transport to travel instead on foot and by bike and not by car. The public could almost feel as well breathe cleaner air whilst vehicular traffic flows were depressed. The Council introduced school streets which have been maintained and a number of Low Traffic Neighbourhoods which were removed as a result of public feedback and observations that they were creating additional congestion and localised emissions. Several commercial street closures allowing outdoor dining, including Northcote Road and Old York Road, were well received in 2020 and have been repeated in 2021. A programme of cycle parking and electric vehicle charge points continued in 2020 with another planned in 2021.

Transport use is reverting closer to its pre-pandemic state but is not expected to fully go back to how it was. A higher degree of working from home should result in a permanent reduction in peak period vehicular traffic and lower levels of public transport use; the latter having implications for the long term funding of transport and highway improvements due to lower levels of fare revenue. Travel is likely to be more evenly spread through the day. A long term negative impact will be an increase in home deliveries with associated environmental harm from vehicles and packaging. COVID has had a negative impact on many TfL projects and programmes affecting the borough, including delaying the planned removal of the Wandsworth one-way system.

It is essential that bold measures are taken to remove the dirtiest vehicles and reduce vehicle numbers to relieve congestion. Updates on interventions will be incorporated into AQAP updates for the ASR 2022.

3. Action to Improve Air Quality

3.1 Air Quality Action Plan Progress

Table J provides a brief summary of the London Borough of Wandsworth progress against the Air Quality Action Plan, showing progress made this year.

The Council is aiming to approved and published a new AQAP for 2021 – 2025. It outlines the actions we will take to improve air quality in the London Borough of Wandsworth between 2021 and 2025 and replaces the previous action plan which ran from 2016 to 2021. Improving air quality in the borough is a top political commitment. The new AQAP will reflect changes in air quality policy, creating an environment that is welcoming to sustainable transport and aimed at the pedestrian and/or cyclist, identifying specific bold and brave measures to tackle pollution in local 'hot-spots' within the borough and prioritising schools.

Table J. Delivery of Air Quality Action Plan Measures

Measure 1: Taking cost effective measures to minimise emissions from Council activities.					
No.	Action	Implement ation Date	Cost	Funding	Progress
1.1	Installation of low NOx boilers on replacement.	36+ months	Low	Corporate	-100% boilers specified for housing are Ultra-Low Nox. -100% of installed boilers are ULNOx. - 95% of systems in public buildings will be ULNOx, and remaining 5% are not boilers.
1.2	Installation of energy saving measures in Council buildings.	36+ months	Low	Corporate	-Since 2008/9 a 32% reduction in carbon emissions within Council buildings has been achieved. In 2008-2009 carbon emissions within Council buildings were 43,505 tCO ₂ e, while in 2017-2018 they were 28,934 tCO ₂ e. -Oversight and governance from the Carbon Reduction Group (CRG). -Wandsworth have established a Carbon Off-set and reduction fund via planning and will use this fund to support projects that reduce carbon and improve air quality.
1.3	Policy change to use petrol/LPG/CNG/hybrid/electric instead of diesel for Council fleet vehicles and contracted vehicles.	36+ months	Medium	Transport	-To use petrol/hybrid/electric vehicles for replacement of council fleet where possible. All vehicles purchased under 1.205 tonnes will not be diesel driven. -In November 2020 the strategic planning and transportation scrutiny committee approved plans to replace the borough's existing fleet of 32 commercial vehicles with 28 replacements that produce lower emissions. Some of the new vehicles will be electric and others will be hybrids.
1.4	Upgrading of vehicles to reduce emissions, retrofitting of vehicles with technology to reduce emissions where appropriate such as in-cab telematics.	12-36 months	Medium	Transport	-SSA Environment Purchasing Policy Statement - Proposal suggested for all vehicles used to deliver council contracts adhere to LEZ and ULEZ standards. -Wandsworth Kitchen and Bathroom renovation contract (Phase 9) - proposal for all vehicles (inc. contractors/subcontractors) to adhere to LEZ and ULEZ standards. Also proposed inclusion for contractors to adhere to TfL Work Related Road Risk initiative which includes FORS. Current targets: ULEZ compliance of all vehicles by 2021 including telematics.

Measure 2: To continue to implement and review the Council Service Transport Plan – promoting alternatives modes of transport to the car, for both journeys to work and business related journeys.

No.	Action	Implementation Date	Cost	Funding	Progress
2.1	To encourage active travel by staff (and/or discouraging travel by car).	36+ months	Low	Transport	<p>-The Council Services Transport Plan ceased to be in formal operation from the advent of the SSA. However, since 2019 several measures continued to be provided and implemented including expansion of the Cycle to Work Scheme; continued support for interest free season ticket loans; and provision of additional staff cycle parking at Wandsworth Town Hall.</p> <p>-We are a corporate car club member and have electric bikes and cars available to staff for their site visits.</p> <p>-Our decarbonisation strategy for our buildings, staff travel plan, and plan for a zero-emission fleets have ensured that operations and staff are encouraged to use sustainable modes of transport including by upgrading our buildings to provide electric vehicle charging and increased facilities for other clean modes of transport, such as cargo-bikes. A Staff Travel Plan will also promote sustainable modes of transport for commuters, including public transport and electromobility.</p>
2.2	Reducing the need for staff to drive to work, if a car is needed for work.	36+ months	Low	Transport	

Measure 3: Ensuring air quality is embedded in corporate policy.

No.	Action	Implementation Date	Cost	Funding	Progress
3.1	This measure seeks to implement the findings of the policy review undertaken to ensure that air quality is embedded into corporate policies, maintaining commitment to air quality and cleaner borough status.	<12 months	Low	Corporate	-Actions are being undertaken to ensure that air quality is taken in to account in each policy revision. A strategic air quality task group (attended by senior managers across the Council, the Director of Public Health and the cabinet member for the responsibility for the Environment) attempts to ensure that air quality is taken account in all aspects of the local authority's work. The Director for Public Health is the Clean Air Champion.
3.2	Report Authors to consider the inclusion of relevant Air Quality impacts comments in committee reports.	<12 months	Low	Corporate	-Every committee report must include air quality comments and air quality implications

3.3	Air quality to be considered as part of the procurement of goods, services and works.	12-36 months	Low	Corporate	<p>-Our Procurement policy has been updated to include a requirement for sustainable products to be sourced. This includes consideration of transport costs, pollution, energy savings, disposal, maintenance/lifecycle costs.</p> <p>-The Council is committed to minimising its impact on the environment and continually improving its environmental performance. As part of this commitment the Council has adopted Environmental Ambition Statement, Environmental Action Plan and Environmental Purchasing Policy, which can be downloaded from www.wandsworth.gov.uk/sustainability In order to enable the Council to comply with relevant regulatory requirements, including Climate Change Act 2008.</p> <p>Over the past few years we have made progress on environmental issues in many ways, for example:</p> <p>-Our environmental planning policies aim to ensure that sustainability is designed into new buildings and plans (see the Local development framework pages).</p> <p>-We encourage walking and cycling to school, support car clubs and are improving public transport and providing electric car charging points.</p>
3.4	Consolidation of goods and services.	36+ months	Low	Corporate	<p>-The Council has worked on projects in Tooting Town centre and Clapham Junction. Several actions were implemented in 2019-20, such as promoting a car free day as a pilot project on a volunteer basis, an air quality guide for local residents and businesses, and a cargo bike scheme for local businesses.</p> <p>-The Council supplied 9 electric cargo bikes to businesses, charities and council teams (the parks police and the enforcement team) through the Energy Savings Trust' eCargo Bike Grant Fund'.</p>
Measure 4: Production of a Council air pollution communications strategy, bringing together internal and external communications.					
No.	Action	Implementation Date	Cost	Funding	Progress
4.1	Establish role of air quality champion.	36+ months	Low	Communication & Public Engagement	-From 2019 we encouraged people to sign up as air quality champions through various campaigns including an online portal. We have a number of Champions that help with action days and anti-idling actions. We are currently exploring a number of possible additional activities that Champions can help with, particularly around communications and distribution of information.

					<p>-From July 2020, as part of the Citizen Science Project, we are working with the Tooting Healthy Streets community to monitor Nitrogen Dioxide (NO₂) in seven locations across Tooting. The monitoring is being carried out with diffusion tubes. We are aiming to acquire twelve months of data for these sites before deciding whether to continue the project and/or select different sites. The results will assist us and the residents understanding the local air quality and proposing measures if necessary. We welcome support from interested groups to help promote air quality message and work on our borough specific campaigns.</p>
4.2	Production and maintenance of an air quality communications strategy including an annual update and training for officers.	36+ months	Low	Communication & Public Engagement	<p>-In 2019-20 our Air Quality Board has been working closely with our Corporate Communications team to design a new Communications Plan for Air Quality. This new Plan includes regular press releases sent to the local, regional and specialist press on measures such as anti-idling events. Proactive work with schools, measures taken to improve air quality, such as lobbying for cleaner buses, and the promotion of cleaner transport options such as river transport, 20mph zones and electric cars. This has resulted in extensive media coverage with regular features in the Councils Brightside magazine, which goes to all borough homes. There has also be extensive coverage on the council social media feeds.</p>
4.3	Provision of air quality information.	36+ months	Medium	Communication & Public Engagement	<p>-The review of webpages (for instance, Wandsworth Council webpage, or the Love Clean Air website which is part of the South London air quality network https://lovecleanair.org) are undertaken in line with the developments of new projects.</p>
4.4	Maintain provision of information on cleaner fuels, technologies and vehicles.	12-36 months	Low	Communication & Public Engagement	<p>-See action 7.2</p>
4.5	Undertaking of events to raise awareness of air quality and active travel.	36+ months	Medium	Communication & Public Engagement	<p>-Raising awareness and empowering people to make positive changes is a key part of the Council's work on air pollution. In order to improve air quality and raise awareness in schools, Wandsworth Council has been undertaking air quality awareness raising activities with schools within the Borough. These activities are part of the Council's wide-ranging air quality improvement programme and they aim to increase awareness among children and parents of changes they can make to reduce air pollution, and inspire them to adopt</p>

					<p>more sustainable means of transport such as walking, cycling and taking less polluted routes. Examples of activities / initiatives include:</p> <ul style="list-style-type: none"> - The anti-idling campaigns, most were online where publicity was provided and alternatives offered. - The interactive air quality theatre show: eco-themed stage plays have been performed in front of children at primary schools to help teach youngsters about climate change, air pollution and the effect that transport choices can have on the environment. -Car Free Day 2020: Residents who own an electric vehicle were able to power them up free of charge at hundreds of locations across Wandsworth. Idling Action training was promoted online both by Wandsworth Council and by London Idling Action. -Wandsworth aim for at least 4 campaigns a year. COVID – 19 had a direct impact on physical events throughout 2020, which were put on hold due to advice from Public Health. - Additional work was done in 2020 to permit social distancing – temporary widening of pavements and bus stops, additional cycle lanes, closed streets and a one way pedestrian systems across the borough.
4.6	Provide GPs and pharmacists with information to provide to individuals with pre-existing conditions and those vulnerable due to age or lifestyle.	36+ months	Low	Communication & Public Engagement	<p>-Aligns with manifesto pledges of supporting vulnerable people and improving air quality.</p> <p>-Airtext, an early warning alert service for days of moderate or high air pollution levels, was supported and promoted on the Council website and in response to Council complaints and enquiries throughout 2020. Airtext as a critically important service providing direct alerts to vulnerable people, including those with COVID/long term COVID. Alerts are automatically forwarded to doctor's surgeries, schools and pharmacies. Wandsworth consider this a low-cost way to raise awareness and reduce exposure amongst the most vulnerable.</p>
4.7	Undertaking engagement with local businesses in hotspot area.	36+ months	Medium	Communication & Public	<p>-Wandsworth were part of Clean Air Villages again for 2020 – a 1 year DEFRA funded project delivered by the Cross River Partnership. Clean Air Villages 3 continued on from Clean Air Villages 2 with Tooting being chosen</p>

				Engagem ent	<p>as the 'village' once again and a trial of a cargo bike delivery being offered. 4 businesses used the cargo bike delivery service to deliver goods to their customers and a community group used the delivery service every 2 weeks to deliver aid parcels.</p> <p>After 6 months of using the cargo bike delivery service in replacement of cars the estimated emissions savings are as follows:</p> <table border="1"> <tr> <td>Nox (g)</td> <td>PM_{2.5} (g)</td> <td>PM₁₀ (g)</td> <td>CO₂ (kg)</td> </tr> <tr> <td>1683.15</td> <td>83.02</td> <td>156.07</td> <td>880.35</td> </tr> </table> <p>The cargo bike delivery service was part funded by Wandsworth Council and part funded by the businesses themselves. Some businesses have now switched from their polluting delivery service to using a cargo bike delivery service.</p>	Nox (g)	PM _{2.5} (g)	PM ₁₀ (g)	CO ₂ (kg)	1683.15	83.02	156.07	880.35
Nox (g)	PM _{2.5} (g)	PM ₁₀ (g)	CO ₂ (kg)										
1683.15	83.02	156.07	880.35										
4.8	To undertake joint working with other organisations such as the GLA, TfL, health professionals such as Wandsworth CCG and other local authorities such as neighbouring authorities and others, for instance, through externally funded joint projects.	36+ months	Low	Corporate	-Business Low Emission Neighbourhood scheme (Thessaly Rd, Nine Elms). 2020/21 is the second year of a three-year project funded by the Mayor's Air Quality Fund. In 2020 a controlled parking zone was implemented and designs for a pedestrian and cycle zone were approved. Plans to undertake an air quality audit at one of the schools and business engagement was postponed to Spring 2021 due to Covid-19 restrictions.								
Measure 5: Call for actions from the Mayor of London, TfL and national government to improve air quality.													
No.	Action	Implement ation Date	Cost	Funding	Progress								
5.1	Campaign for the Mayor and TfL for cleaner buses to operate on routes throughout the borough using local monitoring data.	12-36 months	Low	Transport	-Led by portfolio holder/elected members. -Lobbying TfL for the provision of more low emission bus routes. Improve air quality by applying lessons learned from Putney High street to Clapham Junction and Tooting High street.								
5.2	Campaign to the Mayor and TfL for cleaner taxis to operate on borough roads and stricter controls to reduce emissions from vehicles – Low Emission Zone (LEZ), Ultra Low emission Zone (ULEZ), policies to reduce diesel vehicle use.	36+ months	Low	Transport	-Led by portfolio holder/elected members. -Ensure there is public awareness around ULEZ/LEZ expansion ramifications.								

5.3	Campaign to national government towards a “non- diesel economy”.	36+ months	Low	Transport	Led by portfolio holder/elected members.
Measure 6: Encouraging walking and cycling and the use of public transport and discouraging driving to stations.					
No.	Action	Implement ation Date	Cost	Funding	Progress
6.1	Use of transport and planning policies to encourage walking and cycling.	12-36 months	Low	Transport	-Active Travel Advisory Group. -TfL Low Emission Neighbourhoods. -TfL Cycling Toolkit.
6.2	Promote the use of public transport.	36+ months	Low	Transport	-Wandsworth Town Station and Putney Station: Second entrance - acknowledged. -Network Rail & DfT engagement: Overcrowding relief on local trains & stations including South Western timetable changes. -TfL and Network Rail engagement: Crossrail 2, LHR improved rail access, improving capacity at Battersea Park Station & Nine Elms/Embassy Gardens. -Bus Service Improvements: increasing service frequencies and addition live-information displays at bus stops in key locations. -Legible London Wayfinding Scheme in Battersea/Nine Elms - improving access for pedestrians and signposting public transport.
6.3	Promote sustainable travel to schools – working with schools to implement packages of measures.	12-36 months	Low	Transport	-The Council continues to offer support to all schools in the borough to develop and implement school travel plans. 29 schools were accredited in 2019, 3 Bronze, 10 Silver and 16 Gold. To achieve gold accreditation requires a modal shift away from car use of at least 6% from the school’s baseline survey. STARS, TfL joined 2020 and 2021 so there is no shift from last year and this is the year schools will be applying which will cover both years. What we were able to offer was limited due to COVID restrictions and funding, but we aim to continue our programme again soon. -The Councils Transport Planning, Road Safety and Engineering Teams continue to deliver initiatives like cycle, walking, scooter training, engineering measures/improvements and Theatre Workshops alongside the Independent travel programme, Junior Citizens and Dr Bike events at schools. Wandsworth is also a Bike-It Borough and we offer a number of schools Sustrans cycling support and initiatives through this programme. -School Streets were a focus for 2019 and 5 schools were assessed as feasible pilots. Wandsworth Borough Council has 19 School Streets;

					Earlsfield, Furzedown, Hillbrook and Penwortham Primary Schools were launched in June 2020 and at Alderbrook in October 2020. School Street restrictions were introduced by Experimental Traffic Order and were initially reinforced by volunteers using temporary barriers. At Alderbrook, bollards have been installed and at Earlsfield, Furzedown, Hillbrook and Penwortham Primary Schools, Automatic Numberplate Recognition cameras (ANPR) have been installed and issue Penalty Charge Notices to vehicles that enter the school street at the restricted times without having an exemption.
6.4	Use of on-street parking controls to reduce the number of people driving to stations in the borough to continue their journey by rail into Central London.	12-36 months	Low	Transport	-In 2019 the 77% of borough roads were covered by CPZ and by end of 2020 the percentage went up to 88%. -Multiple requests received per year for amendments or for introduction of CPZ's.
6.5	Facilitate and enable car clubs of travel by sustainable transport modes including cycling and walking.	12-36 months	Medium	Transport	-Low Emission Logistics Project – working with businesses to promote use of cycling, public transport and walking as a means for staff to get to work. -Tooting Town Centre projects. -Clapham Junction projects. -Free 1 to 1 cycle training offered to adults and young people who live and work in the borough or bike ability level 2 training to school children across the borough. We were able to carry out cycle training sessions in 2020, in between lockdowns and approximately 262 adults and 426 children received cycle training.
6.6	Promote and enable car clubs as an alternative to private car ownership, via; - provision of on–street car club parking spaces - planning obligations for car club parking/membership in new residential developments.	12-36 months	Low	Transport	-Car club membership to increase by 1,800 per year (150 per month). -Wandsworth has the highest take-up rate of car club membership in the country with more than 31,000 registered members.
6.7	Introduction of 20mph speed limit areas on borough residential roads.	<12 months	Low	Transport	-A 20mph speed limit is now in place on all residential streets in the borough.

					<p>-All TfL roads designated as Red Routes (except their short extensions into side roads), other main roads classified as 'A' or 'B' roads and private roads are excluded from the 20mph speed limit.</p> <p>Wandsworth Council is seeking approval for all red routes to be reduced to 20 mph.</p>
Measure 7: To encourage the uptake of low emission vehicles.					
No.	Action	Implement ation Date	Cost	Funding	Progress
7.1	Provision of green infrastructure / electric vehicle charging points.	12-36 months	Medium	Transport	<p>-By January 2021, Wandsworth offered nearly 600 public charging points including many using existing infrastructure such as lampposts. Further investment will be aimed at meeting the growing demand for charging for residents and visitors, including rapid charging. Our existing plans are likely to deliver up to 900 on- street charging points initially to encourage people to switch to this more environmentally-friendly form of motoring.</p> <p>-Ubitricity sockets are fitted to around 500 lampposts in the borough of Wandsworth. This number has been boosted in the past few days with the completion of a project to install 126 sockets in every available and suitable lamppost in 21 residential streets in Battersea, saturating an area measuring less than a third of a square mile.</p> <p>And by the end of the year another 140 lamppost sockets are set to come on stream with further installations planned for 2021. This will include an area in Putney's Thamesfield ward where all suitable lampposts will have ubitricity sockets fitted. His will help the council meet its current target of delivering nearly 900 on-street charging points.</p> <p>-Wandsworth residents are already streets ahead when it comes to embracing electric vehicle technology. The annual number of plug-in vehicles registered in the borough has grown from 252 in 2012 to 4,527 in 2019 – with numbers rising by more than ten per cent every three months.</p>
7.2	Maintain provision of information on cleaner.	12-36 months	Medium	Transport	<p>-Council website used to update residents and businesses.</p> <p>See https://www.wandsworth.gov.uk/roads-and-transport/transport/sustainable-travel/electric-vehicles/</p>

7.3	Review of differential car parking charges based on emissions, ULEZ criteria, with diesel vehicles paying more.	12-36 months	Medium	Transport	-Wandsworth consider the use of the parking agenda as key to delivering cleaner air. The borough is reviewing the appropriateness of differential charges. The diesel levy is one of a number of parking/Air Quality Initiatives which we are exploring for a future commitment to differential charges.
Measure 8: Freight / deliveries actions.					
No.	Action	Implement ation Date	Cost	Funding	Progress
8.1	Enabling more delivery and servicing to be made outside peak hours.	12-36 months	Medium	High Street	-Low Emissions Logistics Project. -Tooting Town Centre projects . -Clapham Junction projects .
8.2	Better management/prohibition of deliveries at “hotspots” such as Putney High Street.	12-36 months	High	High Street	-Low Emissions Logistics Project. -Tooting Town Centre projects . -Clapham Junction projects . -Improve air quality by applying lessons learned from Putney High street to Clapham Junction and Tooting High street.
8.3	To investigate consolidation of goods and services in hot spot areas, exploring options such as joint procurement and sharing of services supplied to businesses and low emission last mile delivery.	12-36 months	Medium	High Street	-Low Emissions Logistics Project. -Tooting Town Centre projects. -Clapham Junction projects.
8.4	Improve green infrastructure in and around high streets and areas of high footfall in Borough.	12-36 months	High	High Street	-Putney High Street: <ul style="list-style-type: none"> • Currently exploring ideas around Putney High Street. • Appoint a “healthy streets” champion that works to help reduce street clutter and create new pocket parks, as part of a total safety approach. • Putney High Street regeneration (Thamesfield ward pledge): Work with businesses and developers to deliver an attractive High Street. -Improve environment and shopping at Tooting Bec and Trinity Road, including off-street parking in business yards on Balham High Road. -Our Parks and Open Spaces team have planted over 1,200 trees in the last two winters and as a result our vacant tree pits are nearly now full. The Council will create a new tree strategy and adopt management approaches that ensure long term survival of trees and reduce the need to cut down mature trees. The tree strategy will include an extensive tree planting

					programme with a further 600 trees planted by April 2022 as well as 1,000 new street trees.																																																							
Measure 9: Ensuring that air quality and reducing emission is included in planning policy and implemented.																																																												
No.	Action	Implementation Date	Cost	Funding	Progress																																																							
9.1	Encouraging energy efficient measures and energy efficient design in new buildings.	36+ months	Low	Planning & Development	<p>-Applications submitted that include energy assessments Major developments by year of decision:</p> <table border="1"> <thead> <tr> <th>2015/16</th> <th>2016/17</th> <th>2017/18</th> <th>2018/19</th> <th>2019/20</th> </tr> </thead> <tbody> <tr> <td>66%</td> <td>68%</td> <td>74%</td> <td>80%</td> <td>76%</td> </tr> </tbody> </table> <p>-Developments completed with renewable energy installations</p> <table border="1"> <thead> <tr> <th>2015/16</th> <th>2016/17</th> <th>2017/18</th> <th>2018/19</th> <th>2019/20</th> </tr> </thead> <tbody> <tr> <td>26</td> <td>29</td> <td>12</td> <td>21</td> <td>17</td> </tr> </tbody> </table> <p>-Percent reduction in carbon dioxide emissions achieved overall through on-site renewable energy generation and energy efficiency measure. Currently being assessed BREEAM rating for major new non-residential development Permissions:</p> <table border="1"> <thead> <tr> <th>Rating</th> <th>2016/17</th> <th>2017/18</th> <th>2018/19</th> <th>2019/20</th> </tr> </thead> <tbody> <tr> <td>Outstanding</td> <td>0%</td> <td>0%</td> <td>0%</td> <td>6%</td> </tr> <tr> <td>Excellent</td> <td>48%</td> <td>40%</td> <td>82%</td> <td>56%</td> </tr> <tr> <td>Very Good</td> <td>29%</td> <td>30%</td> <td>0%</td> <td>0%</td> </tr> <tr> <td>Good</td> <td>0%</td> <td>0%</td> <td>0%</td> <td>0%</td> </tr> <tr> <td>Pass</td> <td>0%</td> <td>0%</td> <td>0%</td> <td>0%</td> </tr> <tr> <td>Unclassified</td> <td>24%</td> <td>30%</td> <td>18%</td> <td>39%</td> </tr> </tbody> </table>	2015/16	2016/17	2017/18	2018/19	2019/20	66%	68%	74%	80%	76%	2015/16	2016/17	2017/18	2018/19	2019/20	26	29	12	21	17	Rating	2016/17	2017/18	2018/19	2019/20	Outstanding	0%	0%	0%	6%	Excellent	48%	40%	82%	56%	Very Good	29%	30%	0%	0%	Good	0%	0%	0%	0%	Pass	0%	0%	0%	0%	Unclassified	24%	30%	18%	39%
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9.2	Boilers installed as part of development must have low NOx	36+ months	Low	Planning &	Data not available at this time																																																							

	ratings in accordance with the standards set out in the Mayor of London's sustainable design and construction supplementary planning guidance.			Developm ent	
9.3	Air quality assessments for major developments and developments where exposure is likely or a creation of significant new emissions.	36+ months	Medium	Planning & Developm ent	-Air Quality Neutral Assessments in line with the Sustainable Design and Construction SDP being undertaken. -In 2020, within the Environmental Protection Team, officers reviewed planning applications in terms of air quality for both minor and major developments. The Air Quality Team reviewed air quality assessments, air quality neutral reports, dust management plans, construction environmental management plans, schemes for monitoring dust on construction sites, method statements for the reduction of emissions from construction vehicles in compliance with the London Low Emission Zone, schemes of air pollution mitigation measures to protect future occupiers from air pollution exposure while living in their properties.
9.4	Ensuring that new major developments are air quality neutral in line with the London Plan and Mayor of London's sustainable design and construction supplementary 36+ months planning guidance.	36+ months	Low	Planning & Developm ent	-Air Quality Neutral Assessments in line with the Sustainable Design and Construction SDP being undertaken. -In October 2020, Wandsworth Council has adopted a new Supplementary Planning Document (SPD) that includes air quality obligations for developers. https://www.wandsworth.gov.uk/media/7497/planningobligationsspd_2020_aoption_201002.pdf This SPD forms part of the Local Plan framework which guides the Council's decision making on planning applications.
9.5	Ensure actions from previous air quality GLA audits of schools are being implemented.	12-36 months	Medium	School	-We have installed green screens at three primary schools (Chesterton, St Marys and St Annes) in the borough to reduce children's exposure to air pollution in their playgrounds.
9.6	Undertake more school air quality audits in line with GLA audits.	12-36 months	Medium	School	-6 schools air quality audited in 2019 and in early 2020 by Wandsworth Air Quality officers.
Measure 10: Creation of a design guide of best practice on reducing emissions and exposure for developments and streets.					
No.	Action	Implement ation Date	Cost	Funding	Progress

10	Develop a design guide of best practice. This project aims to take the well- established science of how air pollution is distributed in street canyons and translate it into design guidance that design engineers/planners can use in language that is familiar to them.	12-36 months	Low	Planning & Development	No funding available to progress this action. Action will progress if and when funding becomes available.
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Measure 11: Proactive work to reduce particulate emissions from new developments.

No.	Action	Implementation Date	Cost	Funding	Progress
11	To undertake a project with a developer to assess the effectiveness of measures designed to reduce emissions from major construction sites and to develop a construction hub to disseminate best practice.	12-36 months	Medium	Planning & Development	-London Low Emission Construction Partnership (LLECP) - Joint venture with KCL and other London boroughs. -Construction Site Compliance Officer (CSCO) - appointed to manage environmental impacts from major developments.

Measure 12: Actions to reduce emissions by enforcement of regulatory powers.

No.	Action	Implementation Date	Cost	Funding	Progress
12.1	Regulation of industrial activities to control their emissions to air.	12-36 months	Low	Corporate	-All permitted processes inspected and compliant
12.2	Continue the thorough investigation and resolution of nuisance complaints with an air pollution component, such as bonfires and from demolition and building work dust.	12-36 months	Low	Corporate	-Statutory function and service standards upheld.
12.3	Proactive response to reducing emissions from demolition and construction work.	12-36 months	Low	Corporate	-CSCO working with developers to ensure best practice and GLA compliance. -Non-road mobile machinery (NRMM) working across boroughs. -Code of Practice reviewed but not updated.

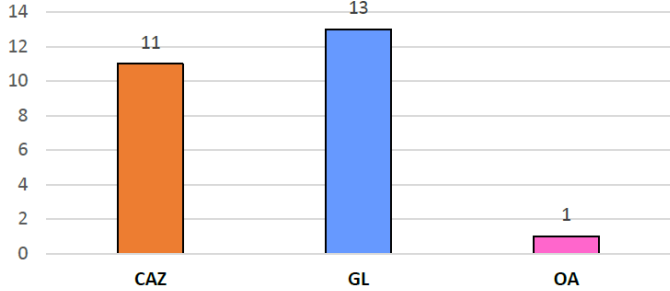
12.4	Continue to enforce and raise awareness of the fact that the whole borough is covered by a smoke control order and that the use of some solid fuel is prohibited.	12-36 months	Low	Corporate	<p>-The Council understand that solid fuel burning is a major source of PM_{2.5} (up to 31% in London) that must be controlled at the local level. Addressing this source is crucial for achieving the LES target to meet WHO guideline levels for PM_{2.5} by 2030.</p> <p>-The Council remains committed to raise awareness about the smoke control order in the whole and that the use of some solid fuel is prohibited. All complaints investigated by Environment Health officers on unauthorised burning.</p>
12.5	Use of vehicle idling powers where appropriate and awareness raising of increased pollution through vehicle idling.	<12 months	Low	Corporate	<p>-All Civil Enforcement Officers have been trained and are able to serve FPN's where required.</p> <p>-Use of CAQC's to approach drivers who are idling.</p> <p>-GLA Anti-idling campaign. Wandsworth is working with schools, encouraging all schools to pledge to not idle and we issue large banners to those that are interested. These are displayed on school fences. Online resources to schools are promoted. Wandsworth Council works with London Idling Action. Toolkits and online tutorials are promoted. All complaints are responded to and additional signage requests are investigated and erected where practical.</p>
Measure 13: Air quality monitoring to review and assess and evaluate actions.					
No.	Action	Implementation Date	Cost	Funding	Progress
13.1	To continue to monitor air quality across the borough measuring nitrogen dioxide (NO ₂) and fine particles (PM ₁₀).	12-36 months	Low	Corporate	<p>-Continuous monitoring of air quality in line with requirements and reporting needs.</p> <p>-In 2020, the Council continued to monitor air quality pollutants (NO₂ and PM₁₀) from 7 automatic monitoring stations as well as a diffusion tube network. In 2020 10 new locations have been added to the diffusion tube network.</p>
13.2	To monitor air pollution to assess and evaluate action in hot spot areas (as identified by the Mayor of London) as part of the project to improve air quality.	12-36 months	Medium	Corporate	<p>-5 Air Quality Focus Areas within Wandsworth.</p> <p>-Actions taken where appropriate (e.g. Tooting High Street).</p> <p>-Low Emissions Logistics Project.</p> <p>-Tooting Town Centre AQAP.</p> <p>-Clapham Junction AQAP.</p>

13.3	Create a monthly dashboard of air pollutant levels in Borough using data from real-time stations.	12-36 months	Low	Corporate	-This has now changed to a simplified reporting Matrix against the Air Quality Action Plan
13.4	Do heat map of air pollution in Borough.	12-36 months	Low	Corporate	-Work to be completed
Measure 14: Air quality innovation.					
No.	Action	Implement ation Date	Cost	Funding	Progress
14.1	Set up a Workshop on use of digital and technology in air quality improvements to bring clean tech companies to Borough to pilot new ideas.				-Setting up a workshop in liaison with GLA Digital office. -Possibilities for air quality monitoring, vehicle management, parking, buildings, new developments, community engagement and participation.
Measure 15: New Projects.					
	-Further Investment in new monitoring equipment as new technology moves forward. This could see enhancement to the diffusion tube network and help provide real time data. -Clean Air Routes				-In 2020 as part of the Clean Air Villages 3 project, which aimed to reduce emissions by working directly with businesses, hospitals and communities, 14 new Clean Air Routes were developed. A Walking or cycling route between Tooting Broadway and St George's Hospital was created: https://crossriverpartnership.org/wp-content/uploads/2020/03/CRP-Clean-Air-Routes-Flyers-Final-11.pdf -The London Borough of Wandsworth acquired a Vivacity monitoring sensor as part of Cross River Partnership's Healthy Streets Everyday project. The sensor was located on Mitcham Road. As a result, the sensor was well positioned to capture classified counts data to help understand active travel patterns.

4. Planning Update and Other New Sources of Emissions

Table K. Planning requirements met by planning applications in the London Borough of Wandsworth in 2020

Condition	Number
Number of planning applications where an air quality impact assessment was reviewed for air quality impacts	17
Number of planning applications required to monitor for construction dust	51
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	17
Number of developments required to install Ultra-Low NO _x boilers	N/A
Number of developments where an AQ Neutral building and/or transport assessments undertaken	14
Number of developments where the AQ Neutral building and/or transport assessments not meeting the benchmark and so required to include additional mitigation	2
Number of planning applications with S106 agreements including other requirements to improve air quality	6

Condition	Number																						
<p>Number of planning applications with CIL payments that include a contribution to improve air quality</p>	<p>Cannot identify individual planning applications where contribution to improve air quality has been included. However, there have been contributions made across the Borough.</p>																						
<p>NRMM: Central Activity Zone and Canary Wharf</p> <p>Number of conditions related to NRMM included.</p> <p>Number of developments registered and compliant.</p> <p>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 IIIB of the Directive and/or exemptions to the policy.</p>	<p>42 NRMM conditions were requested along with the construction method statement conditions.</p> <table border="1" data-bbox="1301 616 1659 1002"> <thead> <tr> <th colspan="2">Site Status Count</th> </tr> </thead> <tbody> <tr> <td>Total registered sites</td> <td>67</td> </tr> <tr> <td>*Self-Compliant</td> <td>9</td> </tr> <tr> <td>**Compliant</td> <td>12</td> </tr> <tr> <td>Non-Compliant</td> <td>1</td> </tr> <tr> <td>Not Cold Engaged</td> <td>23</td> </tr> <tr> <td>***Cold Engaged</td> <td>2</td> </tr> <tr> <td>Non-Registration</td> <td>1</td> </tr> <tr> <td>No NRMM</td> <td>1</td> </tr> <tr> <td>Site Complete</td> <td>2</td> </tr> <tr> <td>Total Audits</td> <td>25</td> </tr> </tbody> </table>	Site Status Count		Total registered sites	67	*Self-Compliant	9	**Compliant	12	Non-Compliant	1	Not Cold Engaged	23	***Cold Engaged	2	Non-Registration	1	No NRMM	1	Site Complete	2	Total Audits	25
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<p>NRMM: Greater London (excluding Central Activity Zone and Canary Wharf)</p> <p>Number of conditions related to NRMM included.</p> <p>Number of developments registered and compliant.</p> <p>Please include confirmation that you have checked that the development has been registered at www.nrmm.london and that all</p>	<p>Site Zonal - Distribution</p>  <table border="1"> <thead> <tr> <th>Zone</th> <th>Count</th> </tr> </thead> <tbody> <tr> <td>CAZ</td> <td>11</td> </tr> <tr> <td>GL</td> <td>13</td> </tr> <tr> <td>OA</td> <td>1</td> </tr> </tbody> </table>	Zone	Count	CAZ	11	GL	13	OA	1														
Zone	Count																						
CAZ	11																						
GL	13																						
OA	1																						

Condition	Number
NRMM used on-site is compliant with Stage IIIA of the Directive and/or exemptions to the policy.	<ul style="list-style-type: none"> - Cleaner Construction for London undertook 25 site audit(s) in the borough of Wandsworth. - 9 site(s) achieved Self-Compliant status, 12 site(s) worked towards and achieved Compliance and 1 site(s) failed and were recorded as non-Compliant. - 2 site(s) upon arrival/engagement were completed and 1 site(s) had No NRMM within scope (37-560kW) presently deployed. - 8% of sites audited were cold engaged and therefore not registered prior to auditing. - 100% of Non-compliance is due to sites not using the online NRMM London Register, even though all their machinery is of the stage required by the Mayor's SPG.

4.1 New or significantly changed industrial or other sources

For 2020 no new sources have been identified.

Appendix A Details of Monitoring Site Quality QA/QC

A.1 Automatic Monitoring Sites

All data undergoes quality assurance and quality control (QA/QC) procedures to ensure that the data obtained are of a high quality. Each NO₂ continuous analyser is automatically calibrated every night and also manually checked and calibrated every two weeks by the contractor, TRL (Transport Research Laboratories), employed by Wandsworth Council for local site operator visits during 2020. Regular calibration visits of between 2-4 weeks were maintained throughout 2020, despite COVID-19. There is a need for frequent calibration adjustments as the gradual build-up of dirt within the analyser reduces the response rate. This fall off in response needs appropriate correction, to ensure the recording of the true concentrations. The calibration process involves checking the monitoring accuracy against a known concentration of span gas. The span gas used is nitric oxide and is certified to an accuracy of 5%. Both the automatic and manual calibrations use this same certified span gas (i.e. the automatic overnight one does not use the less accurate permeation tube method).

The NO₂ continuous analysers are serviced every six months by TRL and also audited by the National Physical Laboratory's (NPL) every six months as part of the Environmental Research Group – Imperial College London (ERG) LAQN QA/QC procedure, to ensure optimum data quality.

Data ratification and air quality support services were undertaken by ERG (Environmental Research Group – Imperial College London) in 2020, and it continues to be undertaken by them.

PM₁₀ Monitoring Adjustment

PM₁₀ particulates are measured using Tapered Element Oscillating Microbalance (TEOM) analysers, with the data presented as the gravimetric equivalent.

For the monitoring data collected from the monitoring stations located in Putney High Street (WA7), Thessaly Road (WAA), Tooting High Street (WAB) and Lavender Hill (WAC), the Volatile Correction Method (VCM) has been used to correct the data. An FDMS was installed at the Felsham Road (WA9) monitoring station until 21 January 2015. This has now been converted to a TEOM, and therefore for 2019 the Volatile Correction Method (VCM) was used to correct the data. The TEOM equipment is serviced every six months by TRL and also audited by NPL every six months as part of the ERG LAQN QA/QC procedure, to ensure optimum data quality. All sites are part the LAQN and ERG are responsible for the daily data collection, storage, validation and dissemination via the LAQN website (www.londonair.org.uk). ERG ratifies the data periodically, viewing data over longer time periods and using the results from fortnightly checks, equipment services and equipment audits.

A.2 Diffusion Tubes

NO₂ monitoring by means of passive diffusion tubes has been undertaken within the Borough since 2004. Monitoring using diffusion tubes has advantages over continuous monitoring because it is cheaper and therefore more sites can be established and assessed. The main disadvantage is that the method is less precise and accurate than continuous monitoring. The recommended methods to reduce these errors include the use of good QA/QC practices and bias adjustment factors that are derived from co-location studies between continuous analysers and diffusion tubes.

The bias adjustment factors are specific to each year, analysing laboratory, method of analysis and location. The factors are therefore also limited to the data supplied. The Review and Assessment website advises that “in many cases, using an overall correction factor derived from as many co-location studies as possible will provide the ‘best estimate’ of the ‘true’ annual mean concentration. It is important to recognise that there will still be uncertainty associated with this bias adjusted annual mean. One analysis has shown that the uncertainty for tubes bias adjusted in this way is $\pm 20\%$ (at 95% confidence level). This compares with a typical value of $\pm 10\%$ for chemiluminescence monitors subject to appropriate QA/QC procedures”.

From the beginning of January 2007 the supply and analysis of all diffusion tubes has been undertaken by Gradko International. The diffusion tubes exposed in 2020 were supplied and analysed by Gradko International. They participate in the AIR Proficiency Testing (PT) scheme, which combines the materials previously offered by the WASP (Workplace Analysis Scheme for proficiency) PT scheme, operated and the STACKS PT scheme, provided by LGC. LGC is the accredited PT provider of the AIR PT scheme, which is an independent analytical performance testing scheme. The scheme is an important QA/QC exercise for laboratories supplying diffusion tubes to Local Authorities for use in the context of Local Air Quality Management (LAQM).

Gradko International laboratory demonstrated a satisfactory performance in a QA/QC scheme for analysis of NO₂ diffusion tubes. The AIR PT Nitrogen Dioxide Proficiency Scheme Results 2020 are shown in Table 1.

Table 1: Laboratory summary performance for AIR NO₂ PT rounds AR0030, 31, 33, 34, 36. 37, 39 and 40

The following table lists those UK laboratories undertaking LAQM activities that have participated in recent AIR NO₂ PT rounds and the percentage (%) of results submitted which were subsequently determined to be **satisfactory** based upon a z-score of $\leq \pm 2$ as defined above.

AIR PT Round	AIR PT AR030	AIR PT AR031	AIR PT AR033	AIR PT AR034	AIR PT AR036	AIR PT AR037	AIR PT AR039	AIR PT AR040
Round conducted in the period	January – February 2019	April – May 2019	July – August 2019	September – November 2019	January – February 2020	May – June 2020	July – August 2020	September – October 2020
Aberdeen Scientific Services	75 %	100 %	100 %	100 %	100 %	NR [4]	NR [4]	100 %
Cardiff Scientific Services	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [4]	NR [4]	NR [3]
Edinburgh Scientific Services	100 %	NR [2]	100 %	25 %	50 %	NR [4]	NR [4]	100 %
SOCOTEC	87.5 % [1]	100 % [1]	100 % [1]	100 % [1]	100 % [1]	NR [4]	NR [4]	100 % [1]
Exova (formerly Clyde Analytical)	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [4]	NR [4]	NR [3]
Glasgow Scientific Services	100 %	100 %	100 %	50 %	100 %	NR [4]	NR [4]	100 %
Gradko International	75 %	100 %	100 %	100 %	75 %	NR [4]	NR [4]	75 %
Kent Scientific Services	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [4]	NR [4]	NR [3]
Kirklees MBC	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [4]	NR [4]	NR [3]
Lambeth Scientific Services	50 %	100 %	50 %	100 %	100 %	NR [4]	NR [4]	100 %
Milton Keynes Council	100 %	100 %	50 %	100 %	100 %	NR [4]	NR [4]	25 %
Northampton Borough Council	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [4]	NR [4]	NR [3]
Somerset Scientific Services	100 %	100 %	100 %	100 %	100 %	NR [4]	NR [4]	100 %
South Yorkshire Air Quality Samplers	100 %	100 %	100 %	75 %	100 %	NR [4]	NR [4]	100 %
Staffordshire County Council	100 %	75 %	75 %	75 %	100 %	NR [4]	NR [4]	50 %
Tayside Scientific Services (formerly Dundee CC)	100 %	NR [2]	100 %	NR [2]	100 %	NR [4]	NR [4]	100 %
West Yorkshire Analytical Services	100 %	100 %	100 %	50 %	100 %	NR [4]	NR [4]	NR [2]

[1] Participant subscribed to two sets of test results (2 x 4 test samples) in each AIR PT round.

[2] NR, No results reported.

[3] Cardiff Scientific Services, Exova (formerly Clyde Analytical), Kent Scientific Services, Kirklees MBC and Northampton Borough Council; no longer carry out NO₂ diffusion tube monitoring and therefore did not submit results.

[4] Round was cancelled due to pandemic.


Gradko is accredited by UKAS for the analysis of NO₂ diffusion tubes. It undertakes the analysis of the exposed diffusion tubes by ultra violet spectrophotometry.

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

 <p>2187</p> <p>Accredited to ISO/IEC 17025:2017</p>	<p>Gradko International Ltd (Trading as Gradko Environmental)</p> <p>Issue No: 024 Issue date: 15 April 2020</p>	
	<p>St Martins House 77 Wales Street Winchester Hampshire SO23 0RH</p>	<p>Contact: Mr A Poole Tel: +44 (0)1962 860331 Fax: +44 (0)1962 841339 E-Mail: diffusion@gradko.co.uk Website: www.gradko.co.uk</p>
Testing performed at the above address only		

DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
ATMOSPHERIC POLLUTANTS Collected on diffusion (sorbent) tubes and monitors	<u>Chemical Tests</u>	Documented In-House Methods
	Ammonia as ammonium (NH ₄ ⁺)	GLM 8 by Ion Chromatography
	Benzene Toluene Ethyl benzene Xylene	GLM 4 by Thermal Desorption/ FID Gas Chromatography
	Hydrogen chloride as chloride (Cl ⁻) Nitrogen dioxide as nitrite (NO ₂ ⁻) Sulphur dioxide as sulphate (SO ₄ ²⁻) Hydrogen fluoride as fluoride (F ⁻)	GLM 3 by Ion Chromatography
	Hydrogen sulphide	GLM 5 by Colorimetric determination (UV Spectrophotometry)
	Ozone as nitrate (NO ₃ ⁻)	GLM 2 by Ion Chromatography
	Nitrogen Dioxide as nitrite (NO ₂ ⁻)	GLM 7 by Colorimetric determination (UV Spectrophotometry)
	Sulphur dioxide as sulphate (SO ₄ ²⁻)	GLM 1 by Ion Chromatography
	Formaldehyde as formaldehyde-DNPH	GLM 18 by HPLC
	Volatile Organic Compounds including: Benzene Toluene Ethylbenzene p-Xylene o-Xylene	GLM 13 by Thermal Desorption GC-Mass Spectrometry



2187

Accredited to
ISO/IEC 17025:2017

Schedule of Accreditation
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2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

Gradko International Ltd
(Trading as Gradko Environmental)
Issue No: 024 Issue date: 15 April 2020

Testing performed at main address only

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
ATMOSPHERIC POLLUTANTS Collected on diffusion (sorbent) tubes and monitors (cont'd)	<u>Chemical Tests</u> (cont'd) Qualitative Analysis and Estimation of Volatile Organic Compounds on diffusion (sorbent) tubes and monitors Naphthalene Tetrachloroethylene Trichloroethylene trans-1,2-Dichloroethene cis-1,2-Dichloroethene Indane Styrene 1,2,3-Trimethylbenzene 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene 1,3-Butadiene Carbon Disulphide Vinyl Chloride Flexible scope for quantitative analysis of Volatile Organic Compounds on diffusion (sorbent) tubes and monitors in accordance with methods developed and validated by in-house procedure LWI 47	GLM 13 by Thermal Desorption GC-Mass Spectrometry with estimations in accordance with ISO standard 16000-6 GLM 13-1 by Thermal Desorption GC-Mass Spectrometry GLM 13-2 by Thermal Desorption GC-Mass Spectrometry GLM 13-3 by Thermal Desorption GC-Mass Spectrometry GLM 13-4 by Thermal Desorption GC-Mass Spectrometry GLM 13-5 by Thermal Desorption GC-Mass Spectrometry GLM 13-6 by Thermal Desorption GC-Mass Spectrometry GLM 13-7 by Thermal Desorption GC-Mass Spectrometry GLM 13-8 by Thermal Desorption GC-Mass Spectrometry LWI 47 by Thermal Desorption GC-Mass Spectrometry
END		

Discussion of Choice of Factor to Use

A co-location study using 2 nitrogen dioxide diffusion tubes has been carried out at the Felsham road, Putney (automatic monitoring site ID: WA9; non- automatic monitoring site IDs: W21 and W22). Due to that some periods showed poor data capture and some periods showed poor precision, we have used the nationally derived bias adjustment factor of 0.82 as per diffusion Tube Bias Factor s/s 03/2021. As the guidance states, the use of nationally derived bias adjustment factor will provide the best estimate of the true annual mean concentration as it is based on more studies than a locally derived one.

Table L. Bias Adjustment Factor

Year	Local or National	If Local, Version of National Spreadsheet	Adjustment Factor
2020	National	03/21	0.82
2019	National	03/20	0.93
2018	National	03/19	0.93
2017	National	03/18	0.89

National Diffusion Tube Bias Adjustment Factor Spreadsheet							Spreadsheet Version Number: 03/21				
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 June 2021	
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods										LAQM Helpdesk Website	
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: Select the Laboratory that Analyses Your Tubes from the Drop-Down List		Step 2: Select a Preparation Method from the Drop-Down List		Step 3: Select a Year from the Drop-Down List		Step 4: 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* shown in blue at the foot of the final column.					
If a laboratory is not chosen, we have no data for this laboratory.		If a preparation method is not chosen, we have no data for this method at this laboratory.		If a year is not chosen, we have no data.		If you have your own co-location study then see footnote*. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953					
Analysed By ¹	Method ²	Year ³	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) ($\mu\text{g}/\text{m}^3$)	Automatic Monitor Mean Conc. (Cm) ($\mu\text{g}/\text{m}^3$)	Bias (B)	Tube Precision ⁴	Bias Adjustment Factor (A) (Cm/Dm)	
Gradko	50% TEA in Acetone	2020	UC	Falkirk Council	10	33	26	24.9%	G	0.80	
Gradko	50% TEA in Acetone	2020	UB	Falkirk Council	11	16	12	33.6%	G	0.75	
Gradko	50% TEA in acetone	2020	UB	Middlesbrough	10	17	12	44.3%	G	0.69	
Gradko	50% TEA in acetone	2020	R	Royal Borough of Windsor and Maidenhead	12	29	25	17.3%	G	0.85	
Gradko	50% TEA in acetone	2020	R	Royal Borough of Windsor and Maidenhead	12	24	22	11.7%	G	0.90	
Gradko	50% TEA in acetone	2020	SU	Redcar & Cleveland Borough Council	11	16	13	23.4%	P	0.81	
Gradko	50% TEA in acetone	2020	R	Newham	10	29	24	18.2%	G	0.85	
Gradko	50% TEA in acetone	2020	R	Sandwell MBC	12	34	27	26.9%	G	0.79	
Gradko	50% TEA in acetone	2020	B	Sandwell MBC	9	14	11	23.0%	S	0.81	
Gradko	50% TEA in acetone	2020	R	Sandwell MBC	11	25	23	9.4%	S	0.91	
Gradko	50% TEA in acetone	2020	UB	Sandwell Metropolitan Borough Council	11	21	19	9.4%	G	0.91	
Gradko	50% TEA in acetone	2020	KS	Manglebone Road Intercomparison	12	57	43	33.0%	G	0.75	
Gradko	50% TEA in acetone	2020	R	London Borough of Richmond upon Thames	12	22	20	9.4%	G	0.91	
Gradko	50% TEA in acetone	2020	B	London Borough of Richmond upon Thames	9	19	16	20.3%	G	0.83	
Gradko	50% TEA in acetone	2020	Overall Factor* (14 studies)						Use	0.82	

A.3 Adjustments to the Ratified Monitoring Data

Short-term to Long-term Data Adjustment

For monitoring sites where data capture is less than 75% of a full calendar year (less than 9 months), the mean of the 'raw' concentrations should be "annualised" in accordance with Box 7.10 of the LLAQM Technical Guidance (TG19) before being compared to annual mean objectives. In 2020 data capture at all sites was very good and above 75% except for one NO₂ site.

The measured annual mean NO₂ concentration at the continuous monitoring station WAB - Tooting High Street had 72% data capture consequently the mean of the 'raw' concentrations has being "annualised".

Distance Adjustment

The results presented in the Table N have been adjusted to represent exposure at the nearest façade. To estimate the concentration at the nearest receptor, the procedure specified in LLAQM.TG(19) 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 recorded an annual mean concentration 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.

The methodology consists of comparing the monitored annual mean NO₂ concentrations at a given point against known relationships between NO₂ concentrations and the distance from a road source.

The monitored annual mean values used in the calculation derived from the diffusion tube NE8 background site (Battersea park).

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

Short-Term to Long-Term Monitoring NO₂ Data Adjustment for the continuous monitoring station WAB - Tooting High Street

NO₂ data at the continuous monitoring station WAB - Tooting High Street had data capture rate of 72% of the full calendar year. Therefore, NO₂ data have been “annualised” using the methodology outlined in LLAQM.TG(19) before being compared to annual mean objectives.

Site	Site Type	Annual Mean (µg/m ³)	Period Mean (µg/m ³)	Ratio (AM/PM)
Greenwich - Eltham	Suburban	13.4	13.4	1.00
Hillingdon - Keats Way	Suburban	28.0	28.8	0.97
Lambeth - Streatham Green	Urban Background	25.8	26.0	0.99
Average				0.986

Table N. NO₂ Fall off with Distance Calculations

Site ID	Site Name	Distance to kerb of nearest road (N/A if not applicable)	Distance from kerb to relevant exposure	NO2 Results 2020 ($\mu\text{g m}^{-3}$)	Background NO2	NO2 Results at relevant exposure receptors ($\mu\text{g m}^{-3}$)
W23	37 West Hill	3.02m	5.22	39	15	35.6
W24	Putney High Street	2.35m	4.7	49	15	43.3
W4	108 Mitcham Road	0.6m	3.06	51	15	40.3
NE3	Queenstown Road	1.05m	2.1	42	15	40.0
NE6	Nine Elms Lane	0.53m	1.06	40	15	36.9
YR2	Royal Academy of Dance	0.70m	1.4	37	15	34.1
YR4	York road /Falcon Road,	0.75m	1.5	38	15	35.0
YR5	Battersea Park Road	0.63m	1.26	52	15	47.3
W42	Bellevue Rd/Trinity Road	1.1m	10	48	15	33.0
W46	Trinity Road	0.8m	11	38	15	26.4
W47	West Hill	0.7m	5	57	15	41.5

Appendix B Full Monthly Diffusion Tube Results for 2020

Table O. NO₂ Diffusion Tube Results

Site ID	Valid data capture for monitoring period % ^a	Valid data capture 2020 % ^b	Annual Mean NO ₂													Annual mean – raw data ^c	Annual mean – bias adjusted ^c (*0.82)
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec			
W23 (37 West Hill)	100	92	53	54	50	47	23	55	N/A	52	49	48	55	45	48	39	
W24 (Putney High Street)	100	100	73	77	53	41	40	58	63	68	64	63	65	55	60	49	
W21 (Felsham road, tube 1)	100	92	37	31	N/A	23	19	26	18	27	26	29	39	34	28	23	
W22 (Felsham road, tube 2)	100	92	35	29	N/A	25	19	25	18	28	26	32	43	33	28	23	
W6 (21 Daylesford Avenue)	100	92	27	18	20	21	13	13	N/A	16	17	17	30	26	20	16	
W25 (Roehampton Church Sc.)	100	92	32	27	24	22	17	18	N/A	22	25	24	32	29	25	20	
W26 (Replingham Road)	100	92	37	33	28	25	21	21	21	N/A	20	19	31	26	26	21	
W27 (68-70 Sutherland Grove)	100	75	N/A	21	18	N/A	14	15	N/A	18	25	21	33	14	20	16	
W28 (61 Summerley street)	100	100	33	26	24	26	17	19	14	21	18	23	37	30	24	20	
W29 (Skelbrook / Garratt lane)	100	92	38	27	27	27	18	N/A	15	25	23	26	32	30	26	21	
W4 (108 Mitcham road)	100	100	80	71	57	53	56	51	56	63	64	69	74	54	62	51	

Site ID	Valid data capture for monitoring period % ^a	Valid data capture 2020 % ^b	Annual Mean NO ₂													Annual mean – raw data ^c	Annual mean – bias adjusted ^c (*0.82)
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec			
W8 (50 Bickely street)	100	75	33	23	N/A	N/A	N/A	18	19	23	29	29	38	27	27	22	
W30 (11B Elmbourne road)	100	100	33	28	23	25	19	19	15	21	26	26	37	28	25	21	
W31 (Hildreth St. / Bedford Hill)	100	83	46	37	34	N/A	N/A	20	17	22	33	31	40	36	32	26	
W32 (2-3 Balham High road)	100	92	46	32	39	36	N/A	34	27	37	36	40	48	35	37	31	
W34 (46 Shelgate road)	100	100	27	28	27	24	18	18	17	23	28	26	36	30	25	21	
W35 (47 Northcote road)	100	100	30	30	29	30	20	24	20	26	29	33	42	35	29	24	
W36 (St Anne's Hill)	100	100	36	29	27	25	21	19	23	26	30	27	37	32	28	23	
W37 (302A Merton Rd)	100	100	41	34	30	27	45	21	27	29	31	33	44	34	33	27	
W38 (High View School)	100	92	31	28	26	27	19	21	N/A	24	27	27	40	30	27	22	
NE2 (Chesterton School)	100	75	38	31	30	27	N/A	22	20	26	N/A	N/A	37	32	29	24	
NE3 (Queenstown Road)	100	100	65	44	51	52	43	45	47	52	57	55	60	48	51	42	
NE4 (Lockington Road)	100	100	37	29	28	26	20	22	20	27	29	33	38	36	29	24	
NE5 (Kirtling Street)	100	83	N/A	36	32	31	23	N/A	23	35	38	43	49	40	35	29	
NE6 (Nine Elms Lane)	100	100	68	51	45	38	39	43	49	49	55	53	56	46	49	40	
NE7 (1 Nine Elms, Parry)	100	100	50	44	42	40	29	33	35	40	44	42	53	43	41	34	

Site ID	Valid data capture for monitoring period % ^a	Valid data capture 2020 % ^b	Annual Mean NO ₂													Annual mean – raw data ^c	Annual mean – bias adjusted ^c (*0.82)
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec			
NE8 (Battersea park)	100	100	24	19	19	20	14	14	13	17	20	18	27	21	19	15	
YR1 (Trafalgar House)	100	100	57	40	41	30	32	33	42	39	43	48	52	35	41	34	
YR2 (Royal Academy of Dance)	100	83	25	51	50	39	38	41	47	N/A	47	52	57	N/A	45	37	
YR3 (Cotton Row)	100	83	41	29	27	23	N/A	N/A	19	22	27	32	42	31	29	24	
YR4 (York road/ Falcon Road)	100	100	59	55	45	36	31	37	41	44	50	55	54	46	46	38	
YR5 (Battersea Park Road)	100	100	72	63	57	54	57	56	59	63	77	69	67	61	63	52	
YR6 (Battersea Square)	100	92	50	40	36	N/A	28	32	34	40	39	39	48	40	39	32	
W39 (Carlton Dr/ Putney Hill)	100	100	41	32	37	34	29	29	32	35	37	35	44	40	35	29	
W40 (Roehampton High St)	100	83	N/A	35	31	29	N/A	23	24	30	32	34	38	33	31	25	
W41 (Northcote / Broomwood Rd)	100	100	34	32	28	27	21	24	28	27	33	28	44	32	30	25	
W42 (Bellevue / Trinity Rd)	100	100	72	54	51	50	21	69	57	71	70	67	67	56	59	48	
W43 (Trinity Rd)	100	100	47	35	33	31	25	27	30	31	34	36	43	38	34	28	
W44 (Thessaly Rd)	100	92	35	29	24	24	N/A	18	18	22	22	26	39	26	26	21	
W45 (A24 Wimbledon)	100	100	48	46	39	30	29	32	34	37	40	43	45	36	38	31	
W46 (Trinity Rd)	100	75	59	48	41	39	39	N/A	N/A	N/A	52	47	52	42	47	38	

Site ID	Valid data capture for monitoring period % ^a	Valid data capture 2020 % ^b	Annual Mean NO ₂													Annual mean – raw data ^c	Annual mean – bias adjusted ^c (*0.82)
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec			
W47 (West Hill)	100	92	95	84	69	22	63	N/A	43	95	79	80	83	69	71	58	
W48 (Balham High Rd)	100	100	48	34	34	32	25	24	25	32	30	31	41	33	32	27	

Notes

Concentrations are presented as $\mu\text{g m}^{-3}$.

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**.

All means have been “annualised” in accordance with LLAQM Technical Guidance if valid data capture for the calendar year is less than 75% and greater than 33%.

(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%).