

BACKGROUND PAPER 3

Westminster City Council Air Quality Annual Status Report for 2020

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

Contact details:

Gavin McIntosh – Environmental Sciences gmcintosh1@westminster.gov.uk

Adam Webber – Environmental Policy and Projects awebber@westminster.gov.uk

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

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Abbreviations

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

Table A. Summary of National Air Quality Standards and Objectives

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

Notes:

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

1. Air Quality Monitoring

1.1 Locations

Table B. Details of Automatic Monitoring Sites for 2020

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
Marylebone Road	528125	182016	Kerbside	Y	44m	1.5m	2.5m	NO _x ; PM ₁₀ ; PM _{2.5} ; SO ₂	Chemiluminescent, TEOM, FDMS
Horseferry Road	529802	178962	Urban Background	Y	21m	n/a	3m	NO _x ; PM ₁₀ ; PM _{2.5} ; Heavy Metals ¹	Chemiluminescent, FDMS, BAM, Partisol
Oxford Street (Selfridges)	528276	181065	Kerbside	Y	0m	1m	1.5m	NO _x , PM ₁₀	Chemiluminescent, BAM
Strand	530785	180911	Roadside	Y	0m	2.5m	1.8m	NO _x	Chemiluminescent
Covent Garden	530444	180903	Urban Background	Y	0m	n/a	2m	NO _x	Chemiluminescent
Cavendish Square	528763	181397	Roadside	Y	15m	5 m	1.7 m	NO _x , PM ₁₀	Chemiluminescent, BAM
Oxford Street East (94 Oxford Street)	529493	181331	Roadside	Y	0m	1.2 m	1.7 m	NO _x , PM ₁₀	Chemiluminescent, BAM

Buckingham Palace Road	528709	178773	Roadside	Y	50m	6m	1.5m	NOx	Chemiluminescent
Duke Street	528409	180965	Roadside	Y	2m	2m	2m	NOx	Chemiluminescent
Ebury Street	528350	178921	Roadside	Y	1.5m	1.5m	1m	NOx	Chemiluminescent
Elizabeth Bridge	528731	178662	Roadside	y	6m	1m	1m	NOx PM2.5	Chemiluminescent, BAM

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

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA? If so, which AQMA?	Distance 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)
WCC1	Chelsea Bridge Road	528542	177974	Kerbside	Y	10	0	2.5	NO ₂	N
WCC2	Lupus Street	529385	178099	Kerbside	Y	20	0	2.5	NO ₂	N
WCC3	Belgrave Road	529294	178514	Kerbside	Y	3	0	2.5	NO ₂	N
WCC4	Regency Street	529770	178479	Kerbside	Y	3	0	2.5	NO ₂	N
WCC5	Ebury Square Gardens	528512	178593	Urban Background	Y	20	3	2.5	NO ₂	N
WCC6	Eaton Gate	528204	178865	Kerbside	Y	10	0	2.5	NO ₂	N
WCC7	41 Charing Cross Road	529980	180770	Kerbside	Y	3	0	2.5	NO ₂	N
WCC8	13 Soho Square	529715	181231	Kerbside	Y	5	0	2.5	NO ₂	N
WCC9	Park Lane	528104	180574	Kerbside	Y	3	0	2.5	NO ₂	N
WCC10	Baker Street	527990	181743	Kerbside	Y	5	0	2.5	NO ₂	N
WCC11	Park Road/Regents Park	527814	182209	Roadside	Y	10	2	2.5	NO ₂	N
WCC12	Lisson Grove	527036	182321	Urban Background	Y	5	0	2.5	NO ₂	N
WCC13	Wellington Road	526948	183009	Kerbside	Y	5	0	2.5	NO ₂	N
WCC14	Abbey Road	526527	183040	Kerbside	Y	15	0	2.5	NO ₂	N
WCC15	Maida Vale	525838	183119	Kerbside	Y	15	0	2.5	NO ₂	N
WCC16	Sutherland Avenue 1	526012	182432	Kerbside	Y	6	0	2.5	NO ₂	N

WCC17	Sutherland Avenue 2	525531	182116	Kerbside	Y	6	0	2.5	NO ₂	N
WCC18	Shirland Road	525142	182507	Kerbside	Y	3	0	2.5	NO ₂	N
WCC19	Harrow Road	524596	182339	Kerbside	Y	3	0	2.5	NO ₂	N
WCC20	Woodfield Road	524887	181979	Urban Background	Y	3	0	2.5	NO ₂	N
WCC21	Westbourne Park Road	525254	181559	Kerbside	Y	3	0	2.5	NO ₂	N
WCC22	Westbourne Grove	525324	181122	Kerbside	Y	3	0	2.5	NO ₂	N
WCC23	Whitley's / Queensway	525817	181136	Urban Background	Y	3	0	2.5	NO ₂	N
WCC24	Sussex Gardens	526892	181140	Kerbside	Y	20	0	2.5	NO ₂	N
WCC25a	Buckingham Palace Road Co-location	528709	178773	Roadside	Y	50	1	1.5	NO ₂	y
WCC25b	Buckingham Palace Road Co-location	528709	178773	Roadside	Y	50	1	1.5	NO ₂	y
WCC25c	Buckingham Palace Road Co-location	528709	178773	Roadside	Y	50	1	1.5	NO ₂	y
WCC26a	Oxford Street East Co-location	529493	181331	Roadside	Y	50	1	1.5	NO ₂	y
WCC26b	Oxford Street East Co-location	529493	181331	Roadside	Y	50	1	1.5	NO ₂	y
WCC26c	Oxford Street East Co-location	529493	181331	Roadside	Y	50	1	1.5	NO ₂	y

WCC27a	Covent Garden Co-location	530446	180900	Urban Background	Y	5	60	2.5	NO ₂	y
WCC27b	Covent Garden Co-location	530446	180900	Urban Background	Y	5	60	2.5	NO ₂	y
WCC27c	Covent Garden Co-location	530446	180900	Urban Background	Y	5	60	2.5	NO ₂	y

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 (if required), the details of which are described in Appendix A.

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

Site ID	Site type	Valid data capture for monitoring period % ^(a)	Valid data capture 2020 % ^(b)	2014	2015	2016	2017	2018	2019	2020
Marylebone Road	Kerbside	97	97	<u>94</u>	<u>88</u>	<u>87</u>	<u>84</u>	<u>85</u>	<u>63</u>	44
Horseferry Road	Urban background	100	100	46	39	37	36	31	34	26
Oxford Street	Kerbside	98	98	<u>143</u>	<u>135</u>	<u>87</u>	<u>72</u>	<u>63</u>	<u>55</u>	34
Strand	Roadside	97	97	n/a	<u>122</u>	<u>101</u>	<u>92</u>	<u>88</u>	<u>76</u>	44
Covent Garden	Urban background	94	94	n/a	n/a	n/a	37	39	39	21
Cavendish Square	Roadside	92	92	n/a	n/a	n/a	n/a	<u>64</u>	<u>50</u>	32
Oxford Street East	Roadside	97	97	n/a	n/a	n/a	n/a	<u>76</u>	<u>51</u>	35
Buckingham Palace Road	Roadside	99	31	n/a	n/a	n/a	n/a	<u>52</u>	<u>51</u>	32
Duke Street	Roadside	98	98	n/a	n/a	n/a	n/a	n/a	<u>41</u>	28
Ebury Street	Roadside	98	98	n/a	n/a	n/a	n/a	n/a	35	21
Elizabeth Bridge	Roadside	70	40	n/a	n/a	n/a	n/a	n/a	n/a	26

Notes:

The annual mean concentrations are presented as $\mu\text{g m}^{-3}$.

Exceedances of the NO_2 annual mean AQO of $40\mu\text{g m}^{-3}$ are shown in **bold**.

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

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

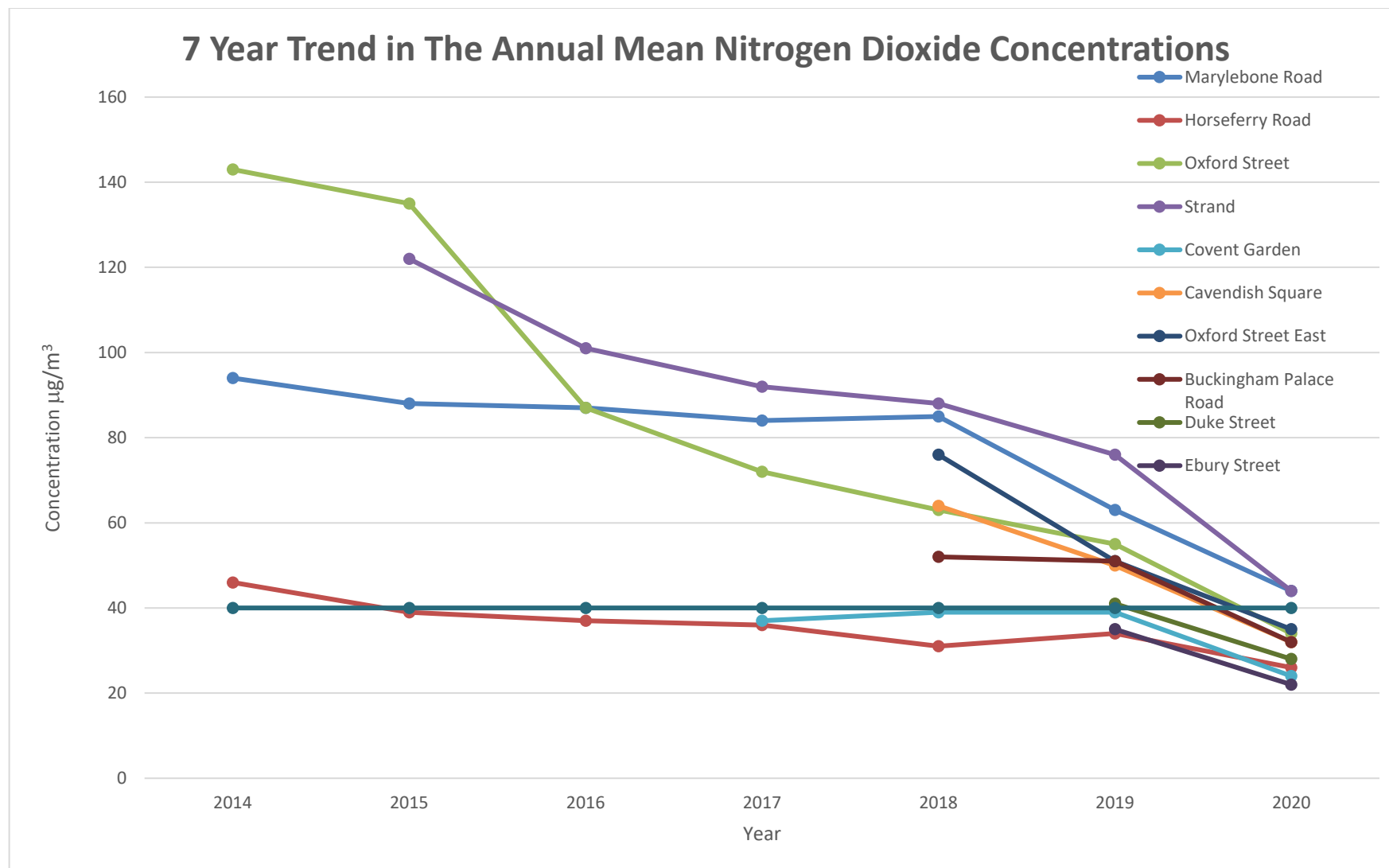
Results have been distance corrected where applicable.

(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%).

7 Year Trend in The Annual Mean Nitrogen Dioxide Concentrations

The 7-year trend in annual Nitrogen Dioxide concentrations shows a general improvement at the roadside and kerbside sites. There has been a steady decrease in concentrations at the Oxford Street and Strand sites. Marylebone Road has shown little improvement between 2014 to 2018, but noticeable improvement is reported for 2019. The Horseferry Road background site has been in operation for the whole 7-year period and is therefore the most relevant to consider for background patterns and this also shows a gradual improvement in nitrogen dioxide concentrations. An increase at Covent Garden was noted from its first year of operation, although it is noted that it has remained static for 2018/2019. 2020 has seen further reductions in measured nitrogen dioxide concentrations across the monitoring network. Oxford street, Covent Garden, Cavendish Square, Buckingham Place Road, and Duke street all reporting that measured concentrations are now below the national objectives. It should be noted that these measurements have the potential to be influenced by the restrictions implemented in response to the Covid-19 pandemic therefore this data should be used with caution.



*Elizabeth Bridge Data has not presented as it has only been operating for part of 2020.

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

Site ID	Site type	Valid data capture for monitoring period % ^(a)	Valid data capture 2020 % ^(b)	2014	2015	2016	2017	2018	2019	2020
Marylebone Road	Kerbside	97	97	60	56	49	38	29	0	0
Horseferry Road	Urban background	100	100	0	0	0	0	0	0	0
Oxford Street	Kerbside	98	98	1532	1391	168	1	3	0	0
Strand	Roadside	97	97	n/a	284	235	26	34	21	0
Covent Garden	Urban background	94	94	n/a	n/a	n/a	0	0	0	0
Cavendish Square	Roadside	92	92	n/a	n/a	n/a	n/a	0	0	0
Oxford Street East	Roadside	97	97	n/a	n/a	n/a	n/a	11	5	0
Buckingham Palace Road	Roadside	99	31	n/a	n/a	n/a	n/a	1	0	(0)
Duke Street	Roadside	98	98	n/a	n/a	n/a	n/a	n/a	0	0
Ebury Street	Roadside	98	98	n/a	n/a	n/a	n/a	n/a	0	0
Elizabeth Bridge	Roadside	70	40	n/a	n/a	n/a	n/a	n/a	n/a	(0)

Notes

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

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

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

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

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

7-year trend with the 1 hour mean objective for Nitrogen Dioxide

The 7-year trend in short term Nitrogen Dioxide concentrations shows an improvement at the roadside and kerbside sites, with a substantial improvement reported at Oxford Street. All sites have reported no exceedances of the short term AQO. It should be noted that 2020 measurements have the potential to be influenced by the restrictions implemented in response to the Covid-19 pandemic, therefore any conclusions with regards to this data should be used with caution.

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

Site ID	Valid data capture for monitoring period % ^(a)	Valid data capture 2020 % ^(b)	2014	2015	2016	2017	2018	2019	2020
Marylebone Road	0	0	31	30	29	27	26	24	n/a
Marylebone Road FDMS	75	75	26	24	26	24	24	22	16
Horseferry Road	97	97	19	17	17	17	17	17	15
Oxford Street	76	76	n/a	n/a	n/a	n/a	28	27	22
Cavendish Square	90	90	n/a	n/a	n/a	n/a	28	25	17
Oxford Street East	98	98	n/a	n/a	n/a	n/a	28	24	22

Notes

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

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

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

(a) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

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

7-year trend in annual mean PM₁₀ concentrations

The 7-year trend shows continued compliance with the PM10 national objective and continued reduction in the annual mean concentration across the monitoring network, including reductions in measured concentrations at Horseferry Road urban

background site in 2020. It should be noted that 2020 measurements have the potential to be influenced by the restrictions implemented in response to the Covid-19 pandemic, therefore any conclusions with regards to this data should be used with caution.

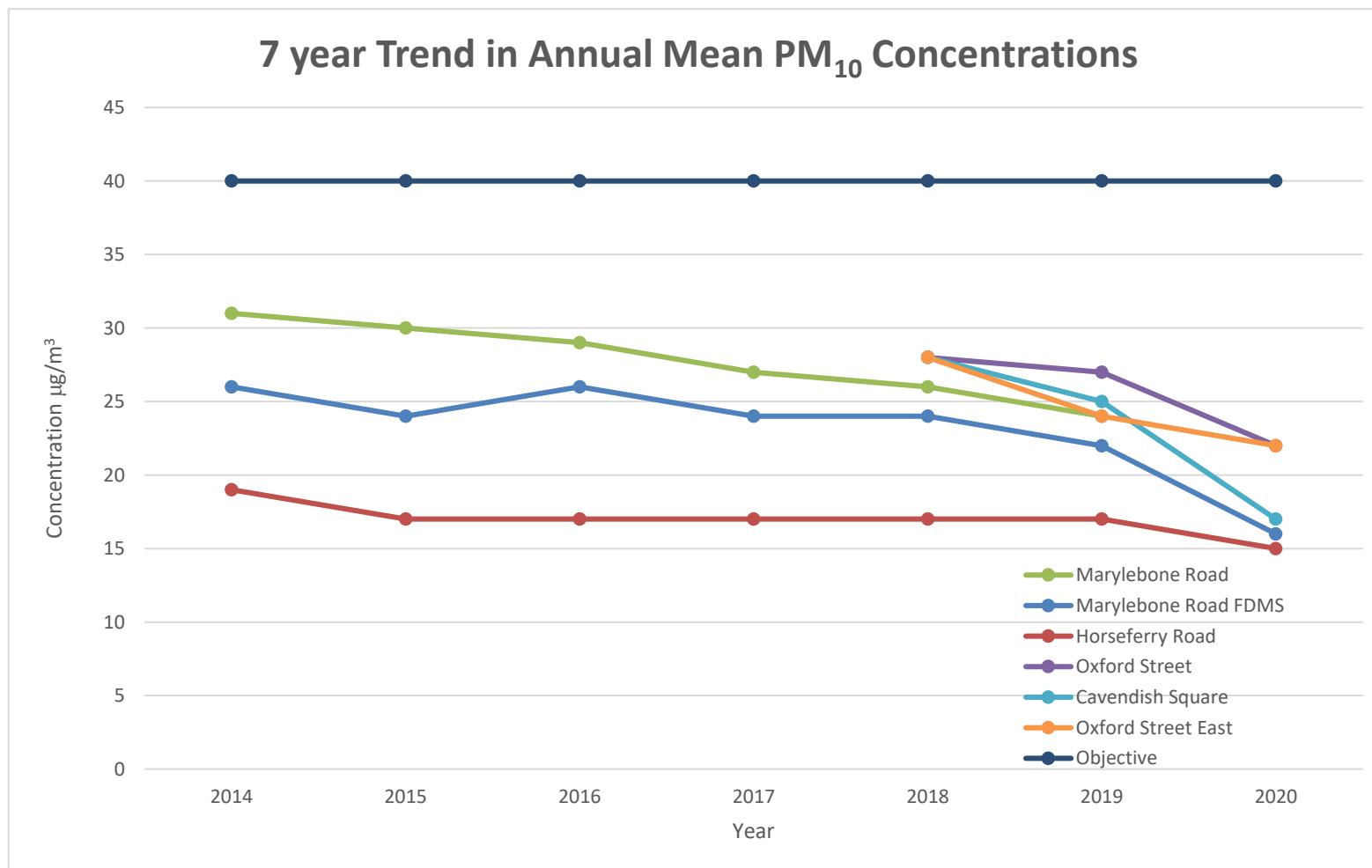


Table G. PM₁₀ Automatic Monitoring Results: Comparison with 24-Hour Mean Objective, Number of PM₁₀ 24-Hour Means > 50 µg m⁻³

Site ID	Valid data capture for monitoring period % ^(a)	Valid data capture 2020 % ^(b)	2014	2015	2016	2017	2018	2019	2020
Marylebone Road	0	0	22	13	15	12	5	11	n/a
Marylebone Road FDMS	75	75	14	10	14	8	7	10	1
Horseferry Road	97	97	8	3	6	6	1	7	2
Oxford Street	76	76	n/a	n/a	n/a	n/a	3	17	6
Cavendish Square	90	90	n/a	n/a	n/a	n/a	3	10	0
Oxford Street East	98	98	n/a	n/a	n/a	n/a	1	0	6

Notes

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

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

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

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

7-year trend for the 24 hour mean objective for PM₁₀

A general improvement in measured levels was reported 2014 through to 2018, however a sharp increase is reported at all sites within 2019, particularly high at the Horseferry Road (urban background) and Oxford Street (kerbside) sites. 2020 has seen a reduction in the measured levels at all sites. It should be noted that 2020 measurements have the potential to be influenced by the restrictions implemented in response to the Covid-19 pandemic, therefore any conclusions with regards to this data should be used with caution.

Table H. Annual Mean PM_{2.5} Automatic Monitoring Results ($\mu\text{g m}^{-3}$)

Site ID	Valid data capture for monitoring period % ^(a)	Valid data capture 2020 % ^(b)	2014	2015	2016	2017	2018	2019	2020
Marylebone Road FDMS	79	79	18	16	16	15	16	14	9
Horseferry Road	86	86	12	10	10	9	11	12	11
Elizabeth Bridge	99	68	N/A	N/A	N/A	N/A	N/A	N/A	9

Notes

The annual mean concentrations are presented as $\mu\text{g m}^{-3}$.

Exceedances of the PM_{2.5} annual mean AQO of $25 \mu\text{g m}^{-3}$ are shown in **bold**.

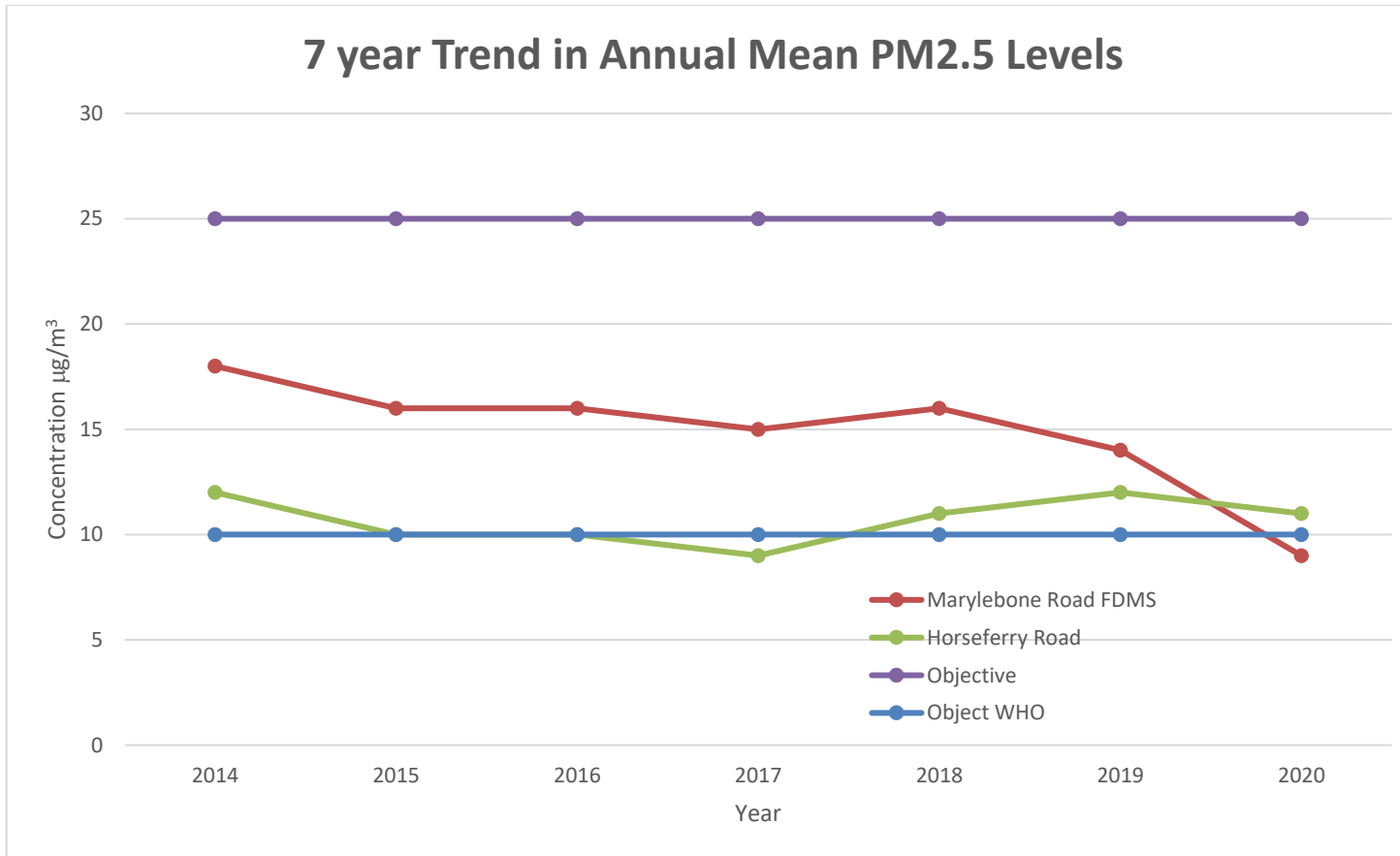
All means have been “annualised” in accordance with LLAQM Technical Guidance, if valid data capture is less than 75% and more than 33%.

(a) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

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

7-year trend in annual mean PM2.5 levels

The 7-year trend shows a general improvement in the measured annual mean concentration at both sites until 2018, at which point both sites reported an increase. Both sites have reported a reduction in measured PM2.5 concentrations in 2020. Elizabeth Bridge monitoring station was installed and operating in 2020 in addition to Westminster's PM2.5 monitoring network. All sites continue to meet the national objective for PM2.5. Comparing reported concentrations to the World Health Organisation PM2.5 guideline limit values, both kerbside sites (Marylebone Road and Elizabeth Bridge) meets this limit, where as background measurements recorded at Horseferry Road, continue to exceed this value. It should be noted that 2020 measurements have the potential to be influenced by the restrictions implemented in response to the Covid-19 pandemic, therefore any conclusions with regards to this data should be used with caution.



*Elizabeth Bridge Data has not presented as it has only been operating for part of 2020.

Table I. 2020 SO₂ Automatic Monitoring Results: Comparison with Objectives

Site ID	Valid data capture for monitoring period % ^(a)	Valid data capture 2020 % ^(b)	Number of 15-minute means > 266 $\mu\text{g m}^{-3}$	Number of 1-hour mean > 350 $\mu\text{g m}^{-3}$	Number 24-hour mean > 125 $\mu\text{g m}^{-3}$
Marylebone Road	96	96	0	0	0

Notes

Results are presented as the number of instances where monitored concentrations are greater than the objective concentration.

Exceedances of the SO₂ objectives are shown in **bold** (15-min mean = 35 allowed a year, 1-hour mean = 24 allowed a year, 24-hour mean = 3 allowed a year).

If the period of valid data is less than 85%, the relevant percentiles are provided in brackets.

(a) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

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

2. Impact of COVID-19 upon LAQM

During the pandemic business as usual was maintained but activity on some existing projects especially related to activity in schools experienced delays due to closures and social distancing and initiation of new projects were postponed.

Movement Strategy

A set of measures and interventions that were installed in the city from June 2020 to support the safe movement of pedestrians during the pandemic. The scope of works was split into two phases. Phase 1 included footway schemes to widen pavements, cycle schemes to increase cycle capacity, as well as the installation of cycle stands and temporary barriers and bollards to assist with social distancing. Whereas Phase 2 focused on hospitality schemes to assist businesses in reopening as restrictions eased.

In total the Movement Strategy featured:

- 16 footway schemes
- 6 cycle schemes
- 7 combined cycle and footway schemes
- 37 hospitality schemes
- 3 street closures
- 13 school street closures
- 106 cycle stand installations
- 9.5km of cables
- 1.2km of barriers for hospitality measures

<https://www.westminster.gov.uk/businesses/coronavirus-helping-hand-businesses/temporary-al-fresco-schemes-road-closures-or-barriers>

<https://www.westminster.gov.uk/news/westminsters-cycling-revolution>

There are also examples of projects that were council priorities but have been directly influenced by Covid, such as the Freight, Servicing and Deliveries Strategy and Action Plan <https://www.westminster.gov.uk/media/document/freight-servicing-and-deliveries-strategy-and-action-plan-2020%E2%80%932040pdf>

As a result of the Covid-19 pandemic, Westminster will be refreshing its current Air Quality Action Plan in 2021 and will liaise with the GLA accordingly on its contents and new actions.

3. Action to Improve Air Quality

3.1 Air Quality Action Plan Progress

Table J provides a brief summary of Westminster City Council progress against the Air Quality Action Plan, showing progress made this year. New projects which commenced in 2020 are shown at the bottom of the table ([where applicable](#)).

In Westminster's AQAP actions are listed under five main themes: monitoring, reducing emissions from building and new development, reducing emissions from transport, raising awareness, and lobbying and partnership working. As per the ASR instructions, these actions have been mapped to the LLAQM Action Matrix 'themes' in the table below.

Table J. Delivery of Air Quality Action Plan Measures

Measure	LLAQM Action Matrix Theme	Action	Progress
1.1	Monitoring and other core statutory duties	Maintaining and where possible expanding monitoring networks, and fulfilling other statutory duties	<p>Westminster is continuing to monitor air quality within the borough and prioritise PM2.5. A new PM2.5 reference monitor has been installed and operating at the Elizabeth Bridge Monitoring site.</p> <p>Westminster are continuing to support landowners with installing air quality monitors. Ebury Street, Duke Street, Marylebone Road, and the Strand monitoring sites are all owned and operated by third parties.</p>
2.1	Emissions from developments and buildings	Ensuring emissions from construction are minimised	<p>In 2020 Westminster worked to update its Code of Construction Practice, which covers all policy and requirements for reducing emissions from construction. The updated CoCP will be adopted in 2021 and full details will be included in next year's ASR.</p>
2.2	Emissions from developments and buildings	Ensuring enforcement of NRMM air quality policies	<p>See Table K below for full details.</p> <p>39 NRMM inspections were completed in 2020</p> <p>From January 2020 to approximately 8th March 2020 physical audits, site inspections were completed</p> <p>From approximately the 9th March 2020 to December 31 2020 desktop audits only were completed as a result of the pandemic.</p>
2.3	Emissions from developments and buildings	Reducing emissions from combustion-based CHP	<p>Policy 32B and 32D of Westminster's City Plan requires developments where CHP is included to be air quality neutral and that Air Quality Assessments are required for these developments.</p>
2.4	Emissions from developments and buildings	Enforce air quality neutral policy	<p>We have successfully secured funding from developers where AQ neutral benchmarks have not been met. For developments that fail to meet the Air quality Neutral Benchmarks we will continue to see funding where excess emissions cannot be mitigated.</p>

Measure	LLAQM Action Matrix Theme	Action	Progress
			See Table K for additional details. Air quality neutral policy is a key part of the new AQ policy (Policy 32) in Westminster's now adopted City Plan.
2.5	Emissions from developments and buildings	Ensuring adequate, appropriate, and well located green space and infrastructure is included in new and existing developments	Draft City Plan 2019 – 2040 Green Infrastructure Policy went through Examination in Public and has increased requirements for enhancing and improving green infrastructure across the City. GI improvements have also been included in audit reports for all Westminster schools (see comments on action 3.5).
2.6	Emissions from developments and buildings	Declaring Smoke Control Zones and ensuring they are fully promoted and enforced	The whole of Westminster is a Smoke Control Area. Enforcement and awareness raising of the SCA has included communications with commercial properties and engagement around pollution from canals in the Paddington Basin area.
2.7	Emissions from developments and buildings	Promoting and delivering energy efficiency and energy supply retrofitting projects in workplaces and homes through EFL retrofit programmes such as Re:fit, Re:new, and through borough carbon offset funds	In 2020 Westminster published new guidance for its carbon offset fund, which included setting out priority projects for funding in line with GLA guidance and Westminster's carbon reduction targets. More details can be found here: https://www.westminster.gov.uk/planning-building-and-environmental-regulations/planning-policy/planning-guidance-support-policies/carbon-offset-fund-guidance
2.8	Emissions from developments and buildings	Master planning and redevelopment areas aligned with air quality positive and Healthy Streets approaches	With a lack of clarity on the actual proposals for AQ Positive, specific action on this has not been taken. However, AQ policies and priorities are placed at the heart of redevelopment areas and area planning, including for the Oxford Street District and Strand/Aldwych schemes, where air quality considerations are central to the aims of the projects.
3.1	Public health and awareness raising	Public Health department taking shared responsibility for borough air quality issues and implementation of AQ action plans	The most recent iteration of the city's AQAP was developed in conjunction with Public Health department, and further integration has taken place during 2021 including coordination with the city's Health and Wellbeing Board which will be included in 2021's ASR.
3.2	Public health and awareness raising	Engagement with businesses	Engagement with businesses has taken place across a variety of the actions set out in this table, from liaising with the private sector on privately owned monitoring sites, to working closely with business on Westminster's new Freight Servicing and Delivery Strategy and Action Plan, and partnering with businesses to trial EV waste vehicles and ensure Westminster continues to have the largest EV charging network of any UK local authority.

Measure	LLAQM Action Matrix Theme	Action	Progress
3.3	Public health and awareness raising	Supporting direct alert services such as airTEXT, and promotion and sharing of high pollution alert services	Westminster continues to support and promote airTEXT through links on its website and also provides high pollution alerts to schools across the city.
3.4	Public health and awareness raising	Encourage all schools to join the TfL STARS accreditation scheme	All schools in Westminster are accredited through the TfL STARS programme.
3.5	Public health and awareness raising	Air quality in and around schools, and extending schools audits to all polluted schools	Air quality audits have been delivered to all schools and nurseries in Westminster, providing information and recommendations to schools on three key themes: green infrastructure; emissions from buildings; and localised solutions to road emissions.
4.1	Delivery servicing and freight	Update of procurement policies to reduce pollution from logistics and servicing	Published the Freight Servicing and Delivery Strategy and Action Plan Freight, Servicing and Deliveries Strategy and Action Plan 2020–2040.pdf
4.2	Delivery servicing and freight	Reducing emissions from deliveries to local businesses and residents	Published the Freight Servicing and Delivery Strategy and Action Plan Freight, Servicing and Deliveries Strategy and Action Plan 2020–2040.pdf
5.1	Borough fleet	Reducing emissions from council fleets.	All Westminster waste collection vehicles have been retrofitted to reduce NOx emissions by up to 99%: https://cleanstreets.westminster.gov.uk/revolutionary-technology-helps-improve-london-air-quality/ Westminster has also introduced electric refuse collection vehicles in 2020: https://cleanstreets.westminster.gov.uk/westminster-city-council-first-electric-refuse-collection-trucks/ As a result of these projects Westminster won a Future Fleet Award 2020.
6.1	Localised solutions	Expanding and improving green infrastructure.	Draft City Plan 2019 – 2040 Green Infrastructure Policy went through Examination in Public and has increased requirements for enhancing and improving green infrastructure.
6.2	Localised solutions	Low Emissions Neighbourhoods	Westminster does not currently have an active LEN.
7.1	Cleaner transport	Ensuring transport and AQ policies and projects are integrated	Policies are tightly integrated, and major urban realm projects and master planning projects include engagement and involvement with AQ staff from inception point onwards.

Measure	LLAQM Action Matrix Theme	Action	Progress
7.2	Cleaner transport	Using parking policy to reduce pollution emissions.	Draft City Plan 2019 – 2040 Parking Policy went through Examination in Public and now accords with Draft New London Plan policy requirements
7.3	Cleaner transport	Discouraging vehicle idling	Westminster continues to enforce no idling across the city through PCNs, and in early 2020 no idling events were held at sites including Paddington train station.
7.4	Cleaner transport	Regular temporary car free days and pedestrianisation schemes	Westminster’s Movement Strategy and response to the Covid-19 pandemic is outlined earlier in this ASR. A particular focus has been on rolling out these projects around schools through the city’s ActiveStreets programme: full details can be found at https://active.westminster.gov.uk/accelerated-activestreets-rollout/
7.5	Cleaner transport	Installation of EV and ULEV charging infrastructure	In early 2021 Westminster achieved its target of 1000 EV charging points across the city, the first UK local authority to reach this milestone. Westminster also published a five year strategy for EV charging, including work on ULEZ charging infrastructure: https://committees.westminster.gov.uk/documents/s36600/366_1%20-%20WCC_EV%20Strategy%20Document_web_AW3.pdf
7.6	Cleaner transport	Provision of infrastructure to support walking and cycling	Westminster’s Movement Strategy and response to the Covid-19 pandemic is outlined earlier in this ASR. This included significant work to promote walking and cycling across the city.

4. Planning Update and Other New Sources of Emissions

Table K. Planning requirements met by planning applications in Westminster in 2020

Condition	Number
Number of planning applications where an air quality impact assessment was reviewed for air quality impacts	48
Number of planning applications required to monitor for construction dust	<u>117</u>
Number of CHPs/Biomass boilers refused on air quality grounds	<u>0</u>
Number of CHPs/Biomass boilers subject to GLA emissions limits and/or other restrictions to reduce emissions	<u>0</u>
Number of developments required to install Ultra-Low NO _x boilers	<u>0</u>
Number of developments where an AQ Neutral building and/or transport assessments undertaken	<u>48</u>
Number of developments where the AQ Neutral building and/or transport assessments not meeting the benchmark and so required to include additional mitigation	<u>2</u>
Number of planning applications with S106 agreements including other requirements to improve air quality	<u>2</u>
Number of planning applications with CIL payments that include a contribution to improve air quality	<u>0</u>
<p>NRMM: Central Activity Zone and Canary Wharf</p> <p>Number of conditions related to NRMM included.</p> <p>Number of developments registered and compliant.</p> <p>Please include confirmation that you have checked that the development has been registered with the GLA through the relevant NRMM website and that all NRMM used on-site is compliant with Stage IIIB of the Directive and/or exemptions to the policy.</p>	<p>59 applications with conditions included</p> <p>38 registered and compliant</p> <p>2 unregistered/uncompliant and being chased.</p> <p>It can be confirmed that WCC has checked that the development are registered and compliant with the relevant emissions limits and/or exception to the policy</p>
<p>NRMM: Greater London (excluding Central Activity Zone and Canary Wharf)</p> <p>Number of conditions related to NRMM included.</p> <p>Number of developments registered and compliant.</p> <p>Please include confirmation that you have checked that the development has been registered at www.nrmm.london and that all NRMM used on-site is compliant with Stage IIIA of the Directive and/or exemptions to the policy.</p>	<p>58 applications with conditions included</p> <p>12 registered and compliant</p> <p>0 unregistered/uncompliant and being chased.</p> <p>It can be confirmed that WCC has checked that the developments are registered and compliant with the relevant emissions limits and/or exception to the policy</p>

Westminster City council requires all strategic, major and basement developments to comply with Westminster's Code of Construction Practice (CoCP). The CoCP

requires sites to formally agree a Site Environmental Management Plan (SEMP) and/or Construction Management Plan (CMP), prior to commencement of the development. The agreed SEMF and CMP will set out the sites NRMM and dust monitoring requirements. All active sites are proactively monitored to ensure that they are complying with the methodologies set out within their SEMF/CMP including the required NRMM emission limits.

4.1 New or significantly changed industrial or other sources

No new sources identified

Appendix A Details of Monitoring Site Quality QA/QC

A.1 Automatic Monitoring Sites

Site	Calibration (WCC unless otherwise noted)
Marylebone Road (AURN)	ERG arrangements
Horseferry Road (AURN)	NOx calibration every 4 weeks BAM tape change every 8 weeks
Oxford Street	NOx calibration every 4 weeks BAM tape change every 8 weeks
Oxford Street East	NOx calibration every 4 weeks BAM tape change every 8 weeks
Buckingham Palace Road	NOx calibration every 4 weeks
Covent Garden	NOx calibration every 4 weeks
Cavendish Square	NOx calibration every 4 weeks BAM tape change every 8 weeks
Strand (Managed by Northbank BID)	Own arrangements
Duke Street (Managed by Grosvenor)	Own arrangements
Ebury Street (Managed by Grosvenor)	Own arrangements

Horseferry Road and Marylebone Road monitoring sites are AURN sites and therefore have AURN QA/QC procedures. For all other sites monitoring data is collected, validated and ratified by ERG. QA/QC procedures are similar to those of the AURN network.

PM₁₀ Monitoring Adjustment

TEOM data has been adjusted using the volatile correction method (VCM).

BAM PM₁₀ – adjusted with a reciprocal of slope of 1.2.

Smart Heated BAM PM₁₀ – adjusted with a reciprocal of slope of 1.035.

Smart Heated BAM PM_{2.5} – no adjustment required.

A.2 Diffusion Tubes

All tubes used by Westminster City Council are prepared using 50% TEA in acetone, and are supplied and analysed by Lambeth Scientific Services Ltd. Lambeth participates in the AIR Proficiency Testing (PT) external proficiency testing scheme run by the Government. Four spiked diffusion tubes are distributed to participating laboratories on a quarterly basis to assess the analytical performance of those laboratories supplying diffusion tubes to Local Authorities for use in the context of LAQM.

The table below shows the results of the most recent 8 rounds of proficiency testing under AIR-PT. The table gives the % of samples where results returned by the laboratory were considered satisfactory – i.e. 1 out of 4 = 25%, and 4 out of 4 = 100%. The guidance directs that a single round is a snap-shot in time, and thus it is more informative to consider performance over a number of rounds. It is further stated that over a rolling five round AIR-PT window, 95% of results (i.e. 19 out of 20 samples) should be considered to be satisfactory.

AIR PT Round	AIR PT AR030	AIR PT AR031	AIR PT AR033	AIR PT AR034	AIR PT AR036	AIR PT AR037	AIR PT AR039	AIR PT AR040
Round conducted in the period	January – February 2019	April – May 2019	July – August 2019	September – November 2019	January – February 2020	May – June 2020	July – August 2020	September – October 2020

Lambeth Scientific Services	50%	100%	50%	100%	100%	NR ²	NR ²	100%
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Based on the latest rounds of Air PT results Lambeth Scientific Services have returned 90% of satisfactory results, below the requirement stated in the guidance. Westminster is currently in the process of reviewing its diffusion tube analysis contract and a decision will be made with regards to continue with Lambeth Scientific as its tube supplier for future years.

Factor from Local Co-location Studies

Westminster diffusion tube networks includes 3 colocation studies but as a result of the limited data collected in 2020 the factor has not been calculated. The results of the co-location studies will be presented in future year reports.

Discussion of Choice of Factor to Use

Due to the limited amount of data collected in 2020, RAW data has been presented only and has not been bias adjusted.

² NR (no result) Round was cancelled due to pandemic.

A.3 Adjustments to the Ratified Monitoring Data

Short-term to Long-term Data Adjustment

Diffusion tube monitoring commenced in November 2020, therefore Data capture is less than 33% of a full calendar year (2 months). Monitoring data therefore cannot be annualised. Monitoring data is RAW data and is for information purposes only.

Distance Adjustment

As the annual mean cannot be presented data has not been distance corrected and RAW data is presented.

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

Site ID	Annualisation Factor Westminster Horseferry Road	Annualisation Factor Islington Arsenal	Annualisation Factor City of London The Aldgate School	Annualisation Factor Hillingdon Harlington	Average Annualisation Factor	Raw Data Annual Mean ($\mu\text{g m}^{-3}$)	Annualised Annual Mean ($\mu\text{g m}^{-3}$)	Comments
Elizabeth Bridge NO ₂	1.09	1.03	0.99	0.86	0.99	25.69	25.59	
Bucking Palace Road NO ₂	0.90	0.87	0.83	0.62	0.81	39.2	31.78	
Site ID	Annualisation Factor Croydon Norbury Manor	Annualisation Factor City of London The Aldgate School	Annualisation Factor Lewisham Honor Oak Park	Annualisation Factor	Average Annualisation Factor	Raw Data Annual Mean ($\mu\text{g m}^{-3}$)	Annualised Annual Mean ($\mu\text{g m}^{-3}$)	Comments
Elizabeth Bridge PM _{2.5}	1.14	1.46	1.12	N/A	1.24	9	10.51	Data for Croydon and Lewisham Both provisional and not ratified

Table N. NO₂ Fall off With Distance Calculations

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted ($\mu\text{g m}^{-3}$))	Background Concentration ($\mu\text{g m}^{-3}$)	Concentration Predicted at Receptor ($\mu\text{g m}^{-3}$)	Comments
Marylebone Road	1.5	1.5	44	26	44	Background concentration taken from Horseferry Road
Strand	2.5	2.5	44	26	44	Background concentration taken from Horseferry Road

Appendix B Full Monthly Diffusion Tube Results for 2020

Table O. NO₂ Diffusion Tube Results

Site ID	Valid data capture for monitoring period % ^(a)	Valid data capture 2020 % ^(b)	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual mean – raw data	Annual mean – bias adjusted
WCC1	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	56	30	n/a	n/a
WCC2	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	52	37	n/a	n/a
WCC3	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	46	32	n/a	n/a
WCC4	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	38	36	n/a	n/a
WCC5	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	37	31	n/a	n/a
WCC6	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	48	33	n/a	n/a
WCC7	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	42	45	n/a	n/a
WCC8	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	36	26	n/a	n/a
WCC9	50	8	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	45	30	n/a	n/a
WCC10	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	50	45	n/a	n/a
WCC11	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	50	33	n/a	n/a
WCC12	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	37	26	n/a	n/a
WCC13	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	39	34	n/a	n/a
WCC14	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	45	34	n/a	n/a
WCC15	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	30	n/a	n/a
WCC16	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	39	32	n/a	n/a
WCC17	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	45	31	n/a	n/a
WCC18	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	59	35	n/a	n/a
WCC19	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	47	38	n/a	n/a
WCC20	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	41	32	n/a	n/a
WCC21	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	51	32	n/a	n/a
WCC22	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	48	47	n/a	n/a

WCC23	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	39	29	n/a	n/a
WCC24	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	43	34	n/a	n/a
WCC25a	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	34	32	n/a	n/a
WCC25b	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	35	33	n/a	n/a
WCC25c	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	41	37	n/a	n/a
WCC26a	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	40	32	n/a	n/a
WCC26b	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	39	32	n/a	n/a
WCC26c	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	49	33	n/a	n/a
WCC27a	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	38	28	n/a	n/a
WCC27b	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	37	30	n/a	n/a
WCC27c	100	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	36	27	n/a	n/a

Notes

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

Westminster commenced measurement of Nitrogen dioxide by diffusion tube in November 2020. A minimum of 3 months data is required to annualise data therefore Westminster do not have sufficient data to present annual mean concentrations this year. The two months data is presented for information purposes only. A full year monitored data will be presented in the 2021 annual status report.