City of London Air Quality Annual Status Report for 2019
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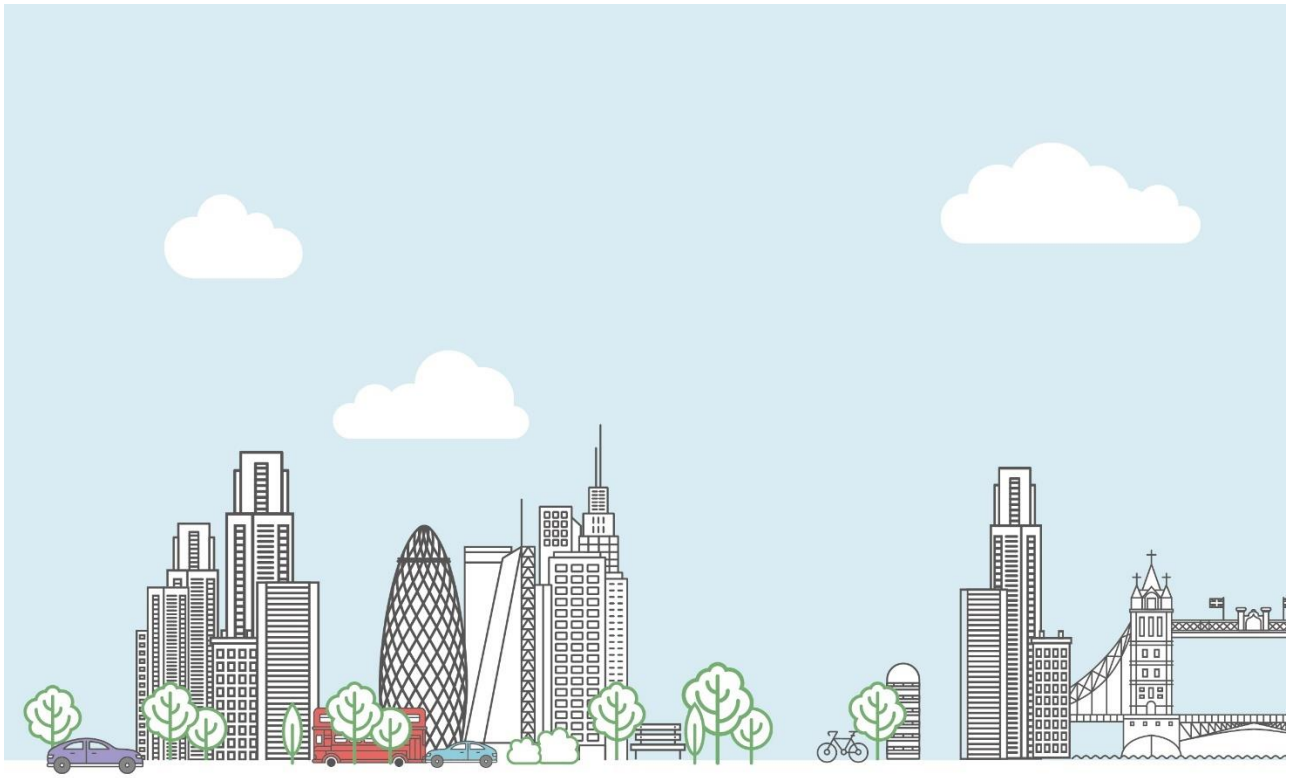

This report provides a detailed overview of air quality in the City of London during 2019. It has been produced to meet the requirements of the London Local Air Quality Management statutory process[1].

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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

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Abbreviations

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

Table A. Summary of National Air Quality Standards and Objectives

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

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

1. Air Quality Monitoring

1.1 Locations

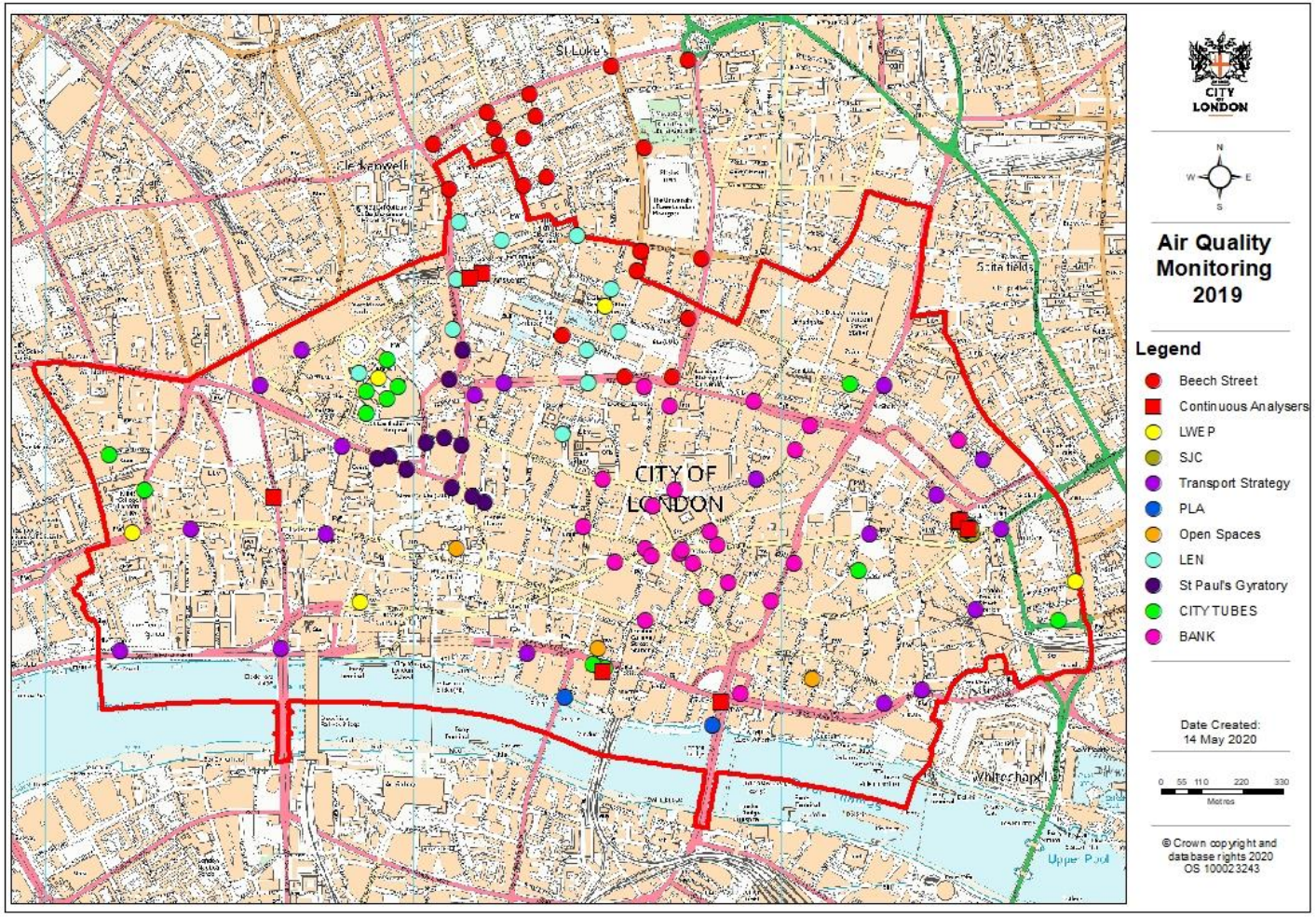


Table B. Details of Automatic Monitoring Sites (continuous analysers), 2019

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
CT2	Farringdon Street	531620	181239	Kerbside	Y	0 m	1m	1.5	$PM_{2.5}$	BAM
CT3	Sir John Cass School	533475	181179	Urban Background	Y	0 m	N/A	1.5	PM_{10}	BAM
CT3	Sir John Cass School	533475	181179	Urban Background	Y	0 m	N/A	1.5	$PM_{2.5}$	BAM
CT3	Sir John Cass School	533475	181179	Urban Background	Y	0 m	N/A	1.5	NO_2	Chemiluminescent
CT4	Beech Street	532141	181861	Roadside	Y	0 m	1m	3	PM_{10}	TEOM
CT4	Beech Street	532176	181862	Roadside	Y	0 m	1m	2	NO_2	Chemiluminescent
CT6	Walbrook Wharf	532528	180784	Roadside	Y	0 m	1m	3	NO_2	Chemiluminescent
CT8	Upper Thames Street	532834	180691	Roadside	Y	0 m	2m	1.5	PM_{10}	TEOM

Details of Non-Automatic Monitoring Sites (diffusion tubes), 2019

Table C (i) Long term diffusion tube sites

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)
CL5	St. Bartholomew's Hospital courtyard	531901	181571	Urban Background	Y	0 m	N/A	1.5	NO_2	N
CL38	St. Andrew's Church, Queen Victoria St	531851	180962	Roadside	Y	0 m	2m	3	NO_2	N
CL39	St. Dunstan's Church, Fleet St	531235	181155	Roadside	Y	0 m	2m	1.5	NO_2	N
CL55	Speed House, Barbican Centre	532482	181799	Urban Background	Y	0 m	N/A	0.5	NO_2	N
CL40	Guinness Trust Estate, Mansell St.	533791	181027	Roadside	Y	0 m	3m	2	NO_2	N

Table C (ii) Bank area diffusion tubes

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)
Bank 1	Cannon Street	532628.4	180916.0	Kerbside	Y	0 m	<1m	2m	NO_2	N
Bank 2	Queen Victoria Street	532576.3	180931.9	Kerbside	Y	0 m	<1m	2m	NO_2	N
Bank 3	King Street	532460.7	181167.5	Kerbside	Y	0 m	<1m	2m	NO_2	N
Bank 4	Corner of Poultry and QVS	532630.9	181111.6	Roadside	Y	0 m	4m	2m	NO_2	N
Bank 5	Magistrates Court	532644.9	181092.6	Kerbside	Y	0 m	<1m	2m	NO_2	N
Bank 6	King William Street	532795.4	180980.2	Kerbside	Y	0 m	<1m	2m	NO_2	N
Bank 7	Lombard and KWS	532759.8	181071.6	Kerbside	Y	0 m	<1m	2m	NO_2	N
Bank 8	Lombard Street	532853.1	181017.6	Kerbside	Y	0 m	<1m	2m	NO_2	N
Bank 9	Lombard Street and Cornhill	532723.0	181099.6	Roadside	Y	0 m	3m	2m	NO_2	N
Bank 10	Cornhill Bank Junction	532729.3	181107.2	Kerbside	Y	0 m	<1m	2m	NO_2	N
Bank 11	Cornhill-Royal Exchange	532822.0	181123.0	Kerbside	Y	0 m	<1m	2m	NO_2	N
Bank 12	Threadneedle Street	532841.0	181192.9	Kerbside	Y	0 m	<1m	2m	NO_2	N
Bank 13	31 Old Broad Street	533036.0	181376.4	Kerbside	Y	0 m	<1m	2m	NO_2	N
Bank 14	Wormwood Street	533077.9	181445.0	Kerbside	Y	0 m	<1m	2m	NO_2	N
Bank 15	3 London Wall	532923.0	181509.1	Kerbside	Y	0 m	<1m	2m	NO_2	N
Bank 16	81 London Wall	532664.5	181552.3	Kerbside	Y	0 m	<1m	2m	NO_2	N
Bank 17	55 Moorgate	532693.1	181497.7	Kerbside	Y	0 m	<1m	2m	NO_2	N
Bank 18	85 Gresham Street	532693.1	181497.7	Kerbside	Y	0 m	<1m	2m	NO_2	N
Bank 19	Lothbury	532723.6	181265.3	Roadside	Y	0 m	2m	2m	NO_2	N
Bank 20	Princes Street	532649.3	181224.6	Kerbside	Y	0 m	<1m	2m	NO_2	N
Bank 21	Gracechurch Street TKMax	532,964.9	180,967.0	Kerbside	Y	0 m	<1m	2m	NO_2	N
Bank 22	Gracechurch Street Leadenhall	533,040.4	181,108.6	Kerbside	Y	0 m	1m	2m	NO_2	N
Bank 23	Fish Street Hill	532,839.3	180,714.3	Kerbside	Y	0 m	<1m	2m	NO_2	N
Bank 24	Harrow Place	533,476.9	181,415.5	Roadside	Y	0 m	<2m	2m	NO_2	N

Table C (iii) Low Emissions Neighbourhood area diffusion tubes

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)
LEN 1	Giltspur Street	531,855.0	181,586.1	Kerbside	Y	0m	1m	2m	NO_2	N
LEN 3	Beech Street- Near barbican station	532,116.9	181,840.1	Roadside	Y	0m	2m	2m	NO_2	N
LEN 4	Aldersgate	532,116.9	181,714.4	Kerbside	Y	0m	1m	2m	NO_2	N
LEN 6	Corner of Whitecross Street and Beech street	532,447.6	181,964.5	Roadside	Y	0m	2m	2m	NO_2	N
LEN 7	Silk Street	532,536.5	181,813.7	Kerbside	Y	0m	1m	2m	NO_2	N
LEN 8	Fore Street	532,471.4	181,650.2	Kerbside	Y	0m	1m	2m	NO_2	N
LEN 9	London Wall/ Brewers Hall Gardens	532,477.7	181,561.3	Kerbside	Y	0m	1m	2m	NO_2	N
LEN 10	Aldermanbury	532,409.5	181,420.0	Roadside	Y	0m	2m	2m	NO_2	N
LEN 15	Fann Street	532, 125.9	181,944.8	Kerbside	Y	0m	1m	2m	NO_2	N
LEN 16	Moor Lane	532, 554.6	181, 701.2	Kerbside	Y	0m	1m	2m	NO_2	N

Table C (iv) Other sites with diffusion tubes

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)
SJC1, 6 and 8	Sir John Cass School rear playground (co-location)	533475	181179	Urban Background	Y	0 m	N/A	1.5m	NO_2	Y
SJC4	Sir John Cass School Front playground	533498.3	181148.9	Roadside	Y	0 m	15m	1m below Street level	NO_2	N
PLA5	Southwark Bridge	532, 411.7	180, 705.8	Roadside	Y	0m	N/A	2m	NO_2	N
PLA6	London Bridge	532, 813.4	180, 635.9	Urban Background	Y	0m	N/A	2m	NO_2	N
Liverpool St	Liverpool Street	533, 189.6	181, 533.5	Kerbside	Y	0m	1m	2m	NO_2	N
Fenchurch Ave	Fenchurch Avenue	533, 211.9	181, 053.4	Roadside	Y	0m	2m	2m	NO_2	N
Fetter Lane	Fetter Lane	531, 270.3	181, 269.4	Kerbside	Y	0m	1m	2m	NO_2	N
OS1	St Mary at Hill's Churchyard	533, 081.7	180, 758.2	Urban Background	Y	0m	2m	2m	NO_2	N
OS3	St Pauls	532, 121.2	181, 110.6	Urban Centre	Y	0m	1m	2m	NO_2	N
OS5	Whittington Gardens	532, 502.2	180, 843.9	Urban Background	Y	0m	20m	2m	NO_2	N
Goodmans Yrd	Goodmans Yard	533,751.1	180,915.6	Roadside	Y	0m	2M	2m	NO_2	N

Table C (v) Diffusion tube sites to support the monitoring of the Transport Strategy

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)
T2	Byward Street	533, 276.9	180, 692.6	Kerbside	Y	0m	1m	2m	NO_2	N
T3	Seething Lane	533, 381.7	180, 726.4	Kerbside	Y	0m	1m	2m	NO_2	N
T4	Crosswall	533, 526.2	180, 948.7	Kerbside	Y	0m	1m	2m	NO_2	N
T5	Minories	533, 594.4	181, 161.4	Kerbside	Y	0m	1m	2m	NO_2	N
T6	Stoney Lane	533, 545.2	181, 355.1	Kerbside	Y	0m	1m	2m	NO_2	N
T7	Heneage Lane	533, 421.4	181, 258.2	Kerbside	Y	0m	1m	2m	NO_2	N
T9	150 Bishopsgate	533, 276.9	181, 558.3	Kerbside	Y	0m	1m	2m	NO_2	N
T10	St Mary Axe	533, 238.8	181, 151.9	Kerbside	Y	0m	1m	2m	NO_2	N
T11	Old Broad Street	532, 929.3	181, 299.5	Kerbside	Y	0m	1m	2m	NO_2	N
T12	Upper Thames Street	532, 310.1	180, 824.9	Kerbside	Y	0m	1m	2m	NO_2	N
T13	Blackfriars Bridge	531, 641.8	180,839.1	Kerbside	Y	0m	1m	2m	NO_2	N
T14	Victoria Embankment	531, 203.7	180, 834.4	Kerbside	Y	0m	1m	2m	NO_2	N
T15	Fleet Street	531, 394.2	181, 159.8	Kerbside	Y	0m	1m	2m	NO_2	N
T16	Ludgate Hill	531, 765.6	181, 150.3	Kerbside	Y	0m	1m	2m	NO_2	N
T17	Museum of London	532, 167.3	181, 528.1	Kerbside	Y	0m	1m	2m	NO_2	N
T18	London Wall	532, 240	181, 559.9	Kerbside	Y	0m	1m	2m	NO_2	N
T19	West Poultry Ave	531, 695.8	181, 651.9	Kerbside	Y	0m	1m	2m	NO_2	N
T20	The Fable	531, 586.2	181, 558.3	Kerbside	Y	0m	1m	2m	NO_2	N
T21	North Old Baily	531, 804.3	181, 386.7	Kerbside	Y	0m	1m	2m	NO_2	N

Table C (vi) Sites to support the Beech Street Zero Emissions Vehicle Street Project

Diffusion tubes were deployed in January 2019 to gather baseline data for monitoring the impacts of the Beech Street Zero Emissions Vehicle Street project. Note: Some of the sites monitored lie outside of the City of London's boundary to assess the impact in neighbouring Boroughs, these have not been included in this report.

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)
BS1	Aldersgate Street	532,108.3	181,947.8	Kerbside	Y	0m	1m	2m	NO_2	N
BS14	Bunhill Row/Chiswell Street	532,617	181,920	Kerbside	Y	0m	1m	2m	NO_2	N
BS16	Moore Lane/Ropemaker Street	532,606	181,886	Kerbside	Y	0m	1m	2m	NO_2	N
BS17	Moorgate	532, 744	181,736	Kerbside	Y	0m	1m	2m	NO_2	N
BS18	London Wall/ Moorgate	532,702	181,580	Kerbside	Y	0m	1m	2m	NO_2	N
BS19	London Wall	532,576.4	181,578.4	Kerbside	Y	0m	1m	2m	NO_2	N
BS20	Wood Street	532,402.6	181,687.0	Kerbside	Y	0m	1m	2m	NO_2	N

Table C (vii) Sites to support the St Paul's gyratory project

Diffusion tubes were deployed in January 2019 to gather baseline data for monitoring the impacts of the St Paul's gyratory project.

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)
SPG1	Montague Street	532,096.7	181,568.5	Kerbside	Y	0m	1m	2m	NO_2	N
SPG3	King Edward St/Angel St	532,078.0	181,400.2	Kerbside	Y	0m	1m	2m	NO_2	N
SPG4	Angel St	532,082.4	181,409.7	Kerbside	Y	0m	1m	2m	NO_2	N
SPG5	Angel Street/St Martins le Grand	532,130.1	181,392.3	Kerbside	Y	0m	1m	2m	NO_2	N
SPG6	Cheapside Underground entrance	532,155.5	181,255.7	Kerbside	Y	0m	1m	2m	NO_2	N
SPG7	Cheapside/Foster Lane	532,192.0	181,236.7	Kerbside	Y	0m	1m	2m	NO_2	N
SPG8	New Change	532,101.5	181,279.6	Kerbside	Y	0m	1m	2m	NO_2	N
SPG9	Cheapside	531,980.8	181,320.8	Kerbside	Y	0m	1m	2m	NO_2	N
SPG10	Newgate/Warwick Lane	531,899.8	181,355.6	Kerbside	Y	0m	1m	2m	NO_2	N
SPG11	Newside, Warwick Lane	531,933.2	181,365.3	Kerbside	Y	0m	1m	2m	NO_2	N

Table C (viii) Sites at St Paul's Cathedral School

Diffusion tubes were installed at St Paul's Cathedral Choir School for 1 year to assess pollution levels around and inside the school.

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)
SPS1	Headmaster's Terrace	532,166.9	181,129.4	Urban Background	Y	0m	N/A	Second storey approx 8m	NO_2	N
SPS2	Front Railings, Bus Stop	532,173.1	181,154.6	Roadside	Y	0m	2m	2m	NO_2	N
SPS3	Main Entrance Window	532,166.2	181,146.7	Urban Background	Y	0m	N/A	2m	NO_2	N
SPS4	Boarding Block Entrance	532,184.0	181,116.5	Urban Background	Y	0m	N/A	2m	NO_2	N
SPS5	Boarding Block Surgery	532,176.9	181,122.5	Urban Background	Y	0m	N/A	inside	NO_2	N
SPS6	Sharon's Lounge Boarding Block	532,178.3	181,107.5	Inside	Y	0m	N/A	inside	NO_2	N
SPS7	Pre-prep Garden Stained Glass	532,157.5	181,133.0	Urban Background	Y	0m	N/A	2m	NO_2	N
SPS8	North Side, Main Playground	532,136.7	181,170.6	Urban Background	Y	0m	N/A	4m	NO_2	N
SPS9	South Tower, Main Playground	532,142.1	181,133.8	Urban Background	Y	0m	N/A	4m	NO_2	N
SPS10	Entrance Lobby Near TV	532,158.6	181,143.8	**Inside**	Y	0m	N/A	Inside	NO_2	N
SPS11	Reception Classroom	532,151.2	181,114.6	**Inside**	Y	0m	N/A	Inside	NO_2	N
SPS12	Art Room	532,153.5	181,116.5	**Inside**	Y	0m	N/A	Inside	NO_2	N
SPS13	Staffroom	532,145.8	181,174.8	**Inside**	Y	0m	N/A	Inside	NO_2	N

SPS14	Science Room Inside	532,145.6	181,171.3	**Inside**	Y	0m	N/A	inside	NO_2	N
SPS15	Science Room Outside	532,146.4	181,167.14	Urban Background	Y	0m	N/A	Top floor approx 15m	NO_2	N

1.2 Comparison of Monitoring Results with Air Quality Objectives

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 NO_2 ratified monitoring results from automatic analysers (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]
CT3 (John Cass)	Urban Background	N/A	95	**47**	**45**	**42**	**42**	38	32	33
CT4 (Beech St)	Roadside	N/A	98	**81**	**80**	**89**	**85**	**80**	**69**	**62**
CT 6 (Walbrook)	Roadside	N/A	97	**122**	**122**	**98**	**92**	**92**	**87**	**73**

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, if valid data capture is less than 75%

Table D (i) Annual mean NO_2 monitoring results for long term diffusion tube sites (µg/m^3)

Site ID	Site type	Location	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]
CL5	Urban Background	St. Bartholomew's Hospital courtyard	N/A	92	**42**	**43**	38	**49**	**63**	**50**	**42**
CL38	Roadside	St. Andrew's Church, Queen Victoria St	N/A	100	**64**	**59**	**53**	**56**	**52**	**50**	**41**
CL39	Roadside	St. Dunstan's Church, Fleet St	N/A	92	**87**	**80**	**87**	**81**	**82**	**70**	**57**
CL55	Urban Background	Speed House, Barbican Centre	N/A	92	37	34	33	35	32	31	28
CL40	Roadside	Guinness Trust Estate, Mansell St.	N/A	92	**59**	**59**	**56**	**51**	**48**	**46**	39

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, if valid data capture is less than 75%

Table D (ii) Annual Mean NO_2 monitoring results for the Bank area (µg/m^3)

Site ID	Site type	Location	Valid data capture % [a]	Valid data capture 2019 % [b]	Annual Mean Concentration (µg/m^3)			
					2016[c]	2017[c]	2018[c]	2019[c]
BANK 1	Kerbside	Cannon Street	N/A	92	**78**	**65**	**50[c]**	**40**
BANK 2	Kerbside	Queen Victoria Street	N/A	92	**72**	**59**	**58**	**51**
BANK 3	Kerbside	King Street	N/A	75	**52**	**52**	**52**	**47**
BANK 4	Roadside	Corner of Poultry and QVS	N/A	75	**71**	**60**	**63**	**55**
BANK 5	Kerbside	Magistrates Court	N/A	67	**66**	**63**	**53**	**56[c]**
BANK 6	Kerbside	King William Street	N/A	92	**76**	**70**	**61[c]**	**61**
BANK 7	Kerbside	Lombard and KWS	N/A	67	**57**	**58**	**56**	**54[c]**
BANK 8	Kerbside	Lombard Street	N/A	100	**59**	**56**	**56**	**45**
BANK 9	Roadside	Lombard Street and Cornhill	N/A	92	**68**	**62**	**60**	**46**
BANK 10	Kerbside	Cornhill Bank Junction	N/A	42	**71**	**67**	**66**	**57[c]**
BANK 11	Kerbside	Cornhill-Royal Exchange	N/A	58	**61**	**57**	**62[c]**	**41[c]**
BANK 12	Kerbside	Threadneedle Street	N/A	50	**85**	**69**	**62[c]**	**42[c]**
BANK 13	Kerbside	31 Old Broad Street	N/A	83	**59**	**57**	**53**	**45**
BANK 14	Kerbside	Wormwood Street	N/A	100	**64**	**61**	**57**	**49**
BANK 15	Kerbside	3 London Wall	N/A	100	**64**	**54**	**65**	**53**
BANK 16	Kerbside	81 London Wall	N/A	100	**60**	**59**	**62**	**53**
BANK 17	Kerbside	55 Moorgate	N/A	92	**69**	**66**	**66**	**52**
BANK 18	Kerbside	85 Gresham Street	N/A	75	**53**	**54**	**52**	**46**
BANK 19	Roadside	Lothbury	N/A	75	**45[C]**	**44[c]**	**45**	39
BANK 20	Kerbside	Princes Street	N/A	42	**78**	**74[c]**	**69[c]**	**49[c]**
BANK 21	Kerbside	Gracechurch Street TKMax	N/A	25	-	**68[c]**	**64[c]**	**46[c]**
BANK 22	Kerbside	Gracechurch Street Leadenhall	N/A	50	-	**66**	**62[c]**	**51[c]**
BANK 23	Kerbside	Fish Street Hill	N/A	92	-	**66[c]**	**61**	**43**
BANK 24	Roadside	Harrow Place	N/A	33	-	**43[c]**	39	**48[c]**

Notes:

Exceedance of the NO_2 annual mean AQO of 40 µgm^{-3} are shown in **bold**.
NO_2 annual means in excess of 60 µg m^{-3}, indicating a potential exceedance of the NO_2 hourly mean AQS objective are shown in bold and underlined.
[a] data capture for the monitoring period, in cases where monitoring was only carried out for part of the year
[b] data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)
[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

Table D (iii) Annual Mean NO_2 monitoring results for the LEN area (µg/m^3)

Site ID	Site Type	Location	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean Concentration (µg/m^3)		
					2017	2018	2019
LEN 1	Kerbside	Giltspur Street	N/A	92	**53**	**43**	38
LEN 3	Roadside	Beech Street- Near barbican station	N/A	83	**69**	**<u>62</u>**	**50**
LEN 4	Kerbside	Aldersgate	N/A	92	**62**	**57**	**47**
LEN 6	Roadside	Corner of Whitecross Street and Beech street	N/A	92	**46**	**42**	40
LEN 7	Kerbside	Silk Street	N/A	83	**41**	**41**	36
LEN 8	Kerbside	Fore Street	N/A	100	**41**	38	34
LEN 9	Kerbside	London Wall/ Brewers Hall Gardens	N/A	100	**48**	**49**	**42**
LEN 10	Roadside	Aldermanbury	N/A	75	38	37	31
LEN15	Kerbside	Fann Street	N/A	75	-	**41**	36
LEN16	Kerbside	Moor Lane	N/A	67	**-**	39	30[c]

Notes:
Exceedance of the NO_2 annual mean AQO of 40 µgm^{-3} are shown in **bold**.
NO_2 annual means in excess of 60 µg m^{-3}, indicating a potential exceedance of the NO_2 hourly mean AQS objective are shown in bold and underlined.
[a] data capture for the monitoring period, in cases where monitoring was only carried out for part of the year
[b] data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)
[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

Table D (iv) Annual Mean NO_2 monitoring results for additional tubes (µg/m^3)

Site ID	Site Type	Location	Valid data capture % [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]
SJC1/6/8*	Urban Background	Sir John Cass School rear playground (co-location)	N/A	92	**47[c]**	**46**	**41**	39	**40**	39	33
SJC4	Roadside	Sir John Cass School Front playground	N/A	92	**59[c]**	**52**	**48**	**43**	**43**	**40**	37
PLA5	Roadside	Southwark Bridge	N/A	83	-	-	-	-	-	**41**	35
PLA6	Urban Background	London Bridge	N/A	75	-	-	-	-	-	37[c]	35
Liverpool St	Kerbside	Liverpool Street	N/A	83	-	-	-	-	-	**71[c]**	**52**
Fenchurch Ave	Roadside	Fenchurch Avenue	N/A	92	-	-	-	-	-	36	35
Fetter Lane	Kerbside	Fetter Lane	N/A	92	-	-	-	-	-	**56**	**44**
OS1	Urban Background	St Mary at Hill's Churchyard	N/A	92	-	-	-	-	-	33	31
OS3	Urban Centre	St Pauls	N/A	75	-	-	-	-	-	**41[c]**	39
OS5	Urban Background	Whittington Gardens	N/A	92	-	-	-	-	-	**42[c]**	37
Goodmans Yrd	Roadside	Goodmans Yard	N/A	58	-	-	-	-	-	-	**44[c]**

Notes:

***triplicate co-location started in 2016, duplicate tubes in 2014 and 2015 and a single tube in 2013**

Exceedance of the NO_2 annual mean AQO of 40 µgm^{-3} are shown in **bold**.

NO_2 annual means in excess of 60 µg m^{-3}, indicating a potential exceedance of the NO_2 hourly mean AQS objective are shown in bold and underlined.

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

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

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

Table D (v) Annual Mean NO_2 monitoring results for the Transport Strategy tubes (µg/m^3)

Site ID	Site Type	Location	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean Concentration (µg/m^3)	
					2018[c]	2019[c]
T2	Kerbside	Byward Street	N/A	83	**67[c]**	**51**
T3	Kerbside	Seething Lane	N/A	75	**71[c]**	**57**
T4	Kerbside	Crosswall	N/A	50	**50[c]**	**44[c]**
T5	Kerbside	Minories	N/A	67	**62[c]**	**49[c]**
T6	Kerbside	Stoney Lane	N/A	67	**40[c]**	39[c]
T7	Kerbside	Heneage Lane	N/A	67	**42[c]**	33[c]
T9	Kerbside	150 Bishopsgate	N/A	42	**74[c]**	**48[c]**
T10	Kerbside	St Mary Axe	N/A	58	**50[c]**	**42[c]**
T11	Kerbside	Old Broad Street	N/A	67	**40[c]**	31[c]
T12	Kerbside	Upper Thames Street	N/A	83	**48[c]**	**53**
T13	Kerbside	Blackfriars Bridge	N/A	75	**62[c]**	**56**
T14	Kerbside	Victoria Embankment	N/A	75	**68[c]**	**57**
T15	Kerbside	Fleet Street	N/A	67	**62[c]**	**47[c]**
T16	Kerbside	Ludgate Hill	N/A	58	**61[c]**	**50[c]**
T17	Kerbside	Museum of London	N/A	75	**66[c]**	**55**
T18	Kerbside	London Wall	N/A	75	**65[c]**	**52**
T19	Kerbside	West Poultry Ave	N/A	58	**51[c]**	38[c]
T20	Kerbside	The Fable	N/A	67	**58[c]**	**51[c]**
T21	Kerbside	North Old Baily	N/A	75	**73[c]**	**56**

Notes:

Exceedance of the NO_2 annual mean AQO of 40 µgm^{-3} are shown in **bold**.

NO_2 annual means in excess of 60 µg m^{-3}, indicating a potential exceedance of the NO_2 hourly mean AQS objective are shown in bold and underlined.

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

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

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

Table D (vi) Annual Mean NO_2 monitoring results for the Beech Street Project (µg/m^3)

Site ID	Site Type	Location	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean Concentration (µgm^{-3}) 2019[c]
BS1	Kerbside	Aldersgate Street	N/A	75	**47**
BS14	Kerbside	Bunhill Row/Chiswell Street	N/A	75	40
BS16	Kerbside	Moore Lane/Ropemaker Street	N/A	92	34
BS17	Kerbside	Moorgate	N/A	75	**52**
BS18	Kerbside	London Wall/ Moorgate	N/A	100	**52**
BS19	Kerbside	London Wall	N/A	92	**49**
BS20	Kerbside	Wood Street	N/A	83	29

Notes:

Exceedance of the NO_2 annual mean AQO of 40 µgm^{-3} are shown in **bold**.

NO_2 annual means in excess of 60 µg m^{-3}, indicating a potential exceedance of the NO_2 hourly mean AQS objective are shown in bold and underlined.

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

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

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

Table D (vii) Annual Mean NO_2 monitoring results for the St Pauls Gyratory Project (µg/m^3)

Site ID	Site Type	Location	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean Concentration (µgm^{-3}) 2019[c]
SPG1	Kerbside	Montague Street	90	83	**49**
SPG3	Kerbside	King Edward St/Angel St	90	83	**48**
SPG4	Kerbside	Angel St	80	83	**45**[c]
SPG5	Kerbside	Angel Street/St Martins le Grand	80	83	**44**[c]
SPG6	Kerbside	Cheapside (underground entrance)	90	83	**42**
SPG7	Kerbside	Cheapside/Foster Lane	100	83	**45**
SPG8	Kerbside	New Change	50	83	**50**[c]
SPG9	Kerbside	Cheapside	100	83	**48**
SPG10	Kerbside	Newgate/Warwick Lane	90	83	**51**
SPG11	Kerbside	Newside, Warwick Lane	90	83	**55**
SPG12	Kerbside	King Edward Street/Newgate	80	83	**59**[c]

Notes:

Exceedance of the NO_2 annual mean AQO of 40 µgm^{-3} are shown in **bold**.

NO_2 annual means in excess of 60 µg m^{-3}, indicating a potential exceedance of the NO_2 hourly mean AQS objective are shown in bold and underlined.

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

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

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

Table D (viii) Annual Mean NO_2 monitoring results for the St Pauls Cathedral Choir School Project (µg/m^3)

Site ID	Site Type	Location	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean Concentration (µg/m^3) 2019[c]
SPS1	Urban Background	Headmaster's Terrace	N/A	100	36
SPS2	Roadside	Front Railings, Bus Stop	N/A	75	42
SPS3	Urban Background	Main Entrance Window	N/A	100	34
SPS4	Urban Background	Boarding Block Entrance	N/A	100	39
SPS5	Inside	Boarding Block Surgery	N/A	100	30
SPS6	Inside	Sharon's Lounge Boarding Block	N/A	50	22[c]
SPS7	Urban Background	Pre-prep Garden Stained Glass	N/A	50	29[c]
SPS8	Urban Background	North Side, Main Playground	N/A	50	28[c]
SPS9	Urban Background	South Tower, Main Playground	N/A	100	31
SPS10	Inside	Entrance Lobby Near TV	N/A	100	30
SPS11	Inside	Reception Classroom	N/A	100	23
SPS12	Inside	Art Room	N/A	100	25
SPS13	Inside	Staffroom	N/A	83	23
SPS14	Inside	Science Room Inside	N/A	100	26
SPS15	Urban Background	Science Room Outside	N/A	100	33

Notes:

Exceedance of the NO_2 annual mean AQO of 40 µgm^{-3} are shown in **bold**.

NO_2 annual means in excess of 60 µg m^{-3}, indicating a potential exceedance of the NO_2 hourly mean AQS objective are shown in bold and underlined.

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

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

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

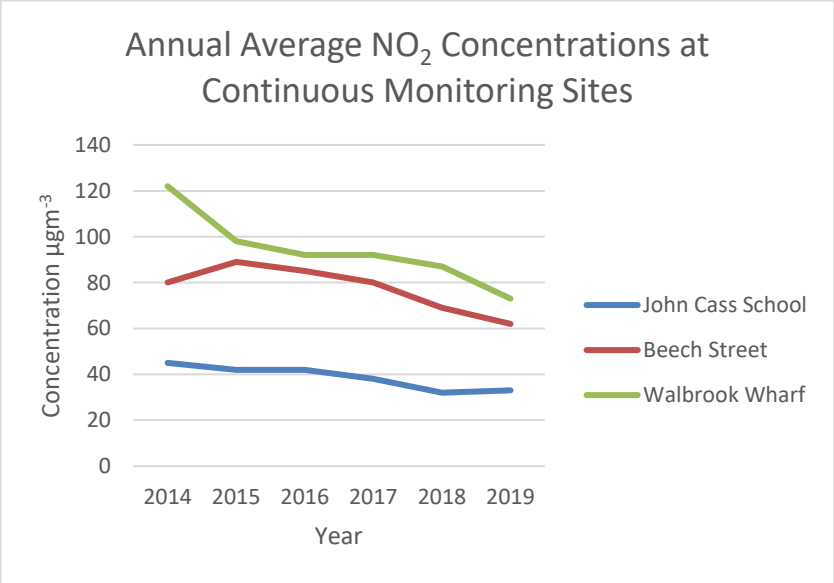
7-year trend in Nitrogen Dioxide (NO_2) concentrations

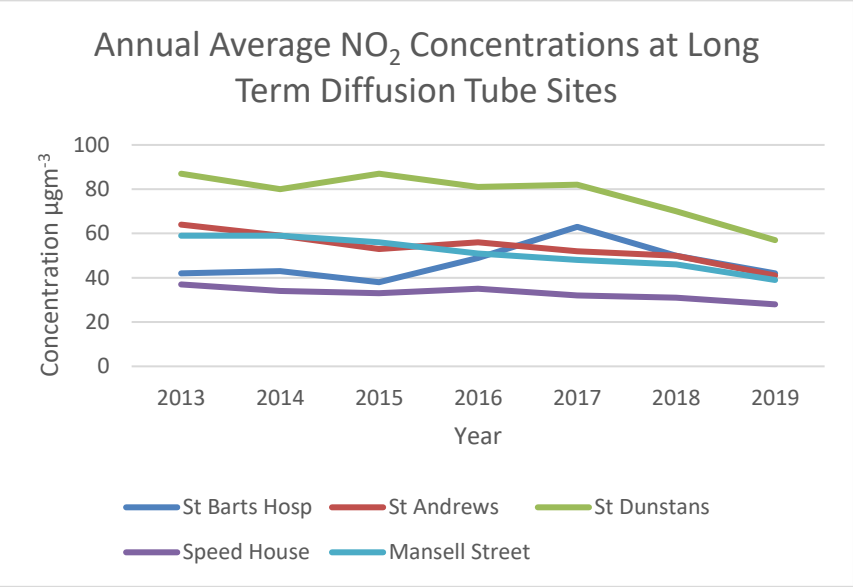
The graphs in this section represent sites that have more than one year of data

Continuous and Long-Term Diffusion Tubs Sites

Since 2013, concentrations of nitrogen dioxide at background sites (areas away from the direct influence of traffic) have been gradually decreasing. Speed House (in the Barbican Estate) has been consistently below the annual objective of 40µg/m^3 over the past 7 years and in 2019 the level was below 30µg/m^3 for the first time since monitoring began. Levels of nitrogen dioxide at Sir John Cass's Foundation Primary School dipped below the objective in 2017, with concentrations now round 33µg/m^3. The exception to the downward trend is St Bart's Hospital site which experienced a sharp increase in 2016-17. This was associated with the installation of a new energy centre. We have been working with St Barts NHS Trust to investigate and rectify this issue and NO_2 concentrations are declining once again.

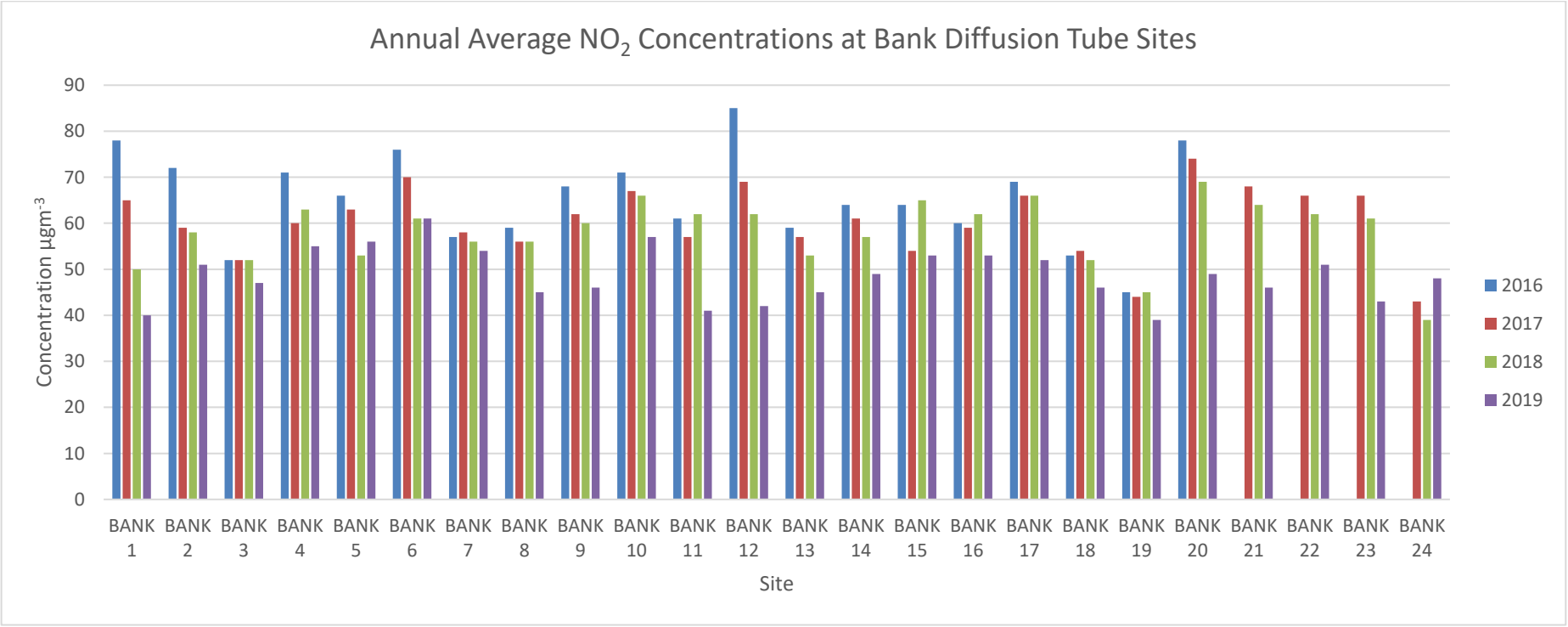
Roadside concentrations of nitrogen dioxide saw a dramatic drop across nearly all sites in the City in 2019. Some sites had a reduction of 35% from the previous year.





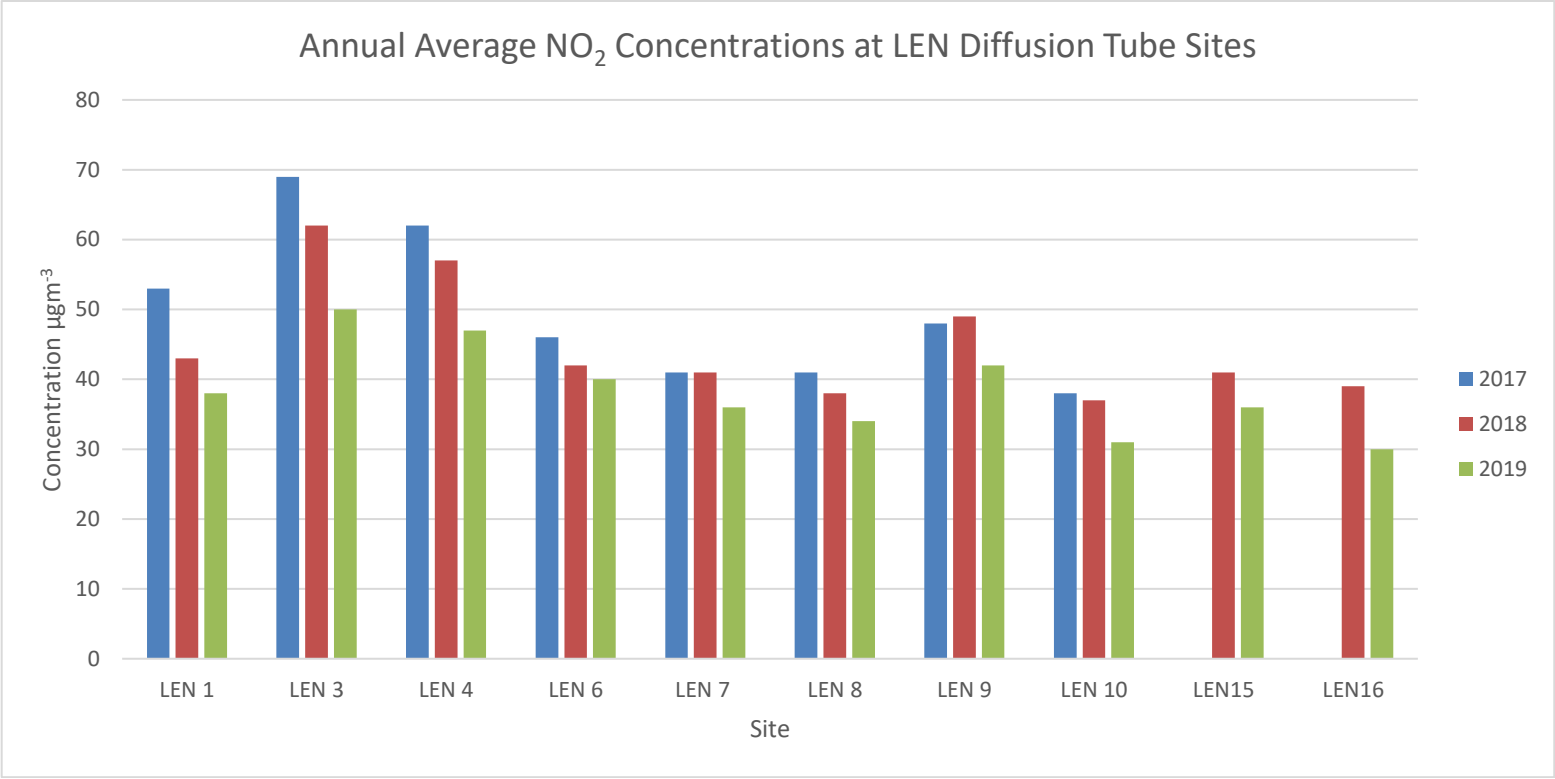
Bank Area

Diffusion tube monitoring began in the Bank area in 2016 to establish a baseline prior to the planned traffic changes to Bank Junction through the 'Bank on Safety' scheme. Traffic restrictions have been in place since 22nd May 2017. Since 2016 all monitoring sites (except one) have a seen a reduction in NO_2 concentrations, some significantly so, for example Bank 1, Cannon Street, has reduced from an annual average of 78 µg/m^3 in 2016 to meeting the legal limit, 40 µg/m^3, in 2019. Bank 12, Threadneedle Street, has also seen a significant reduction in concentrations from 85 µ/gm^3 in 2016 down to 42 µg/m^3 in 2019. All sites but two, however, remain above the annual objective.



Low Emission Neighbourhood Area

Monitoring commenced in the City Low Emission Neighbourhood (LEN) area at the end of 2017 to measure the impact of the project. NO_2 concentrations in the area vary. All sites in the LEN area have had a reduction in NO_2 concentrations over the past 3 years, with 7 out of the 10 sites that were monitored in 2019 now meeting the annual objective. This includes several roadside locations.



Transport Strategy Monitoring Sites

Extra diffusion tubes were deployed in 2018 to fill the gaps in the monitoring network in order to measure the impacts of the City of London's first Transport Strategy, which was adopted in May 2019. All sites monitored are roadside sites and, all but one, have experienced a reduction in NO_2 concentrations from 2018 to 2019. Site T9, 150 Bishopsgate, had a very large reduction in concentration from 74 µg/m^3 to 47 µg/m^3. Monitoring commenced in May 2018, so all the sites were annualised in 2018.

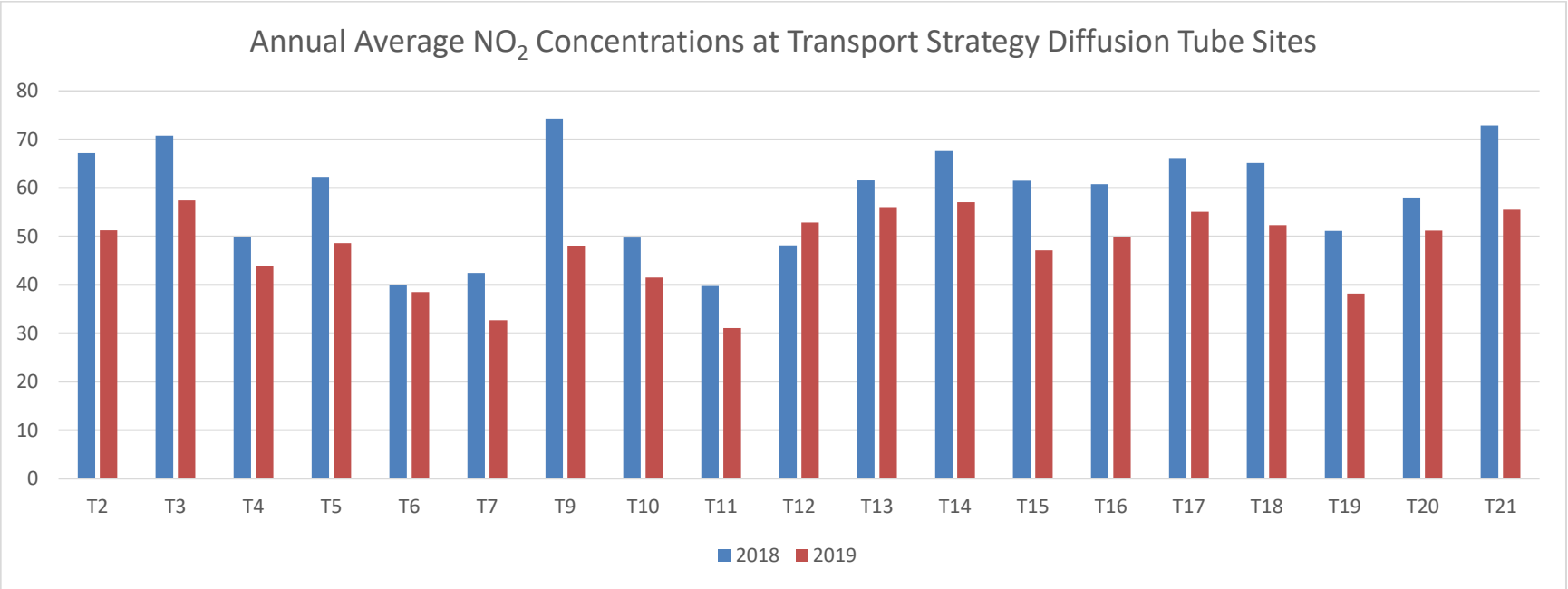


Table E. Nitrogen Dioxide Automatic Monitor Results: Comparison with 1-hour Mean Objective

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]
CT3 (John Cass)	N/A	95	0	0	0	0	0	0	0
CT4 (Beech St)	N/A	98	**125**	**175**	**212**	**144**	**67**	**27**	7
CT 6 (Walbrook)	N/A	97	**771**	**656**	**203**	**145**	**126**	**37**	15

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

7-year trend:

Unlike diffusion tubes that provide annual averages, automatic analysers provide hourly data that can be used to assess compliance with the health based hourly average target. Both roadside sites (CT4 and CT6) have declined in hourly exceedances over the past 7 years, from a very high number of exceedances at CT6 in 2013, to all sites meeting the objective for the first time in 2019 as seen in the table above.

Table F. Annual Mean PM_{10} Automatic Monitoring Results (µg m^{-3})

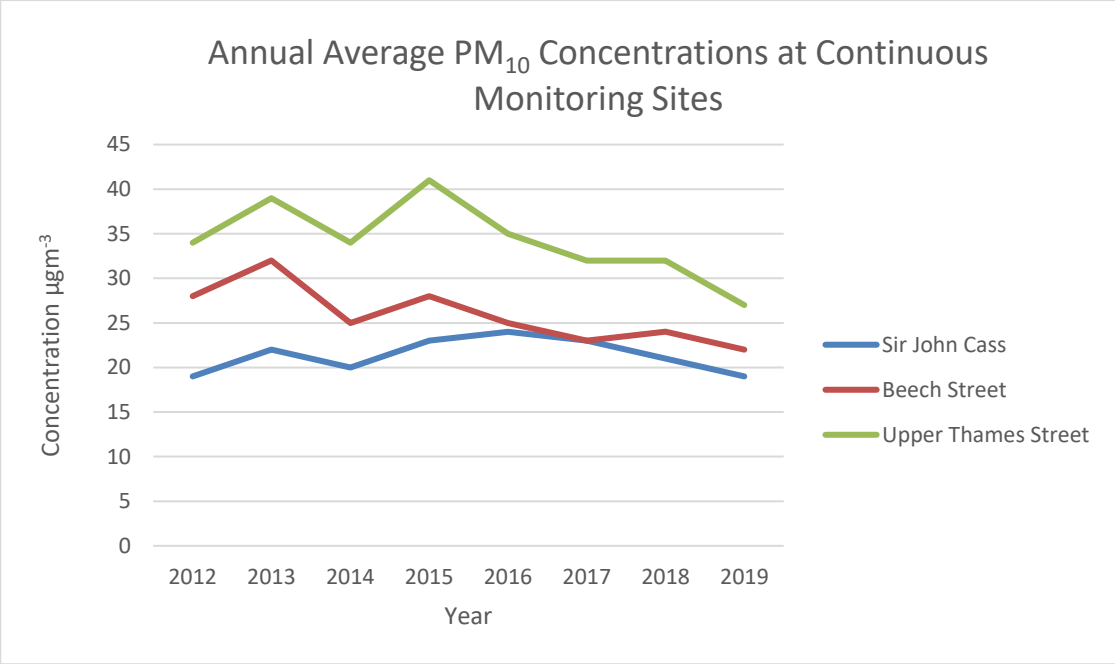
Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean Concentration (µg/m^3)						
			2013[c]	2014[c]	2015[c]	2016[c]	2017[c]	2018[c]	2019[c]
CT3 (John Cass)	N/A	98%	22	20	23	24	23	21	19
CT4 (Beech St)	N/A	93%	32	25	28	25	23	24	22
Ct8 (Upper Thames St)	N/A	80%	39	34	**41**	35	32	32	27

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

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

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

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



7 Year Trend in PM_{10} Concentrations

There has been a consistent reduction in PM_{10} levels at roadside sites over the past 7 years (with the exception of Upper Thames Street in 2015 which was influenced by the construction on the cycle superhighway). PM_{10} levels at John Cass School have been more varied over the past 7 years as background sites are more heavily influenced by weather and long-range transport of particulates from sources outside the City. All three sites had a reduction in PM_{10} concentrations in 2019.

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]
CT3 (John Cass)	N/A	98%	8	5	3	11	8	3	7
CT4 (Beech St)	N/A	93%	**35**	19	17 (41)	16	8	9	6
Ct8 (Upper Thames St)	N/A	80%	**51**	25	**72**	**45**	30	25	14

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 90.4th percentile is shown in brackets after the number of exceedances.

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

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

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

Table 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]
CT2 Farringdon	N/A	96	**27**	**26**	22/17**	16**	16	16	14
CT3 Sir John Cass	N/A	86	No data			15	14[c]	12	12

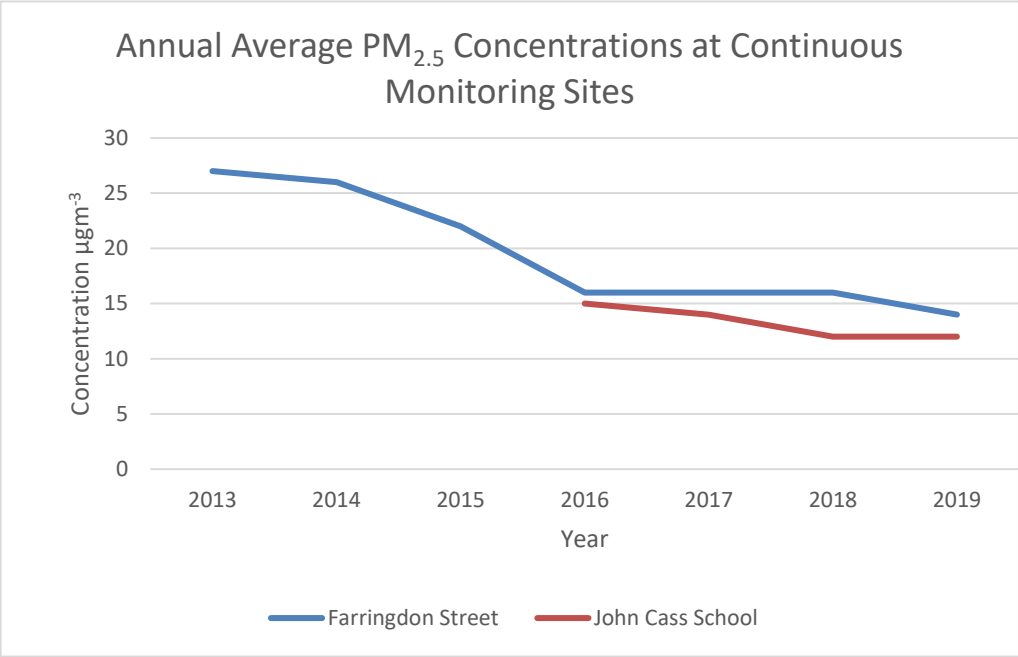
Notes: Exceedance of the $PM_{2.5}$ annual mean AQO of 25 µg m^{-3} are shown in **bold**.

****January-August 2015 (non-reference equivalent) / August-October 2015 (reference equivalent) site closed after October 2015 and relocated in July 2016**

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

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

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



7 Year trend in $PM_{2.5}$

The Farringdon monitoring site has shown a steady decline in $PM_{2.5}$ concentrations over the past 7 years. However a new EU reference equivalent BAM was installed in August 2015, but was taken offline in October 2015 due to the Cycle Super Highway Works; therefore data capture is reduced for 2015 (and 2016) and two values are provided to separate the data for two monitoring methods; the 2015 data has not been annualised due to the number of changes at this site. The reference equivalent BAM was re-installed in July 2016 in a slightly changed location, approximately 30m north of the Junction, still kerbside. The monitor at John Cass School recorded a small decrease in concentrations from 2016 to 2018 and then has stayed at the same level in 2019. The data for both sites is below the objective for 2019.

2. Action to Improve Air Quality

2.1 Air Quality Action Plan Progress

Table J provides a brief summary of City of London's progress in 2019 against actions in the latest Air Quality Strategy which was published during 2019.

Table J. Delivery of Air Quality Action Plan Measures

Measure	Action	Progress
1. Air quality monitoring	Ensure that adequate and appropriate monitoring is undertaken across the City of London to fulfil statutory obligations and make good quality data available to the public.	• The City Corporation has two PM2.5, three PM10 and three NOx continuous analysers. All sites are serviced and audited in line with national guidance. The data is ratified by Kings College London and made available to the public at www.londonair.org.uk. • As part of the ongoing maintenance and management of automatic equipment, and to ensure resilience, 2 NOx analysers were replaced in 2019 with new equipment. • We have 4 *AQ Mesh* analysers measuring nitrogen dioxide and, during 2019, we measured nitrogen dioxide at 139 locations using diffusion tubes.
	Use air quality data to generate pollution alerts and messages using a range of media such as the free CityAir Smart Phone App.	• The air quality monitoring data is used to provide current information on air quality through the City Corporation CityAir App. It is also used to support the AirTEXT service.
	Publish an annual report of air quality data on the City Corporation web site.	• The 2018 Annual Status Report is available on the City Corporation website: www.cityoflondon.gov.uk/air • This report will also be made available on the web site.

	Continue to make live data from continuous air quality monitors available to the public on the London Air Quality Network web site.	• Data from all continuous analysers is available on the London Air Quality Network web site www.londonair.org.uk This is managed by Kings College London.
	Support the testing of new air quality sensors to establish their degree of accuracy.	• In 2019, we worked with *CMS Supatrack* to trial their *Earthsense* monitor by calibrating it against our Sir John Cass Foundation Primary School monitoring site for two weeks. • A '*Breathe London*' sensor is co-located with our Farringdon Street PM2.5 monitor as part of the London wide monitoring network.
	Undertake an annual assessment of air quality to ensure levels of nitrogen dioxide in 90% of the Square Mile meet health-based Limit Values and World Health Organisation Guidelines by 2025	• An area compliance assessment was undertaken for the year 2018, which was the latest year with a completed set of ratified data. • The area of the Square Mile to comply with the nitrogen dioxide limit value and WHO guideline was 30%. It was calculated using computer modelling, together with all of the monitoring data collected across the Square Mile. The resolution of the output is $1m^2$
2. Leading by Example	Continue to place air quality as an important political priority and support the outcomes of the City Corporate Plan and local and London-wide action.	• We hosted a London Borough Air Quality Best Practice event on the 30th September 2019. Six boroughs presented best practice and there were over 60 attendees, representing 15 London boroughs.
	Provide information on reducing emissions from buildings for City Corporation facilities managers and investment property managers.	• On Clean Air Day 2019, we presented at a City-wide Facility Managers Forum for both City Corporation and external business Facilities Managers. • We continue to encourage facility and building managers to make use of our Building Engineer toolkit to reduce air pollution emissions from building in the Square Mile.
	Reduce emissions of air pollutants from buildings owned by the City Corporation.	• Energy Audits were completed in 11 buildings. 14 Display Energy Certificates were refreshed. • Gas consumption decreased marginally from 2018 to 2019. • 100% of the electricity used by the City Corporation is from renewable sources.
	Review the provision of electric vehicle charging across City Corporation sites including residential estates.	• The Energy Savings Trust has completed an assessment of future charge point requirements to 2025 across the Square Mile, with reference to the Mayor of London Electric Vehicle Infrastructure Task Force. A draft action plan has been developed to deliver the recommendations over the next few years.

	Ensure that, subject to operational requirements, 100% of vehicles owned or leased by the City Corporation are electric or hybrid by 2025.	• We have introduced the following vehicle purchasing hierarchy: fully electric; plug in hybrid; petrol hybrid, Euro VI petrol; Euro VI diesel • We have reduced the size of the corporate fleet by over 40% over the past 5 years. Our fleet covers operations across London such as our Open Spaces, Heathrow Animal Reception Centre and the Ports. • We have recently purchased 14 new plug-in hybrid and standard hybrid vehicles including 3 electric vehicles for the Lord Mayor, which includes 2 London electric taxis. • We have installed 20 new electric vehicle charge points to support our vehicles. • 100% of the electricity used by the City Corporation is from renewable sources so electricity used to charge Corporate vehicles isn't contributing to air pollution outside the City of London boundary.
	Continue to trial low and zero emission technology.	• Eight new types of electric vehicle technology have been trialled over the last 3 years.
	Continue to encourage zero emission vehicles through the supply chain.	• The Corporate refuse contract has 9 electric vehicles, 10 hybrid vehicles. A further 8 electric refuse collection vehicles (RCVs) will be in use by the summer of 2020.
	Require electric or hybrid vehicles as a default for the Corporate taxi contract, together with annual emission reduction targets	• The taxi contract is yet to be renewed
	Require zero emission and electric or hybrid vehicles as a default for courier contracts, together with annual emission reduction targets	• The Courier contract is in the process of being renewed. The specification includes a requirement for low and zero emission vehicles.
	Continue to ensure that all relevant Corporate strategies and policies reflect the importance of improving local air quality and reducing exposure.	• The Air Quality Team worked closely with Strategic Transport and Planning teams in the development of the first Transport Strategy and latest City Plan to ensure that air quality is a key consideration.

	Work with London Councils and other stakeholders to develop proposals for legislation to help improve air quality across London.	• The Emission Reduction (Local Authorities in London) Private Members Bill was introduced to the House of Lords by Lord Tope in October 2019, and again in January 2020. The Bill is supported by London Councils.
3. Collaborating with others	Continue to work closely with the Greater London Authority and Transport for London on policies to improve air quality and ensure that all actions support the aims and objectives of the Mayor's Environment Strategy.	Funding was obtained from the Mayors Air Quality Fund in 2019 for: • Pan London Idling Engine Action Project, jointly managed with the London Borough of Camden. • City Cluster Zero Emission Zone • Clean Air Thames project We are also involved in other Mayor of London funded projects being led by other London Boroughs: • Non-Road Mobile Machinery enforcement project, led by the London Borough of Merton • Healthy Streets Everyday project, led by the London Borough of Islington
	Continue to collaborate with London Boroughs and London Councils on action to improve air quality.	• We work closely with officers at London Councils on a range of issues, for example providing input to LEDNets (London Environment Directors Network) position statement on air quality. We also assist London Councils in commenting on consultation documents e.g. Controlling Emissions from Non-Road Mobile Machinery. • We hosted and chaired four meetings of the London Air Quality Steering group attended by representatives from the Grater London Authority, Environment Agency, London Councils, Public Health England, and Lead Cluster co-ordinators. • We continued to host the Central London Air Quality cluster group in 2019. Going forward this will be shared between the member Boroughs due to a change in accommodation. • We supported a multi-London Borough initiative for London Car Free Day in September 2019.

	Support Universities with research into the health impacts of air pollution, to increase understanding of the sources of pollution and the effectiveness of interventions to reduce pollution.	• We continue to support research into the impact of urban form on air quality. • Support has also been provided for a series of debates entitled 'Cities, Climate and Critical Urban Infrastructure' This is part of a range of events organised by *The Edge* which is a multi-disciplinary built environment think tank.
	Continue to support the Third Sector to deliver air quality improvement projects and raise awareness amongst London's communities.	• We provided a representative for the judging panel for the Future Build Building Research Establishment Innovation Award. • We hosted three Environmental Protection UK Air Quality Committee meetings and three Trustee meetings.
	Support the Port of London Air Quality Strategy through air quality monitoring and in taking wider action to reduce emissions from vessels on the river Thames.	• Nitrogen dioxide monitoring continues at two locations along the river. • Funding was received through the Mayor's Air Quality Fund for a three-year Clean Air Thames project to trial retrofit on river vessels. The project is being led on our behalf by Cross River Partnership.
	Continue to support the Cross-River Partnership in its delivery of air quality projects in central London.	• The City Corporation continues to provide the co-chair for Cross River Partnership and is working in partnership with the organisation on the Clean Air Thames Project, Healthy Streets Everyday project and Clean Air Villages Defra funded project.
	Continue to support the Environment Agency with action to improve air quality, including the implementation of the Medium Combustion Plant Directive.	• We are use existing sources of data to collate a database of combustion plant and large energy centres in the Square Mile. We are investigating opportunities to obtain funding to further develop this data. • We respond to enquiries and consultations on Medium Combustion Plant permits as they arise.
	Continue to engage with and support the Business Community to become Air Quality Champions and reduce their impact on local air pollution.	• We continue to engage with the City business community through our CityAir programme. We are working with over 60 businesses in the Square Mile providing support to reduce their emissions profile, support local action to improve air quality and raise awareness amongst employees about air pollution. • In May 2019, we held a networking lunch event celebrating the 33 businesses who pledged to become 'Air Quality Champions'. Each organisation's list of pledged actions is being reviewed in a year and each will complete a yearly audit which will focus on air quality and be undertaken in mid-2020.

		• In September 2019, a new consultancy was appointed to take this programme forward to March 2021. The initial six months of their appointment has been focused on rebranding the programme and methods to extend the reach of the programme. • We continue to support Cheapside Business Alliance, and have an air quality representative on their Environment, Signage and Wayfinding Steering Group.
4. Reducing emissions from transport	Support the Mayor of London with the effective implementation of the Ultra-Low Emission Zone.	• The introduction of the Mayor's ULEZ was widely publicised through our social media channels and business networks in the run up to April 2019. • The six-month findings of ULEZ were shared amongst the business network and through our Air Quality newsletter. • We are continuing to strive towards 100% ULEZ compliance, operating a 'Transition to Zero Emission Fleet policy', a decision-making hierarchy which applies to all purchased, leased and hired vehicles operated by the City Corporation.
	Work with the taxi industry to reduce empty running of taxis within the Square Mile.	Action to commence in 2021
	Urge Transport for London to prioritise Zero Emission Capable buses on routes through the City of London.	Action to commence in 2021
	Ensure that Healthy Street Plans have air quality improvement targets and that the air quality impact of major transport and public realm schemes are measured.	• All major road schemes are assessed for air quality impacts. • Air Quality monitoring and modelling has been carried out for Beech Street Zero Emissions Street. • Wide scale air quality monitoring is continuing to assess the impacts of the Bank project and provide baseline data around St Paul's gyratory.
	Introduce Local Zero Emission Zones by 2022.	• Beech Street zero emission street project was developed through 2019 and went live in March 2020.
	Implement a wide range of action through the City Corporation Transport	• The City Corporation's first Transport Strategy was adopted in May 2019. It includes a range of actions to support cycling. • A City wide Cycle Parking Review commenced in 2019 • Planning requirements for new developments include provision of secure cycle parking

	Strategy to support and encourage cycling.	• Work with Active City Network and Healthy Streets officer ongoing to Promote cycling through improving awareness, support London-wide and national campaigns and explore the potential for an annual City Corporation cycling festival, and other campaigns. • 300 dockless cycle parking bays have been installed 2019 • City Cycle Network scheme development base data collected and scheme design commenced: Route 1: CS1 to Monument via Bank Route 2: Aldgate to Blackfriars via Bank (improvements at Mansion House junction with TfL)
	Pilot an ultra-low emission vehicle street.	• Beech Street zero emission street project was developed through 2019 and went live in March 2020.
	Assess the suitability of rolling out LEN pilot projects at other locations across the Square Mile.	• The Low Emission Neighbourhood Legacy report was completed in May 2019. Effective measures that were identified have been incorporated into a range of operations.
	Implement a wide range of action, through the City Local Plan and the City Corporation Transport Strategy, and Freight and Servicing SPD to reduce emissions from freight vehicles in the Square Mile.	• We have stimulated the marketplace for consolidation services through the planning process, with 13 s106 agreements for use of a physical consolidation centre agreed by developers. This demand will be coordinated to develop proposals for a Citywide service by 2022. • Four sites have been proposed for use as last mile logistics hubs, with London Wall having gone to market to find a suitable operator. This process has been delayed by the Coronavirus pandemic. • We are working with servicing providers to increase our understanding of the barriers and opportunities for reduced fleet requirements when undertaking servicing activity. This is being considered as part of last mile logistics hubs.

		• A planning application to reinstate Swan Lane Pier has been received by the City Corporation. As part of the designs we have requested that the site be flexible in use to facilitate light freight operations.
	Implement a range of actions through the City Corporation Transport Strategy and City Local Plan to reduce the exposure of pedestrians to transport generated air pollution in the Square Mile.	• Scheme development to implement traffic restrictions on St Mary Axe has progressed and we anticipate implementation in 2020. • A zero emission street was introduced in on Beech Street in March 2020. • Plans emerging place for Charterhouse Square School for a 'School Street' timed closure during drop off and pick up. • We have delivered improvements in 2019/20 for pedestrian space or priority at: - Gresham Street/Old Jewry; Basinghall St, - work has commenced on Gresham Street/Wood Street and Creechurch Lane/Leadenhall St - Puddle Dock - new walking route and junction safety partially completed March 2020 • New sections of the Barbican High-walk were opened in early 2019. • Detailed design is progressing on the riverside walkway for completion in 2020. • Car free day took place across central London in September 2019, when the city had several roads closed. Bank junction and Cheapside were transformed into a car-free festival space. • In summer 2019 Chancery Lane and St Mary Axe had lunchtime streets weeks. • Legible London signing implementation had mostly been completed by March 2020. • Work with Active City Network and Healthy Streets officer ongoing to support Improve awareness of traffic free walking routes and other campaigns.
	Install additional publicly accessible electric vehicle (EV) rapid charge points by 2025	The Energy Savings Trust has completed an assessment of future charge point requirements to 2025 across the Square Mile, with reference to the Mayor of London Electric Vehicle Infrastructure Task Force. A draft action plan has been developed to deliver the recommendations over the next few years. To date:

		• One rapid electric charge point has been installed in Noble Street taxi rest bay • A rapid charge point is being installed at Billingsgate Market • 6 rapid charge points will be available in Baynard House Car park by summer 2020 • 50 standard electric charge points are available to the public in our car parks • 22 charge points installed in barbican residential car parks • Electric charge points are being upgraded a Walbrook Wharf to support the refuse collection vehicles • 20 charge points have been installed to support City Corporation owned electric vehicles
	Through the City Local Plan require the installation of rapid charge points in new developments.	• We ensure that electric vehicle charging facilities are installed in accordance with our parking and servicing standards.
	Ensure that improving air quality and reducing exposure is an integral part of all major transport and public realm schemes and that all schemes incorporate greening where possible.	• All major transport and public realm schemes are reviewed for air quality impacts and air quality monitoring and modelling is carried out were necessary. Air quality modelling and monitoring was carried out in 2019 for the Beech Street Zero Emission Street project and around St Pauls Gyratory.
	Continue to take a wide range of action to discourage unnecessary vehicle engine idling in the Square Mile.	• One Idling Action day was held in March 2019 and then there was a break in the project due to awaiting the results of the funding bids and then hiring the new Idling Project Officers. • Enforcement options have been reviewed and a City-wide anti idling Traffic Management Order is being progressed. • The City Corporation is jointly leading the Pan London Idling Action Project with Camden. • Action is taken following complaints of vehicle engine idling, and signs erected, and letters sent where necessary.

	Ensure City Corporation parking charges favour low and zero emission vehicles in the City of London.	• In August 2018, we introduced on street parking charges based on vehicle emissions. Older, more polluting vehicles pay a higher charge to park on street in the City of London. • The charge for vehicles which are Zero Emission Capable is £4 per hour. Petrol vehicles that meet Euro 4 emission criteria and diesel vehicles that meet Euro 6/VI are charged £5.20 per hour. Older vehicles are charged £6.80 per hour. The charging framework supports the Mayor of London Ultra Low Emission Zone scheme.
5. Reducing emissions from no-transport sources	Continue to assess all planning applications for air quality impact.	• All planning applications are reviewed for air quality impacts, with conditions recommended where necessary. • All major developments require an air quality assessment. This has been incorporated into the draft new Local Plan and will be included in the Air Quality Supplementary Planning Document update.
	Encourage the use of non-combustion technology during construction and in the operation of new developments.	• The City Corporation Draft Local Plan reflects the draft London Plan in prioritising non combustion and zero emissions heating and energy systems. • The Air Quality Supplementary Planning Document update will include BREEAM maximum pollution credits for local air quality to be obtained from non-combustion systems where possible. This will be updated in 2020.
	Apply stringent emission standards for combustion plant where non-combustion plant is not feasible in new developments.	• All planning applications for developments proposing combustion plant are required to demonstrate that non-combustion is not feasible. • If combustion plant is necessary, conditions are applied requiring plant to meet NOx emissions standards.
	Ensure that where possible chimney stacks terminate above the height of the nearest building.	• The City Corporation Air Quality Supplementary Planning Document (SPD) requires a consideration of combustion flue location and emission discharge velocity at the planning stage to ensure appropriate provision has been made. • The Air Quality SPD will be reviewed once the new City Plan has been approved and we will look to strengthen our requirements.

		• We respond to applications for chimney height approval as they arise. There were just 2 applications in 2019.
	Require all new developments to be air quality neutral as a minimum and developments subject to an Environmental Impact Assessment to be Air Quality Positive in line with the requirements of the emerging London Plan.	• All major developments must submit an Air Quality Neutral Assessment. • The requirement for Air Quality Positive Assessments for Environmental Impact Assessment developments has been included in our draft new Local Plan and will be reflected in the Air Quality Supplementary Planning Document update.
	Update the City Corporation Supplementary Planning Document for Air Quality to reflect new policies and requirements of the City Local Plan and London Plan.	• This is due to be updated once the Draft Local Plan has been finalised.
	Ensure emissions from construction sites are minimised through close management and control.	• Construction sites are required to follow the City of London Code of Practice for Deconstruction and Construction Sites. We work with construction companies during the development of the proposals for construction practice proposals in order to minimise emissions to atmosphere. • Site audits of Non-Road Mobile Machinery (NRMM) are undertaken through the pan London project, funded by the Mayor of London. • A specific concern is the lack of three phase supply available as mains power has been removed during demolition. Also tower crane movements require a massive peak in power demand, which many Hybrid generators struggle to cope with. Our CoP for Deconstruction and Construction Sites encourages sites to secure an electrical supply for sites well in advance of works. Membership of the NRMM Project ensures that where alternative fuels and power sources are not available, sites use the least-polluting diesel equipment possible. • Electric equipment is a relatively new technology, with limited types and sizes of NRMM being available. However, a range of technologies are currently being developed and their suitability and supply will continue to be investigated via the pan

		London project. Another consideration is to reduce emissions by reducing the power requirements on site. A common problem which is being investigated, is over-sized generators or the use of inefficient heating/lighting systems. More energy efficient cabins and LED lighting, can reduce the demand for power on site and enable smaller cleaner generators to be used, including hybrid generators.
	Regularly update the City Corporation best practice guidance on minimising emissions from construction and demolition in order to reflect best practice.	• An updated version will be available in 2021.
	Enforce the Mayor of London NRMM requirements on construction sites as a minimum.	• We continue to be a member of the pan London Non-Road Mobile Machinery project. Our sites are audited regularly for compliance with NRMM requirements. A range of sources are used to identify active demolition and construction sites. During 2019, 12 sites were visited, of which 8 sites included NRMM equipment. All sites were fully compliant. • While funding for the LLECP has now stopped, we will continue to liaise with the Centre for Low Emission Construction and look for opportunities to trial low emission equipment.
	Introduce a Stage V emission limit for NRMM on construction sites by 2025 where available.	• The Code of Practice for Deconstruction and Construction Sites will be available in 2021. Additional requirements for emissions from plant and equipment will be incorporated into the next edition. The current CoP is compatible with existing London wide standards. It also encourages the use of the lowest emission options.
	Investigate options for reducing emissions from NRMM used in street works, filming and other events.	• Funding for a trial will be sought during 2020/21.
	Examine options for reducing emissions from existing combustion plant in the Square Mile.	• A number of innovative technologies are currently being developed including the introduction of emission Stage V, retrofitted emission reduction systems, electrification, and hybrid power solutions. However, these technologies are new and their suitability and supply as they are developed will continue to be investigated via the Pan London NRMM project.

		• We are developing a seminar and best practice advice for Facilities Managers to reduce emissions from buildings. this will take place in 2020/21.
	Improve the understanding of the use of emergency generators in City of London buildings being used for Demand Side Response and Short-Term Operating Reserve.	• This work will take place in 2020/2021
	Continue to ensure that emissions from chimneys are dispersed as far as possible using the provisions of the Clean Air Act 1993.	• Two Chimney Height approvals were issued during 2019.
	Ensure compliance with emission control requirements for the City Corporation's prescribed processes.	• All permitted processes premises are inspected in line with their risk rating and the recommended inspection schedule. • There are 3 dry cleaning operations and we are working with Barts Heath NHS Trust on an application for a permit to operate combustion plant.
	Promote and enforce smoke control provisions detailed in the City of London Various Powers Act 1954 and 1973 and the Clean Air Act 1993.	• A factsheet has been produced providing information on smoke provisions and advice to food premises on exempt appliances and authorised fuels. • We also plan to incorporate a system of recording premises using solid fuels for cooking into regular food inspections and disseminate the factsheet directly to food businesses.
6. Public health and raising awareness	Make greater use of Public Health Networks to disseminate information about air quality.	• We support the Mayor of London's air pollution alerts to schools and GP practice, amplifying this message through Twitter alerts. • The City Corporation CityAir App is promoted both on our website, through our e-newsletter and at every event we attend.
	Assess options to improve and further develop the free CityAir Smart Phone App and continue to support and promote the AirText service.	• We continue to support and promote AirTEXT through a yearly subscription. • Over 30,000 people now use our free CityAir app. The App will be upgraded during 2020/21

	Disseminate information about air quality through various channels such as social media, the City Corporation web site and an e-newsletter.	• We continue to promote air quality messaging through our Twitter account, bi-monthly e-newsletters and our website pages. • We use our Twitter account to alert 2900+ followers to days of moderate, high and very high air pollution.
	Develop an action plan, in support of the Mayor of London's air pollution forecasting service, to reduce exposure on days of high and very high levels of air pollution.	• Action to be completed in 2020.
	Increase awareness of air pollution amongst the City of London residential community.	• Throughout the year Air Quality Officers host information stalls at a variety of events include Car Free Day, lunchtime streets, Business Healthy initiatives, Active City Network events and Clean City Award Scheme events. • We utilise the Barbican Resident's weekly e-newsletter for pertinent messaging. • We support the Transport Team at resident's meetings and run air quality briefings for residents in connection to air quality specific projects, for example Electric Vehicle charging. • We support residents who request information to undertaking their own air quality monitoring and are developing a Citizen Science air quality monitoring project to run throughout 2020.
	Run events in support of National Clean Air Day.	• On 20th June 2019 we ran 2 'Clean Air walks', one for residents and the other internal staff. We ran a 'Clean Air' assembly for a local school and presented at a Sustainability Forum for Facility Managers. • The City's Clean Air Day events were supported by online social media, linking in with national efforts.
	Develop plans for improving air quality and reducing the exposure to pollution of children who attend schools and nurseries in the City of London	• Action plans are being developed for all five City schools and five nurseries, with reference to the Mayor of London's toolkit. Engagement opportunities were offered to schools for air quality awareness lessons, assemblies, Clean Air Day events and no idling events. • Detailed monitoring has been offered to all 5 schools in the Square Mile and nurseries

		at locations where there is a risk of limit values being exceeded. To date, monitoring using diffusion tubes is taking place at 4 out of 5 schools and 3 nurseries. Monitoring is taking place inside and outside the schools to inform action plans. • Particulate monitoring also took place at St Pauls Cathedral School and we are supporting the school with 'No Engine Idling' signs outside their entrance. • Data from the permanent background monitoring site at Sir John Cass Foundation school is being used to produce quarterly reports for the School Governors, assessing the impact of interventions.
	Continue to support Barts Health NHS and other health care facilities to reduce their own impact on local air pollution and assist vulnerable patients in reducing their exposure to pollution.	• We have been working with Barts Health NHS Trust to minimise exposure of staff and visitors to on site air pollution.
	Continue to work with businesses to raise awareness of air pollution amongst workers.	• We continue to engage with the City business community through our CityAir programme. • Through 2019, we have supported businesses undertaking educational events for staff, including assisting with lunchtime stalls for employees on Clean Air Day and Earth Day. • We continue to support Heart of the City through amplification of their messaging on social media, inclusion of their officers in CityAir lunchtime networking events and through planned development of specific air quality resources for their members.

3. Planning Update and Other New Sources of Emissions

Table K. Planning requirements met by planning applications in City of London in 2019

Condition	Number
Number of planning applications where an air quality impact assessment was reviewed for air quality impacts	*7*
Number of planning applications required to monitor for construction dust	41
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	2
Number of developments required to install Ultra-Low NO_x boilers (note: not all of these applications were proposing boilers but were conditioned that if any boilers installed must be Ultra Low emissions)	16
Number of developments where an AQ Neutral building and/or transport assessments undertaken	9
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	0
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.	41 Planning Apps with NRMM Condition in 2019. 13 Sites audited through the pan London NRMM project 19-20 - 4 Self compliant, 4 compliant, 4 no NRMM on site and one non compliant All checks carried out by the NRMM project team.
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.	N/A

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

Site	Data Management	Site Serviced and Repaired by:	Site Audited by:	City of London Calibration and Maintenance
CT2 (Farringdon Street)	Kings College	Matts Monitors (biannual)	--	Filter change every 8 weeks
CT3 (Sir John Cass School)	Kings College	Matts Monitors (biannual)	National Physics Laboratory (biannual)	Calibration every 4 weeks and BAM filter change every 8 weeks
CT4 (Beech St NOx)	Kings College	Matts Monitors (biannual)	National Physics Laboratory (biannual)	Calibration every 2 weeks
CT4 (Beech St PM10)	Kings College	Matts Monitors (biannual)	National Physics Laboratory biannual)	Filter change as needed
CT6 (Walbrook Wharf)	Kings College	Matts Monitors (biannual)	National Physics Laboratory (biannual)	Calibration every two weeks
CT8 (Upper Thames Street)	Kings College	Matts Monitors (biannual)	National Physics Laboratory (biannual)	Filter change as needed

PM_{10} Monitoring Adjustment

PM_{10} data from the two TEOM sites (CT4 Beech Street and CT8 Upper Thames Street) have been adjusted using the Volatile Correction Model (VCM). The BAM data at CT3 (PM_{10}) has been corrected in line with the EU reference equivalent method by dividing by 1.211.

A.2 Diffusion Tube Quality Assurance / Quality Control

- Diffusion Tubes supplied and analysed by Gradko International Laboratory
- Preparation method used is 50% Triethanolamine (TEA) in Acetone preparation method and analysed using U.V. Spectrophotometry.
- Gradko International Ltd is a UKAS accredited laboratory and participates in the AIR-PT Scheme (a continuation of the Workplace Analysis Scheme for Proficiency (WASP)) for NO2 tube analysis and the Annual Field Inter-Comparison Exercise. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO2 concentrations reported are of a high calibre. The lab follows the procedures set out in the Harmonisation Practical Guidance.

- Laboratory tube precision for 2019= 100% Good Precision
- Air NO2 PT Scheme results = 75% Jan-Feb and 100% April -Nov 2019
- Bias adjustment factor from the National Bias Adjustment Spreadsheet available on the LAQM Support Website= **0.87** (Spreadsheet Version Number 03/20
- Co-location studies were carried out at Walbrook Wharf Roadside site and Sir John Cass School Background site.
- The bias adjustment factor being applied to the annual means from the diffusion tubes is 0.87 from the National Bias Adjustment Spreadsheet

Bias Adjustment Factors used for previous years data:

2012	2013	2014	2015	2016	2017	2018	2019
1.04	1	0.97	0.98	1.03	0.97	0.92	0.87

Factor from Local Co-location Studies (if available)

John Cass School background continuous monitor: 33 μg m^{-3}
Tube 1: 34.48 μg m^{-3}
Tube 2: 37.39 μg m^{-3}
Tube 3: 37.44 μg m^{-3}
Bias Adjustment: 0.88

Walbrook Wharf Roadside continuous monitor: 73 μg m^{-3}
Tube 1: 74.25 μg m^{-3}
Tube 2: 74.17 μg m^{-3}
Tube 3: 73.72 μg m^{-3}
Bias Adjustment: 0.96

Discussion of Choice of Factor to Use

The national Bias adjustment factor has been used for consistency as it has been used for previous years and as it is derived from a larger number of co-location studies, at sites nearly all in a similar nature of our monitoring sites across the city.

A.3 Adjustments to the Ratified Monitoring Data

Short-term to Long-term Data Adjustment

- All continuous analysers met the 75% data capture criteria therefore no adjustments were necessary.
- Diffusion tube data for sites that had data capture of less than 75% were annualised using data from our Continuous site at Sir John Cass School.

Distance Adjustment

No distance adjustment has been carried out it is assumed that all sites are of relevant public exposure.

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*													
			Jan	*Feb*	*March*	*Apr*	*May*	*June*	*Jul*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Annual mean – raw data* [c]	*Annual mean – bias adjusted* [c]
CL5	N/A	92	59.61	74.22	57.94	37.31	36.29	32.43	37.81	52.78	46.82		49.74		48.49	42.19
CL38	N/A	100	47.72	55.09	45.40	53.56	44.26	41.50	42.81	45.27	45.28	45.68	55.45		47.46	41.29
CL39	N/A	92	65.98		86.09	71.53	67.28	71.67	65.47	62.72	56.81	48.19	63.50		65.92	57.35
CL55	N/A	92	40.34	44.08	33.26	32.01	23.87	24.76	21.77	25.04	28.87	32.96	42.41		31.76	27.63
CL40	N/A	92	51.81	60.46	45.90		40.10	38.10	38.93	43.94	40.82	43.71	49.44		45.32	39.43
BANK 1	N/A	*92*	71.89	66.14	63.57	45.75		38.65	34.33	6.35	41.24	38.66	51.80	48.12	46.04	40.06
BANK 2	N/A	*92*	66.11	64.82	57.56	62.77	63.17	66.38		51.99	53.13	53.25	59.55	48.98	58.88	51.23
BANK 3	N/A	*75*	70.10	61.53	61.56	53.25	42.70	46.94				41.69	58.31	54.89	54.55	47.46
BANK 4	N/A	*75*	71.95	69.26		65.15	66.45		58.03	58.97	59.89		61.60	57.08	63.16	54.94
BANK 5	N/A	*67*	66.54	68.89			62.57	64.48			58.07	52.84	60.93	57.99	64.47[c]	56.09[c]
BANK 6	N/A	*92*	79.31	73.13	74.69		74.24	76.59	69.85	62.05	75.44	63.52	65.83	52.93	69.78	60.71
BANK 7	N/A	*67*	68.67	67.74			58.53		46.66	53.44	52.29		53.61	51.71	62.31[c]	54.21[c]
BANK 8	N/A	*100*	65.69	58.16	57.06	53.40	41.45	53.63	44.99	51.56	51.85	41.79	52.93	49.37	51.82	45.09
BANK 9	N/A	*92*	61.29		64.55	56.27	51.95	56.17	49.56	56.00	51.95	51.15	51.98	32.46	53.03	46.14
BANK 10	N/A	*42*	67.52	75.54	73.12	64.70		62.09							65.16[c]	56.69[c]
BANK 11	N/A	*58*	57.50		51.08	46.00	44.79	45.88	41.50					45.51	47.66[c]	41.47[c]

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean NO_2													
			Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual mean – raw data [c]	Annual mean – bias adjusted [c]
BANK 12	N/A	50	66.85	66.42	64.23	56.29	-	-	-	-	-	54.20	56.45	-	48.78[c]	42.44[c]
BANK 13	N/A	83	66.12	62.50	54.05		47.76	49.98	43.63	44.09	49.82	42.05	56.75	-	51.67	44.96
BANK 14	N/A	100	71.67	74.79	62.17	49.38	48.32	53.03	49.95	43.00	56.24	52.22	58.27	51.79	55.90	48.63
BANK 15	N/A	100	77.14	67.09	71.39	61.02	58.72	56.58	51.13	61.73	58.40	52.34	60.14	58.86	61.21	53.26
BANK 16	N/A	100	72.45	73.49	77.45	54.36	59.84	60.59	54.83	52.81	52.86	56.05	62.14	59.58	61.37	53.39
BANK 17	N/A	92	70.06	63.94	64.75	66.27	56.11	58.62	51.41	48.38	59.44	55.88	56.86	-	59.25	51.54
BANK 18	N/A	75	66.37	54.64	58.29	56.94	46.05	47.11	-	-	-	45.11	53.45	45.87	52.65	45.80
BANK 19	N/A	75	56.20	58.10	-	45.33	37.28	41.60	33.95	37.99	-	-	45.32	44.75	44.50	38.72
BANK 20	N/A	42	-	87.83	80.45	64.48	-	-	-	-	-	-	61.97	61.86	56.26[c]	48.95[c]
BANK 21	N/A	25	79.82	-	80.84	63.01	-	-	-	-	-	-	-	-	52.89[c]	46.01[c]
BANK 22	N/A	50	81.44	82.16	81.17	73.26	71.03	-	-	-	-	61.37			59.17[c]	51.48[c]
BANK 23	N/A	92	64.13	-	57.53	53.76	49.06	46.61	44.14	39.27	41.61	45.98	52.28	45.05	49.04	42.66
BANK 24	N/A	33	57.75	-	-	-	-	-	33.14	39.09	-	-	47.45	-	54.93[c]	47.79[c]
LEN 1	N/A	92	57.30	63.92	-	39.42	35.80	33.66	33.84	38.54	35.33	40.58	47.34	51.23702	43.36	37.72
LEN 3	N/A	83	68.03	66.17	58.18	61.84	52.02	56.79	-	49.24	45.97	55.87	64.97	-	57.91	50.38
LEN 4	N/A	92	69.83	64.75	59.39	54.59	51.55	51.74	57.82	51.08	23.69	55.01	-	57.14147	54.24	47.19
LEN 6	N/A	92	64.24	54.39	53.27	47.02	39.78	44.28	-	44.66	30.44	10.09	67.17	45.73552	45.55	39.63
LEN 7	N/A	83	48.60	45.52	44.69	40.02	34.16	32.57	29.20	-	28.37	-	60.10	45.69831	40.89	35.58
LEN 8	N/A	100	53.19	50.92	42.61	33.63	31.27	29.44	31.67	35.13	19.59	35.76	57.08	41.9296	38.52	33.51
LEN 9	N/A	100	55.40	55.03	49.48	42.28	38.82	47.84	47.32	43.52	31.78	52.86	68.62	50.34457	48.61	42.29

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			Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual mean – raw data [c]	Annual mean – bias adjusted [c]
LEN 10	N/A	75	45.74	40.18	36.40	30.62	25.29	31.03	-	-	-	33.96	48.42	33.56203	36.13	31.44
LEN15	N/A	75	66.32	53.05	-	35.90	30.32	28.72692	32.75	36.63	33.43	-	50.42	-	40.84	35.53
LEN16	N/A	67	49.28	43.07	39.7052	-	-	29.52	-	29.74	26.37	-	48.89	40.32477	34.70[c]	30.19[c]
SJC1	N/A	92	50.54	51.76	-	37.97	28.59	29.73	28.55	33.74	35.01	36.81	53.75	36.88	38.48	33.48
SJC4	N/A	92	51.70	52.05	45.55	39.17	35.90	37.46	-	38.69	32.52	42.15	53.93	41.68	42.80	37.23
SJC6	N/A	92	47.02	44.45	34.60	39.82	27.72	-	28.44	33.87	33.29	36.33	46.25	39.53	37.39	32.53
SJC8	N/A	92	49.81	49.12	33.21	31.95	30.37	-	29.99	30.50	29.81	37.22	52.70	37.19	37.44	32.57
PLA5	N/A	83	60.72	12.09	-	48.82	34.46	-	31.16	41.63	41.09	41.83	51.75	44.03	40.76	35.46
PLA6	N/A	75	54.65	49.30	-	-	28.86	36.63	30.94	36.56	33.03	-	56.52	37.49	40.44	35.18
Liverpool St	N/A	83	86.07	-	-	78.66	54.34	56.95	43.29	40.69	45.67	49.35	86.26	51.05	59.23	51.53
Fenchurch Ave	N/A	92	50.02	51.19	39.74	37.97	30.62	-	31.93	30.75	33.69	34.81	58.65	43.20	40.23	35.00
Fetter Lane	N/A	92		59.46	49.16	55.46	42.70	48.58	41.66	43.79	-	50.20	68.08	48.70	50.78	44.18
OS1	N/A	92	45.83	42.49	34.53	37.42	27.08	28.77	23.54	-	28.84	34.34	50.96	34.10	35.26	30.68
OS3	N/A	75	60.81	54.78	43.48	37.74	32.21	36.32	-	-	-	38.57	47.38	50.06	44.59	38.80
OS5	N/A	92	60.48	52.82	39.32	-	40.12	36.36	31.73	38.44	33.72	39.61	50.66	41.16	42.22	36.73
Goodmans Yrd	N/A	58	-	-	-	61.96	41.38	38.80	-	41.99	32.37	-	51.74	55.29	50.17[c]	43.64[c]
T2	N/A	83	70.57	67.68	76.38	54.17	56.05	-	-	48.73	54.14	53.05	61.70	46.76	58.92	51.26

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			Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual mean – raw data [c]	Annual mean – bias adjusted [c]
T3	N/A	75	86.46	76.69	80.29	-	57.06	-	-	56.90	53.88	62.80	65.87	54.13	66.01	57.43
T4	N/A	50	65.55	-	-	44.30	43.81	-	-	-	41.40	53.78	-	43.81	50.55[c]	43.98[c]
T5	N/A	67	71.11	78.68	58.35	48.03		-	-	51.13	51.24	67.50	60.47	-	55.89[c]	48.62[c]
T6	N/A	67	60.32	59.12	47.44	36.38	58.70	-	-	34.61	-	-	53.70	42.39	44.27[c]	38.52[c]
T7	N/A	67	-	52.19	40.91	34.92	33.42	-	-	-	36.77	41.66	49.79	40.71	37.64[c]	32.74[c]
T9	N/A	42	82.35	73.53	68.87	68.43		-	-	-	-	-	75.92	-	55.17[c]	47.99[c]
T10	N/A	58	-	47.50	44.84		62.08	-	-	48.39	-	48.04	47.22	-	47.70[c]	41.50[c]
T11	N/A	67	46.77	55.51	39.27	38.85		-	-	15.20	-	40.47	45.51	38.44	35.74[c]	31.09[c]
T12	N/A	83	71.52	68.66	62.77	66.16	38.45	-	-	51.09	59.38	68.38	62.96	58.53	60.79	52.89
T13	N/A	75	79.92	70.62	67.72	59.95		-	-	60.21	54.63	60.27	66.38	60.60	64.48	56.10
T14	N/A	75	82.42	79.42	69.65	63.68	60.24	-	-	56.48	57.64	55.69	65.46	-	65.63	57.10
T15	N/A	67	70.54	68.62	56.26	68.98	58.60	-	-	-	-	55.51	64.16	53.67	54.22[c]	47.17[c]
T16	N/A	58	-	66.78	64.48	-	-	-	-	52.62	56.30	-	-	-	57.27[c]	49.83[c]
T17	N/A	75	69.25	72.69	54.47	49.33	-	-	-	54.68	58.51	74.26	75.74	61.06	63.33	55.10
T18	N/A	75	70.58	71.34	64.23	56.41	-	-	-	46.07	42.54	62.00	68.13	60.25	60.17	52.35
T19	N/A	58	-	53.02	-	45.05	-	-	-	35.82	34.98	44.09	57.44	45.11	43.93[c]	38.22[c]
T20	N/A	67	75.55	64.13	71.32	-	54.84	-	-	37.29	42.77	51.47	74.59	-	58.85[c]	51.20[c]
T21	N/A	75	84.46	82.85	52.05	55.89		-	-	55.54	57.17	68.45	63.03	55.06	63.83	55.54
BS1	N/A	75	58.05	-	53.88	53.97	51.55	-	-	55.96	43.12	49.25	65.02	61.45	54.70	47.58

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BS14	N/A	*75*	55.65	48.42	44.08	44.10	39.93	41.70	41.48	42.31	-	-	58.90	-	46.29	40.27
BS15	N/A	*50*	76.89	78.23	-	62.52	68.02	-	-	66.82	-	-	75.54	-	66.62[c]	57.96[c]
BS16	N/A	*92*	42.88	46.63	37.76	38.67	30.12	31.45	33.59	34.31	35.64	-	54.77	43.58	39.04	33.96
BS17	N/A	*75*	-	84.28	80.65	65.73	-	68.27	25.14	-	32.81	50.57	73.27	54.86	59.51	51.77
BS18	N/A	*100*	82.32	65.63	66.85	61.89	58.86	58.91	60.22	52.07	35.66	54.60	69.18	48.52	59.56	51.82
BS19	N/A	*92*	67.29	65.15	55.56	50.77	50.73	61.14	55.26	54.29	39.65	-	70.58	45.26	55.97	48.70
BS20	N/A	*83*	49.94	-	35.96	31.36	27.30	27.52	-	27.41	19.34	34.98	47.38	36.48	33.77	29.38
SPG1	*90*	83	-	-	-	56.49	55.83	59.57	43.36	43.17	61.25	55.66	68.21	60.39	55.99	48.71
SPG3	*90*	83	-	-	60.11	58.70	55.95	58.11	39.01	44.36	-	59.08	67.85	54.15	55.26	48.07
SPG4	*80*	83	-	-	-	47.42	46.07	46.34	33.22	-	49.19	48.98	57.37	54.33	52.11	45.34[c]
SPG5	*80*	83	-	-	52.62	46.41	51.12	56.35	-	38.06	46.63	-	58.12	50.47	50.80	44.20[c]
SPG6	*90*	83	-	-	48.13	58.26	49.32	64.60	38.72	20.54	46.69	-	58.06	51.53	48.43	42.13
SPG7	*100*	83	-	-	57.67	53.83	54.03	63.98	39.17	32.00	53.40	52.89	65.84	43.04	51.59	44.88
SPG8	*50*	83	-	-	-	-	44.42	-	37.45	42.89	43.87	-	62.28	-	57.88	50.36[c]
SPG9	*100*	83	-	-	64.17	58.33	52.42	60.12	39.07	45.25	60.31	57.59	57.30	56.58	55.11	47.95
SPG10	*90*	83	-	-	78.76	49.48	62.55	56.05	-	45.48	54.76	50.26	73.91	53.61	58.32	50.74
SPG11	*90*	83	-	-	69.67	76.83	68.05	78.66	50.44	46.23	68.78	56.28	-	54.83	63.31	55.08
SPG12	*80*	83	-	-	-	60.15	69.93	64.42	46.56	48.11	66.66	47.30	-	56.33	67.37	58.61[c]
SPS1	*N/A*	*100*	45.98	50.43	48.51	34.63	34.81	31.37	35.96	38.69	37.40	45.37	50.45	43.38	41.41	36.03

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SPS2	N/A	75	58.02	60.96	52.08	35.72	40.57	44.29	36.06	-	-	46.64	58.74	-	48.12	41.86
SPS3	N/A	100	46.76	51.95	42.82	36.54	37.21	38.31	37.41	34.46	39.45	42.11	44.84	23.79	39.64	34.49
SPS4	N/A	100	55.34	53.84	45.93	44.79	41.47	41.89	33.36	35.51	41.16	43.90	49.38	47.28	44.49	38.70
SPS5	N/A	100	41.78	43.83	31.92	34.75	30.69	29.70	30.80	24.78	30.56	36.04	40.10	37.69	34.39	29.92
SPS6	N/A	50	26.76	32.98	27.85	26.33	26.84	30.85	-	-	-	-	-	-	24.99[c]	21.74[c]
SPS7	N/A	50	46.17	47.49	37.97	37.14	30.47	32.06	-	-	-	-	-	-	33.68[c]	29.30[c]
SPS8	N/A	50	46.08	40.86	44.40	28.41	29.49	33.48	-	-	-	-	-	-	32.43[c]	28.21[c]
SPS9	N/A	100	44.97	44.56	37.57	30.26	27.72	30.60	27.07	33.36	31.01	35.97	42.36	42.79	35.69	31.05
SPS10	N/A	100	36.86	39.60	37.17	31.46	33.09	30.40	30.95	32.19	33.57	34.17	40.86	39.22	34.96	30.42
SPS11	N/A	100	19.53	26.56	28.09	18.98	27.93	27.05	29.48	30.50	25.55	27.62	29.34	24.70	26.28	22.86
SPS12	N/A	100	27.14	32.37	30.08	23.95	26.70	30.21	31.61	30.55	29.20	30.76	28.23	29.96	29.23	25.43
SPS13	N/A	83	23.52	31.30	25.69	21.18	-	-	28.38	24.80	26.77	24.19	29.22	29.85	26.49	23.05
SPS14	N/A	100	33.53	29.26	26.67	24.82	24.95	26.94	29.45	34.35	34.37	27.47	33.11	30.13	29.59	25.74
SPS15	N/A	100	45.81	49.85	37.13	31.95	28.39	29.32	32.47	38.24	37.71	39.80	43.84	42.10	38.05	33.10