

**London Borough of Wandsworth**  
**Air Quality Annual Status Report for 2019**  
**Date of publication: 12<sup>th</sup> June 2020**



This report provides a detailed overview of air quality in the London Borough of Wandsworth during 2019. It has been produced to meet the requirements of the London Local Air Quality Management statutory process<sup>1</sup>.

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<sup>1</sup> LLAQM Policy and Technical Guidance 2019 (LLAQM.TG(19)). <https://www.london.gov.uk/what-we-do/environment/pollution-and-air-quality/working-boroughs>

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## **Abbreviations**

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

**Table A. Summary of National Air Quality Standards and Objectives**

<b>Pollutant</b>	<b>Objective (UK)</b>	<b>Averaging Period</b>	<b>Date<sup>1</sup></b>
Nitrogen dioxide - NO <sub>2</sub>	200 µg m <sup>-3</sup> not to be exceeded more than 18 times a year	1-hour mean	31 Dec 2005
	40 µg m <sup>-3</sup>	Annual mean	31 Dec 2005
Particles - PM <sub>10</sub>	50 µg m <sup>-3</sup> not to be exceeded more than 35 times a year	24-hour mean	31 Dec 2004
	40 µg m <sup>-3</sup>	Annual mean	31 Dec 2004
Particles - PM <sub>2.5</sub>	25 µg m <sup>-3</sup>	Annual mean	2020
	Target of 15% reduction in concentration at urban background locations	3 year mean	Between 2010 and 2020
Sulphur Dioxide (SO <sub>2</sub> )	266 µg m <sup>-3</sup> not to be exceeded more than 35 times a year	15 minute mean	31 Dec 2005
	350 µg m <sup>-3</sup> not to be exceeded more than 24 times a year	1 hour mean	31 Dec 2004
	125 µg m <sup>-3</sup> not to be exceeded more than 3 times a year	24 hour mean	31 Dec 2004

Note: <sup>1</sup> by which to be achieved by and maintained thereafter

## **1. Air Quality Monitoring**

The latest monitoring results for 2019 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 2019 Wandsworth operated seven automatic air quality monitoring sites and a diffusion tube network covering 32 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 King's College London.

Wandsworth Council also undertakes non-automatic monitoring of nitrogen dioxide using diffusion tubes, 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 NO<sub>2</sub> concentrations at a number of locations across the borough. The results provide monthly NO<sub>2</sub> averages and can be used to compare measured concentrations with the annual mean NO<sub>2</sub> 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 2019**

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	<b>Wandsworth Town Hall</b> , High street Wandsworth (Since 1994)	525779	174662	Urban background	Y	22m	22m	4.85m	CO, NO <sub>2</sub> , O <sub>3</sub>	Chemiluminescent
WA7	<b>Putney High Street</b> , 94A Putney High street (Since 2009). Denomination according to London Air website: <b>Putney high street</b>	524035	175334	Kerbside	Y	1m	0.85m	1.75m	NO <sub>2</sub> , PM <sub>10</sub>	Chemiluminescent ; TEOM
WA8	<b>Putney High Street</b> , 94A Putney High street, first floor (Since 2010). Denomination according to London Air website: <b>Putney high street façade</b>	524032	175335	Roadside	Y	1m	1m	4.85m	NO <sub>2</sub>	Chemiluminescent
WA9	<b>Felsham Road</b> , Putney (Since 2011). Denomination according to London Air website: <b>Putney</b>	524044	175495	Urban background	Y	4.8m from Felsham road; 46m from Putney high street kerb	1m	3.35m	NO <sub>2</sub> , PM <sub>10</sub>	Chemiluminescent ; TEOM
WAA	<b>Thessaly Road</b> , Battersea (Since 2011). Denomination according to London Air website: <b>Battersea</b>	529137	177249	Roadside	Y	7.5m from Battersea Park road kerb	1m	1.75m	NO <sub>2</sub> , PM <sub>10</sub>	Chemiluminescent ; TEOM
WAB	<b>Tooting High Street</b> (Since 2015)	527567	171628	Roadside	Y	2m	2m	1.75m	NO <sub>2</sub> , PM <sub>10</sub>	Chemiluminescent ; TEOM
WAC	<b>313 Lavender Hill</b> , Clapham Junction (Since 2016); Denomination according to London Air website: <b>Lavender Hill - Clapham Junction</b>	527430	175454	Roadside	Y	8m from Lavender Hill kerb; 3.75m Illminster Gardens kerb	1m	1.75m	NO <sub>2</sub> , PM <sub>10</sub>	Chemiluminescent ; TEOM

**Table C. Details of Non-Automatic Monitoring Sites for 2019**

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)
<b>Across borough</b>										
W23	37 West Hill, Wandsworth Town	525111	174619	Roadside	Y	2.20m	3.02m	2.52m	NO <sub>2</sub>	No
W24	Putney sign (Mac Donald's), Putney	524045	175366	Roadside	Y	2.35m	2.35m	2.3m	NO <sub>2</sub>	N
W21 & W22	Felsham Road tube 1 & tube 2, Putney	524044	175495	Urban Background	Y	4.8m from Felsham road; 46m from Putney high street kerb	1m	3.35m	NO <sub>2</sub>	Y
W6	21 Daylesford Avenue, Putney	522270	175307	Urban Background	Y	11m	2.4m	2.85m	NO <sub>2</sub>	N
W25	Roehampton Church School (on corner of Roehampton Lane), Roehampton	522542	173700	Roadside	Y	0.86m	0.53m	2.25m	NO <sub>2</sub>	N
W26	Replingham Road (corner of Heythrope street), Southfield	524847	173282	Kerbside	Y	2.54m	0.62m	2.37m	NO <sub>2</sub>	N
W27	68-70 Sutherland Grove (opposite St. Cecilia's school), Southfield	524633	173594	Urban Background	Y	2.00m	0.65m	2.83m	NO <sub>2</sub>	N
W28	61 Summerley Street, Earlsfield	526011	172869	Urban background	Y	2.06m	0.60m	2.36m	NO <sub>2</sub>	N
W29	Junction Skelbrook Street / Garratt Lane, Earlsfield	526099	172833	Roadside	Y	0.70m	3.29m	2.27m	NO <sub>2</sub>	N
W4	108 Mitcham Road, Tooting Broadway	527688	171204	Kerbside	Y	3m	0.6m	2.65m	NO <sub>2</sub>	N
W8	50 Bickely Street, Tooting Broadway	527524	171239	Urban Background	Y	2.97m	1.85m	2.8m	NO <sub>2</sub>	N
W30	11B Elmbourne Road, Balham	528900	172431	Urban Background	Y	4.50m	0.50m	2.56m	NO <sub>2</sub>	N
W31	Junction Hildreth Street / Bedford Hill, Balham	528607	173333	Kerbside	Y	1.44m	3.64m	2.21m	NO <sub>2</sub>	N
W32	2-3 Balham High Road, Balham	528436	173133	Kerbside	Y	4.40m	0.71m	2.30m	NO <sub>2</sub>	N
W33	Now called NE4 Lockington 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)
W34	46 Shelgate Road, Northcote	527569	174986	Urban Background	Y	2.14m	0.40m	2.38m	NO <sub>2</sub>	N
W35	47 Northcote Road, Northcote	527487	174981	Kerbside	Y	4.21m	0.49m	2.37m	NO <sub>2</sub>	N
W36	St. Anne's Hill (opposite St. Anne's School), Fairfield	525875	174616	Urban Background	Y	2.73m	0.89m	2.38m	NO <sub>2</sub>	N
W37	302A Merton Rd (Riversdale School), Southfields	525278	173483	Roadside	Y	3.35m	3.35m	2.33m	NO <sub>2</sub>	N
W38	High View School, Plough Terrace, Fairfield	526863	175239	Kerbside	Y	0.45m	0.45m	2.42m	NO <sub>2</sub>	N
<b>Nine Elms</b>										
NE2	Chesterton School, Latchmere	528043	176618	Roadside	Y	2.85m	2.85m	2.20m	NO <sub>2</sub>	N
NE3	Queenstown Road, Queenstown	528771	176819	Kerbside	Y	1.05m	1.05m	2.30m	NO <sub>2</sub>	N
NE4	Lockington Road, Battersea (previously called as "W33 Lockington road" in 2017)	528871	176943	Urban Background	Y	1.22m	0.69m	2.37m	NO <sub>2</sub>	N
NE5	Kirtling Street, Queenstown	529265	177353	Kerbside	Y	0.50m	0.50m	2.35m	NO <sub>2</sub>	N
NE6	Nine Elms Lane, Queenstown	529413	177486	Kerbside	Y	0.53m	0.53m	2.40m	NO <sub>2</sub>	N
NE7	1 Nine Elms, Parry Street, Queenstown	530129	177727		Y	0.5m	0.5m	2.35m	NO <sub>2</sub>	N
NE8	Battersea park, Queenstown	528023	177176		Y	420m from Prince of Wales Drive	420m from Prince of Wales Drive	2.37m	NO <sub>2</sub>	N
<b>York Road</b>										
YR1	Trafalgar House, St Mary's Park	526201	175340	Kerbside	Y	0.84m	0.84m	2.30m	NO <sub>2</sub>	N
YR2	Royal Academy of Dance, St Mary's Park	526581	175731	Kerbside	Y	0.70m	0.70m	2.26m	NO <sub>2</sub>	N
YR3	Cotton Row, St Mary's Park	526480	175930	Urban background	Y	160m from York road	160m from York road	2.34m	NO <sub>2</sub>	N
YR4	York road, corner with Falcon Road, Latchmere	527086	176119	Kerbside	Y	0.75m	0.75m	2.25m	NO <sub>2</sub>	N
YR5	256 Battersea Park Road, St Mary's Park	527109	176022	Kerbside	Y	0.63m	0.63m	2.32m	NO <sub>2</sub>	N
YR6	31-32 Battersea Square, St Mary's Park	526817	176686	Kerbside	Y	0.44m	0.44m	2.35m	NO <sub>2</sub>	N



## 1.2 Comparison of Monitoring Results with AQOs

The results presented are after adjustments for “annualisation”. For results that indicate the exposure estimate, calculated for the nearest residential façade see Appendix C.

**Table D. Annual Mean NO<sub>2</sub> Ratified and Bias-adjusted Monitoring Results (µg m<sup>-3</sup>)**

Site ID	Site type	Valid data capture for monitoring period % <sup>a</sup>	Valid data capture 2019 % <sup>b</sup>	Annual Mean Concentration (µg m <sup>-3</sup> )						
				2013 <sup>c</sup>	2014 <sup>c</sup>	2015 <sup>c</sup>	2016 <sup>c</sup>	2017 <sup>c</sup>	2018 <sup>c</sup>	2019 <sup>c</sup>
<b>WA2</b> (Wandsworth Town Hall)	Automatic	N/A	100%	48	43	36	43	40	38	41
<b>WA7</b> (Putney High Street; Denomination according to London Air website: Putney high)	Automatic	N/A	92%	124	123	123	124	76	68	69
<b>WA8</b> (Putney High Street first floor; Putney high street façade)	Automatic	N/A	97%	106	95	96	110	60	62	66
<b>WA9</b> (Felsham Road; Denomination according to London Air website: Putney)	Automatic	N/A	95%	40	41	40	45	31	35	35
<b>WAA</b> (Thessaly Road, Battersea; Denomination according to London Air website: Battersea)	Automatic	N/A	88%	45	47	40	40	33	33 <sup>c</sup>	32
<b>WAB</b> (Tooting High Street)	Automatic	N/A	89%	N/A	N/A	60 for monitoring period (68 for 2015)	59	55	53	50
<b>WAC</b> (313 Lavender Hill; Denomination according to London Air website: Lavender Hill - Clapham Junction)	Automatic	N/A	57%	N/A	N/A	N/A	46 (ratified)	43	42	37 <sup>c</sup>
<b>W23</b> (37 West Hill)	Diffusion tube	N/A	100%	N/A	N/A	N/A	N/A	57	55	49

Site ID	Site type	Valid data capture for monitoring period % <sup>a</sup>	Valid data capture 2019 % <sup>b</sup>	Annual Mean Concentration ( $\mu\text{g m}^{-3}$ )						
				2013 <sup>c</sup>	2014 <sup>c</sup>	2015 <sup>c</sup>	2016 <sup>c</sup>	2017 <sup>c</sup>	2018 <sup>c</sup>	2019 <sup>c</sup>
<b>W24</b> (Putney Sign Mac Donald's)	Diffusion tube	N/A	92%	N/A	N/A	N/A	N/A	<b>63</b>	<b>55</b>	<b>59</b>
<b>W21 &amp; W22</b> (Felsham road, tube 1 & 2)	Diffusion tube	N/A	100%	<b>44</b>	<b>40</b>	35	<b>41</b>	28	32	30
<b>W6</b> (21 Daylesford Avenue)	Diffusion tube	N/A	67%	26	26	24	28	23	23	23 <sup>c</sup>
W25 (Roehampton Church School)	Diffusion tube	N/A	100%	N/A	N/A	N/A	N/A	32	29	27
<b>W26</b> (Replingham Road)	Diffusion tube	N/A	58%	N/A	N/A	N/A	N/A	31	30	31 <sup>c</sup>
<b>W27</b> (68-70 Sutherland Grove)	Diffusion tube	N/A	92%	N/A	N/A	N/A	N/A	24	25	23
<b>W28</b> (61 Summerley street)	Diffusion tube	N/A	100%	N/A	N/A	N/A	N/A	27	28	27
<b>W29</b> (Junction Skelbrook street / Garratt lane)	Diffusion tube	N/A	100%	N/A	N/A	N/A	N/A	31	32	31
<b>W4</b> (108 Mitcham road)	Diffusion tube	N/A	100%	<b>97</b>	<b>96</b>	<b>79</b>	<b>80</b>	<b>66</b>	<b>64</b>	<b>62</b>
<b>W8</b> (50 Bickely street)	Diffusion tube	N/A	92%	<b>41</b>	36	33	35	31	31	28
<b>W30</b> (11B Elmbourne road)	Diffusion tube	N/A	100%	N/A	N/A	N/A	N/A	33	31	29
<b>W31</b> (Junction Hildreth Street / Bedford Hill)	Diffusion tube	N/A	100%	N/A	N/A	N/A	N/A	39	39	36
<b>W32</b> (2-3 Balham High road)	Diffusion tube	N/A	83%	N/A	N/A	N/A	N/A	<b>46</b>	<b>44</b>	39
<b>W33</b>	Now called <b>NE4 Lockington road</b>									
<b>W34</b> (46 Shelgate road)	Diffusion tube	N/A	83%	N/A	N/A	N/A	N/A	31	30	31
<b>W35</b> (47 Northcote road)	Diffusion tube	N/A	92%	N/A	N/A	N/A	N/A	34	35	32
<b>W36</b> (St Anne's Hill)	Diffusion tube	N/A	92%	N/A	N/A	N/A	N/A	39	33	31

Site ID	Site type	Valid data capture for monitoring period % <sup>a</sup>	Valid data capture 2019 % <sup>b</sup>	Annual Mean Concentration ( $\mu\text{g m}^{-3}$ )						
				2013 <sup>c</sup>	2014 <sup>c</sup>	2015 <sup>c</sup>	2016 <sup>c</sup>	2017 <sup>c</sup>	2018 <sup>c</sup>	2019 <sup>c</sup>
W37 (302A Merton Rd)	Diffusion tube	N/A	100%	N/A	N/A	N/A	N/A	N/A	37	37
W38 (High View School)	Diffusion tube	N/A	100%	N/A	N/A	N/A	N/A	N/A	32	29
NE2 (Chesterton School)	Diffusion tube	N/A	92%	N/A	N/A	N/A	N/A	N/A	35	34
NE3 (Queenstown Road)	Diffusion tube	N/A	100%	N/A	N/A	N/A	N/A	N/A	<b>63</b>	<b>59</b>
NE4 (Lockington Road)	Diffusion tube	N/A	100%	N/A	N/A	N/A	N/A	36	34	31
NE5 (Kirtling Street)	Diffusion tube	N/A	100%	N/A	N/A	N/A	N/A	N/A	46	39
NE6 (Nine Elms Lane)	Diffusion tube	N/A	75%	N/A	N/A	N/A	N/A	N/A	54	48
NE7 (1 Nine Elms, Parry)	Diffusion tube	N/A	100%	N/A	N/A	N/A	N/A	N/A	49	47
NE8 (Battersea park)	Diffusion tube	N/A	100%	N/A	N/A	N/A	N/A	N/A	24 <sup>c</sup>	20
YR1 (Trafalgar House)	Diffusion tube	N/A	100%	N/A	N/A	N/A	N/A	N/A	53	44
YR2 (Royal Academy of Dance)	Diffusion tube	N/A	92%	N/A	N/A	N/A	N/A	N/A	<b>75</b>	<b>57</b>
YR3 (Cotton Row)	Diffusion tube	N/A	100%	N/A	N/A	N/A	N/A	N/A	31	29
YR4 (York road, corner with Falcon Road)	Diffusion tube	N/A	100%	N/A	N/A	N/A	N/A	N/A	49	49
YR5 (256 Battersea Park Road)	Diffusion tube	N/A	75%	N/A	N/A	N/A	N/A	N/A	<b><u>73</u></b>	<b><u>70</u></b>
YR6 (31-32 Battersea Square)	Diffusion tube	N/A	92%	N/A	N/A	N/A	N/A	N/A	44	43

Notes: Exceedance of the NO<sub>2</sub> annual mean AQO of 40  $\mu\text{g m}^{-3}$  are shown in bold (orange). NO<sub>2</sub> annual means in excess of 60  $\mu\text{g m}^{-3}$  (in red), indicating a potential exceedance of the NO<sub>2</sub> hourly mean AQS objective are shown in bold and underlined.

<sup>a</sup> data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

<sup>b</sup> 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%)

<sup>c</sup> Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

Table D shows the NO<sub>2</sub> diffusion tube monitoring results, with bias corrected values for each year from 2013 to 2019 (Note – see Table O-1 for the uncorrected monthly data for 2019).

The results in bold indicate an exceedance of the annual mean Air Quality Objective (AQO) of 40 µg m<sup>-3</sup> and the results underlined indicate an NO<sub>2</sub> annual mean in excess of 60 µg m<sup>-3</sup> highlighting a potential exceedance of the NO<sub>2</sub> hourly mean AQO.

All data from the automatic monitoring stations have been fully ratified. Data capture rate of 75% was achieved at all nitrogen dioxide diffusion tube sites and automatic monitoring stations in 2019 except for:

- W6 (21 Daylesford Avenue) diffusion tube: 67% capture rate
- W26 (Replingham Road) diffusion tube: 58% capture rate
- WAC (Lavender Hill - Clapham Junction) automatic monitoring station: 57% capture rate

Consequently, it has been necessary to annualise the results of these three sites in accordance with the procedure described in LAQM TG (16). A nationally derived bias adjustment factor of 0.93 was used for all diffusion tube data. Bias Corrected (0.93) as per diffusion Tube Bias Factor 03/2020.

The distance correction calculations for diffusion tubes are presented in Appendix C, Table O-2. Nitrogen dioxide concentration reduces rapidly with distance from the kerbside, the data in Table O-2 shows what a dramatic 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 NO<sub>2</sub> concentration is predicted to be below the AQO of 40 µg m<sup>-3</sup> at the façade of the nearest residential property.

Annual mean NO<sub>2</sub> concentrations measured at all the automatic monitoring stations have constantly decreased since 2016, and more generally over the 7-year period (2013-2019) for which data have been reported.

Significant reductions have been continuously noticed since 2016 at the automatic monitoring stations of WAB Tooting High Street, and WAC Lavender Hill - Clapham Junction. In Putney High Street (at both WA7 and WA8 automatic monitoring stations) significant reductions were noticeable until 2018, and then values were constant in 2019. At WA2 Wandsworth Town Hall, WA9 Felsham Road and WAA Battersea significant reductions were evident until 2017, and after that values were constant and below the national objectives. The automatic monitoring station data are further described by Figure A. The red line indicates the Air Quality objective limit of 40 µgm<sup>3</sup>.

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 locations have been scheduled for 2020.

## Diffusion Tube Data Analysis

In 2019 the diffusion tube network consisted of 32 monitoring locations across Wandsworth. The results from the 2019 monitoring (Table D) show that the objective of  $40 \mu\text{g m}^{-3}$  was exceeded at 11 monitored locations in the borough which is 34% of sites. Two of these sites also exceeded an annual mean of  $60 \mu\text{g m}^{-3}$  which indicates that the 1 hour-mean objective may also have been exceeded at these locations:

- W4 (108 Mitcham road),  $62 \mu\text{g m}^{-3}$
- YR5 256 (Battersea Park Road),  $70 \mu\text{g m}^{-3}$

Both sites have exceeded  $60 \mu\text{g m}^{-3}$  for at least the last two years but overall annual concentrations have remained relatively static.

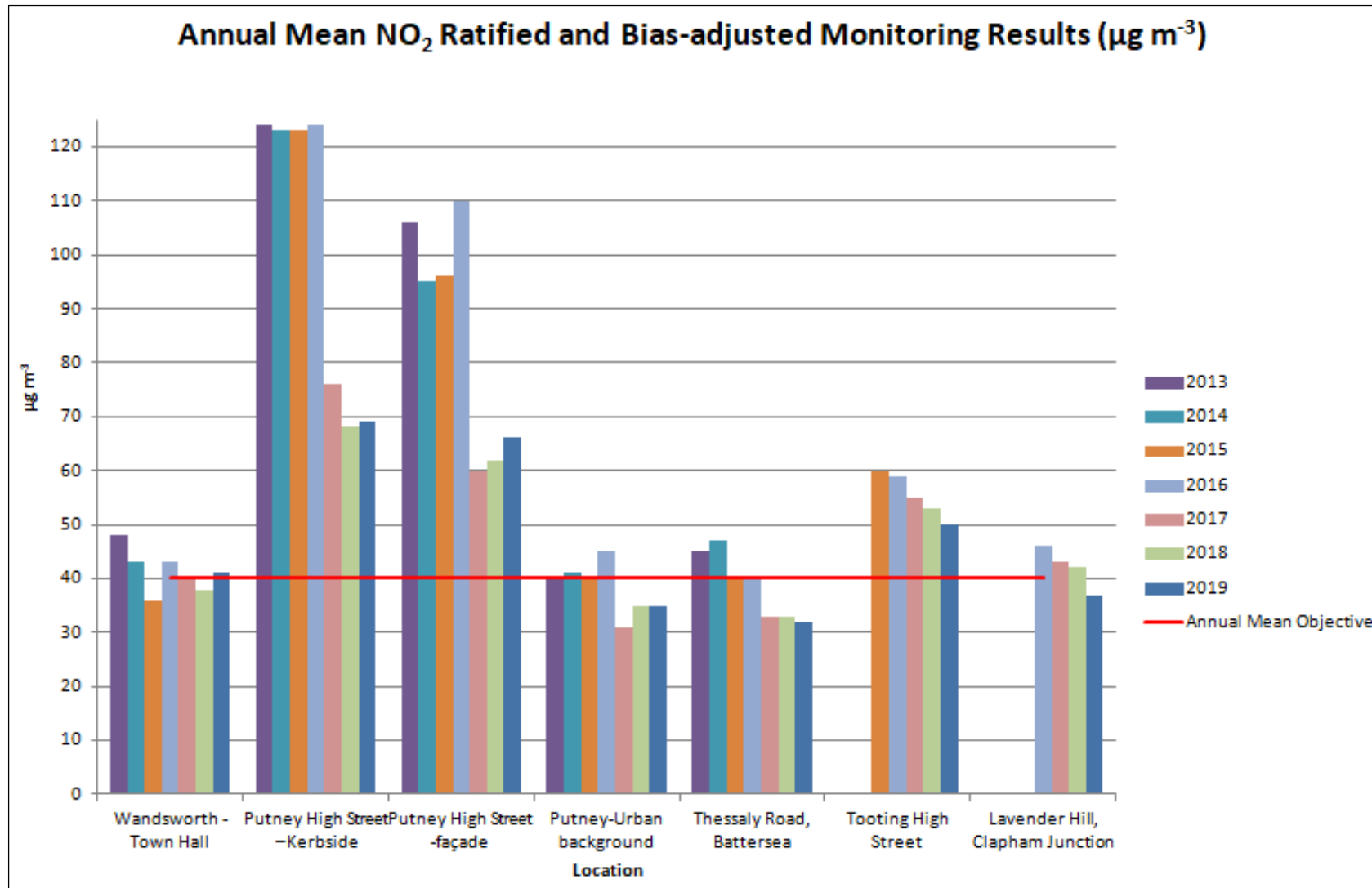
The source of pollution in town centres remains road traffic and construction sites, it is essential that bold measures are taken to remove the dirtiest vehicles and reduce vehicle numbers to relieve congestion. The borough Air Quality Action Plan outlines a range of measures that are being undertaken to reduce transport based emissions, progress updates for 2019 are provided in Table H.

In 2018 sites at Queenstown Road (Site ID: NE3) and York Road (Site ID: YR2) were among the four sites exceeding an annual mean of  $60 \mu\text{g m}^{-3}$ , concentrations fell below this threshold in 2019 indicating that an exceedance of the 1 hour-mean objective was unlikely to have occurred at these locations.

Between 2017 and 2019, the majority of the existing diffusion tube locations have showed a reduction in the annual mean  $\text{NO}_2$  concentrations. The diffusion tubes exceeded the annual mean  $\text{NO}_2$  air quality objective ( $40 \mu\text{g m}^{-3}$ ) at busy roadside locations, but met the objective at all urban background locations and at other less busy roadside locations. The  $60 \mu\text{g m}^{-3}$  concentration were exceeded at certain roadside locations: Putney High Street, Mitcham Road (Tooting), Nine Elms area and York road. These are locations already identified air quality focus areas. Exceedances of the  $60 \mu\text{g m}^{-3}$  concentration indicate the potential risk of the hourly mean air quality objective being exceeded.

The overall monitoring results for the Borough show that  $\text{NO}_2$  concentrations exceeded the UK annual mean objective (as it has done for each year since 2005), and improvements are still required. As the greatest exceedances 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.

Figure A. Annual mean NO<sub>2</sub> Ratified and Bias-adjusted Automatic Monitoring results (µg m<sup>-3</sup>)



**Table E. NO<sub>2</sub> Automatic Monitor Results: Comparison with 1-hour Mean Objective**

Site ID	Valid data capture for monitoring period % <sup>a</sup>	Valid data capture 2019 % <sup>b</sup>	Number of Hourly Means > 200 µg m <sup>-3</sup>						
			2013 <sup>c</sup>	2014 <sup>c</sup>	2015 <sup>c</sup>	2016 <sup>c</sup>	2017 <sup>c</sup>	2018 <sup>c</sup>	2019 <sup>c</sup>
<b>WA2</b> (Wandsworth Town Hall)	N/A	100%	0	0 (124.4)	0 (108.1)	0	0	0	0
<b>WA7</b> (Putney High Street; Denomination according to London Air website: Putney high street)	N/A	92%	<b>1580</b>	<b>1537</b>	<b>1443</b>	<b>1248</b>	<b>76 (247)</b>	<b>26</b>	11
<b>WA8</b> (Putney High Street first floor; Denomination according to London Air website: Putney high street façade)	N/A	97%	<b>661</b>	<b>505</b>	<b>329</b>	<b>403</b>	9	5	<b>19</b>
<b>WA9</b> (Felsham Road; Denomination according to London Air website: Putney)	N/A	95%	2	0 (132.7)	0 (104)	<b>45</b>	7 (179)	0	0
<b>WAA</b> (Thessaly Road, Battersea; Denomination according to London Air website: Battersea)	N/A	88%	0	1	0 (113.6)	1	0 (98)	0 (0.97)	0
<b>WAB</b> (Tooting High Street)	N/A	89%	N/A	N/A	9	2	0	2	3
<b>WAC</b> (313 Lavender Hill; Denomination according to London Air website: Lavender Hill - Clapham Junction)	N/A	57%	N/A	N/A	N/A	<b>23</b>	0	0	0

Notes: Exceedance of the NO<sub>2</sub> short term AQO of 200 µg m<sup>-3</sup> over the permitted 18 days per year are shown in **bold** (orange).

<sup>a</sup> data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

<sup>b</sup> 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%)

<sup>c</sup> Means should be “annualised” in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

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 WAC (Lavender Hill - Clapham Junction) site, where the data capture rate was 57%.

Exceedances of the hourly mean objective limit were observed at the Putney High Street kerbside automatic monitoring station, but the number of exceedances was significantly less than in previous years. The air quality objective was met at the other air quality monitoring stations.

The exceedances of the 1-hour mean objective are further illustrated by Figures B, C and D. The red line indicates the short term air quality objective of no more than 18 exceedances of the 200 µg m<sup>-3</sup>.

Figure B. NO<sub>2</sub> Automatic Monitor results: Comparison with 1-hour Mean Objective

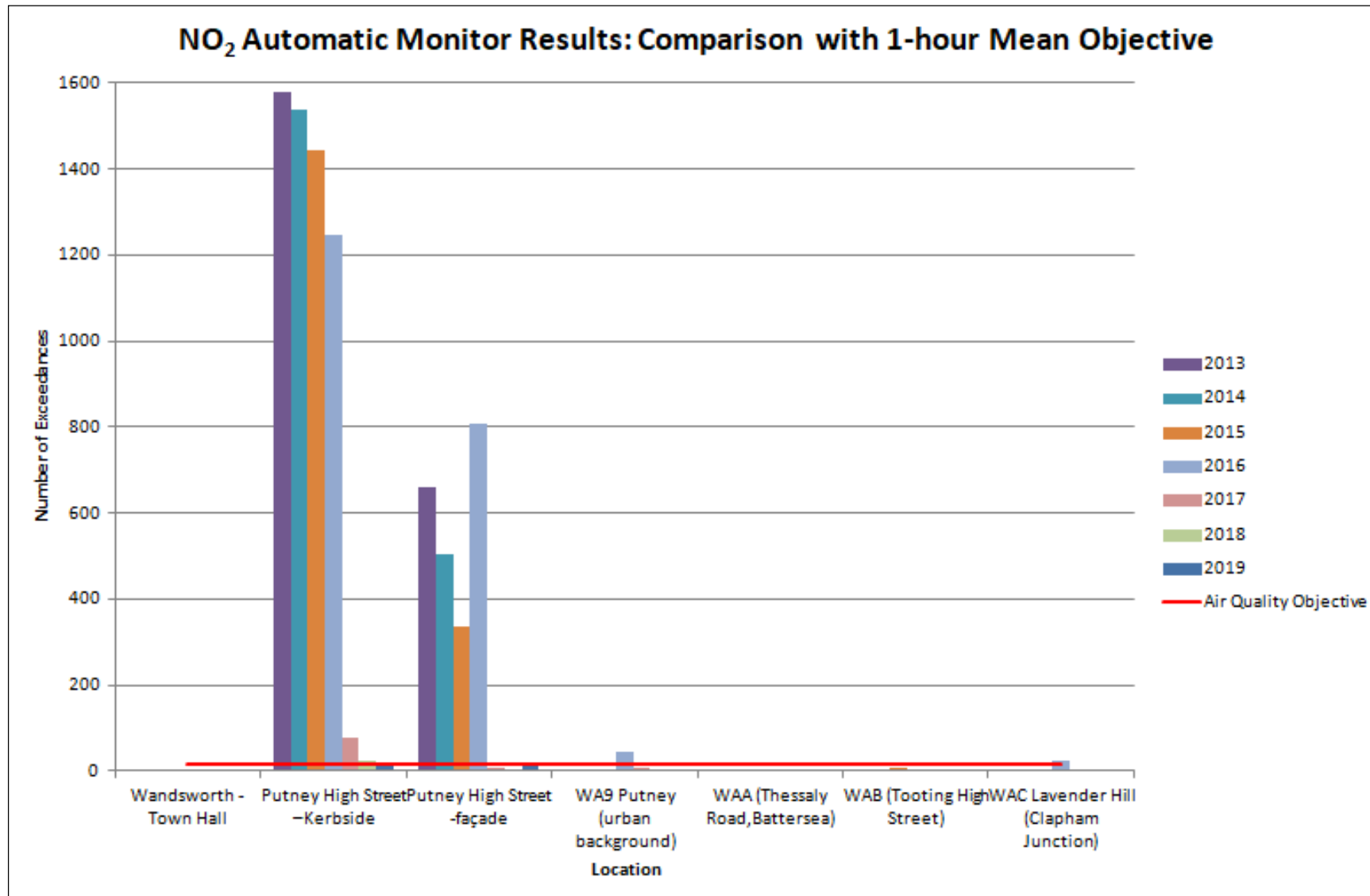




Figure C. NO<sub>2</sub> Automatic Monitor results: Comparison with 1-hour Mean Objective automatic monitoring stations, excluding Putney high street

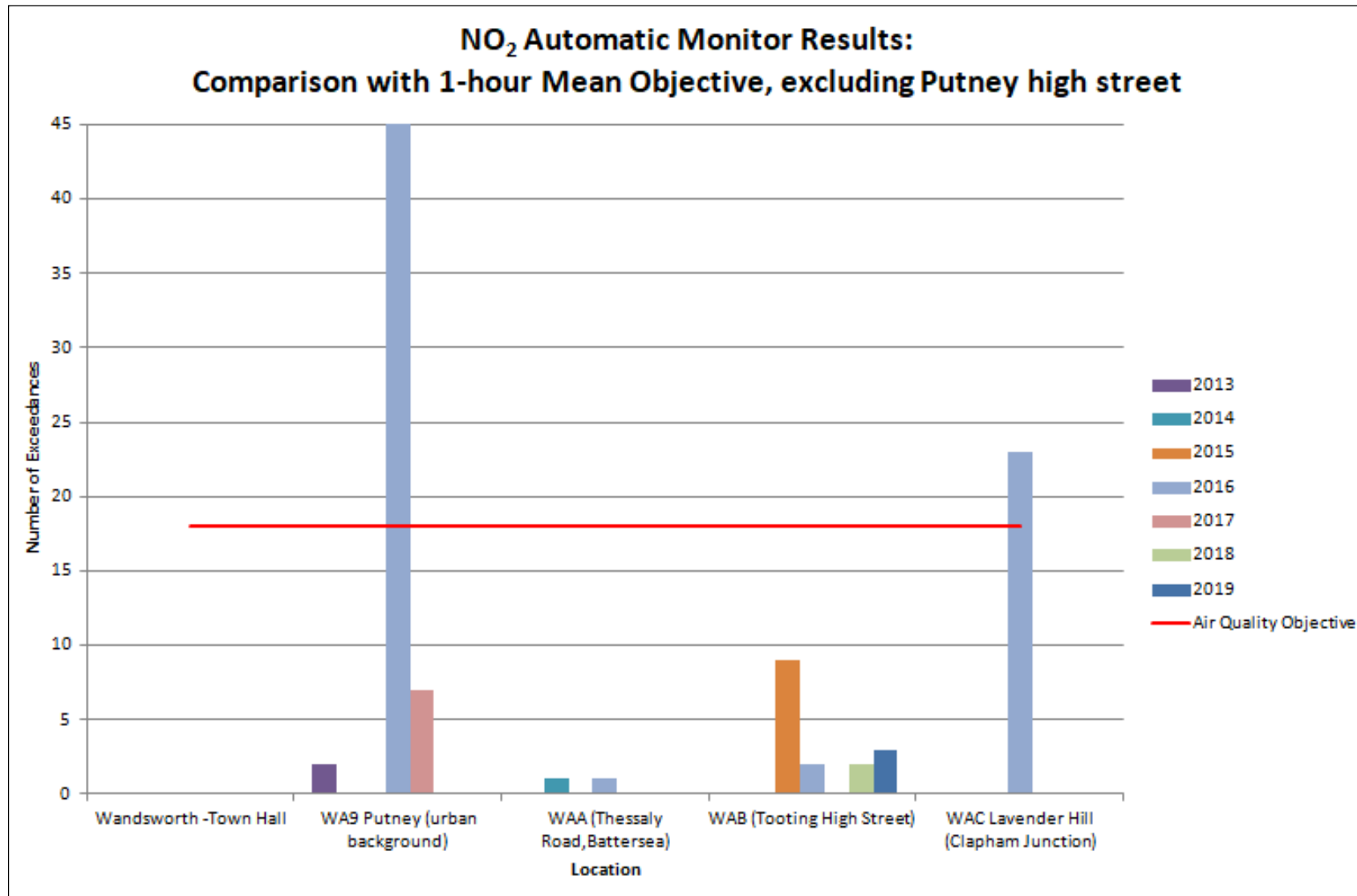
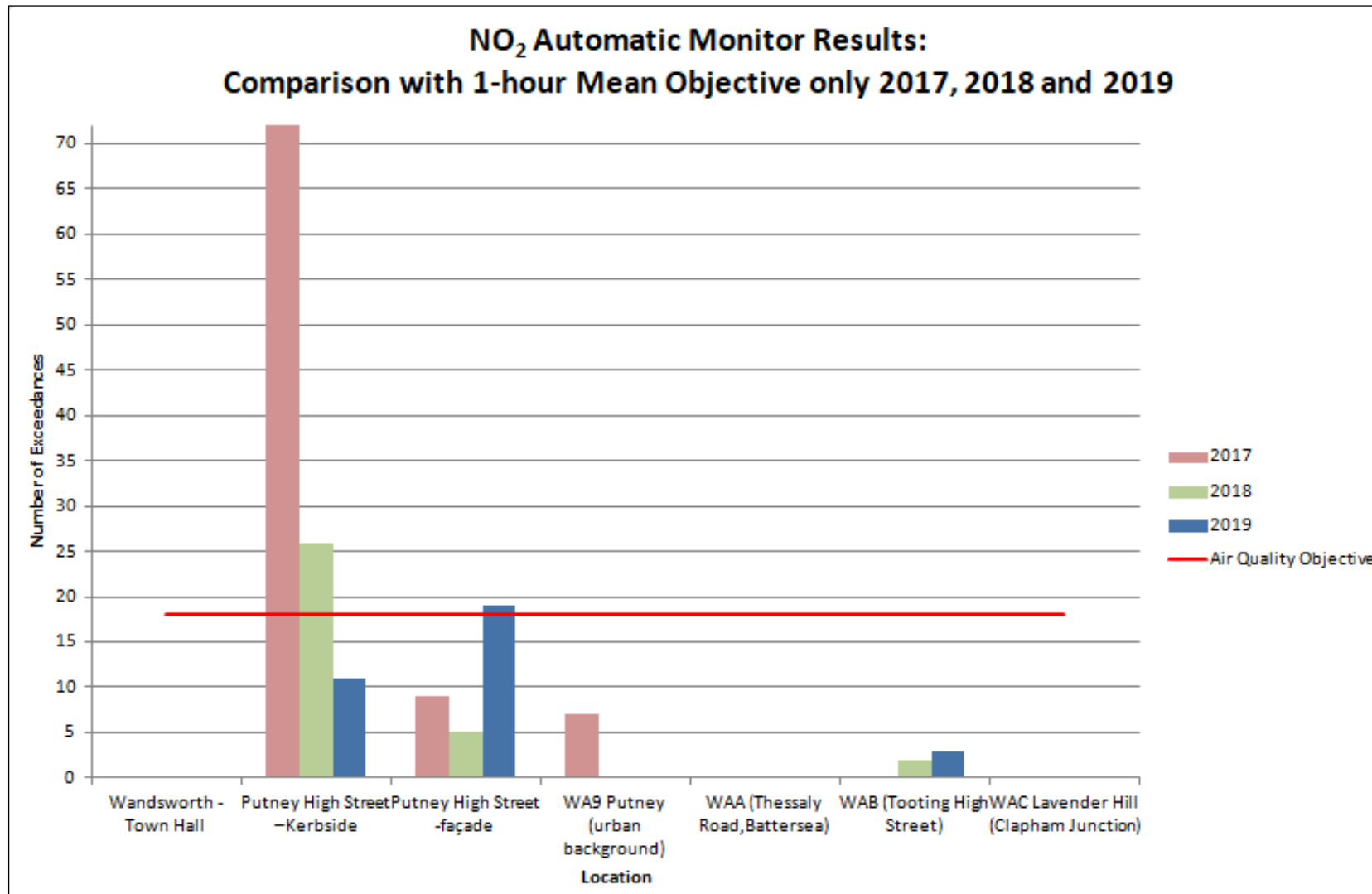


Figure D. NO<sub>2</sub> Automatic Monitor results: Comparison with 1-hour Mean Objective automatic monitoring stations only 2017, 2018 and 2019



**Table F. Annual Mean PM<sub>10</sub> Automatic Monitoring Results (µg m<sup>-3</sup>)**

Site ID	Valid data capture for monitoring period % <sup>a</sup>	Valid data capture 2019% <sup>b</sup>	Annual Mean Concentration (µg m <sup>-3</sup> )						
			2013 <sup>c</sup>	2014 <sup>c</sup>	2015 <sup>c</sup>	2016 <sup>c</sup>	2017 <sup>c</sup>	2018 <sup>c</sup>	2019 <sup>c</sup>
<b>WA7</b> (Putney High Street; Denomination according to London Air website: Putney high street)	N/A	86%	28	24	25	21	21	25	22
<b>WA9</b> (Felsham Road; Denomination according to London Air website: Putney)	N/A	89%	24	20	18	18	17	17	18
<b>WAA</b> (Thessaly Road; Denomination according to London Air website: Battersea)	N/A	97%	31	28	27	32	27	25	23
<b>WAB</b> (Tooting High Street)	N/A	85%	N/A	N/A	25	24	23	23	23
<b>WAC</b> (313 Lavender Hill; Denomination according to London Air website: Lavender Hill - Clapham Junction)	N/A	57%	N/A	N/A	N/A	18	20	21	20 <sup>c</sup>

Notes: Exceedance of the PM<sub>10</sub> annual mean AQO of 40 µg m<sup>-3</sup> are shown in **bold** (orange).

<sup>a</sup> data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

<sup>b</sup> 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%)

<sup>c</sup> Means should be “annualised” in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

All data from the automatic monitoring stations have been fully ratified.

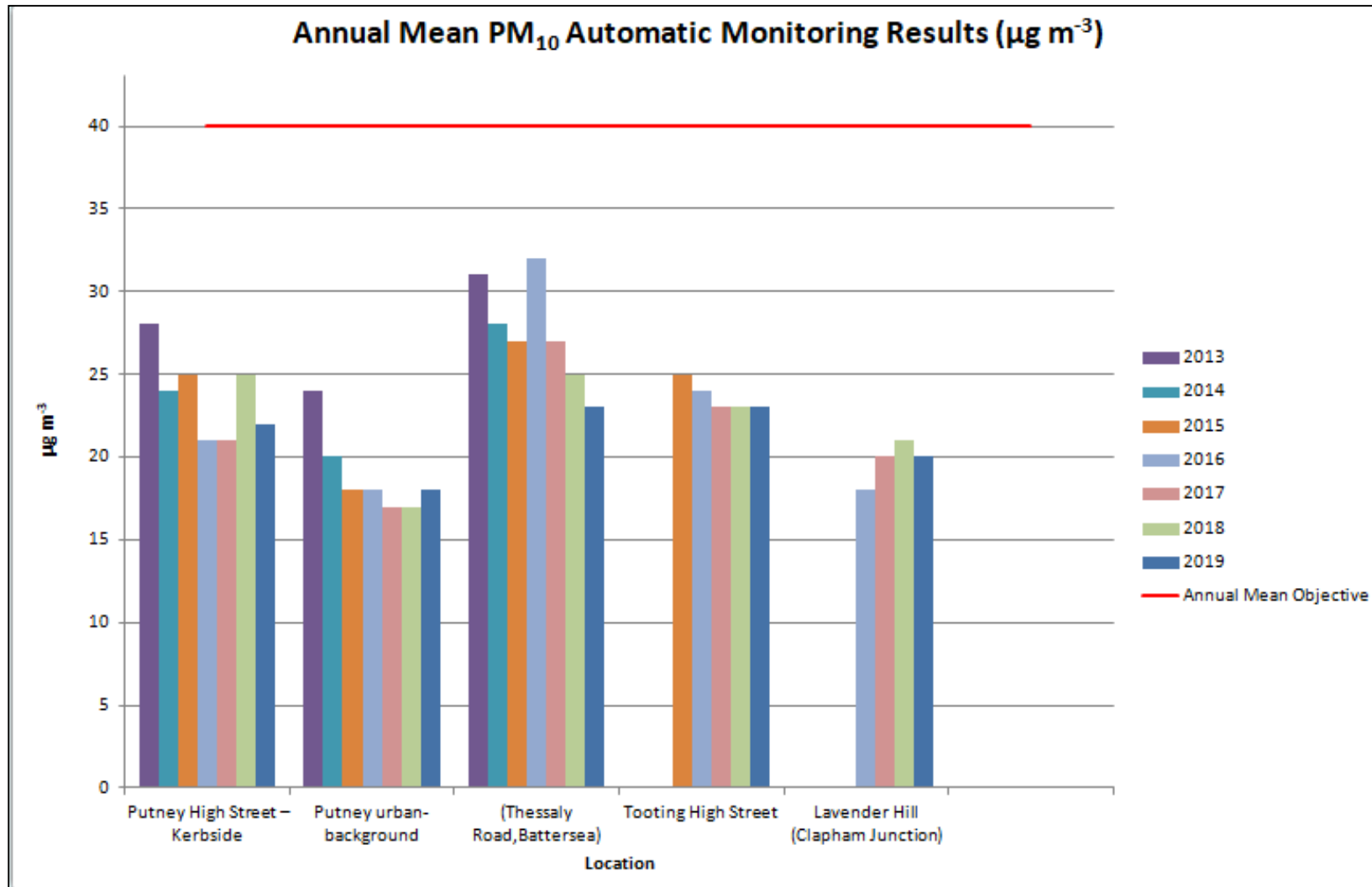
Data capture rates for all sites (both automatic monitoring stations and diffusion tubes) were above 75%, except for the following site:

- WAC (Lavender Hill - Clapham Junction) automatic monitoring station: 57% capture rate.

Since 2013, the annual mean objective for PM<sub>10</sub> have been met at all monitoring stations. However, the measured concentrations at Putney High Street, Battersea, and Tooting High Street exceed the World Health organisation (WHO) limit of 20 µgm<sup>-3</sup>.

The annual mean PM<sub>10</sub> results are further illustrated by Figure E. The red line indicates the air quality objective of no more than 40 µgm<sup>-3</sup>.

Figure E. Annual Mean PM<sub>10</sub> Automatic Monitoring Results ( $\mu\text{g m}^{-3}$ )



**Table G. PM<sub>10</sub> Automatic Monitor Results: Comparison with 24-Hour Mean Objective**

Site ID	Valid data capture for monitoring period % <sup>a</sup>	Valid data capture 2019% <sup>b</sup>	Number of Daily Means > 50 µg m <sup>-3</sup>						
			2013 <sup>c</sup>	2014 <sup>c</sup>	2015 <sup>c</sup>	2016 <sup>c</sup>	2017 <sup>c</sup>	2018 <sup>c</sup>	2019 <sup>c</sup>
<b>WA7</b> (Putney High Street; Denomination according to London Air website: Putney high street kerbside)	N/A	86%	5	5	10	4	2	3	9
<b>WA9</b> (Felsham Road; Denomination according to London Air website: Putney urban background)	N/A	89%	3 (41.7)	2 (31)	4 (21.2)	6	5	1	5
<b>WAA</b> (Thessaly Road; Denomination according to London Air website: Battersea)	N/A	97%	<b>48</b>	28	16	<b>43</b>	16	10	14
<b>WAB</b> (Tooting High Street)	N/A	85%	N/A	N/A	10	11	11	3	9
WAC (313 Lavender Hill; Denomination according to London Air website: Lavender Hill - Clapham Junction)	N/A	57%	N/A	N/A	N/A	1 (27.5)	4	3	2

Notes: Exceedance of the PM<sub>10</sub> short term AQO of 50 µg m<sup>-3</sup> over the permitted 35 days per year or where the 90.4th percentile exceeds 50 µg m<sup>-3</sup> are shown in **bold** (orange). Where the period of valid data is less than 85% of a full year, the 90.4th percentile is shown in brackets after the number of exceedances.

<sup>a</sup> data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

<sup>b</sup> 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%)

<sup>c</sup> Means should be “annualised” in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

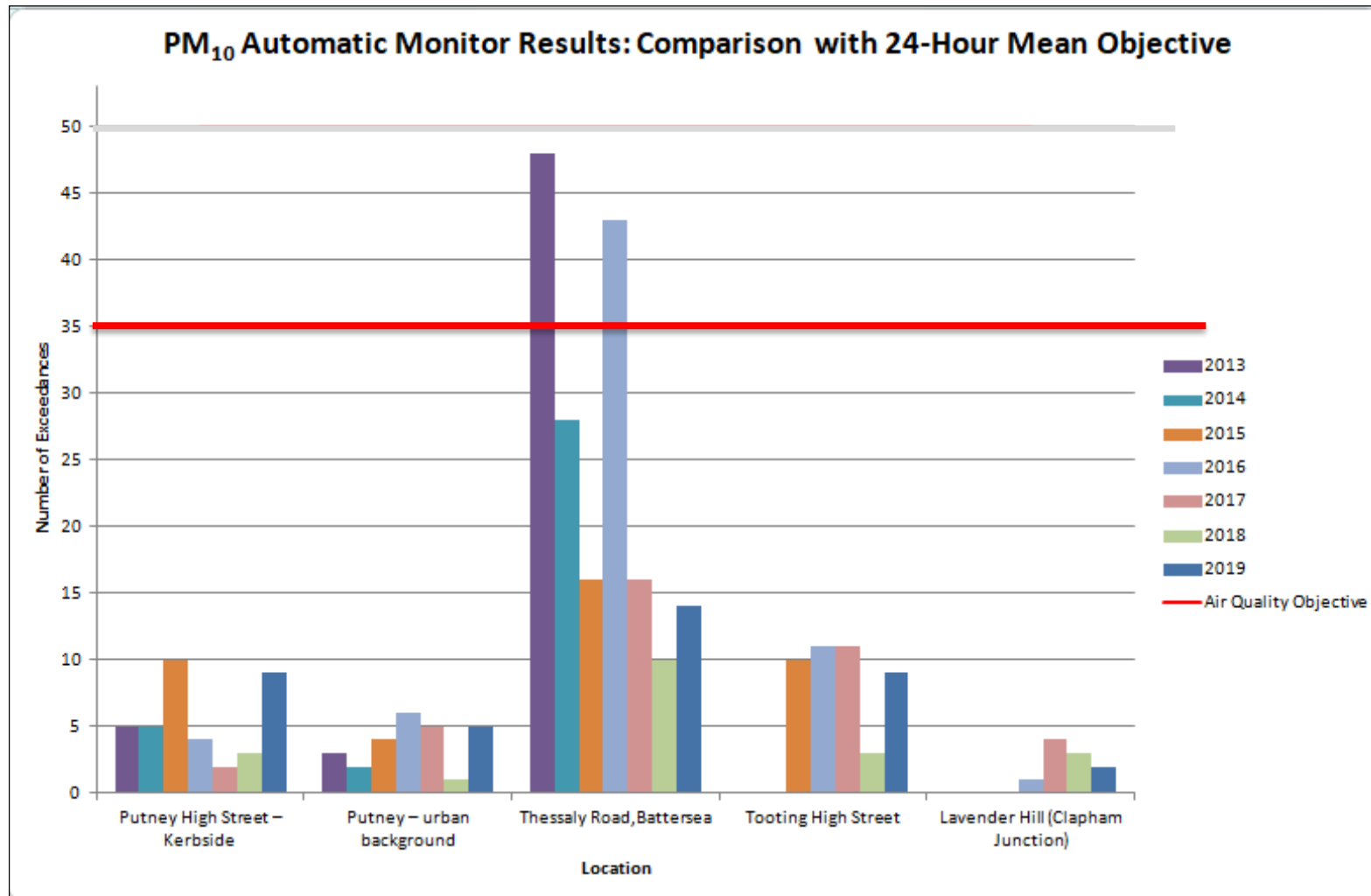
All data have been fully ratified for all the continuous monitoring stations.

All data capture at all monitoring stations are in excess of 75% at all monitoring stations, except at the WAC (Lavender Hill - Clapham Junction) site, where data capture was 57%.

In 2019, the 24-hour mean objective for PM<sub>10</sub> of 50 µgm<sup>-3</sup> has not been exceeded more than 35 times per year in any monitoring stations. Therefore, the 24-hour mean objective for PM<sub>10</sub> has been met.

The trend data from 2013 to 2019, and the PM<sub>10</sub> comparison with 24-hour mean objective are further illustrated by Figure F. The red line indicates the air quality objective of no more than 35 exceedances of 50 µgm<sup>-3</sup>.

Figure F. PM<sub>10</sub> Automatic Monitor Results: Comparison with 24-Hour Mean Objective



## **2. Action to Improve Air Quality**

### **2.1 Air Quality Action Plan Progress**

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

**Table H. Delivery of Air Quality Action Plan Measures**

<b>Measure 1: Taking cost effective measures to minimise emissions from Council activities.</b>					
<b>No.</b>	<b>Action</b>	<b>Implementation Date</b>	<b>Cost</b>	<b>Funding</b>	<b>Progress</b>
1.1	Installation of low NOx boilers on replacement.	36+ months	Low	Corporate	<ul style="list-style-type: none"> <li>• 100% boilers specified for housing are Ultra-Low Nox.</li> <li>• 100% of installed boilers are ULNOx.</li> <li>• 95% of systems in public buildings will be ULNOx, remainder are different systems.</li> </ul>
1.2	Installation of energy saving measures in Council buildings.	36+ months	Low	Corporate	<ul style="list-style-type: none"> <li>• Since 2008/9 a 32% reduction in carbon emissions within Council buildings has been achieved.</li> <li>• Oversight and governance from the Carbon Reduction Group (CRG).</li> </ul>
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	<ul style="list-style-type: none"> <li>• LEZ/ULEZ consideration currently being discussed at senior levels.</li> <li>• Daily fines of £250-£2000 can be imposed if vehicles within LEZ/ULEZ do not meet criteria.</li> </ul>
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	<ul style="list-style-type: none"> <li>• SSA Highways Contract (April 2019) - 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.</li> <li>• SSA Environment Purchasing Policy Statement - Proposal suggested for all vehicles used to deliver council contracts adhere to LEZ and ULEZ standards.</li> <li>• 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.</li> </ul>



					Current targets: ULEZ compliance of all vehicles by 2021 including telematics.
<b>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.</b>					
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	The Council Services Transport Plan ceased to be in formal operation from the advent of the SSA. However in 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
2.2	Reducing the need for staff to drive to work, if a car is needed for work.	36+ months	Low	Transport	
<b>Measure 3: Ensuring air quality is embedded in corporate policy.</b>					
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	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>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 <a href="http://www.wandsworth.gov.uk/sustainability">www.wandsworth.gov.uk/sustainability</a></p> <p>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> <ul style="list-style-type: none"> <li>-Our environmental planning policies aim to ensure that sustainability is designed into new buildings and plans (see the Local development framework pages).</li> <li>-We encourage walking and cycling to school, support car clubs and are improving public transport and providing electric car charging points.</li> </ul>
3.4	Consolidation of goods and services.	36+ months	Low	Corporate	<p>The Council has prepared in 2017 two specific Air Quality Action Plans for Tooting Town centre and Clapham Junction respectively. Several actions were implemented in 2019, 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>
<b>Measure 4: Production of a Council air pollution communications strategy, bringing together internal and external communications.</b>					
No.	Action	Implementation Date	Cost	Funding	Progress
4.1	Establish role of air quality champion.	36+ months	Low	Communication & Public Engagement	<p>In 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>

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	In 2019 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 been extensive coverage on the council social media feeds.
4.3	Provision of air quality information.	36+ months	Medium	Communication & Public Engagement	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 <a href="https://lovecleanair.org">https://lovecleanair.org</a> ) are undertaken in line with the developments of new projects.
4.4	Maintain provision of information on cleaner fuels, technologies and vehicles.	12-36 months	Low	Communication & Public Engagement	See action 7.2
4.5	Undertaking of events to raise awareness of air quality and active travel.	36+ months	Medium	Communication & Public Engagement	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 more sustainable means of transport such as walking, cycling and taking less polluted routes. Examples of activities / initiatives include: - The anti-idling campaigns - 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.

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	Aligns with manifesto pledges of supporting vulnerable people and improving air quality.
4.7	Undertaking engagement with local businesses in hotspot area.	36+ months	Medium	Communication & Public Engagement	Pilot Clean Air Village project delivered and now expanded in partnership with Cross River Partnership.
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	Low Emission Neighbourhoods scheme.

**Measure 5: Call for actions from the Mayor of London, TfL and national government to improve air quality.**

No.	Action	Implementation 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	<ul style="list-style-type: none"> <li>Led by portfolio holder/elected members.</li> <li>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.</li> </ul>
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	<ul style="list-style-type: none"> <li>Led by portfolio holder/elected members.</li> <li>Ensure there is public awareness around ULEZ/LEZ expansion ramifications.</li> </ul>
5.3	Campaign to national government towards a “non- diesel economy”.	36+ months	Low	Transport	Led by portfolio holder/elected members.

<b>Measure 6: Encouraging walking and cycling and the use of public transport and discouraging driving to stations.</b>					
<b>No.</b>	<b>Action</b>	<b>Implementation Date</b>	<b>Cost</b>	<b>Funding</b>	<b>Progress</b>
6.1	Use of transport and planning policies to encourage walking and cycling.	12-36 months	Low	Transport	<ul style="list-style-type: none"> <li>• Active Travel Advisory Group.</li> <li>• TfL Low Emission Neighbourhoods.</li> <li>• TfL Cycling Toolkit.</li> </ul>
6.2	Promote the use of public transport.	36+ months	Low	Transport	<ul style="list-style-type: none"> <li>• Wandsworth Town Station and Putney Station: Second entrance - acknowledged.</li> <li>• Network Rail &amp; DfT engagement: Overcrowding relief on local trains &amp; stations including South Western timetable changes in 2019.</li> <li>• TfL and Network Rail engagement: Crossrail 2, LHR improved rail access, improving capacity at Battersea Park Station &amp; Nine Elms/Embassy Gardens.</li> <li>• Bus Service Improvements: increasing service frequencies and addition live-information displays at bus stops in key locations.</li> <li>• Legible London Wayfinding Scheme in Battersea/Nine Elms - improving access for pedestrians and signposting public transport.</li> </ul>
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. 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. School Streets were a focus for 2019 and 5 schools were assessed as feasible pilots. Wandsworth is also a Bike-It Borough and we offer a number of schools Sustrans cycling support and initiatives through this programme.
6.4	Use of on-street parking controls to reduce the number of people driving to stations in the borough to	12-36 months	Low	Transport	<ul style="list-style-type: none"> <li>• 77% of borough roads covered by CPZ.</li> <li>• Multiple requests received per year for amendments or for introduction of CPZ's.</li> </ul>

	continue their journey by rail into Central London.				
6.5	Facilitate and enable car clubs of travel by sustainable transport modes including cycling and walking.	12-36 months	Medium	Transport	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Tooting Town Centre AQAP.</li> <li>• Clapham Junction AQAP.</li> </ul>
6.6	Promote and enable car clubs as an alternative to private car ownership, via; <ul style="list-style-type: none"> <li>- provision of on–street car club parking spaces</li> <li>- planning obligations for car club parking/membership in new residential developments.</li> </ul>	12-36 months	Low	Transport	Car club membership to increase by 1,800 per year (150 per month).
6.7	Introduction of 20mph speed limit areas on borough residential roads.	<12 months	Low	Transport	<p>A 20mph speed limit is now in place on all residential streets in the borough.</p> <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	Implementation Date	Cost	Funding	Progress
7.1	Provision of green infrastructure / electric vehicle charging points.	12-36 months	Medium	Transport	On-street charging increased to 231 lamp column chargers provided by Siemens/Ubitercity and 155 sockets at 54 sites run by Source London
7.2	Maintain provision of information on cleaner.				Council website used to update residents and businesses. See <a href="https://www.wandsworth.gov.uk/roads-and-transport/transport/sustainable-travel/electric-vehicles/">https://www.wandsworth.gov.uk/roads-and-transport/transport/sustainable-travel/electric-vehicles/</a>

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.
<b>Measure 8: Freight / deliveries actions.</b>					
No.	Action	Implementation Date	Cost	Funding	Progress
8.1	Enabling more delivery and servicing to be made outside peak hours.	12-36 months	Medium	High Street	<ul style="list-style-type: none"> <li>• Low Emissions Logistics Project.</li> <li>• Tooting Town Centre AQAP.</li> <li>• Clapham Junction AQAP.</li> </ul>
8.2	Better management/prohibition of deliveries at “hotspots” such as Putney High Street.	12-36 months	High	High Street	<ul style="list-style-type: none"> <li>• Low Emissions Logistics Project.</li> <li>• Tooting Town Centre AQAP.</li> <li>• Clapham Junction AQAP.</li> <li>• Improve air quality by applying lessons learned from Putney High street to Clapham Junction and Tooting High street.</li> </ul>
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	<ul style="list-style-type: none"> <li>• Low Emissions Logistics Project.</li> <li>• Tooting Town Centre AQAP.</li> <li>• Clapham Junction AQAP.</li> </ul>
8.4	Improve green infrastructure in and around high streets and areas of high footfall in Borough.	12-36 months	High	High Street	<ul style="list-style-type: none"> <li>• Putney High Street: <ul style="list-style-type: none"> <li>- Currently exploring ideas around Putney High Street.</li> <li>- Appoint a “healthy streets” champion that works to help reduce street clutter and create new pocket parks, as part of a total safety approach.</li> <li>- Putney High Street regeneration (Thamesfield ward pledge): Work with businesses and developers to deliver an attractive High Street.</li> </ul> </li> <li>• Improve environment and shopping at Tooting Bec and Trinity Road, including off-street parking in business yards on Balham High Road.</li> </ul>

					<ul style="list-style-type: none"> <li>• Aiming for 60,000 trees in the borough. Plant 500 new trees by April 2019 and provide 100 trees to community organisations to plant on their own land.</li> </ul>																																																				
<b>Measure 9: Ensuring that air quality and reducing emission is included in planning policy and implemented.</b>																																																									
<b>No.</b>	<b>Action</b>	<b>Implementation Date</b>	<b>Cost</b>	<b>Funding</b>	<b>Progress</b>																																																				
9.1	Encouraging energy efficient measures and energy efficient design in new buildings.	36+ months	Low	Planning & Development	<p><b>Applications submitted that include energy assessments</b> 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> </tr> </thead> <tbody> <tr> <td>6</td> <td>7</td> <td>8</td> <td>9</td> </tr> <tr> <td>66%</td> <td>68%</td> <td>74%</td> <td>80%</td> </tr> </tbody> </table> <p><b>Developments completed with renewable energy installations</b></p> <table border="1"> <thead> <tr> <th>2015/16</th> <th>2016/17</th> <th>2017/18</th> <th>2018/19</th> </tr> </thead> <tbody> <tr> <td>6</td> <td>7</td> <td>8</td> <td>9</td> </tr> <tr> <td>26</td> <td>29</td> <td>12</td> <td>21</td> </tr> </tbody> </table> <p><b>Percent reduction in carbon dioxide emissions achieved overall through on-site renewable energy generation and energy efficiency measure.</b> Currently being assessed</p> <p><b>BREEAM rating for major new non-residential development</b> Permissions:</p> <table border="1"> <thead> <tr> <th>Rating</th> <th>2016/17</th> <th>2017/18</th> <th>2018/19</th> </tr> </thead> <tbody> <tr> <td>Outstanding</td> <td>0%</td> <td>0%</td> <td>0%</td> </tr> <tr> <td>Excellent</td> <td>48%</td> <td>40%</td> <td>82%</td> </tr> <tr> <td>Very Good</td> <td>29%</td> <td>30%</td> <td>0%</td> </tr> <tr> <td>Good</td> <td>0%</td> <td>0%</td> <td>0%</td> </tr> <tr> <td>Pass</td> <td>0%</td> <td>0%</td> <td>0%</td> </tr> <tr> <td>Unclassified</td> <td>24%</td> <td>30%</td> <td>18%</td> </tr> </tbody> </table>	2015/16	2016/17	2017/18	2018/19	6	7	8	9	66%	68%	74%	80%	2015/16	2016/17	2017/18	2018/19	6	7	8	9	26	29	12	21	Rating	2016/17	2017/18	2018/19	Outstanding	0%	0%	0%	Excellent	48%	40%	82%	Very Good	29%	30%	0%	Good	0%	0%	0%	Pass	0%	0%	0%	Unclassified	24%	30%	18%
2015/16	2016/17	2017/18	2018/19																																																						
6	7	8	9																																																						
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Good	0%	0%	0%																																																						
Pass	0%	0%	0%																																																						
Unclassified	24%	30%	18%																																																						



9.2	Boilers installed as part of development must have low NOx ratings in accordance with the standards set out in the Mayor of London's sustainable design and construction supplementary planning guidance.	36+ months	Low	Planning & Development	Data not available at this time
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 & Development	<ul style="list-style-type: none"> <li>• Air Quality Neutral Assessments in line with the Sustainable Design and Construction SDP being undertaken.</li> <li>• In 2019, within the Environmental Protection Team, officers reviewed planning applications in terms of air quality for both minor and major developments. As defined in Part 1 of The Town and Country Planning (Development Management Procedure) (England) Order 2015, major developments are development of dwellings where 10 or more dwellings are to be provided, or the site area is 0.5 hectares or more; Development of other uses, where the floor space is 1,000sq metres or more, or the site area is 1 hectare or more. 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, etc.</li> </ul>
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 & Development	Air Quality Neutral Assessments in line with the Sustainable Design and Construction SDP being undertaken.

9.5	Ensure actions from previous air quality GLA audits of schools are being implemented.	12-36 months	Medium	School	<ul style="list-style-type: none"> <li>Action plan for living green walls been created for 3 schools so far (St Marys, St Anne's and Chesterton), in line with the GLA air quality audit recommendations.</li> </ul>
9.6	Undertake more school air quality audits in line with GLA audits.	12-36 months	Medium	School	<ul style="list-style-type: none"> <li>6 schools air quality audited in 2019 by Wandsworth Air Quality: Officers/ Transport officers/ Sustainability Officers: <ul style="list-style-type: none"> <li>- St Georges Church of England Primary School</li> <li>- Roehampton Church of England Primary School</li> <li>- Ark John Archer Primary Academy School</li> <li>- Finton House School Primary School</li> <li>- St Anselm's Catholic Primary School</li> <li>- West Hill Primary School.</li> </ul> </li> </ul>

**Measure 10: Creation of a design guide of best practice on reducing emissions and exposure for developments and streets.**

No.	Action	Implementation 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.

**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	12-36 months	Medium	Planning & Development	<ul style="list-style-type: none"> <li>London Low Emission Construction Partnership (LLECP) - Joint venture with KCL and other London boroughs.</li> <li>Construction Site Compliance Officer (CSCO) - appointed to manage environmental impacts from major developments.</li> </ul>

	sites and to develop a construction hub to disseminate best practice.				
<b>Measure 12: Actions to reduce emissions by enforcement of regulatory powers.</b>					
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	<ul style="list-style-type: none"> <li>• CSCO working with developers to ensure best practice and GLA compliance.</li> <li>• Non-road mobile machinery (NRMM) working across boroughs.</li> <li>• Code of Practice reviewed but not updated.</li> </ul>
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	The Council remains committed raise awareness about the smoke control order in the whole and that the use of some solid fuel is prohibited. The Council enforces this control order as well.
12.5	Use of vehicle idling powers where appropriate and awareness raising of increased pollution through vehicle idling.	<12 months	Low	Corporate	<ul style="list-style-type: none"> <li>• All Civil Enforcement Officers have been trained and are able to serve FPN's where required.</li> <li>• Use of CAQC's to approach drivers who are idling</li> <li>• GLA Anti-idling campaign</li> </ul>
<b>Measure 13: Air quality monitoring to review and assess and evaluate actions.</b>					
No.	Action	Implementation Date	Cost	Funding	Progress

13.1	To continue to monitor air quality across the borough measuring nitrogen dioxide (NO2) and fine particles (PM10).	12-36 months	Low	Corporate	<ul style="list-style-type: none"> <li>• Continuous monitoring of air quality in line with requirements and reporting needs.</li> <li>• In 2019, the Council continued to monitor air quality pollutants (NO<sub>2</sub> and PM<sub>10</sub>) from 7 automatic monitoring stations as well as a diffusion tube network.</li> </ul>
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	<ul style="list-style-type: none"> <li>• 5 Air Quality Focus Areas within Wandsworth.</li> <li>• Actions taken where appropriate (e.g. Tooting High Street).</li> <li>• Low Emissions Logistics Project.</li> <li>• Tooting Town Centre AQAP.</li> <li>• Clapham Junction AQAP.</li> </ul>
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	Implementation 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.				<ul style="list-style-type: none"> <li>• Setting up a workshop in liaison with GLA Digital office.</li> <li>• Possibilities for air quality monitoring, vehicle management, parking, buildings, new developments, community engagement and participation.</li> </ul>

### 3. Planning Update and Other New Sources of Emissions

**Table I. Planning requirements met by planning applications in the London Borough of Wandsworth in 2019**

Condition	Number
Number of planning applications where an air quality impact assessment was reviewed for air quality impacts	46
Number of planning applications required to monitor for construction dust	78
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	13
Number of developments required to install Ultra-Low NO <sub>x</sub> boilers	No definitive record
Number of developments where an AQ Neutral building and/or transport assessments undertaken	46
Number of developments where the AQ Neutral building and/or transport assessments not meeting the benchmark and so required to include additional mitigation	0
Number of planning applications with S106 agreements including other requirements to improve air quality	10
Number of planning applications with CIL payments that include a contribution to improve air quality	Cannot identify individual planning applications where contribution to improve air quality has been included. However, there have been contributions made across the Borough.
<p><b>NRMM: Central Activity Zone and Canary Wharf</b>            Number of conditions related to NRMM included.            Number of developments registered and compliant.            Please include confirmation that you have checked that the development has been registered at <a href="http://www.nrmm.london">www.nrmm.london</a> and that all NRMM used on-site is compliant with Stage IIIB of the Directive and/or exemptions to the policy.</p>	<ul style="list-style-type: none"> <li>• Conditions related to NRMM: no definitive record. Cannot identify individual planning applications where contribution to improve air quality has been included. However, there have been contributions made across the Borough.</li> <li>• Total number of audited sites: 11</li> <li>• Number of audited sites compliant: 5</li> <li>• Number of audited sites non-compliant: 4</li> <li>• Audited sites with no NRMM: 2</li> </ul>

Condition	Number
<p><b>NRMM: Greater London (excluding Central Activity Zone and Canary Wharf)</b>            Number of conditions related to NRMM included.            Number of developments registered and compliant.            Please include confirmation that you have checked that the development has been registered at <a href="http://www.nrmm.london">www.nrmm.london</a> and that all NRMM used on-site is compliant with Stage IIIA of the Directive and/or exemptions to the policy.</p>	<ul style="list-style-type: none"> <li>• Conditions related to NRMM: no definitive record. Cannot identify individual planning applications where contribution to improve air quality has been included. However, there have been contributions made across the Borough.</li> <li>• Total number of audited sites: 14</li> <li>• Number of audited sites compliant: 14</li> <li>• Number of audited sites non-compliant: 0</li> </ul>

### 3.1 New or significantly changed industrial or other sources

In 2019, one new LAPPC Part B process was identified, compared to the previous year.

## **Appendix A Details of Monitoring Site QA/QC**

### **A.1 Automatic Monitoring Sites**

Routine calibrations of our air quality monitoring stations were carried out by the local site operator on a fortnightly basis. This was ESU1 until 30<sup>th</sup> November 2017 and then by TRL (Transport Research Laboratories) from 1<sup>st</sup> December 2017 onwards. Site audits are undertaken on a six monthly basis by The National Physical Laboratory's (NPL).

Servicing and maintenance of the air quality monitoring stations were undertaken by TRL (Transport Research Laboratories) in 2019, and it continues to be undertaken by them.

Data ratification and air quality support services were undertaken by King's College London in 2019, and it continues to be undertaken by them.

There are no relevant issues to be highlighted.

#### **PM<sub>10</sub> Monitoring Adjustment**

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.

### **A.2 Diffusion Tube Quality Assurance / Quality Control**

NO<sub>2</sub> 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 2019 were still 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).

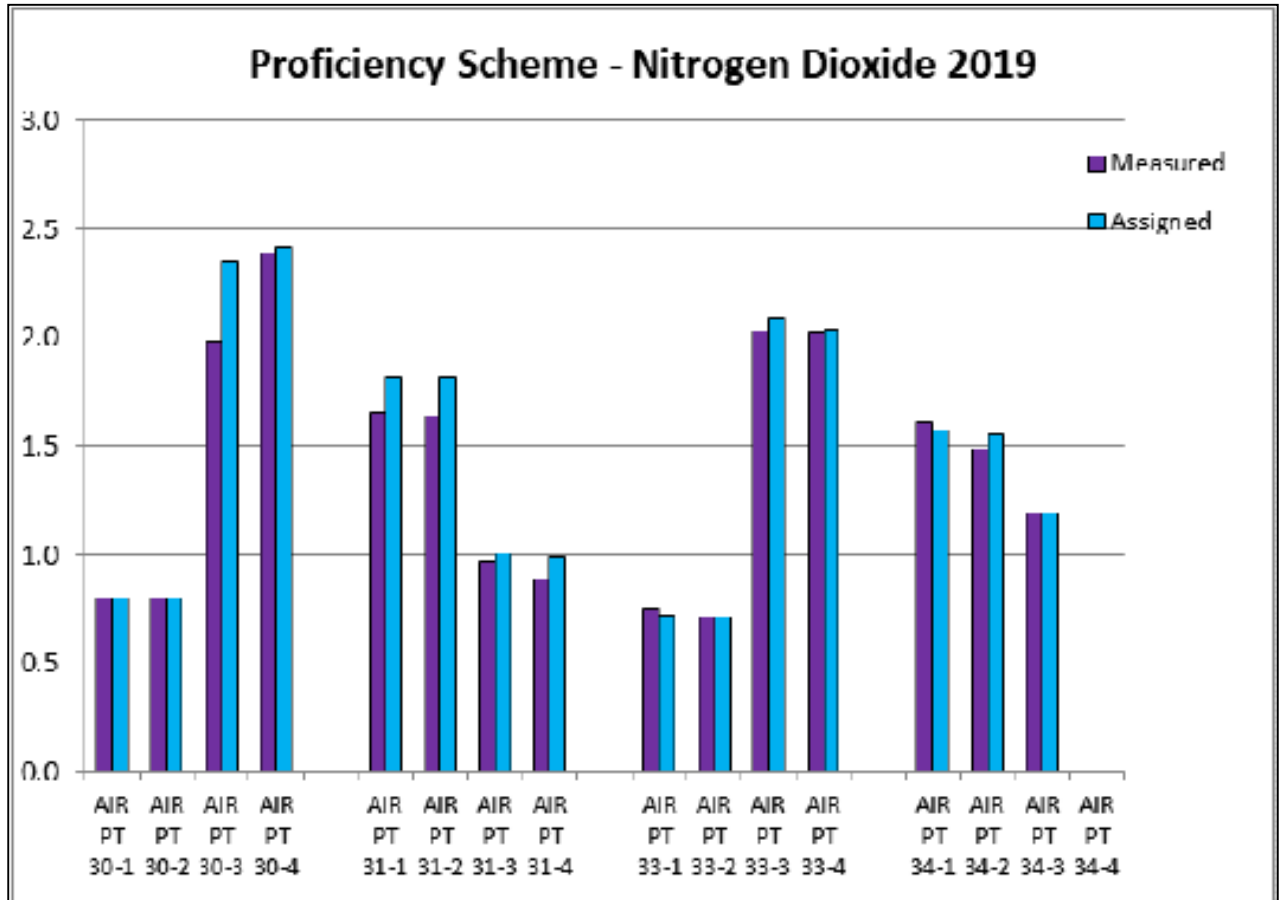
Gradko International laboratory demonstrated a satisfactory performance in a QA/QC scheme for analysis of NO<sub>2</sub> diffusion tubes. The AIR PT Nitrogen Dioxide Proficiency Scheme Results 2019 are shown in Table J and Figure G.

**Table J. Gradko Nitrogen Dioxide Proficiency Scheme Results**

Methods: GLM 7 – CARY 60 Spectrophotometer					
AIR PT Proficiency Scheme - Nitrogen Dioxide 2019					
Date	Round	Assigned value	Procedure GLM 7		
			Measured concentration	z-Score	% Bias
Feb-19	AIR PT 30-1	0.8	0.8	0	0.0%
Feb-19	AIR PT 30-2	0.8	0.8	0	0.0%
Feb-19	AIR PT 30-3	2.35	1.98	-2.1	-15.7%
Feb-19	AIR PT 30-4	2.42	2.39	-0.16	-1.2%
May-19	AIR PT 31-1	1.82	1.65	-1.24	-9.3%
May-19	AIR PT 31-2	1.82	1.64	-1.31	-9.9%
May-19	AIR PT 31-3	1.01	0.97	-0.53	-4.0%
May-19	AIR PT 31-4	0.99	0.89	-1.35	-10.1%
Aug-19	AIR PT 33-1	0.72	0.75	0.56	4.2%
Aug-19	AIR PT 33-2	0.71	0.71	0	0.0%
Aug-19	AIR PT 33-3	2.09	2.03	-0.38	-2.9%
Aug-19	AIR PT 33-4	2.04	2.02	-0.13	-1.0%
Oct-19	AIR PT 34-1	1.57	1.61	0.38	2.5%
Oct-19	AIR PT 34-2	1.56	1.49	-0.56	-4.5%
Oct-19	AIR PT 34-3	1.19	1.19	0	0.0%
Oct-19	AIR PT 34-4		Sample wasted not submitted		



Figure G. Gradko Nitrogen Dioxide Proficiency Scheme Graph



## Appendix B Adjustments to the Ratified Monitoring Data

### Short-term to Long-term Data Adjustment

#### B.1 Continuous monitoring station WAC Lavender Hill - Clapham Junction, NO<sub>2</sub>

NO<sub>2</sub> data at the continuous monitoring station WAC Lavender Hill - Clapham Junction had data capture rate of 57% of the full calendar year. Therefore, NO<sub>2</sub> data have been “annualised” using the methodology outlined in LLAQM.TG(16) before being compared to annual mean objectives.

**Table K. Short-Term to Long-Term Monitoring NO<sub>2</sub> Data Adjustment for the continuous monitoring station WAC Lavender Hill - Clapham Junction**

B1= Monitoring period mean for continuous monitoring station of reference				D1= Monitoring period mean for site WAC (Lavender Hill - Clapham Junction)						
Wandsworth Town Hall							Putney Fesham Road			
				WAC (Lavender Hill - Clapham Junction) NO <sub>2</sub> Capture rate: 57%						
Monitoring Period	B1 = WA2 Wandsworth Town Hall	D1 = WAC Lavender Hill Clapham	B1 when D1 is available				Monitoring Period	B1 = WA9 Putney Fesham Road	D1 = WAC Lavender Hill Clapham	B1 when D1 is available
January	63.9	49.5	63.9	Am1/Pm1 = Annualisation Factor = R1 =	1.00	1	January	46	49.5	46
February	55.1	46.4	55.1	Am2/Pm2 = Annualisation Factor = R2 =	1.03	2	February	50.9	46.4	46
March	38.4			(R1+R2)/2 = Ra =	1.01	3	March	39.9		
April	54.1			Estimate of Mean = M x Ra =	37.45	4	April	43.4		
May	41.7	32.2	41.7			5	May	30.1	32.2	30.1
June	28.2	26.7	28.2			6	June	26.6	26.7	26.6
July	27.6	28.1	27.6			7	July	29.6	28.1	29.6
August	25.2	22.8	25.2			8	August	27.8	22.8	27.8
September	32.8					9	September	30.3		
October	36.5					10	October	31.1		
November	46.3	47.9	46.3			11	November	41.6	47.9	41.6
December	39.7	42.9	39.7			12	December	30.4	42.9	30.4
<b>Average</b>	<b>40.79</b>	<b>37.06</b>	<b>40.96</b>				<b>Average</b>	<b>35.64</b>	<b>37.06</b>	<b>34.76</b>
	<b>Am1</b>	<b>M</b>	<b>Pm1</b>					<b>Am2</b>	<b>M</b>	<b>Pm2</b>

#### B.2 Continuous monitoring station WAC Lavender Hill - Clapham Junction, PM<sub>10</sub>

PM<sub>10</sub> data at the continuous monitoring station WAC Lavender Hill - Clapham Junction had data capture rate of 57% of the full calendar year. Therefore, PM<sub>10</sub> data have been “annualised” using the methodology outlined in LLAQM.TG(16) before being compared to annual mean objectives.

**Table L. Short-Term to Long-Term Monitoring PM<sub>10</sub> Data Adjustment for the continuous monitoring station WAC Lavender Hill - Clapham Junction**

B1= Monitoring period mean for continuous monitoring station of reference				D1= Monitoring period mean for site WAC (Lavender Hill - Clapham Junction)						
Lambeth Streatham Green				Putney Fesham Road						
				WAC (Lavender Hill - Clapham Junction) PM10 Capture rate: 57%						
Monitoring Period	B1 = Lambeth Streatham Green (urban background)	D1 = WAC Lavender Hill Clapham	B1 when D1 is available				Monitoring Period	B1 = WA9 Putney Fesham Road	D1 = WAC Lavender Hill Clapham	B1 when D1 is available
January	21.6	20.3	21.6	$Am1/Pm1 = \text{Annualisation Factor} = R1 =$	0.98	1	January	17.6	20.3	17.6
February	24.4	21.9	24.4	$Am2/Pm2 = \text{Annualisation Factor} = R2 =$	1.00	2	February	22.9	21.9	22.9
March	19	14.1	19	$(R1+R2)/2 = Ra =$	0.99	3	March	16.2	14.1	16.2
April	30.6	23.6	30.6	$\text{Estimate of Mean} = M \times Ra =$	19.64	4	April	28.4	23.6	28.4
May	16.4	18.8	16.4			5	May	15.5	18.8	15.5
June	14.8	17.1	14.8			6	June	15.3	17.1	15.3
July	14.9	17.9	14.9			7	July	15.2	17.9	15.2
August	16.3	26	16.3			8	August	15.9	26	15.9
September	15					9	September	17.9		
October	16.7	40.4	16.7			10	October	16.7	40.4	16.7
November	18.2	17.9	18.2			11	November	18.5	17.9	18.5
December	17.4	18	17.4			12	December	16.2	18	16.2
<b>Average</b>	<b>18.78</b>	<b>19.83</b>	<b>19.12</b>				<b>Average</b>	<b>18.03</b>	<b>19.83</b>	<b>18.04</b>
	<b>Am1</b>	<b>M</b>	<b>Pm1</b>					<b>Am2</b>	<b>M</b>	<b>Pm2</b>

### B.3 Diffusion tube station W6 (21 Daylesford Avenue)

NO<sub>2</sub> data at the diffusion tube station W6 (21 Daylesford Avenue) had data capture rate of 67% of the full calendar year. Therefore, NO<sub>2</sub> data have been “annualised” using the methodology outlined in LLAQM.TG(16) before being compared to annual mean objectives.

**Table M. Short-Term to Long-Term Monitoring NO<sub>2</sub> Data Adjustment for the diffusion tube station W6 (21 Daylesford Avenue)**

B1= Monitoring period mean for continuous monitoring station of reference (in this case: WA2 Wandsworth Town Hall)					D1= Monitoring period mean for W6 site								
W6 (21 Daylesford Avenue) Capture rate: 67%													
Start Date	End Date	B1 = WA2 Wandsworth Town Hall	D1 = W6 Site	B1 when D1 is available				Start Date	End Date	B1 = WA9 Putney Felsham Road	D1 = W6 Site	B1 when D1 is available	
07/01/2019	08/02/2019	59.5	32	59.5	<b>Am1/Pm1 = Annualisation Factor = R1 =</b>	<b>0.91</b>		1	07/01/2019	08/02/2019	46.4	32	46.4
08/02/2019	05/03/2019	52.7	33	52.7	<b>Am2/Pm2 = Annualisation Factor = R2 =</b>	<b>0.90</b>		2	08/02/2019	05/03/2019	50.4	33	50.4
05/03/2019	04/04/2019	41.2	23	41.2	<b>(R1+R2)/2 = Ra =</b>	<b>0.91</b>		3	05/03/2019	04/04/2019	45.4	23	45.4
04/04/2019	01/05/2019	54.1	25	54.1	<b>Estimate of Mean = M x Ra =</b>	<b>22.91</b>		4	04/04/2019	01/05/2019	42.7	25	42.7
01/05/2019	14/06/2019	37.8						5	01/05/2019	14/06/2019	29.6		
14/06/2019	09/07/2019	29.5						6	14/06/2019	09/07/2019	28		
09/07/2019	06/08/2019	25.9						7	09/07/2019	06/08/2019	27.7		
06/08/2019	04/09/2019	25.1	15	25.1				8	06/08/2019	04/09/2019	27.5	15	27.5
04/09/2019	02/10/2019	33.6	20	33.6				9	04/09/2019	02/10/2019	31.3	20	31.3
02/10/2019	06/11/2019	36.3	23	36.3				10	02/10/2019	06/11/2019	32.4	23	32.4
06/11/2019	04/12/2019	50.5	31	50.5				11	06/11/2019	04/12/2019	42.5	31	42.5
04/12/2019	08/01/2020	36.2						12	04/12/2019	08/01/2020	27.9		
<b>Average</b>		<b>40.20</b>	<b>25.25</b>	<b>44.13</b>				<b>Average</b>			<b>35.98</b>	<b>25.25</b>	<b>39.83</b>
		<b>Am1</b>	<b>M</b>	<b>Pm1</b>							<b>Am2</b>	<b>M</b>	<b>Pm2</b>

#### B.4 Diffusion tube station W26 (Replingham Road)

NO<sub>2</sub> data at the diffusion tube station W26 (Replingham Road) had data capture rate of 58% of the full calendar year. Therefore, NO<sub>2</sub> data have been “annualised” using the methodology outlined in LLAQM.TG(16) before being compared to annual mean objectives.

**Table N. Short-Term to Long-Term Monitoring NO<sub>2</sub> Data Adjustment for the diffusion tube station W26 (Replingham Road)**

		B1= Monitoring period mean for continuous monitoring station of reference			D1= Monitoring period mean for W26 site								
					W26 (Replingham Road) Capture rate: 58%								
Start Date	End Date	B1 = WA2 Wandsworth Town Hall	D1 = W26 Site	B1 when D1 is available				Start Date	End Date	B1 = WA9 Putney Felsham Road	D1 = W26 Site	B1 when D1 is available	
07/01/2019	08/02/2019	59.5	35	59.5	Am1/Pm1 = Annualisation Factor = R1 =	0.96	1	07/01/2019	08/02/2019	46.4	35	59.5	
08/02/2019	05/03/2019	52.7	43	52.7	Am2/Pm2 = Annualisation Factor = R2 =	0.86	2	08/02/2019	05/03/2019	50.4	43	52.7	
05/03/2019	04/04/2019	41.2			(R1+R2)/2 = Ra =	0.91	3	05/03/2019	04/04/2019	45.4			
04/04/2019	01/05/2019	54.1			Estimate of Mean = M x Ra =	31.11	4	04/04/2019	01/05/2019	42.7			
01/05/2019	14/06/2019	37.8					5	01/05/2019	14/06/2019	29.6			
14/06/2019	09/07/2019	29.5					6	14/06/2019	09/07/2019	28			
09/07/2019	06/08/2019	25.9					7	09/07/2019	06/08/2019	27.7			
06/08/2019	04/09/2019	25.1	21	25.1			8	06/08/2019	04/09/2019	27.5	21	25.1	
04/09/2019	02/10/2019	33.6	31	33.6			9	04/09/2019	02/10/2019	31.3	31	33.6	
02/10/2019	06/11/2019	36.3	33	36.3			10	02/10/2019	06/11/2019	32.4	33	36.3	
06/11/2019	04/12/2019	50.5	42	50.5			11	06/11/2019	04/12/2019	42.5	42	50.5	
04/12/2019	08/01/2020	36.2	35	36.2			12	04/12/2019	08/01/2020	27.9	35	36.2	
Average		40.20	34.29	41.99				Average		35.98	34.29	41.99	
		Am1	M	Pm1						Am2	M	Pm2	

**Appendix C Full Monthly Diffusion Tube Results for 2019**

**Table O-1. NO<sub>2</sub> Diffusion Tube Results**

Site ID	Valid data capture for monitoring period % <sup>a</sup>	Valid data capture 2019 % <sup>b</sup>	Annual Mean NO <sub>2</sub>												Annual mean – raw data <sup>c</sup>	Annual mean – bias adjusted <sup>c</sup> (National Diffusion Tube Bias Adjustment Factor 0.93 as per 03/2020)
			Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec		
W23 (37 West Hill)	N/A	100%	50	70	59	71	49	57	48	31	47	50	54	53	53	49
W24 (Putney Sign Mac Donald's)	N/A	92%	65	85	65	51	65	55	--- <sup>d</sup>	58	65	62	54	70	63	59
W21 (Felsham road)	N/A	100%	37	50	32	37	24	24	24	22	26	33	41	37	32	30
W22 (Felsham road)	N/A	100%	35	50	32	37	24	25	25	21	30	34	42	38	33	31
W6 (21 Daylesford Avenue)	N/A	67%	32	33	23	25	--- <sup>d</sup>	--- <sup>d</sup>	--- <sup>d</sup>	15	20	23	31	--- <sup>d</sup>	25	23 <sup>c</sup>
W25 (Roehampton Church School)	N/A	100%	35	44	34	31	24	26	23	20	25	26	34	31	30	27
W26 (Replingham Road)	N/A	58%	35	43	--- <sup>d</sup>	--- <sup>d</sup>	--- <sup>d</sup>	--- <sup>d</sup>	--- <sup>d</sup>	21	31	33	42	35	34	31 <sup>c</sup>
W27 (68-70 Sutherland Grove)	N/A	92%	30	34	25	27	18	16	15	16	--- <sup>d</sup>	25	35	28	25	23
W28 (61 Summerley street)	N/A	100%	35	41	26	33	22	22	19	22	27	28	38	33	29	27

Site ID	Valid data capture for monitoring period % <sup>a</sup>	Valid data capture 2019 % <sup>b</sup>	Annual Mean NO <sub>2</sub>												Annual mean – raw data <sup>c</sup>	Annual mean – bias adjusted <sup>c</sup> (National Diffusion Tube Bias Adjustment Factor 0.93 as per 03/2020)
			Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec		
W29 (Junction Skelbrook street / Garratt lane)	N/A	100%	45	47	33	35	25	28	24	20	31	31	42	33	33	31
W4 (108 Mitcham road)	N/A	100%	63	90	71	60	61	54	66	60	66	63	71	69	66	62
W8 (50 Bickely street)	N/A	92%	39	41	33	31	24	25	22	18	29	32	40	--- <sup>d</sup>	30	28
W30 (11B Elmbourne road)	N/A	100%	41	50	31	36	28	25	22	22	27	29	35	35	32	29
W31 (Junction Hildreth Street / Bedford Hill)	N/A	100%	45	60	39	38	32	32	33	28	36	38	44	42	39	36
W32 (2-3 Balham High road)	N/A	83%	49	62	--- <sup>d</sup>	--- <sup>d</sup>	34	33	35	28	40	39	49	46	41	39
W34 (46 Shelgate road)	N/A	83%	44	45	33	32	--- <sup>d</sup>	--- <sup>d</sup>	22	19	28	29	40	35	33	31
W35 (47 Northcote road)	N/A	92%	42	46	36	39	27	32	27	20	35	34	45	--- <sup>d</sup>	35	32
W36 (St Anne's Hill)	N/A	92%	39	44	34	--- <sup>d</sup>	29	30	26	21	32	35	42	31	33	31
W37 (302A Merton Rd, Riversdale School)	N/A	100%	46	53	45	40	38	36	35	26	38	36	42	39	39	37
W38 (High View School, Plough Terrace)	N/A	100%	33	43	30	35	24	26	23	20	30	31	40	35	31	29
NE2 (Chesterton School)	N/A	92%	42	49	36	35	29	33	32	35	--- <sup>d</sup>	33	41	37	37	34
NE3 (Queenstown Road)	N/A	100%	66	77	75	78	63	70	58	31	63	55	74	54	64	59

Site ID	Valid data capture for monitoring period % <sup>a</sup>	Valid data capture 2019 % <sup>b</sup>	Annual Mean NO <sub>2</sub>												Annual mean – raw data <sup>c</sup>	Annual mean – bias adjusted <sup>c</sup> (National Diffusion Tube Bias Adjustment Factor 0.93 as per 03/2020)
			Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec		
NE4 (Lockington Road)	N/A	100%	37	<b>50</b>	32	37	27	30	25	28	32	27	<b>43</b>	35	34	<b>31</b>
NE5 (Kirtling Street)	N/A	100%	<b>49</b>	<b>60</b>	<b>41</b>	<b>45</b>	33	38	37	27	<b>41</b>	<b>42</b>	<b>51</b>	38	<b>42</b>	<b>39</b>
NE6 (Nine Elms Lane)	N/A	75%	<b>56</b>	--- <sup>d</sup>	<b>47</b>	<b>54</b>	<b>45</b>	<b>55</b>	--- <sup>d</sup>	<b>42</b>	--- <sup>d</sup>	<b>49</b>	<b>58</b>	<b>56</b>	<b>51</b>	<b>48</b>
NE7 (1 Nine Elms, Parry Street)	N/A	100%	<b>56</b>	<b>67</b>	<b>54</b>	<b>52</b>	<b>42</b>	<b>54</b>	<b>42</b>	37	<b>52</b>	39	<b>58</b>	<b>52</b>	<b>51</b>	<b>47</b>
NE8 (Battersea park)	N/A	100%	24	29	21	24	16	19	16	16	21	20	29	22	21	<b>20</b>
YR1 (Trafalgar House)	N/A	100%	<b>52</b>	<b>61</b>	<b>52</b>	<b>47</b>	<b>43</b>	<b>53</b>	<b>41</b>	32	<b>48</b>	38	<b>55</b>	<b>47</b>	<b>47</b>	<b>44</b>
YR2 (Royal Academy of Dance)	N/A	92%	<b>76</b>	<b>80</b>	<b>64</b>	<b>63</b>	--- <sup>d</sup>	<b>64</b>	<b>59</b>	38	<b>60</b>	<b>55</b>	<b>63</b>	<b>53</b>	<b>61</b>	<b>57</b>
YR3 (Cotton Row)	N/A	100%	<b>42</b>	<b>43</b>	30	32	23	28	21	21	22	29	<b>44</b>	37	31	<b>29</b>
YR4 (York road, corner with Falcon Road)	N/A	100%	<b>62</b>	<b>72</b>	<b>49</b>	<b>43</b>	<b>42</b>	<b>44</b>	<b>48</b>	<b>43</b>	<b>51</b>	<b>57</b>	<b>56</b>	<b>67</b>	<b>53</b>	<b>49</b>
YR5 (256 Battersea Park Road)	N/A	75%	<b>85</b>	<b>87</b>	<b>80</b>	--- <sup>d</sup>	--- <sup>d</sup>	<b>92</b>	--- <sup>d</sup>	<b>57</b>	<b>71</b>	<b>64</b>	<b>78</b>	<b>66</b>	<b>76</b>	<b>70</b>
YR6 (31-32 Battersea Square)	N/A	92%	--- <sup>d</sup>	<b>75</b>	<b>41</b>	<b>48</b>	<b>44</b>	<b>51</b>	38	30	<b>46</b>	<b>45</b>	<b>51</b>	<b>44</b>	<b>47</b>	<b>43</b>

Exceedance of the NO<sub>2</sub> annual mean AQO of 40 µg m<sup>-3</sup> are shown in **bold** (orange/red).

NO<sub>2</sub> annual means in excess of 60 µg m<sup>-3</sup>, indicating a potential exceedance of the NO<sub>2</sub> hourly mean AQS objective are shown in bold and underlined (red).

<sup>a</sup> Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

<sup>b</sup> 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%)

<sup>c</sup> Means should be “annualised” in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

<sup>d</sup> Notes: Sample missing at collection.



**Table O-2. Adjustments to the Ratified Monitoring Data to represent exposure**

Distance Adjustment

All NO<sub>2</sub> diffusion tube results have been adjusted to represent exposure at the nearest façade. The concentration at the nearest receptor has been estimated using the LAQM NO<sub>2</sub> Fall-off with Distance Calculator (Version 4.1) in line with the procedure detailed in LLAQM.TG (16). The methodology consists of comparing the monitored annual mean NO<sub>2</sub> concentrations at a given point against known relationships between NO<sub>2</sub> concentrations and the distance from a road source.

The monitored annual mean values were used in the calculation and the background concentration was derived from the diffusion Tube NE8 (Battersea park) background site.

**Table K. Distance Adjustment - Monitored Annual Mean NO<sub>2</sub> compared to exposure at nearest façade (g m<sup>-3</sup>)**

Site ID	Site Name	Distance to kerb of nearest road (N/A if not applicable)	Distance from kerb to relevant exposure	NO <sub>2</sub> Results 2019 (µg m <sup>-3</sup> )	NO <sub>2</sub> Results at relevant exposure receptors (µg m <sup>-3</sup> )
W23	37 West Hill, Wandsworth Town	3.02m	5.22	49	45
W24	Putney sign (Mac Donald's), Putney	2.35m	4.7	59	52
W21 & W22	Felsham Road tube 1 & tube 2, Putney	1m	5.8	30	27
W6	21 Daylesford Avenue, Putney	2.4m	13.4	23 <sup>c</sup>	22

Site ID	Site Name	Distance to kerb of nearest road (N/A if not applicable)	Distance from kerb to relevant exposure	NO2 Results 2019 ( $\mu\text{g m}^{-3}$ )	NO2 Results at relevant exposure receptors ( $\mu\text{g m}^{-3}$ )
W25	Roehampton Church School (on corner of Roehampton Lane), Roehampton	0.53m	1.39	27	26
W26	Replingham Road (corner of Heythrope street), Southfield	0.62m	3.16	31	28
W27	68-70 Sutherland Grove (opposite St. Cecilia's school), Southfield	0.65m	2.65	23	22
W28	61 Summerley Street, Earlsfield	0.60m	2.66	27	25
W29	Junction Skelbrook Street / Garratt Lane, Earlsfield	3.29m	0.7	31	36
W4	108 Mitcham Road, Tooting Broadway	0.6m	3.06	62	50
W8	50 Bickely Street, Tooting Broadway	1.85m	4.82	28	26
W30	11B Elmbourne Road, Balham	0.50m	5	29	25
W31	Junction Hildreth Street / Bedford Hill, Balham	3.64m	5.08	36	35
W32	2-3 Balham High Road, Balham	0.71m	5.11	39	32
W34	46 Shelgate Road, Northcote	0.40m	2.54	31	28
W35	47 Northcote Road, Northcote	0.49m	4.7	32	27
W36	St. Anne's Hill (opposite St. Anne's School), Fairfield	0.89m	3.62	31	28
W37	302A Merton Rd (Riversdale School), Southfields	3.35m	6.7	37	34
W38	High View School, Plough Terrace, Fairfield	0.45m	0.9	29	28
NE2	Chesterton School, Latchmere	2.85m	5.7	34	32
NE3	Queenstown Road, Queenstown	1.05m	2.1	59	54
NE4	Lockington Road, Battersea (previously called as "W33 Lockington road" in 2017)	0.69m	1.91	31	29
NE5	Kirtling Street, Queenstown	0.50m	1	39	37
NE6	Nine Elms Lane, Queenstown	0.53m	1.06	48	45

Site ID	Site Name	Distance to kerb of nearest road (N/A if not applicable)	Distance from kerb to relevant exposure	NO2 Results 2019 ( $\mu\text{g m}^{-3}$ )	NO2 Results at relevant exposure receptors ( $\mu\text{g m}^{-3}$ )
NE7	<b>1 Nine Elms, Parry Street</b> , Queenstown	0.5m	1	<b>47</b>	<b>46</b>
NE8	<b>Battersea park</b> , Queenstown	N/A	420	20	20
YR1	<b>Trafalgar House</b> , St Mary's Park	0.84m	1.68	<b>44</b>	<b>41</b>
YR2	<b>Royal Academy of Dance</b> , St Mary's Park	0.70m	1.4	<b>57</b>	<b>52</b>
YR3	<b>Cotton Row</b> , St Mary's Park	N/A	160	29	29
YR4	<b>York road, corner with Falcon Road</b> , Latchmere	0.75m	1.5	<b>49</b>	45
YR5	<b>256 Battersea Park Road</b> , St Mary's Park	0.63m	1.26	<b>70</b>	<b>64</b>
YR6	<b>31-32 Battersea Square</b> , St Mary's Park	0.44m	0.88	<b>43</b>	40

Exceedance of the NO<sub>2</sub> annual mean AQO of 40  $\mu\text{g m}^{-3}$  are shown in **bold** (orange/red).

NO<sub>2</sub> annual means in excess of 60  $\mu\text{g m}^{-3}$ , indicating a potential exceedance of the NO<sub>2</sub> hourly mean AQS objective are shown in bold and underlined (red).

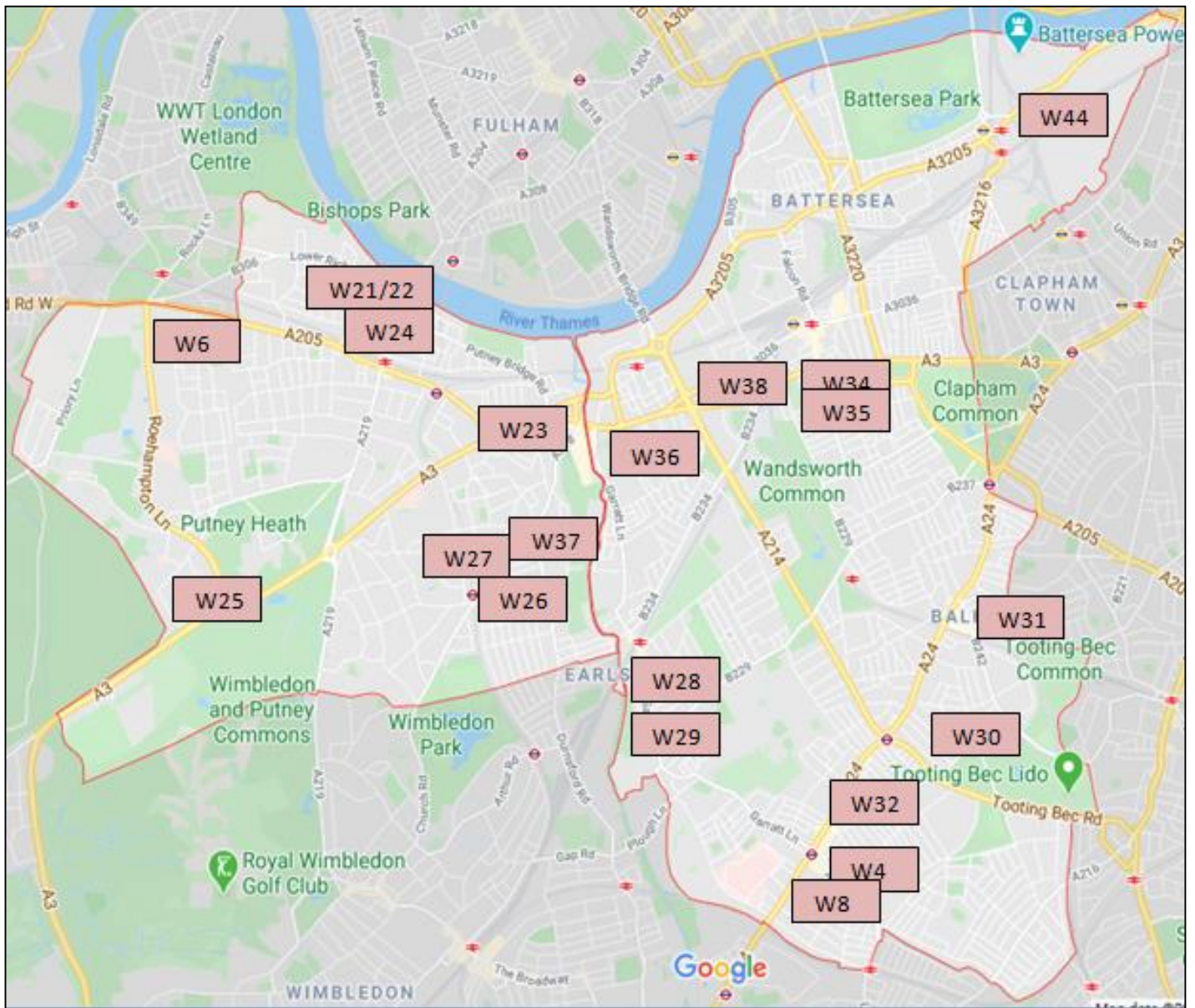
## **Appendix D Locations of non-automatic monitoring sites for 2019**

### **D.1 Across Borough**

**Table P. Diffusion tube locations across borough**

<b>ID</b>	<b>Name</b>	<b>Area</b>	<b>Grid reference (X,Y)</b>
W23	37 West Hill	Wandsworth Town	525111, 174619
W24	Putney Sign (MacDonald's)	Putney	524045, 175366
W21	Felsham Rd (tube 1)	Putney	524044, 175495
W22	Felsham Rd (tube 2)	Putney	524044, 175495
W6	21 Daylesford Avenue	Putney	522270, 175307
W25	Roehampton Church School (on corner of Roehampton Lane)	Roehampton	522542, 173700
W26	Replingham Road (corner of Heythrope street)	Southfields	524847, 173282
W27	68-70 Sutherland Grove (opposite St. Cecilia's School)	Southfields	524633, 173594
W28	61 Summerley Street	Earlsfield	526011, 172869
W29	Junction Skelbrook Street / Garratt Lane	Earlsfield	526099, 172833
W4	108 Mitcham Road	Tooting Broadway	527688, 171204
W8	50 Bickely Street	Tooting Broadway	527524, 171239
W30	11b Elmbourne Road	Balham	528900, 172431
W31	Junction Hildreth Street / Bedford Hill	Balham	528607, 173333
W32	2-3 Balham High Road	Balham	528436, 173133
W34	46 Shelgate Road	Northcote	527569, 174986
W35	47 Northcote Road	Northcote	527487, 174981
W36	208 St Anne's Hill (opposite St Anne's School)	Fairfield	525875, 174616
W37	302A Merton Rd (Riversdale School Gate)	Southfields	525278, 173483
W38	High View School, Plough Terrace (No Stopping Sign o/s school)	Fairfield	526863, 175239

Figure H. Diffusion tube locations across borough



## D.2 Nine Elms

Table Q. Diffusion tube locations in Nine Elms

Site ID	Name	Area	Grid Reference (X,Y)
NE2	Chesterton School	Latchmere	528043, 176618
NE3	Queenstown Road	Queenstown	528771, 176819
NE4	Lockington Road	Battersea	528871, 176943
NE5	Kirtling Street	Queenstown	529265, 177353
NE6	Nine Elms Lane	Queenstown	529413, 177486
NE7	1 Nine Elms, Parry Street	Queenstown	530129, 177727
NE8	Battersea park	Queenstown	528023, 177176

Figure I. Diffusion tube locations in Nine Elms



### D.3 York Road

**Table R. Diffusion tube locations in York Road**

Map ID	Site ID	Name	Area	Grid Reference (X,Y)
1	YR1	Trafalgar House	St. Mary's Park	526201, 175340
2	YR2	Royal Academy of Dance	St. Mary's Park	526581, 175731
3	YR3	Cotton Row	St. Mary's Park	526480, 175930
4	YR4	York Road, corner with Falcon Road	Latchmere	527086, 176119
5	YR5	256 Battersea Park Road	St. Mary's Park	527109, 176022
6	Y6	31-32 Battersea Square	St. Mary's Park	526817, 176686

**Figure J. Diffusion tube locations in York Road**

