Royal Borough of Greenwich Air Quality Annual Status Report for 2019
Date of publication: May 2020

This report provides a detailed overview of air quality in the Royal Borough of Greenwich during 2019. It has been produced to meet the requirements of the London Local Air Quality Management statutory process[1].

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

CONTENTS

Tables

Abbreviations

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

Table A.   Summary of National Air Quality Standards and Objectives

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

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

1.   Air Quality Monitoring

1.1   Locations

Table B.   Details of Automatic Monitoring Sites for 2019

Site ID	Site Name	Easting	Northing	Site Type	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Inlet height (m)	Pollutants Monitored	Monitoring Technique
GR4	Eltham	543978	174655	Suburban	Y	Y (0)	N/A	5	NO_2 PM_{10} $PM_{2.5}$ SO_2 (and O_3)	FDMS
GN5 (Operational October 2017)	Hoskins St (Trafalgar Rd)	539018	178007	Roadside	Y	Y (0)	5	3	NO_2 PM_{10} $PM_{2.5}$	TEOM
GB6	Falconwood	544997	175098	Roadside	Y	Y (5)	1.2	3	NO_2 PM_{10} $PM_{2.5}$ O_3	FDMS
GR7	Blackheath Hill	538141	176710	Roadside	Y	Y (0)	10	3	NO_2 PM_{10}	FDMS

GR8	Woolwich Flyover	540200	178367	Roadside	Y	Y (0)	3	3	NO_2 PM_{10} $PM_{2.5}$ (and O_3)	TEOM
GR9	Westhorne Avenue	541879	175016	Roadside	Y	Y (0)	12	3	NO_2 PM_{10} $PM_{2.5}$ (and O_3)	FDMS
GNO Note- previously GR10	Burrage Grove	544084	178881	Roadside	Y	Y (1)	12	3	NO_2 PM_{10} $PM_{2.5}$	FDMS
GN6 (operational July 2018)	John Harrison Way	539687	179123	Roadside	Y	Y (0)	3	3	NO_2 PM_{10} $PM_{2.5}$	FDMS
GN3 Note - previously GR13	Plumstead High St	545560	178526	Roadside	Y	Y (0)	5	3	NO_2 PM_{10} $PM_{2.5}$ (and O_3)	FDMS
GN4 Note- previously GR14	Fiveways Sidcup Rd	543582	172653	Roadside	Y	Y (5)	2	3	NO_2 PM_{10}	FDMS

Changes to the Royal Borough of Greenwich Real Time Monitoring Stations

At the end of 2015, station GR5 on Trafalgar Road was closed. This was due to the sale of premises where the station was located. A new site on Trafalgar Road at the junction with Hoskins St was identified and the station relocated in October 2017.

During construction works, the power supply to station GN2 (Millennium Village) was damaged. As the site on which the station was located was due to be redeveloped, the decision was taken not to repair the power supply but to seek a new location for the station. A new site was identified on John Harrison Way, and the station was relocated in January 2018. GN6 in John Harrison Way became fully operational in July 2018.

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

Site ID	Site Name	Easting	Northing	Site Type	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Inlet height (m)	Pollutants monitored	Tube co-located with an automatic monitor? (Y/N)
GW23 (1)	Siebert Rd	540420	177706	Roadside	Y	Y	17.2	2	NO_2	N
GW24 (2)	Plumstead Common Rd	543806	177951	Roadside	Y	Y	3.0	2	NO_2	N
GW25 (3)	Eltham Rd	540099	174881	Roadside	Y	Y	3.0	2	NO_2	N
GW26 (4)	Foots Cray Rd	544015	173139	Roadside	Y	Y	0.5	2	NO_2	N
GW27 (5)	Charlton Village	541645	177874	Roadside	Y	Y	0.5	2	NO_2	N
GW28 (58)	Dunblane Rd	542656	176207	Roadside	Y	Y	7.5	2	NO_2	N

GW29 (6)	Woolwich Rd Charlton	541167	178512	Roadside	Y	Y	1.5	2	NO_2	N
GW30 (53)	Indus Rd	541372	177070	Roadside	Y	Y	5.0	2	NO_2	N
GW31 (57)	Deansfield School	543383	175664	Roadside	Y	Y	3.0	2	NO_2	N
GW32 (7)	Banchory Rd	540664	177235	Roadside	Y	Y	17.1	2	NO_2	N
GW33 (8)	Blackheath Hill	537971	176776	Roadside	Y	Y	1.5	2	NO_2	N
GW34 (9)	Bannockburn School	545490	178543	Roadside	Y	Y	3.0	2	NO_2	N
GW35 (10)	Woolwich Rd Greenwich	539527	178281	Roadside	Y	Y	1.5	2	NO_2	N
GW36 (11)	Boord St	539320	179234	Roadside	Y	N (50.0)	30.0	2	NO_2	N
GW37 (12)	De Lucy School	546630	179557	Background	Y	Y	215.0	2	NO_2	N
GW38 (13)	Westhorne Avenue	541885	175045	Background	Y	Y	30.0	2	NO_2	N
GW39 (14,15,16)	Bexley Rd ECC (Triplicate co-located site)	543986	174660	Background	Y	N	N/A	2	NO_2	Y
GW40 (17)	Shrewsbury House	544065	176996	Background	Y	Y	575.0	2	NO_2	N

GW41 (18)	Sidcup Rd	543391	172765	Roadside	Y	Y	3.0	2	NO_2	N
GW42 (19)	Greenwich Church St	538317	177652	Roadside	Y	Y	2.0	2	NO_2	N
GW43 (20)	Creek Rd	537353	177632	Roadside	Y	Y	2.0	2	NO_2	N
GW44 (21)	Eltham High St	543096	174439	Roadside	Y	Y	3.6	2	NO_2	N
GW48 (23)	Greenwich South St	538044	176960	Roadside	Y	Y	2.5	2	NO_2	N
GW49 (24)	Woolwich High St	543472	179217	Roadside	Y	Y	1.0	2	NO_2	N
GW50 (25,26,27)	Woolwich Flyover (Triplicate co-located site)	540203	178367	Roadside	Y	Y	3	2	NO_2	Y
GW51 (28)	Bugsbys Way	539638	179024	Roadside	Y	Y	2.0	2	NO_2	N
GW52 (29)	Woolwich High St	542842	179108	Roadside	Y	Y	1.5	2	NO_2	N
GW53 (30)	Shooters Hill Rd	542181	176878	Roadside	Y	Y	1.5	2	NO_2	N

GW54 (31)	Westhorne Av	541915	175039	Roadside	Y	Y	2.5	2	NO_2	N
GW55 (32,33,34)	Crown Woods Way (Triplicate site)	545005	175097	Roadside	Y	Y	1.2	2	NO_2	Y
GW56 (35)	Sidcup Rd	543679	172598	Roadside	Y	Y	1.5	2	NO_2	N
GW57a (36)	Trafalgar Rd	538968	177955	Roadside	Y	Y	7.0	2	NO_2	N
GW58 (39,40,41)	Blackheath Hill (Triplicate co-located site)	538143	176712	Roadside	Y	Y	10	2	NO_2	Y
GW59 (42,43,44)	Westhorne Av (Triplicate co-located site)	541883	175016	Roadside	Y	Y	12	2	NO_2	Y
GW60 (45,46,47)	Burrage Grove (Triplicate co-located site)	544086	178882	Roadside	Y	Y	12	2	NO_2	Y
GW61 (50,51,52)	John Harrison Way (Triplicate co-located site)	539687	179123	Roadside	Y	Y	3	2	NO_2	Y
GW101 (48)	Plumstead Rd	544727	178884	Roadside	Y	Y	1.0	2	NO_2	N
GW102 (49)	Plumstead Rd	544075	178898	Roadside	Y	Y	1.0	2	NO_2	N

GW103 (54)	Wricklemarsh Rd	540935	176575	Roadside	Y	Y	9.0	2	NO_2	N
GW104 (55)	Sun Lane	540743	177072	Roadside	Y	Y	12.5	2	NO_2	N
GW105 (56)	Cliftons Roundabout	541143	174294	Roadside	Y	Y	5.0	2	NO_2	N
GW106 (22)	Grand Depot Rd	543505	178576	Roadside	Y	Y	1.0	2	NO_2	N

1.2   Comparison of Monitoring Results with AQOs

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

Table D.   Annual Mean NO₂ Ratified and Bias-adjusted Monitoring Results (μg m⁻³)

Site ID	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean Concentration (μg m⁻³)						
				2013 [c]	2014 [c]	2015 [c]	2016 [c]	2017 [c]	2018 [c]	2019 [c]
GR4 Eltham	Automatic	N/A	97	21	20	20	21	20	16	17
GR5 Trafalgar Road	Automatic	N/A	N/A	**41**	**38**	36	Closed	Closed	Closed	Closed
GN5 Hoskins Street (Operational October 2017)	Automatic	N/A	99	N/A	N/A	N/A	N/A	N/A	**43**	**41**
GN6 John Harrison Way (operational July 2018)	Automatic	N/A	99	N/A	N/A	N/A	N/A	N/A	34	33
GB6 Falconwood	Automatic	N/A	99	**51**	**45**	**41**	**45**	40	39	36
GR7 Blackheath	Automatic	N/A	99	**48**	**44**	39	**46**	38	35	38

Site ID	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean Concentration (µg m^{-3})						
				2013[c]	2014[c]	2015[c]	2016[c]	2017[c]	2018[c]	2019[c]
GR8 Woolwich Flyover	Automatic	N/A	99	64	75	66	64	65	57	52
GR9 Westhorne Av	Automatic	N/A	97	46	43	40	42	39	38	34
GN0 (GR10) Burrage Grove	Automatic	N/A	99	45	38	35	39	35	35	33
GN2(GR12) Millennium Village	Automatic	N/A	N/A	38	36	28	30	Closed	Closed	Closed
GN3(GR13) Plumstead High St	Automatic	N/A	96	37	37	34	36	34	33	34
GN4(GR14) Fiveways	Automatic	N/A	93	58	53	44	46	41	40	37
GW23	Diffusion tube	N/A	100	46.0	42.7	41.5	41.43	36.6	31.1	34.6
GW24	Diffusion tube	N/A	100	58.3	54.8	53.5	54.95	50.1	45.8	44.8
GW25	Diffusion tube	N/A	100	48.9	45.2	38.4	38.79	35.1	32.2	32.2
GW26	Diffusion tube	N/A	100	32.2	31.2	28.6	28.26	28.4	23.8	26.5
GW27	Diffusion tube	N/A	100	49.8	43.7	39.7	41.48	38.6	31.9	34.9

Site ID	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean Concentration (µg m^{-3})						
				2013[c]	2014[c]	2015[c]	2016[c]	2017[c]	2018[c]	2019[c]
GW28	Diffusion tube	N/A	100	36.4	36.9	**35.8**	**41.03**	32.6	31.3	29.8
GW29	Diffusion tube	75	75	<u>**65.2**</u>	<u>**61.8**</u>	<u>**62.3**</u>	**58.14**	**56.2**	**53.8**	**49.2**
GW30	Diffusion tube	N/A	100	39.3	38.3	**35.0**	**40.47**	35.9	33.6	32.7
GW31	Diffusion tube	92	92	37.9	37.5	**35.7**	**40.37**	30.3	26.3	26.0
GW32	Diffusion tube	N/A	100	**48.5**	**51.9**	**49.6**	**47.42**	**45.9**	39.3	39.5
GW33	Diffusion tube	83	92	<u>**62.7**</u>	<u>**63.4**</u>	<u>**60.8**</u>	<u>**60.96**</u>	**53.9**	**46.6**	**47.4**
GW34	Diffusion tube	N/A	100	**45.1**	**44.0**	38.9	39.11	37.2	33.9	35.3
GW35	Diffusion tube	83	83	<u>**72.3**</u>	<u>**69.4**</u>	**59.1**	**56.01**	**53.6**	**48.9**	**52.9**
GW36	Diffusion tube	N/A	100	**55.2**	<u>**60.1**</u>	**57.2**	**58.13**	**56.4**	**46.9**	**49.3**
GW37	Diffusion tube	N/A	100	22.7	23.6	21.8	22.91	23.3	21	21.9
GW38	Diffusion tube	N/A	100	37.0	35.9	34.2	34.92	32.1	28.3	29.0
GW39	Diffusion tube	83	83	22.0	20.0	19.1	19.17	19.1	17.2	18.5
GW40	Diffusion tube	N/A	100	21.3	19.4	18.8	19.19	16.5	16.9	18.2
GW41	Diffusion tube	N/A	100	**43.3**	**44.7**	**50.0**	**55.56**	**54.5**	**44.9**	**47.7**

Site ID	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean Concentration (µg m^{-3})						
				2013[c]	2014[c]	2015[c]	2016[c]	2017[c]	2018[c]	2019[c]
GW42	Diffusion tube	92	*92*	**53.1**	**52.8**	**49.9**	**48.90**	**44.8**	**40.1**	**39.8**
GW43	Diffusion tube	N/A	*100*	**<u>60.4</u>**	**57.0**	**57.3**	**56.30**	**50.4**	**43.5**	**44.2**
GW44	Diffusion tube	N/A	*92*	**55.6**	**50.7**	**48.9**	**48.84**	**48.0**	**43.5**	**47.8**
GW48	Diffusion tube	92	92	**45.6**	**42.0**	**42.2**	38.24	38.5	33.1	37.8
GW49	Diffusion tube	N/A	100	**43.4**	**44.6**	**44.2**	**54.80**	**58.1**	**41.8**	**43.8**
GW50	Diffusion tube	N/A	100	**<u>67.5</u>**	**<u>73.9</u>**	**<u>70.7</u>**	**<u>67.11</u>**	**69.5**	**54.3**	**53.2**
GW51	Diffusion tube	N/A	100	**43.3**	**46.9**	**44.9**	**45.80**	**43.6**	37.0	39.0
GW52	Diffusion tube	92	92	**44.9**	**43.9**	39.6	39.03	39.2	37.2	36.6
GW53	Diffusion tube	N/A	100	34.2	37.0	36.1	37.08	34.0	29.0	29.8
GW54	Diffusion tube	92	92	**57.5**	**56.4**	**52.5**	**52.08**	**48.7**	**50.6**	**53.0**
GW55	Diffusion tube	N/A	100	**<u>60.8</u>**	**57.6**	**51.7**	**58.78**	**44.6**	**42.1**	**39.9**
GW56	Diffusion tube	N/A	100	**56.1**	**56.7**	**51.0**	**51.31**	**47.5**	**40.6**	39.1
GW57a	Diffusion tube	N/A	100	39.7	36.4	35.0	36.02	33.7	29.5	29.7
GW58	Diffusion tube	N/A	100	**49.4**	**48.5**	**46.3**	**43.86**	**41.7**	37.9	36.6

Site ID	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean Concentration (µg m^{-3})						
				2013[c]	2014[c]	2015[c]	2016[c]	2017[c]	2018[c]	2019[c]
GW59	Diffusion tube	N/A	100	**43.9**	**44.7**	**40.8**	**38.12**	37.6	35.4	33.7
GW60	Diffusion tube	83	83	38.0	32.7	31.6	40.04	32.2	29.5	29.3
GW61	Diffusion tube	N/A	100	39.1	35.2	30.5	32.12	28.1	31.9	32.8
GW101	Diffusion tube	92	92	<u>**79.5**</u>	**81.8**	**68.1**	**50.03**	**58.1**	**56.5**	**53.8**
GW102	Diffusion tube	N/A	100	<u>**66.2**</u>	**67.1**	**57.7**	**43.76**	**48.0**	**50.5**	**51.5**
GW103	Diffusion tube	83	83	**46.3**	**47.3**	**48.9**	**43.87**	**41.2**	35.9	35.1
GW104	Diffusion tube	N/A	100	**50.5**	**52.0**	**53.1**	**48.96**	**49.8**	**43.7**	**44.9**
GW105	Diffusion tube	N/A	100	**53.9**	**55.7**	**52.2**	**46.79**	**52.4**	**46.5**	**46.0**
GW106	Diffusion tube	92	92	**47.5**	**45.4**	39.9	**43.44**	38.4	35.5	36.0

Notes: Exceedance of the NO$_2$ annual mean AQO of 40 µg m^{-3} are shown in **bold**.

NO$_2$ annual means in excess of 60 µg m^{-3}, indicating a potential exceedance of the NO$_2$ hourly mean AQS objective are shown in bold and underlined.

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

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

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

The majority of diffusion tubes are located where there is relevant exposure and there is little difference between the distance of the tube from the kerb and that of the relevant receptor from the kerb. The exceptions are GW36 Boord Street and GW39 Bexley Road ECC. GW36 is situated in a more industrial area although there is a residential block approximately 50m from its location. GW39 is a background location and is a significant distance (>70m) from the

nearest residential receptor. Therefore, a correction for distance has been carried out only for GW36 to estimate the concentrations at the façade of the nearest residential receptors. An image showing the data used in the calculation is provided at Appendix A3.

Table D2. Annual Mean NO$_2$ Ratified and Bias-adjusted Monitoring Results (μg m^{-3}) - Correction for Distance

Site ID	Site Type	Measured annual mean NO2 concentration (in µg/m3)	Predicted annual mean NO2 concentration (in µg/m3)
GW36 Boord Street	Diffusion Tube	49.3	39.1

Annual mean NO2 level from diffusion tubes data
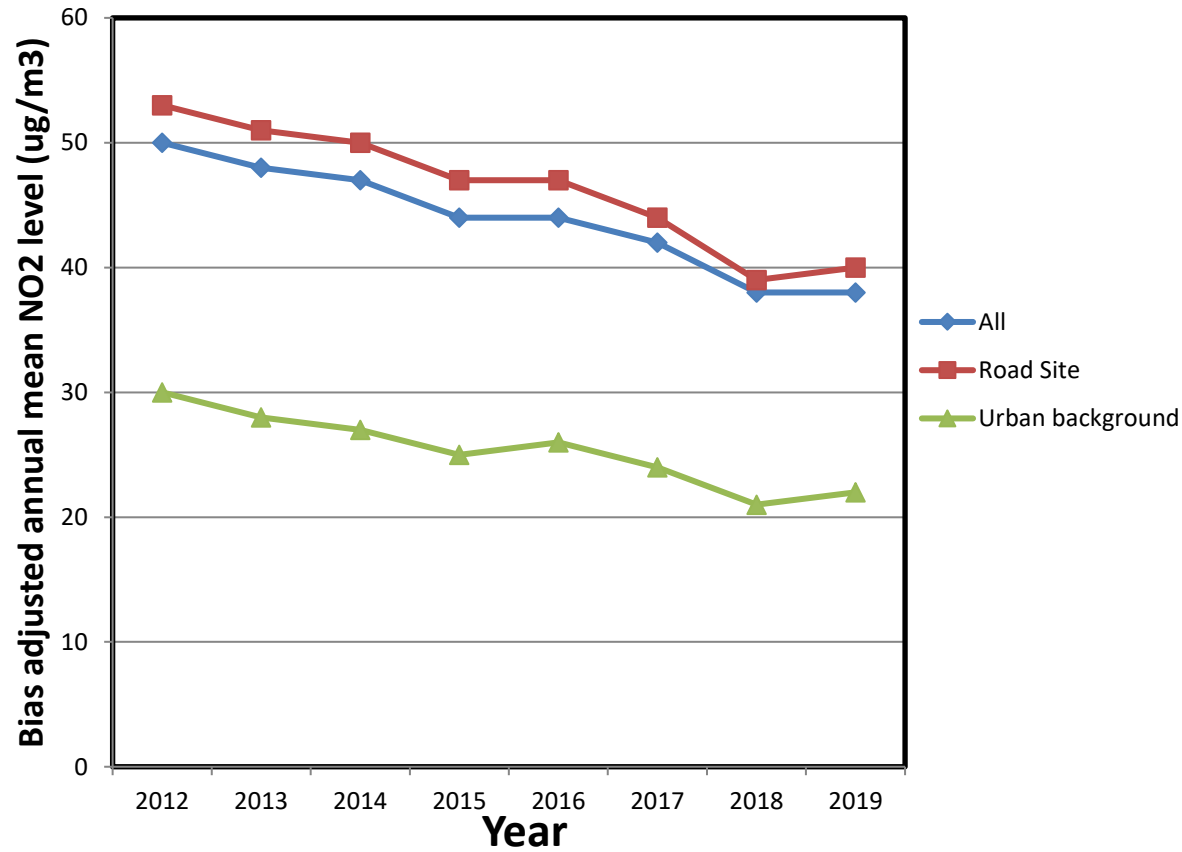
Comment

Results from Royal Borough of Greenwich diffusion tubes sites identify that 17 roadside sites still exceed the annual objective after applying the adjustment factor.

Annual Mean NO2 Level Automatic Sites

Legend:
- GR4 Eltham
- GR7 Blackheath
- GR8 Woolwich Flyover
- GN10 Burrage Grove
- GR9 Westhorne Av
- GR13 Plumstead High Street
- GB6 Falconwood
- GN4 Fiveways
- GN5 Hoskins St
- GN6 JHWay
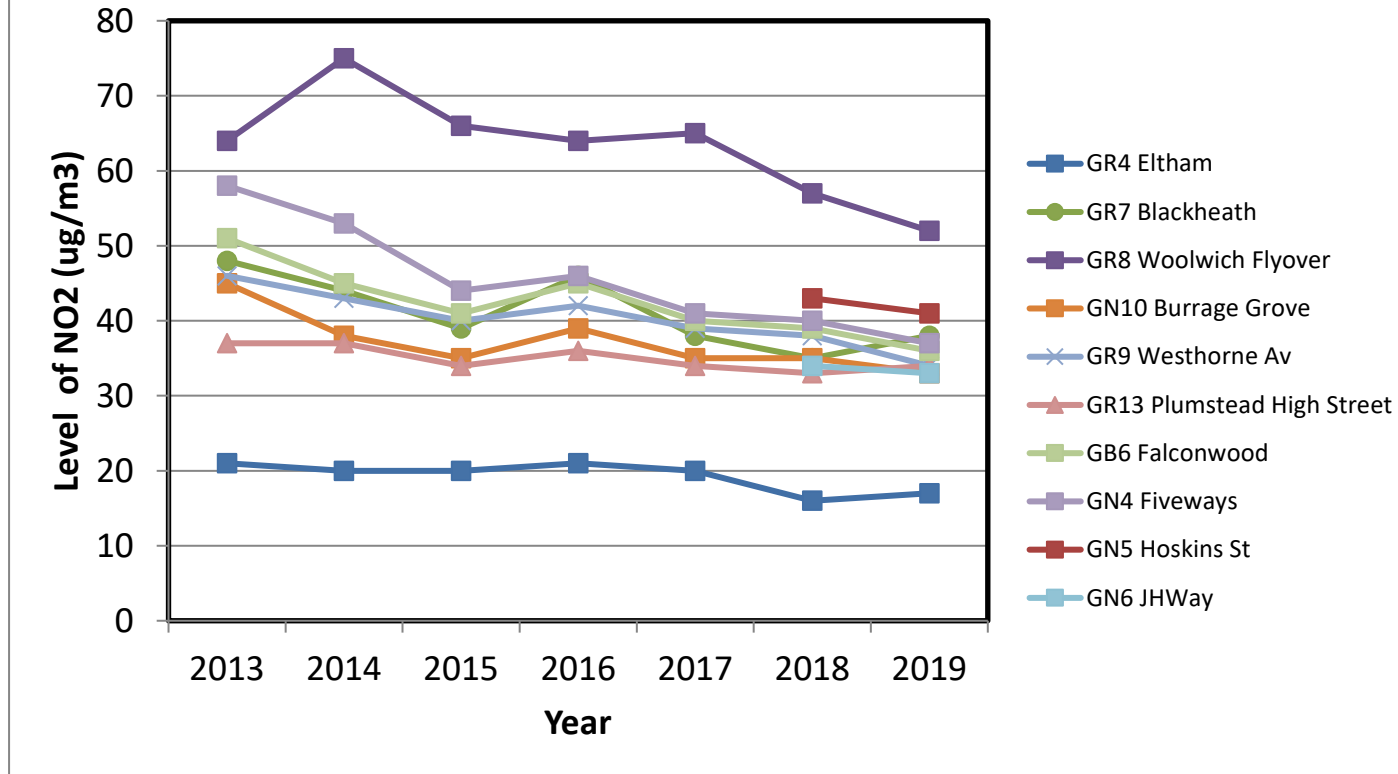
Comment

Results from Royal Borough of Greenwich automatic monitoring sites show a slight decline in the level of NO2. However, two roadside sites at GN5 Hoskins St and GR8 Woolwich Flyover, recorded NO2 levels above the level of 40ug/m3 set in the Air Quality Objectives.

Table E. NO$_2$ Automatic Monitor Results: Comparison with 1-hour Mean Objective

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Number of Hourly Means > 200 µg m^{-3}						
			2013 [c]	2014 [c]	2015 [c]	2016 [c]	2017 [c]	2018 [c]	2019 [c]
GR4 Eltham	N/A	*97*	0	0	0	0	0	0	*0*
GR5 Trafalgar Road	N/A	*N/A*	0	5	0	Closed	Closed	Closed	Closed
GN5 Hoskins Street (operational Oct 2017)	N/A	*99*	N/A	N/A	N/A	N/A	N/A	1	0
GN6 John Harrison Way (operational July 2018)	N/A	*99*	N/A	N/A	N/A	N/A	N/A	0	0
GB6 Falconwood	N/A	*99*	11	10	2	3	1	0	0
GR7 Blackheath	N/A	*99*	1	0	0	0	0	0	0
GR8 Woolwich Flyover	N/A	*99*	8	**26**	6	24	7	0	0

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Number of Hourly Means > 200 µg m⁻³						
			2013 [c]	2014 [c]	2015 [c]	2016 [c]	2017 [c]	2018 [c]	2019 [c]
GR9 Westhorne Av	N/A	*97*	4	1	0	9	2	0	0
GN0 Burrage Grove	N/A	*99*	0	0	0	1	0	0	0
GN2 Millennium Village	N/A	*N/A*	2	0	0	0	Closed	Closed	Closed
GN3 Plumstead High St	N/A	*96*	0	0	0	0	0	0	0
GN4 Fiveways	N/A	*93*	7	2	1	0	0	0	0

Notes: Exceedance of the NO$_2$ short term AQO of 200 µg m⁻³ over the permitted 18 days per year are shown in **bold**.

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

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

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

Table F.   **Annual Mean PM$_{10}$ Automatic Monitoring Results (µg m⁻³)**

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean Concentration (µg m⁻³)						
			2013 [c]	2014 [c]	2015 [c]	2016 [c]	2017 [c]	2018 [c]	2019 [c]
GR4 Eltham	N/A	*86*	20	18	17	18	19	17	14

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean Concentration (µg m^{-3})						
			2013[c]	2014[c]	2015[c]	2016[c]	2017[c]	2018[c]	2019[c]
GR5 Trafalgar Road	N/A	N/A	23	20	19	Closed	Closed	Closed	Closed
GN5 Hoskins Street (operational Oct2017)	N/A	96	N/A	N/A	N/A	N/A	N/A	22	22
GN6 John Harrison Way (operational July 2018)	N/A	92	N/A	N/A	N/A	N/A	N/A	15	14
GB6 Falconwood	N/A	97	30	25	17	18	18	21	19
GR7 Blackheath	N/A	95	30	27	25	24	23	22	20
GR8 Woolwich Flyover	N/A	99	32	29	29	30	25	25	23
GR9 Westhorne Av	62	62	24	25	22	23	21	18	15
GN0 Burrage Grove	N/A	98	28	23	22	23	18	18	17

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean Concentration ($\mu g\ m^{-3}$)						
			2013 [c]	2014 [c]	2015 [c]	2016 [c]	2017 [c]	2018 [c]	2019 [c]
GN2 Millennium Village	N/A	*N/A*	26	26	17	20	Closed	Closed	Closed
GN3 Plumstead High St	47	*47*	*20*	23	18	19	20	18	16
GN4 Fiveways	N/A	*97*	31	29	23	23	21	25	25

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

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

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

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

Annual mean PM10 level by monitoring sites
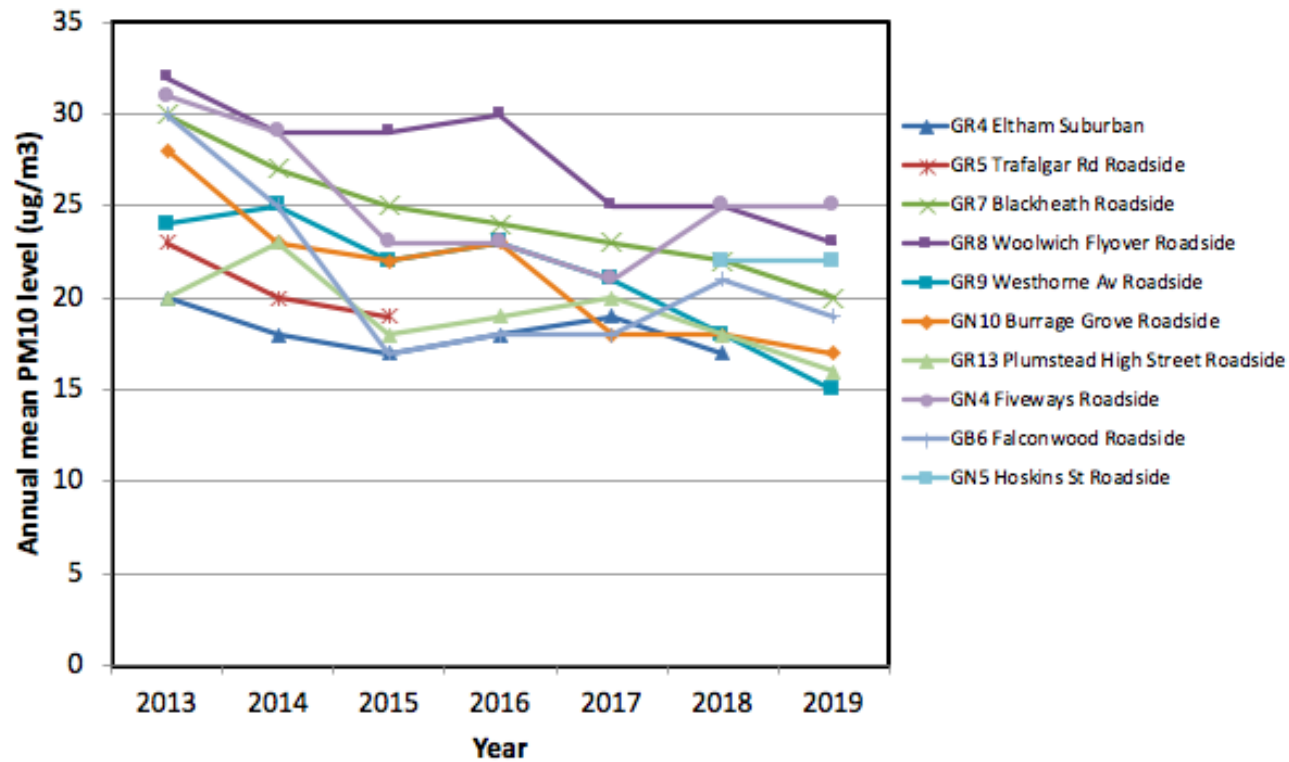
Legend:
- GR4 Eltham Suburban
- GR5 Trafalgar Rd Roadside
- GR7 Blackheath Roadside
- GR8 Woolwich Flyover Roadside
- GR9 Westhorne Av Roadside
- GN10 Burrage Grove Roadside
- GR13 Plumstead High Street Roadside
- GN4 Fiveways Roadside
- GB6 Falconwood Roadside
- GN5 Hoskins St Roadside

Comment

Results from Royal Borough of Greenwich automatic monitoring sites identify that PM10 levels are below the level of 40ug/m3 set in the Air Quality Objectives.

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

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Number of Daily Means > 50 µg m^{-3}						
			2013[c]	2014[c]	2015[c]	2016[c]	2017[c]	2018[c]	2019[c]
GR4 Eltham	N/A	86	5	7	4	6	4	1	2
GR5 Trafalgar Road	N/A	N/A	8	5	2	Closed	Closed	Closed	Closed
GN5 Hoskins Street (operational Oct2017)	N/A	96	N/A	N/A	N/A	N/A	N/A	4	12
GN6 John Harrison Way (operational July 2018)	N/A	92	N/A	N/A	N/A	N/A	N/A	0	6
GB6 Falconwood	N/A	97	28	13	1	1	2	2	8
GR7 Blackheath	N/A	95	29	18	12	14	15	5	7

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Number of Daily Means > 50 µg m^{-3}						
			2013[c]	2014[c]	2015[c]	2016[c]	2017[c]	2018[c]	2019[c]
GR8 Woolwich Flyover	N/A	*99*	26	17	18	22	9	6	10
GR9 Westhorne Av	N/A	*94*	17	19	9	15	16	4	2
GN0 Burrage Grove	N/A	*98*	*18*	15	5	10	8	3	7
GN2 Millennium Village	N/A	*N/A*	*20*	16	1	6	Closed	Closed	Closed
GN3 Plumstead High St	47	*47*	3	14	3	8	2	1	5
GN4 Fiveways	N/A	*97*	31	25	3	2	1	10	17

Notes: Exceedance of the PM$_{10}$ short term AQO of 50 µg m^{-3} over the permitted 35 days per year or where the 90.4th percentile exceeds 50 µg m^{-3} are shown in **bold**.
Where the period of valid data is less than 85% of a full year, the 90.4[th] percentile is shown in brackets after the number of exceedances.
[a] data capture for the monitoring period, in cases where monitoring was only carried out for part of the year
[b] data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)
[c] Means have been "annualised" in accordance with LLAQM Technical Guidance, where valid data capture was less than 75%

Table H. Annual Mean PM$_{2.5}$ Automatic Monitoring Results (µg m^{-3})

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean Concentration (µg m^{-3})						
			2013[c]	2014[c]	2015[c]	2016[c]	2017[c]	2018[c]	2019[c]
GR4 Eltham	N/A	97	15.2	11.5	10.6	11.7	12	10	11
GN5 Hoskins Street (operational Oct2017)	N/A	100	N/A	N/A	N/A	N/A	N/A	9	9
GN6 John Harrison Way (operational July 2018)	N/A	95	N/A	N/A	N/A	N/A	N/A	10	11
GB6 Falconwood	N/A	98	16.4	14.4	14.3	15.3	13	13	12
GR8 Woolwich Flyover	N/A	98	14.9	14.6	12.2	13.4	13.1	12	11
GR9 Westhorne Av	N/A	98	17.2	15.8	12.7	12.9	11	11	10

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean Concentration (μg m^{-3})						
			2013 [c]	2014 [c]	2015 [c]	2016 [c]	2017 [c]	2018 [c]	2019 [c]
GN0 Burrage Grove	N/A	*36*	17.5	*17.1*	12.1	14.5	12	13	11
GN2 Millennium Village	N/A	*N/A*	15.4	*15.5*	11.5	11.4	Closed	Closed	Closed
GN3 Plumstead High St	N/A	*95*	15.3	16.3	14.7	14	12	13	13

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

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

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

Annual Mean PM2.5 level according to type of monitoring sites
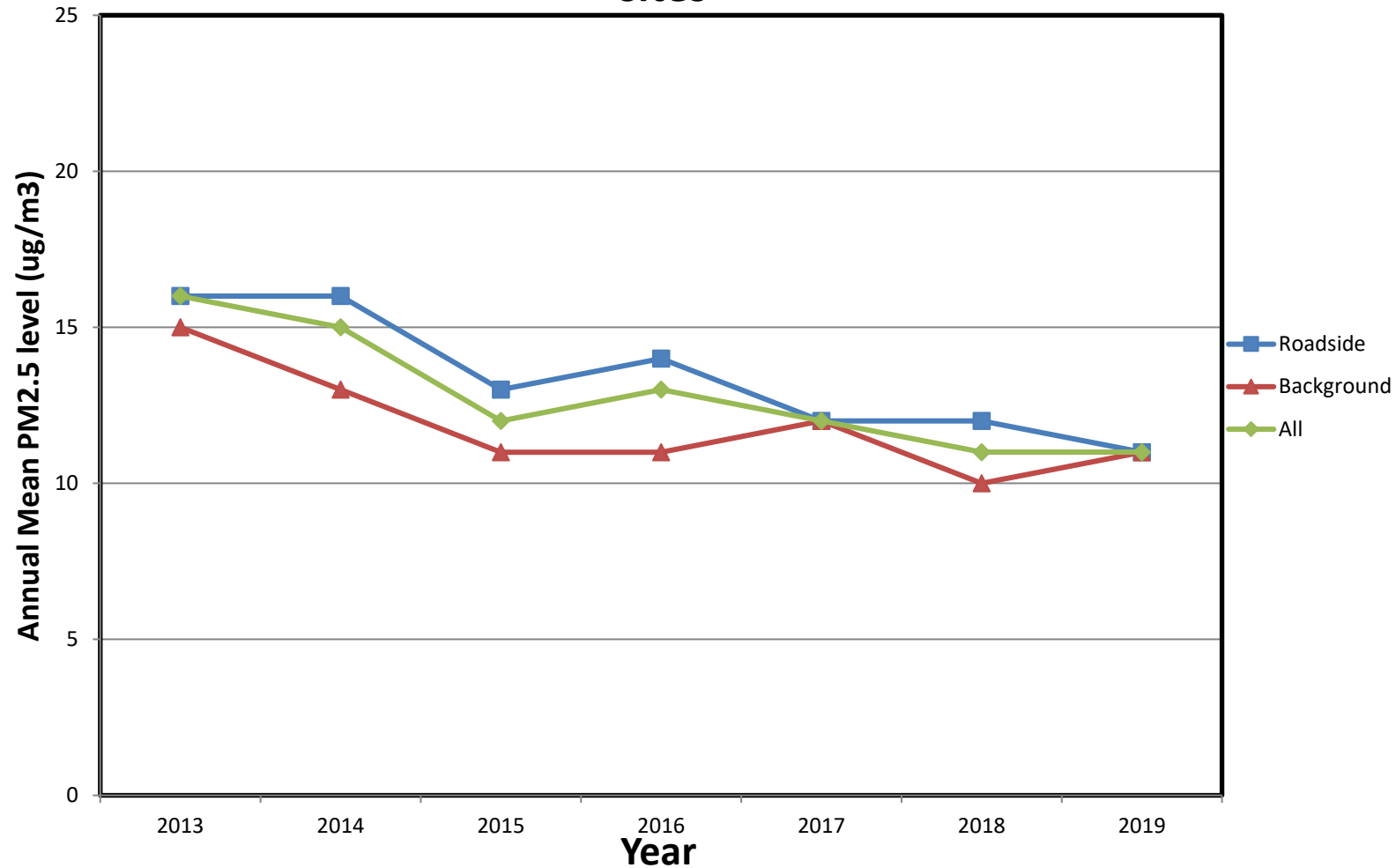
Comment

Results from Royal Borough of Greenwich automatic monitoring sites identify that PM2.5 levels are below the level of 25ug/m3 set in the Air Quality Objectives.

Table I.   SO$_2$ Automatic Monitor Results: Comparison with Objectives

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Number of: [c]		
			15-minute means > 266 μg m^{-3}	1-hour mean > 350 μg m^{-3}	24-hour mean > 125 μg m^{-3}
GR4	72	72	0	*0*	0

Exceedances of the SO$_2$ AQOs are shown in **bold** (15-min mean = 35 allowed a year, 1-hour mean = 24 allowed a year, 24-hour mean = 3 allowed / year)
[a] data capture for the monitoring period, in cases where monitoring was only carried out for part of the year
[b] data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)
[c] Means have been "annualised" in accordance with LLAQM Technical Guidance, where valid data capture was less than 75%

2.   Action to Improve Air Quality

2.1   Air Quality Action Plan Progress

The Royal Borough of Greenwich's 2017 – 2021 Air Quality Action Plan (AQAP) has four key priorities: to manage the impact of future growth in the borough, support healthier lifestyles for residents, reduce the impact of traffic on air quality and congestion, and reduce our own impact on air quality. The AQAP is subject to an annual review, appraisal of progress, and reports to the Member led Air Quality and Climate Change Task Force.

Table J provides a summary of progress against the Air Quality Action Plan during 2019.

Table J.   Delivery of Air Quality Action Plan Measures

Action	Measure	Progress
Action 1. Ensuring emissions from construction sites are minimised	Measure 1. Develop a process for ensuring planning officers are aware of current air quality regulations and these are considered within the planning process	The Council's website contains information for developers on controlling dust emissions during demolition and construction. Planning officers either receive comments on applications requiring, through condition, the submission of a Construction Management Plan or will direct developers to the information on the webpage. Planners have also been made aware of the Low Emission Zone for Non-Road Mobile Machinery (NRMM) and a condition has been created and been used by Planning throughout 2019 requiring compliance of NRMM with LEZ standards.
Action 2. Ensuring enforcement of NRMM air quality policies	Measure 2. Agree approach to inspection/enforcement and funding	The Royal Borough is actively participating in the Non-Road Mobile Machinery (NRMM) enforcement scheme led by Merton to minimise emissions and dust from machinery on construction sites.
Action 3. Enforcing CHP/biomass and AQ policies	Measure 3. Planning condition for CHP and communal boilers to be reviewed	In Summer 2019, Planning Policy commenced the Local Plan review. The first stage is focusing on scoping and evaluating options to go beyond new London Plan Policies and/or to provide further borough-specific guidance on new London Plan Policies.

Action 4. Enforcing AQ neutral policies	Measure 2. Ensure relevant discharge of conditions applications are referred to EH.	Planning officers consult Environmental Health on planning applications and, where appropriate, an Air Quality Neutral Assessment has been required. Where benchmarks have not been met, mitigation measures have been secured before any permission is granted. A process has been set up for Environmental Health to record the number of applications where an AQ Neutral Assessment had to be requested and this is being rolled out to officers in 2020.
Action 5. Development which may increase air pollution or introduce receptors to polluted areas make a financial contribution to deliver air quality improvements	Measure 2. Expenditure of receipts on AQAP	Money from previous S106 contributions has been used to fund NRMM project (see action 2), and Clean Air Day events (see action 11). More recently, the focus has been on securing developments that don't contribute to air pollution as opposed to expenditure of receipts.
Action 6. Ensuring adequate, appropriate and well located green space and infrastructure is included in new developments	Measure 1. Ensure that Air Quality is considered for green space provision, and agree standards	Planning currently secures green spaces (roofs, walls, buffer zones) in line with London Plan/Local Plan policies and supplementary guidance. This includes, as appropriate, green roofs, new amenity space and open space. From August - October 2019, the council consulted on the Site Allocations Preferred Approach Local Plan. Where localised sources of pollution were identified, for example a site adjacent to main road corridors, the draft allocations identified requirement for new soft landscaped open space and/or encouraged the use of green infrastructure to mitigate poor air quality. As part of Local Plan review, a borough-wide Characterisation and Tall Buildings Study was commissioned in 2019. This is a detailed baseline assessment of the borough, and will identify areas capable of intensification for residential/other types of development. It will ensure that new development is directed to the most sustainable locations, and is a key evidence base document to inform Local Plan review, which will seek to further strengthen the policy framework for securing urban greening for air quality improvements.

	Measure 2. Build resource on effective planting for AQ improvement/ screening.	Secured funding from the Mayor of London will see public realm work along White Hart Road adjust the nature of the highway, introducing green infrastructure and tree planting where possible and improving cycle and pedestrian routes. These will connect to the Ridgeway and beyond to the proposed Housing Zone. The implementation of highways and public realm work is due to start in 2020.
Action 7. Ensuring that smoke control zones are appropriately identified and fully promoted and enforced	Measure 1. Better promotion of SCZ's on website	The information on smoke control zones on the website was reviewed to remove incorrect information. We plan to update the website next year, once the exercise has been completed. Meanwhile, we have ensured that information on smoke control zones and the Clean Air Act goes out to members of the public who make enquiries or complaints. We have created a standard smoke control letter that outlines the offence and provides information on exempt appliances and authorised fuels. From January 1st 2019 to December 31st 2019, we investigated approximately four smoke control enquiries.
Action 8. The Council will work closely with the Environment Agency to drive up environmental standards in processes with an Environmental Permit enforced either by the Council or the Agency	Measure 1. Contact made with Environment Agency to agree meeting dates	Progress has been made with the Environment Agency in terms of working in partnership with regard to regulated processes. In 2019, a meeting was convened to bring together a number of different agencies to help improve an area of the borough where various environmental issues have been reported. The area includes processes regulated by both the Council and the Environment Agency. A joint approach to tackling issues such as fugitive dust emissions and track-out is now being developed.
Action 9. Promoting and delivering energy efficiency retrofitting projects in workplaces and homes using the GLA RE:NEW and RE:FIT	Measure 1. Improve energy efficiency in the Royal Borough's corporate buildings through a Carbon Management Plan and in corporate buildings through the	The Council joined the RE:FIT framework in 2019, and preparation of the PV installation on Greenacres school was completed in 2019. The implementation will be completed in early 2020 to achieve an estimated savings of 15 tonnes CO2 annually.

programmes to replace old boilers / top-up lost insulation in combination with other energy conservation measures	GLA's RE:FIT programme; focussing on five buildings in phase 1	In June 2019, the Council set a carbon reduction target of Net Zero carbon by 2030 for all of the borough's emissions. The Carbon Neutral Plan evidence base has been prepared, detailing the trajectories to achieve the target. The Carbon Neutral Actions will be adopted in 2020.
	Measure 2. Expand Solar PV installed capacity on Council owned properties by supporting community energy efficiency retrofitting projects.	The Council has supported South East London Community Energy in commencing a project to install renewable energy on Thamesmere and Coldharbour Leisure centres. Preparations began in 2019, with installation commencing in 2020. Furthermore, through its Capital Programme in 2019, the Council has delivered energy efficiency measures on its own housing stock, including retrofitting six properties with increased loft insulation and upgrading over 627 boilers to A rated boilers.
	Measure 6. Retrofit energy efficiency measures to up to five Council blocks in the East Greenwich area as part of the European Horizon2020 smart cities programme.	Retrofit works are currently underway in two social housing estates in the East Greenwich area, including energy efficiency measures and new technologies. This includes the exploration of an innovative water source heat pump heating system, providing a first of its kind low emission source of heating. Works are expected to be complete by the end of 2020.
	Measure 7. Promote energy efficiency in both council and private homes.	The Council has a Stay Warm Stay Safe programme, which includes an energy efficiency assessment and help on keeping fuel bills down to residents who are over 60, caring for a young or vulnerable person or having problems paying their winter fuel bills. Public Health promotes the Stay Warm Stay Safe scheme through the Live Well Greenwich website, the Greenwich Community Directory and communications campaigns.
Action 10. Ensure that Directors of Public Health (DsPH) are fully briefed on the scale of the problem in Royal Borough of Greenwich; what is being done, and what is needed. A briefing should be provided	Measure 1. DsPH to sign off Air Quality Action Plan and ASRs	Directors of Public Health (DsPH) sign off Air Quality Action Plans and review Annual Status Reports.

Action 11. Public Health Teams should be supporting engagement with local stakeholders (businesses, schools, community groups and healthcare providers). They should be asked for their support via the DsPH when projects are being developed	Measure 1. Explore these links and use them where appropriate and consistent with data protection requirements	Diffusion tubes were placed outside of Hawksmoor Primary School in August 2019 and will monitor local air pollution for 12 months, as part of Public Health's 'Superzone' pilot. The Superzone aims to make the area safer and healthier for children through targeted interventions to tackle a number of challenges, including air quality.
	Measure 2. Explore the development of a campaign to educate vulnerable groups on the cause and effect of poor air quality and how they can protect their own health	Public Health supported multiple events across the borough for Clean Air Day on June 20th, 2019. Three local schools partnered with the Royal Borough to host events for students and families. For example, St Thomas Moore Primary held a 'bling up your bike/scooter' competition as part of the campaign. We also ran a stall in the Woolwich Library to raise awareness of air pollution issues and encouraged people to make a pledge to change their behaviour, focusing on active travel. Charlton Athletic Community Trust (CACT) brought along an electric bike and in total, 79 members of the public made a pledge; an additional 30 engaged with us; 10.1K people saw our content on Facebook; our Twitter activity was seen 32.2K times; and our #CleanAirDay stories were seen on Instagram by 1384 people. Air Quality and Public Health Officers also worked together to develop information and content for the new air quality website, which was released on Clean Air Day 2019. This includes information for vulnerable groups, and what the public can do to reduce their contribution and exposure to air pollution.
Action 12. Director of Public Health to have responsibility for ensuring their Joint Strategic Needs Assessment (JSNA) has up to date information on air quality impacts on the population	Measure 1. Maintain Air Quality information in each JSNA and Health and Wellbeing Strategy update	The Air quality Joint Strategic Needs Assessment (JSNA) highlights the scale of the problem and what is being done /needs to be done. There is a rolling, responsive approach to updating elements of the JSNA as evidence and local needs and priorities shift. DsPH access links to London Air and ASR reports on the Royal Borough's website and the Live Well Greenwich site for current monitoring data.

		In 2019, Public Health conducted a detailed geographical examination of hospital activity data over a 5 year period (2013-2018), which indicated that there are greater numbers of cases of respiratory admissions for 0-19 year olds amongst Greenwich residents living near to main roads, and the higher rates are often seen close to big intersections. Links were also made to regeneration areas.
Action 13. Strengthening co-ordination with Public Health by ensuring that at least one public health specialist within the borough has air quality responsibilities outlined in their job profile	Measure 1. Retain consultant/PH membership on Air Quality Task Force	The Director of Public Health is part of the Air Quality and Climate Change Task Force, a strategic-led group made up of Councillors and senior leaders, which discusses air quality issues, priorities and resources. The Head of Public Health Development attends the Air Quality and Climate Change Working group, where Council Officers discuss the Air Quality Action Plan, statutory requirements, and wider projects and funding opportunities.
Action 14. Director of Public Health to sign off Statutory Annual Status Reports and all new Air Quality Action Plans	AQAP and ASR will be signed off by DsPH. Continued working with PH team will ensure knowledge of air quality impacts in Royal Greenwich	Please refer to actions 10, 11, 12, and 13 above.
Action 15: Ensure that the Head of Transport and Head of Planning is fully briefed on the Public Health duties and the fact that all directors (not just Director of Public Health) are responsible for delivering them, as well as on air quality opportunities and risks related to transport in the borough. Provide a briefing which can be disseminated	Measure 1. Air Quality officers in Royal Borough of Greenwich maintain close working relationships with colleagues in Transport planning and ensure that policies are aligned to achieve air quality benefits	The Borough's third Local Implementation Plan for transport has a Strategic Objective of a 'Healthier Greenwich'. This envisages a transport network, places and streets that encourage active travel, keeping us all fit and healthy, mentally and physically. This provides a plan for the directorate to meet its public health duties and assess its progress in this field. The programme of work is detailed in other entries here. There has also been continued partnership working between the directorates, with combined Air Quality Task force meetings taking place in February, May, and September of 2019. New Air Quality Working groups were also formed in 2019 to better focus on partnerships and policies with specific teams. One of those working groups is 'Active Travel and

amongst the Transport and Planning teams.		Transportation'. Further examples of partnership working in 2019 include participating in the Mayor of London's Anti-idling campaign and Nursery Air Quality Audits.
Action 16. Engagement with businesses	Measure 2. Provide information on the health effects and potential for nuisance from having bonfires	Our new Council air pollution website was launched on Clean Air Day 2019. The site includes a new section 'What can Businesses Do?', which provides information and advice on how businesses can improve air quality. This information includes disposing of waste in a sustainable way and avoiding having bonfires.
	Measure 4. Consider how business engagement can support the success of other [AQAP] projects	Public Health has been promoting and supporting the London Healthy Workplace Award (Accreditation scheme led by the Mayor of London's office) across Royal Greenwich. Under this framework, businesses working towards the accreditation have been required to demonstrate how active travel has been incorporated into their action plan to improve staff health and wellbeing. 36 organisations were accredited in Greenwich in 2019. Where possible in 2019, the Council worked with local businesses to run events, such as the Royal Greenwich Get Together, using existing power sources and solar powered units in order to reduce generator use and emissions.
Action 17. Promotion of availability of airTEXT and the London Air Quality Network	Measure 2. Enhanced presence on website	airTEXT and the London Air Quality Network were promoted via the Council's website, the Greenwich Community Directory, and Public Health's Live Well Greenwich site in 2019. The Live Well Greenwich website, which provides local information, events and support to improve health and wellbeing, includes a page dedicated to air pollution and health. The page includes the promotion of airTEXT and the London Air Quality Network. Between January 1st and December 31st of 2019, the page received 144 views.

| Action 18. Encourage schools to join the TfL STARS accredited travel planning programme by providing information on the benefits to schools and supporting the implementation of such a programme including reducing car use | Measure 1. Identify barriers for schools to participate in active travel initiatives and work towards improvement | In 2019, 55 schools achieved STARS accreditation: 14 x Bronze; 2 x Silver; and 39 x Gold. In addition, another 25 schools engaged in at least one active travel activity.

As part of Transportation's work to encourage active and sustainable travel to school, the Transport team launched a trial School Streets scheme for six months in four schools, to remove motor vehicles from outside school gates at peak times.

Roads outside the following four schools are closed to motor vehicles:
- De Lucy School - the whole of Cookhill Road from Tuesday 30 October 2018
- Gordon School - Grangehill Road between Earlshall Road and Craigton Road from Tuesday 30 October 2018
- Haimo School - Haimo Road between Froissart Road and South Circular (A205) Slip Road from Tuesday 30 October 2018
- St Joseph's School - Commerell Street until Pelton Road from 28 November 2018.
The trial scheme was reviewed in 2019 and has been made permanent. A further 3 sites are currently being assessed for suitability for School Streets, trials will be launched in 2020.

As well as taking part in the Mayor's funded Idling Action project, an Air Quality officer presented to approximately 100 primary school children at the Junior Travel Ambassador Conference in October 2019. The presentation raised awareness of road transport emissions; active travel and STARs; the impact of idling vehicle engines; and encouraged all schools to hold anti-idling workshops and events using available resources. |
| | Measure 2. Participate in GLA air quality audit for schools | Air quality audits took place at both Haimo Primary School and Invicta Primary School in Greenwich in 2018.

Since the audit at Haimo Primary School, the Council has continued to provide support with STARS (Sustainable Travel: Active, Responsible, Safe), TfL's flagship scheme to encourage young Londoners to travel actively, |

		responsibly, and safely to school. The Council also continued to maintain the pilot School Street. This School Street was reviewed in 2019 and has been made permanent.
		Since the audit at Invicta Primary, the Council has continued to provide support with the STARS scheme, whilst also supporting the school to hold a Car Free Day in September 2019. Invicta and Seibert Road were closed between 8-10am and 2-4pm, games and activities were set up in the road for families to take part in including, balance bike races, dodgeball, basketball, rowing, and a 'Park and Stride'.
		Air quality audits also took place at Rachel McMillan and Robert Owen Nursery schools in 2019. Air Quality and Transport colleagues later met with the nurseries and auditors in the summer months to discuss how the recommendations would be taken forward.
Action 19. Raising awareness of Air Quality	Measure 1. Feedback to overall Horizon2020 funded Sharing Cities, smart city programme	Delivery of the Horizon2020 Sharing Cities smart programme is progressing, which will introduce new low emission services in the areas of energy, housing and transport. New shared and electric mobility measures are complete and work is ongoing on deep energy efficiency retrofit.
Action 19. Raising awareness of Air Quality	Measure 2. Autonomous vehicle projects (work to explore and trial the deployment of connected and autonomous vehicles which offer AQ benefits as they support the electrification of the transport system, and could lead to reduced vehicle numbers)	A National centre for excellence for connected and autonomous vehicles is currently being delivered in the Borough.
Action 20. Update procurement policies to include a requirement for	Measure 1. Apply contract conditions for compliance with	In 2019, the Council's Procurement team were engaged to work on the development of air quality friendly procurement guidance. A draft guidance document has been produced for review.

suppliers with large fleets to have attained at least Bronze Fleet Operator Recognition Scheme (FORS) and Construction Logistics Cycle Safety (CLoCS) accreditation when appropriate	FORS/CLoCS standards	
Action 21. Update Royal Borough of Greenwich Procurement policies to ensure sustainable logistical measures are implemented (including requirements for preferentially scoring bidders based on their sustainability criteria, and requirements for suppliers with large fleets to have attained bronze Fleet Operator Recognition Scheme (FORS) accreditation) or EcoStars equivalent.	Measure 1. Incorporate FORS and/or ECOstars accreditation into all future contracts	Please refer to Action 20 above.
Action 22. Re-organisation of freight to support consolidation (or micro-consolidation) of deliveries, by setting up or participating in new logistics facilities, and/or requiring that council suppliers participate in these	Measure 1. Review current procurement practice and identify changes that can be made to reduce the number of delivery and servicing vehicles serving council administrative buildings	The evidence base for the Carbon Neutral Plan, being developed to support the Council's response to the Climate Emergency, identified a number of options relevant to this objective. These include the following priority actions, which it suggests should be developed further between 2020 and 2023 following the completion of the Carbon Neutral Plan: "Y. Beginning to convert the Council's fleet to ZEVs where feasible Z. Assessing the feasibility of ZEZs, access restrictions, consolidations opportunities and larger cycling infrastructure projects." Please also refer to Action 20 above.

Action 23: Priority loading for ultra-low emission delivery vehicles	Measure 1. To be proposed at East and South-East region sub group for consideration	The Council has commissioned a new Parking Strategy, which will help it to better use parking as a tool for achieving its objectives. This includes encouraging the switch to ULEVs through access to parking and/or loading.
Action 24. Assess and gain accreditation for Royal Borough of Greenwich's fleet and fleet management against schemes such as the Fleet Operator Recognition Scheme (FORS), aiming for Gold accreditation; and the EcoStars accreditation	Measure 1. Maintain current accreditation and work towards improvement	The Council's fleet has retained FORS Bronze accreditation for 2019. Additional funding for hardware improvements to bring the fleet to silver standard has been secured for the years 19/20 and 20/21. The LIP funding for 19/20 has been spent on bringing a number of vehicles to FORS silver standard.
Action 25. Increasing the number of hydrogen, electric, hybrid, bio-methane and cleaner (e.g. Euro VI) vehicles in the boroughs' fleet	Measure 2. Increasing the mix of clean fuel types in the fleet, such as electric powered vans and increasing provision of electric vehicle infrastructure at the Birchmere Centre	The fleet continues to be replaced with zero emission or LEZ/ULEZ-compliant vehicles. There are now 12 electric vehicles on the fleet, 1 plug-in petrol hybrid and 3 diesel hybrids. The following fleet mix is in operation: - 25.50% Euro 6/VI ICE diesel (excluding hybrids) - 0.89% hybrids (diesel/PHEV) - 2.66% full electric Overall: - 33.92% fleet ULEZ compliant - 79.49% HGV fleet LEZ compliant A longer-term strategy is in place to ensure that 98% of our non-HGV fleet will be ULEZ compliant by October '21. We will be replacing approximately 300 vehicles over the next 18 months. The Council joined the E-flex project which shall see the installation of Vehicle-to-Grid (V2G) chargers in a bid to increase the electrification of its fleet despite constrained electrical capacity.

Action 26. Accelerate uptake of new Euro VI vehicles in borough fleet	Continue to invest in improving the environmental and air quality impact of the refuse collection fleet, including: Introduce Euro VI vehicles through the vehicle replacement programme, with a plan that all RCVs include Euro VI engines by 2019/20	A tender has been accepted to replace the last remaining Euro V RCVs for Euro VI variants. Delivery expected in May 2020. Other HGVs also being replaced ahead of the LEZ deadline.
Action 28. Green Infrastructure	Measure 2. Investigate how and where the Royal Borough's Green Infrastructure may be enhanced and improved, including how the Borough's urban green spaces such as land on estates, or other similar Council owned parcels of land, may better contribute to this network.	During 2019, Parks, Estates and Open Spaces Department planted 713 trees (including street trees), bringing the total to 1133 across the borough, towards the Council's target to plant 2022 trees by 2022.

Royal Borough of Greenwich has been working with Park Friends Groups during 2019 to seek external funding to support tree planting initiatives. A number of bids have been successful to the Mayor of London's Greener City Funding in the first two rounds and new trees have been planted in Glyndon, Abbey Wood and Eltham areas supported by this funding. |
| Action 29. Low Emission Neighbourhoods (LENs) | Measure 1. Produce case studies of lessons learned from pilot LEN area to roll out to other parts of the Borough (and securing funding to do so) | The Borough's third Local Implementation Plan for transport incorporates case studies of successful LEN pilots, which are being mainstreamed into our general transport improvements. These include:

• Increased use of greening and 'place making' features in transport schemes.
• Light segregation of cyclists (using bollards instead of heavy infrastructure).
• Continuous footways, which give pedestrian's priority at small side roads.
• Doubling of the E-Z ride electric bike scheme fleet.

The significant expansion of electric vehicle chargers is described under Action 36. |

Action 30. Discouraging unnecessary idling of vehicle engines (e.g. through anti-idling campaigns and enforcement activity)	Measure 1. Discouraging unnecessary idling of vehicle engines (e.g. through anti-idling campaigns and enforcement activity)	Greenwich joined the Mayor's funded Idling Action London project in 2019, which will include running a number of idling action events in the borough; holding workshops at schools and with businesses; as well as developing a media and advertising campaign. The project aims to discourage unnecessary idling of vehicle engines. A report has been drafted that will assist the Council's Cabinet in 2020 with authorising the use of powers to enforce against drivers who allow their vehicle engines to run unnecessarily when parked anywhere in the Borough.
Action 31. Speed control measures e.g. lowering the legal speed limit to 20mph in built up residential areas	Measure 1. Assess which 'traffic calming' measures result in less deceleration/acceleration and promote smooth driving. AND/OR Measure 2. Prioritise these for use in Greenwich 20 mph zones	The Borough's third Local Implementation Plan for transport sets out the Council's aspiration to include all residential areas in 20mph zones (and some of the more strategic links, on a case by case basis) in the Borough by 2023. This includes: • Further expansions of 20 mph zones. A 20 mph zone has been completed at Waterdale Road (Plumstead). Work on another 20 mph zone at Colepits Wood Road (Avery Hill) has been consulted on and work is due to start in April 2020. • Proposals for the first 20 mph limit on a strategic route in Royal Greenwich, through a local safety scheme on the A206 near Windrush School. • Improvements to programme management and governance processes to ensure transport schemes are holistic, encouraging the spread of experience in lowering speeds in 20mph zones across all schemes.
Action 32. Expanding Car Clubs and increasing the proportion of electric, hydrogen and ultra-low emission vehicles in their fleet	Measure 1. Continue the expansion of car clubs in the Borough to reduce the number of privately owned, and older higher polluting, vehicles	The decision on whether to allow 'free floating' one-way car clubs is on the Royal Borough's forward plan and will be ready to take shortly. 'Free floating' one-way car clubs, like Zip Car's Flex scheme, are an exciting opportunity. They allow people to make one-way trips, from A to B, without having to return the car back to where they started.

Action 33. Very Important Pedestrian Days (e.g. no vehicles on certain roads on a Sunday) and similar initiatives	Measure 2. Car free events (e.g. in conjunction with the O2, or Charlton Athletic)	World Car Free Day 2019 took place on Sunday 22nd September, with schools celebrating on Friday 20th September. The Royal Borough coordinated a range of activities with schools and communities, that provided a 'grass-routes celebration' of Car Free Day all across the Borough. • Neighbours across three roads got together to temporarily close their streets to traffic and create Play Streets. • Nine primary schools closed nearby roads at the beginning and end of the school day, to celebrate. These measures were supported by Healthy Streets Everyday funding secured by the Council. This was used to provide reusable banners, play materials and other materials to help bring the celebrations to life.
Action 34. Free or discounted residential parking permits for zero emission cars	Measure 1. Implementation in parking policies	The Council has commissioned a new Parking Strategy, which will help it to better use parking as a tool for achieving its objectives. Proposals for the Strategy are expected to include variable parking charges based on vehicles' emissions levels.
Action 35. Surcharge on diesel vehicles below Euro 6 standards for Resident and Controlled Parking Zone permits		
Action 36. Installation of residential electric charge points	Measure 2. Provision of road space and pavement space to support charging infrastructure	Building on the 39 residential electric vehicle charge points installed in the 2018/19 financial year, the Royal Borough successfully bid for additional funding from the second round of London's 'Go Ultra Low City Scheme'. This is part of a wider programme of Electric Vehicle charging investment in Royal Greenwich in 2020, which will give us: • 60 lamppost chargers • 61 Source London charging points
Action 37. Installation of rapid chargers to help enable the take up of electric taxis, cabs	Measure 1. Identify suitable locations and secure funding to	As noted above, in 2020 the Royal Borough aims to help deliver 11 new rapid chargers (including a new rapid charging hub at Glass Yard).

and commercial vehicles (in partnership with TfL and/or OLEV)	expand the electric vehicles charging infrastructure network	
Action 38. Reprioritisation of road space; reducing parking at some destinations and or restricting parking on congested high streets and A roads to improve bus journey times, cycling experience, and reduce emissions caused by congested traffic	Measure 1. Incorporate this as part of the consideration LIP3 and/or emerging Transport Strategy	The Council has commissioned a new Parking Strategy, which will help it to better use parking as a tool for achieving its objectives. The proposed Strategy is expected to include proposals to significantly re-balance the use of our kerbside space, to encourage walking, cycling, public transport and ULEVs. Action 39 below details the significant work undertaken to provide better walking and cycling infrastructure, which increasingly includes expanded and segregated provision for cycling. Work on the Greenwich Town Centre Liveable Neighbourhood scheme will help create far more space for walking and cycling. Bus Priority – 2019/20 programme – Plumstead Road Eastbound was successfully completed in October 2019, with the introduction of a segregated cycle lane and a dedicated bus lane, to provide protection to both buses and cyclists. Works at Charlton Station (Charlton Church Lane) will commence in February 2020. Improvements to programme management and governance processes to ensure transport schemes are holistic, should help to enable a wider range of schemes to re-prioritise road space. An early example is the increased use of carriageway space (rather than footway) for proposed new cycle parking.
Action 39. Provision of infrastructure to support walking and cycling	Measure 1. Encourage and enable modal shift from private car use to public transport, walking	RBG have commissioned a cycle network analysis and a walking network analysis to develop the key priorities for the coming years. A cycling strategy and walking strategy are being prepared and will provide a delivery plan to the findings of these commissions.

		E-Z Cycle Phase 2 launched in January 2019, managed by Charlton Athletic Community Trust, which opens e-bikes up to anyone who lives, works or studies in the entire borough. Sessions take place twice a month at The Valley, Charlton, and Charlton Athletic Training Ground, New Eltham. Over the two year cycle of the scheme up to 600 residents could access this offer.
		New strategic cycle routes:
		We continue to work with TfL on Cycleway 4 (formerly Cycle Superhighway 4). It will connect Greenwich with Tower Bridge. Construction of this route is now under way in Greenwich and the Greenwich section is expected to be complete by late 2020.
		TfL recently completed public consultation on the first phase of the Greenwich to Woolwich Cycleway, along the A206 between the Anchor and Hope roundabout, and Woolwich Ferry roundabout. This will be an extension of Cycleway 4, creating a continuous route from Woolwich to Tower Bridge. As well as providing high quality cycling facilities, the proposals also included improved pedestrian crossings and new bus lanes - to create a sustainable transport corridor between two of the biggest commercial centres and transport hubs in Royal Greenwich.
		Interim improvements to the Woolwich Road flyover roundabout (Angerstein): the Council will be delivering interim improvements this Spring, to make the Angerstein roundabout safer for cyclists to cross. These changes will be in advance of a full re-design by TfL in the next few years, as part of the Greenwich to Woolwich Cycleway. This will include further safety and public realm improvements to reduce severance between the communities around the junction.
		Work on the Greenwich Town Centre Liveable Neighbourhood scheme will

		help create far more space for walking and cycling.
Action 40. Local Low Emission Zones (LEZ)	Measure 1. Continue to lobby for ULEZ extension to the M25 at the earliest possible time.	Lobbying continues, at all levels.

Following the GLA's consultation in October 2019, the new London Local Air Quality Management (LLAQM) was published. This included a new '2019 Air Quality Action Matrix'. Actions from this new matrix that aren't already included in the Royal Borough's Air Quality Action Plan (2017 – 2021), are listed below.

Theme	Action	Progress
Monitoring and other core statutory duties	Action 1. Maintaining and where possible expanding monitoring networks, and fulfilling other statutory duties	• The Royal Borough has the largest real-time monitoring network in London with ten automatic monitoring station sites. A map showing the locations of the monitoring stations, and the sets of our monitoring data can be accessed here. • We have 42 diffusion tube sites, with a total of 56 diffusion tubes. Full location and monitoring details can be accessed in our Annual Status Reports, which can be downloaded from our website. • In addition to existing sites, which have been retained and properly maintained, we implemented a further six diffusion tubes at the Woolwich Ferry roundabout from January 2019, and two diffusion tubes outside Hawksmoor primary school in August 2019, as part of the Public Health 'Superzone' initiative. • Further to this, in May 2019 the Port of London Authority (PLA) installed a number of continuous air pollution monitors near Greenwich Ship Tier to assess the impact of short-term, local river activity on air quality in the area, including cruise visits. This project is in partnership with Breathe London and LB Tower Hamlets.

3.   Planning Update and Other New Sources of Emissions

Table K.   Planning requirements met by planning applications in Royal Borough of Greenwich in 2019

Condition	Number	Comments
Number of planning applications where an air quality impact assessment was reviewed for air quality impacts	15	A new system of recording EH responses to planning applications was introduced in 2018. The procedures for recording were still being established in 2019. Therefore, the data may be subject to some inaccuracies.
Number of planning applications required to monitor for construction dust	17 applications 2 Pre-applications	The figure relates to requirements for monitoring although 0 required real-time automatic monitoring. The pre-applications were discussions where the requirement was raised.
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	8 applications 1 pre-application	A pre-application discussion advised that emission limits would be imposed if the proposal for a CHP was pursued.
Number of developments required to install Ultra-Low NO_x boilers	5	A new system of recording EH responses to planning applications was introduced in 2018. The procedures for recording were still being established in

		2019. Therefore the data may be subject to some inaccuracies.
Number of developments where an AQ Neutral building and/or transport assessments undertaken	6	The figure represents only the number of separate Air Quality Neutral Assessments that were submitted. Where the Air Quality Neutral Assessment was incorporated into an Air Quality Assessment, this was not recorded.
Number of developments where the AQ Neutral building and/or transport assessments not meeting the benchmark and so required to include additional mitigation	2	The figure is based on the above.
Number of planning applications with S106 agreements including other requirements to improve air quality	8	
Number of planning applications with CIL payments that include a contribution to improve air quality	0	
NRMM: Central Activity Zone and Canary Wharf Number of conditions related to NRMM included. Number of developments registered and compliant. Please include confirmation that you have checked that the development has been registered at www.nrmm.london and that all NRMM used on-site is compliant with Stage IIIB of the Directive and/or exemptions to the policy.	*N/A*	
NRMM: Greater London (excluding Central Activity Zone and Canary Wharf) Number of conditions related to NRMM included. Number of developments registered and compliant. Please include confirmation that you have checked that the development has been registered at www.nrmm.london and that all NRMM used on-site is compliant with Stage IIIA of the Directive and/or exemptions to the policy.	10 applications included a request for a separate NRMM condition. 21 registered and compliant. 1 unregistered/ uncompliant.	A new system of recording EH responses to planning applications was introduced in 2018. The procedures for recording were still being established in 2019. Therefore, the data may be subject

		to some inaccuracies.

All planning officers send email requests for comments to the Environment Protection Team, for allocation to specialist air quality officers to review and comment. Officers from the Environmental Protection Team who have experience in air quality are requested to attend pre-application meetings for major developments where appropriate.

Some applications include a condition requiring the submission of a Construction Management Plan and compliance with the Low Emission Zone standards for Non-Road Mobile Machinery (NRMM) was being secured through this approach. During 2019, officers switched to an approach where compliance with the NRMM Low Emission Zone was requested as a separate condition. The figure in the above table represents only the latter. The borough participates in the pan-London project to monitor compliance with these standards.

Environment Protection Officers regulate dust emissions from construction sites and work closely with Planning Enforcement. Where required, major construction sites, often with COPA 1974 section 61 Construction Site Noise agreements in place, provide dust monitoring results.

3.1   New or significantly changed industrial or other sources

No new sources identified.

Appendix A Details of Monitoring Site QA/QC

A.1   Automatic Monitoring Sites

A Local Site Operator (LSO) visits the monitoring sites every two weeks to visually inspect and check the site operation and to carry out zero/span calibration of the gas analysers. Six monthly UKAS accredited independent equipment audits are carried out by the National Physical Laboratory (NPL) which also carry out on-site certification of gas cylinders. Additionally, six monthly equipment service visits are carried out by Enviro Technology Services Plc.

PM$_{10}$ Monitoring Adjustment

PM10 measurements are automatically recalculated as EU reference equivalent using the Volatile Correction Model (VCM) – Correction applied to TEOM measurements

A.2   Diffusion Tube Quality Assurance / Quality Control

- Diffusion Tubes are prepared and analysed by UKAS accredited Gradko International Ltd
- Diffusion Tubes are prepared using 50% triethanolamine with acetone method and analysed using UV spectrometry
- The lab follows the procedures set out in the Defra Technical Guidance for LAQM TG(16)
- For details attaining to 'results' – precision, bias adjustment factors; and reference methods please refer to - 'London Wide Environment Program Nitrogen Dioxide diffusion tube survey report,2019.

Discussion of Choice of Factor to Use

The Royal Borough of Greenwich has used the London Wide Environment Program (LWEP) Bias Adjustment Factor of 0.90 because it is the factor used across Greater London as part of the London Wide Environment Program. The impact of this will mean that our readings will be higher than if the National Bias Adjustment Factor (0.87) were used so that a more conservative approach is adopted.

A.3   Adjustments to the Ratified Monitoring Data

Short-term to Long-term Data Adjustment

The capture rate for all of our diffusion tube sites is between 75 – to 100%. The data capture rate for all of our monitoring sites is between 86 – to 100%, with the exception of the PM10 analyser at site GR9 (Westhorne Avenue), which has a data capture rate of 62% and the PM10 analyser at site GR13 which has a data capture rate of 47%. The low capture rate in both cases is due to a failure of the

FDMS Units. Due to ongoing manufacturing and supply issues it took few months to source a new dryer. Given this, we acknowledge that GR13 and GR9 PM10 data is an incomplete data set that has not been annualised , and it should be used for information purposes only.

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

Annualisation of PM10 for GR9 Westhorne Avenue

Original Annual Mean	Annualisation Factor	Annualised Mean
17	0.91	15.5

Site	Site Type	Annual Mean (ug/m3)	Period Mean (ug/m3)	Ratio
Bexley-Belvedere	Background	18.4	20	0.918
Greenwich Eltham	Background	14.3	15.9	0.897
Lewisham – Honor Oak Park	Background	14.7	16.1	0.915
			Average	0.91

Annualisation of PM10 for GN3 Plumstead High Street

Original Annual Mean	Annualisation Factor	Annualised Mean
19	0.848	16.1
Site	**Site Type**	**Annual Mean (ug/m3)**	**Period Mean (ug/m3)**	**Ratio**

Bexley- Belvedere	Background	18.4	21	0.877
Greenwich Eltham	Background	14.3	17.5	0.813
Lewisham – Honor Oak Park	Background	14.7	17.2	0.855
			Average	0.848

Distance Adjustment

As set out in Table D2, a calculation to correct for distance was carried out for GW36 Boord Street. The procedure used was that which is specified in LLAQM.TG(19). The *data used in the calculation are shown below. The local annual mean background NO2 concentration was taken from GW40 Shrewsbury House.*

Enter data into the pink cells

Step 1	How far from the KERB was your measurement made (in metres)?	30	metres
Step 2	How far from the KERB is your receptor (in metres)?	50	metres
Step 3	What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?	18.2	$\mu g/m^3$
Step 4	What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?	49.3	$\mu g/m^3$
Result	The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor	39.1	$\mu g/m^3$

Appendix B   Full Monthly Diffusion Tube Results for 2019

Table M.   NO$_2$ Diffusion Tube Results

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean NO$_2$												Annual mean – raw data [c]	Annual mean – bias adjusted [c]
			Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec		
GW23		100	51.42	35.71	31.61	57.27	40.03	32.76	34.37	23.99	29.99	37.37	54.63	31.87	38.4	34.6
GW24		100	56.90	49.79	50.08	62.37	56.48	44.64	50.51	38.63	39.69	45.53	62.40	40.55	49.8	**44.8**
GW25		100	44.60	42.96	35.23	31.51	33.31	32.64	31.85	33.28	30.90	34.23	50.96	29.77	35.9	32.3
GW26		100	38.17	35.55	29.78	36.40	23.69	23.51	23.53	23.21	21.16	31.25	39.98	27.14	29.4	26.5
GW27		100	52.03	47.30	40.51	42.92	35.80	31.26	34.58	29.31	32.51	36.17	47.60	35.21	38.8	34.9
GW29	75	75	53.17	68.78	59.62	62.98	58.36			36.56	43.47		57.75	51.01	54.6	**49.2**
GW32		100	64.79	57.40	43.16	43.89	39.00	36.29	38.89	38.57	33.85	36.92	53.35	40.97	43.9	39.5
GW33	92	92	58.74	55.92	54.00	70.41		49.20	52.64	38.47	45.66	45.93	64.34	44.29	52.7	**47.4**
GW34		100	52.75	46.33	41.09	35.70	34.44	29.86	34.36	29.07	30.46	41.97	57.59	37.43	39.3	35.3
GW35	83	83	74.35	48.85	63.68		57.40	52.82	57.56		42.36	53.66	74.40	62.79	58.8	**52.9**
GW36		100	68.91	69.12	58.72	44.50	44.11	49.56	54.27	52.76	42.69	52.01	60.41	50.26	54.8	**49.3**
GW37		100	35.15	29.09	26.28	26.36	16.99	17.61	17.94	17.35	20.86	24.45	34.90	25.17	24.3	21.9
GW38		100	36.96	31.23	24.83	44.60	31.57	29.18	27.08	25.22	28.91	33.12	43.01	31.33	32.3	29.0
GW39a	83	83	29.57	27.31		22.53	15.47	14.14	14.40	13.02	14.32	21.41	27.81		20.0	18.0

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean NO$_2$												Annual mean – raw data [c]	Annual mean – bias adjusted [c]
			Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec		
GW39b	83	89	28.86	25.16	17.49	23.41			13.99	15.10	17.04	19.05	23.96	18.01	20.2	18.2
GW39c	89	89	31.02	27.78	21.82	24.58	16.62	15.00	13.93	15.76	17.72	20.77	29.08	21.35	21.3	19.2
GW40		100	30.43	22.57	20.71	21.96	15.87	13.86	13.88	13.73	16.66	21.37	30.44	21.38	20.2	18.2
GW41		100	72.54	61.77	52.93	50.18	49.84	42.71	50.59	48.62	43.32	44.49	62.64	41.62	52.9	**47.7**
GW42	92	92	50.88	43.69	35.27	55.03	41.82	43.03	42.83	35.97		41.69	54.28	41.79	44.2	39.8
GW43		100	53.77	60.85	48.82	53.47	44.56	41.71	47.51	37.06	40.02	48.20	61.20	52.21	49.1	**44.2**
GW44	92	92	60.89	55.93	52.54	70.17	52.03	40.35	45.11		41.53	48.56	57.07	44.05	53.1	**47.8**
GW106	92	92	50.55	45.35	43.93	43.70	36.12	32.87	36.60	30.99	27.80	41.07	50.57	40.01	40.0	36.0
GW48	92	92	54.64	48.52	39.00	38.05	31.97	32.32	33.96	28.48		40.71	54.19	45.52	41.9	37.8
GW49		100	58.62	66.71	56.51	40.36	41.26	42.11	43.07	39.17	43.98	47.40	54.52	49.98	48.6	**43.8**
GW50a		100	64.52	66.23	60.70	48.95	53.73	52.37	62.69	57.82	50.10	60.75	65.07	67.98	58.5	**52.7**
GW50b		100	67.14	73.70	60.38	49.95	56.92	53.73	62.85	64.82	48.27	56.94	63.50	63.19	60.1	**54.1**
GW50c		100	68.84	70.31	63.96	48.30	29.23	56.35	64.57	66.43	54.64	60.15	62.35	60.56	58.8	**52.9**
GW51		100	55.62	52.45	43.56	39.93	39.36	39.35	38.79	39.74	34.74	45.47	55.72	34.77	43.3	39.0
GW52	92	92	52.19	44.06	43.60	55.91	38.75	29.51	32.58	26.53		35.84	53.11	34.92	40.6	36.6
GW53		100	42.22	39.48	33.98	35.33	27.75	27.17	28.72	29.83	25.63	34.37	47.34	25.95	33.1	29.8
GW54	92	92	68.55	66.46	55.68	69.14	59.71	56.62	54.51	52.77		56.46	60.92	46.99	58.9	**53.0**
GW55a		100	53.33	47.54	45.50	63.24	47.95	40.79	38.36	32.34	34.57	50.33	65.35	33.45	46.1	**41.5**

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean NO$_2$												Annual mean – raw data [c]	Annual mean – bias adjusted [c]
			Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec		
GW55b		100	48.91	48.29	40.93	70.75	37.54	38.41	37.45	28.29	31.68	41.75	62.58	37.16	43.6	39.3
GW55c		100	56.06	41.47	42.71	61.09	41.51	40.23	37.27	29.49	39.57	43.29	58.55	28.37	43.3	39.0
GW56		100	59.83	47.62	50.54	48.42	38.02	36.10	39.96	31.64	38.60	39.91	50.26	40.94	43.5	39.1
GW57a		100	48.22	40.69	35.42	37.15	26.68	26.63	25.20	23.06	27.14	31.96	41.32	32.70	33.0	29.7
GW58a		100	49.28	47.91	43.71	52.57	37.80	37.86	36.51	32.66	37.41	40.05	45.32	39.02	42.8	38.6
GW58b		100	47.32	45.35	44.48	49.08	38.54	38.50	37.26	27.55	34.45	38.87	47.74	35.32	40.4	36.3
GW58c		100	49.88	44.65	39.96	48.66	22.28	38.64	34.18	28.94	32.28	39.63	49.81	36.94	38.8	34.9
GW59a		100	40.03	43.32	33.84	49.62	39.59	39.72	32.24	31.67	35.24	38.93	50.25	33.20	39.0	35.1
GW59b		100	41.97	34.75	33.49	50.31	34.39	35.85	33.88	27.64	31.47	40.26	47.57	34.46	37.2	33.5
GW59c		100	35.75	38.85	30.69	46.92	35.17	31.84	33.32	29.17	32.45	37.54	49.43	34.65	36.3	32.7
GW60a		100	44.02	35.54	37.85	35.68	31.93	28.18		21.26	30.81	30.57		33.40	32.9	29.6
GW60b	83	83	43.42	34.49	34.84	38.58	29.18	29.80	27.00	20.44	29.54	33.09	41.45	31.68	32.8	29.5
GW60c	83	83	38.28	35.58	32.38	36.53	30.58	27.40	27.97	22.36	27.43	31.87	40.72	33.23	32.0	28.8
GW101	92	92	65.16	61.04		58.47	53.18	56.57	54.97	47.01	58.17	58.20	72.22	60.29	59.8	**53.8**
GW102		100	65.78	62.31	66.57	68.01	49.64	47.45	46.23	43.00	46.08	63.44	73.90	59.08	57.2	**51.5**
GW61a		100	45.44	40.12	43.79	31.07	30.63	29.75	30.89	29.87	30.87	36.66	43.11	40.29	36.1	32.5
GW61b		100	47.88	41.47	45.66	30.40	28.10	28.97	30.42	34.67	33.00	37.94	43.97	44.58	37.3	33.5
GW61c		100	45.20	43.97	42.87	29.57	31.29	28.33	32.12	30.05	32.76	36.91	43.93	35.94	36.1	32.5

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean NO$_2$												Annual mean – raw data [c]	Annual mean – bias adjusted [c]
			Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec		
GW31	92	92	33.81	33.42	30.61		25.59	25.52	21.35	23.91	25.96	31.71	37.85	28.42	28.9	26.0
GW103	83	83	49.85	46.49	44.02	33.50	30.33		29.49	30.72		41.50	40.93	43.36	39.0	35.1
GW104		100	63.50	62.75	56.55	38.35	39.58	39.35	42.05	47.40	41.88	46.27	58.55	62.36	49.9	**44.9**
GW105		100	56.28	53.99	62.12	49.98	46.99	50.78	43.63	51.29	49.40	45.48	51.63	52.07	51.1	**46.0**
GW30		100	48.27	38.08	39.03	40.19	33.24	31.55	29.42	28.63	30.90	36.49	42.49	37.17	36.3	32.7
GW28		100	37.41	38.22	32.80	37.37	30.30	29.51	27.59	25.71	27.62	34.94	43.88	32.45	33.2	29.8

Exceedance of the NO$_2$ annual mean AQO of 40 µg m^{-3} are shown in **bold**.

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

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

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