Stevenage
BOROUGH COUNCIL

2021 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

Date: October, 2021

Information	Stevenage Borough Council Details
Local Authority Officer	Wesley A Cushing
Department	Environmental Health and Licensing
Address	Daneshill House, Danestrete, Stevenage, SG1 1HN
Telephone	01438 242908
E-mail	wesley.cushing@stevenage.gov.uk
Report Reference Number	SBC/ASR/2021
Date	October 2021

Executive Summary: Air Quality in Our Area

Air Quality in Stevenage Borough Council

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation with equalities issues because areas with poor air quality are also often less affluent areas[1,2].

The mortality burden of air pollution within the UK is equivalent to 28,000 to 36,000 deaths at typical ages[3], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[4].

Air quality in Stevenage continues to remain good. There are no AQMAs and no major point sources of emissions. However, there is major remodelling of the town centre taking place including office and residential development and moving of the bus station. Emissions have remained largely constant over the years. Monitoring of nitrogen dioxide (NO_2) and particulate matter less than 2.5 microns ($PM_{2.5}$) is undertaken using one automatic monitor in Stevenage located at St George's Way. This monitor was previously at Lytton Way but was moved in November 2018 to align well with new residential development to give representative results. Additional monitoring of NO_2 using diffusion tubes is also ongoing in areas that are been developed for housing.

---

[1] Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

[2] Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

[3] Defra. Air quality appraisal: damage cost guidance, July 2020

[4] Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades and will continue to improve due to national policy decisions, there are some areas where local action is needed to improve air quality further.

The 2019 Clean Air Strategy[5] sets out the case for action, with goals even more ambitious than EU requirements to reduce exposure to harmful pollutants. The Road to Zero[6] sets out the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

Stevenage Borough Council has continued to promote cycling via the pool bike scheme, walking and the use of electric cars as part of its measure to maintain and improve air quality around the borough.

Conclusions and Priorities

Monitoring continues to provide valuable data. Concentrations over time, while fluctuating, are largely flat, although a clear reduction was observed across most monitoring sites from 2019 to 2020. It is likely that this is partly due to reduced traffic emissions because of the COVID-19 lockdown.

Local Engagement and How to get Involved

The public can:

•   Use the excellent network of cycle paths laid out across the borough

•   Ensure cars are serviced regularly

•   Reduce the use of cars for short journeys

•   When changing vehicles, consider a more efficient / cleaner one.

[5] Defra. Clean Air Strategy, 2019

[6] DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

Table of Contents

Figures

Tables

Local Air Quality Management

This report provides an overview of air quality in Stevenage Borough Council during 2020. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Stevenage Borough Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England are presented in Table E.1.

Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 12 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

Stevenage Borough Council currently does not have any AQMAs.

2.2 Progress and Impact of Measures to address Air Quality in Stevenage

Defra's most recent appraisal of Stevenage's 2019 ASR concluded that there were a few inconsistencies in the reported monitored concentrations, the application of some LAQM TG16 methodology, the quality of the maps and highlighted the need for more elaborate details on the progress to date on the air quality measures. This report is based on the revised Diffusion Tube Data Processing Tool which includes the application of LAQM TG16 methods for distance corrections, application of bias factors and annualization and the final representation of results in suitable format, hence reducing the likelihood of reporting inconsistences. Maps have also been updated to clearly show the monitoring locations.

Stevenage Borough Council has taken forward a number of direct measures during the current reporting year of 2021 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 0.1. Eleven measures are included within Table 0.1, with the type of measure and the progress Stevenage Borough Council have made during the reporting year of 2021 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 0.1.

Table 0.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Local plan mobility strategy	Promoting Travel Alternatives	Promotion of cycling	Prior to 2016	Ongoing	SBC	SBC	None	None	None	Ongoing	Reduced vehicle emissions	NK	Ongoing	None
2	Local plan mobility strategy	Promoting Travel Alternatives	Promotion of walking	Prior to 2016	Ongoing	SBC	SBC	None	None	None	Ongoing	Reduced vehicle emissions	NK	Ongoing	None
3	Local plan mobility strategy	Transport Planning and Infrastructure	Cycle network	Prior to 2016	Ongoing	SBC	SBC	None	None	None	Ongoing	Reduced vehicle emissions	NK	Ongoing	First phase successful, second phase on-going
4	Relocating diffusion tubes	Other	Other	Prior to 2016	Ongoing	SBC	SBC	None	None	None	Ongoing	Some tubes have been removed and new locations found	Tubes deployed	Ongoing	None
5	Local plan mobility strategy	Transport Planning and Infrastructure	Public cycle hire scheme	Prior to 2016	Ongoing	SBC	SBC	None	None	None	Ongoing	Reduced vehicle emissions	NK	Ongoing	None
6	Electric car club	Alternatives to private vehicle use	Car Clubs	Prior to 2016	Ongoing	SBC	SBC	None	None	None	Ongoing	Reduced vehicle emissions	NK	Ongoing	None
7	Promotion of Clean Air Day	Public Information	Via the Internet	Prior to 2016	Ongoing	SBC	SBC	None	None	None	Ongoing	Public information	NK	Annual	None
8	Air pollution episode alert system	Public Information	Other	Prior to 2016	Ongoing	SBC	SBC	None	None	None	Ongoing	Public information	NK	Complete	None
9	Monitoring air quality	Public Information	Via other mechanisms	Prior to 2016	Ongoing	HCC / SBC	HCC / SBC	None	None	None	Ongoing	Public information	NK	Ongoing	None
10	Engagement with Comms	Public Information	Via the Internet	Prior to 2016	Ongoing	SBC	SBC	None	None	None	Ongoing	Public information	NK	Ongoing	None
11	Consider air quality on new planning applications	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Prior to 2016	Ongoing	SBC	SBC	None	None	None	Ongoing	Reduced vehicle emissions	NK	Ongoing	None

Note: NA – not available

2.3 PM$_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of PM$_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5μm or less). There is clear evidence that PM$_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Stevenage Borough Council is taking the following measures to address PM$_{2.5}$ such as:

- encouraging the use of electric vehicles and low emission vehicles;
- continuing to promote the extensive network of cycle paths around the borough and
- consideration of air quality in general when new developments are proposed.

Hertfordshire County Council's public health team provided funding for the PM$_{2.5}$ analyser at St George's Way which continues to gather data for establishing a baseline level of PM$_{2.5}$ across Hertfordshire.

Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance

This section sets out the monitoring undertaken within 2020 by Stevenage Borough Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2016 and 2020 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Stevenage Borough Council undertook automatic (continuous) monitoring at St George's Way during 2020. Table A.1 in Appendix A shows the details of the automatic monitoring sites. The http://www.airqualityengland.co.uk page presents automatic monitoring results for Stevenage Borough Council, with automatic monitoring results also available through the UK-Air website.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

Stevenage Borough Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 26 sites during 2020. Table A.2 in Appendix A presents the details of the non-automatic sites.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. annualisation and/or distance correction), are included in Appendix C.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualisation (where the annual mean data capture is below 75% and greater than 25%), and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO$_2$)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO$_2$ annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2020 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

Table A.5 in Appendix A compares the ratified continuous monitored NO$_2$ hourly mean concentrations for the past five years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

The automatic monitoring NO$_2$ results at St Georges' Ways reveals that the both the annual mean and 1-hour the air quality objective was achieved in 2020.

Similarly, all the 26 diffusion tube monitoring sites are below the annual mean air quality objective of 40. A such, it is expected that the 1 hour mean objective is also likely to be achieved as the annual mean is not greater than 60µg/m^3.

Figure A.1 to Figure A.3 in Appendix A: Monitoring Results present these data in a graphical format for the roadside, kerbside, suburban & urban background monitoring locations for the last five years.

Roadside monitoring sites (1, 7, 10, 17, 19, 21, 23, 26, 28 and 31) are the only roadside sites with data available for comparison across the last five years; they remain consistently below the NO$_2$ annual mean objective except for roadside Site 17. All the roadside sites showed a significant reduction in NO$_2$ concentrations from 2019 to 2020 of around 23%.

Similarly, across the five years most of the kerbside sites (4, 9, 24, 34, 35 and 40) remain consistently below the NO_2 annual mean objective, except for kerbside Site 34. However kerbside Site 34 achieves the NO_2 objective in 2020. All the kerbside sites showed a significant reduction in NO_2 concentrations from 2019 to 2020 of around 26%.

There is currently only one urban background sites (18) and four suburban sites (3, 11, 12 and 13) in Stevenage. All these sites were considerably below the annual mean objective across the five years and they all experienced a significant reduction in NO_2 concentrations from 2019 to 2020 of around 27%.

3.2.2 Particulate Matter (PM$_{2.5}$)

Table A.6 in Appendix A presents the ratified and adjusted monitored PM$_{2.5}$ annual mean concentrations for the past five years.

The automatic monitoring PM$_{2.5}$ results at St Georges' Way reveals that the annual mean PM$_{2.5}$ concenrtation remain below 10µg/m^3 in 2020 and in previous years.

.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Inlet Height (m)
AQMS 2	St Georges Way	Roadside	523923	224329	NO_2	No	Chemiluminescent	85	1.5	2.9
AQMS 2	St Georges Way	Roadside	523923	224329	$PM_{2.5}$	No	BAM	85	1.5	2.9

Notes:

(1) 0m if the monitoring Site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable

Table A.2 – Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube Co located with a Continuous Analyser?	Tube Height (m)
1	Town Centre	Roadside	523771	224090	NO_2	No	102.0	4.0	No	2.4
3	Monks View	Suburban	524345	224468	NO_2	No	9.5	0.2	No	2.9
4	Bedwell Crescent	Kerbside	525373	226985	NO_2	No	20.0	0.8	No	2.5
7	High Street	Roadside	523278	225479	NO_2	No	9.0	2.4	No	3.0
9	Magpie Crescent	Kerbside	526652	223438	NO_2	No	12.5	2.0	No	2.9
10	Shoreham Close	Roadside	522075	225568	NO_2	No	8.0	2.1	No	2.5
11	Newlyn Close	Suburban	522126	224862	NO_2	No	3.5	1.7	No	2.7
12	Chadwell Road	Suburban	522955	223335	NO_2	No	25.0	0.4	No	2.6
13	Whitney Drive	Suburban	523070	226070	NO_2	No	8.0	1.9	No	2.3
17	Hitchin Road	Roadside	522700	226550	NO_2	No	14.0	2.4	No	2.5
18	Fairlands Valley Park	Background	525425	224183	NO_2	No	167.0	172.5	No	2.6
19	7 Tates Way	Roadside	522700	226570	NO_2	No	0.0	9.0	No	2.3
21	13 Hitchin Road	Roadside	523128	225677	NO_2	No	0.0	16.0	No	2.2
22	Townsend Mews	Roadside	523360	224786	NO_2	No	0.0	7.8	No	2.7
23	Hitchin Road - Longfields	Roadside	523014	226029	NO_2	No	7.4	2.5	No	2.1
24	Martins Way	Kerbside	525987	226368	NO_2	No	8.0	0.8	No	2.2
26	Vardon Road	Roadside	524542	225654	NO_2	No	10.2	7.7	No	2.6
28	Chells Way	Roadside	526078	224818	NO_2	No	1.5	1.5	No	2.4
31	Hydean Way	Roadside	525160	223069	NO_2	No	0.0	6.0	No	2.6
34	A602/A1(M) Junction 7	Kerbside	523697	225920	NO_2	No	>50	2.2	No	2.2
35	A602 The Chequers	Kerbside	527020	221097	NO_2	No	>50	0.5	No	2.2
36	St Georges Way	Roadside	523923	224329	NO_2	No	>50	1.5	Yes	2.9
37	Fishers Green Road	Roadside	522608	225880	NO_2	No	2.9	1.7	No	2.6
38	High Street - Costa	Roadside	523406	225035	NO_2	No	4.0	4.3	No	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube Co located with a Continuous Analyser?	Tube Height (m)
39	High Street - Bike Stop	Roadside	523319	225021	NO_2	No	3.5	5.0	No	2.0
40	London Road	Kerbside	524097	222765	NO_2	No	>50	0.9	No	2.0

Notes:

(1) 0m if the monitoring Site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable.

Table A.3 – Annual Mean NO₂ Monitoring Results: Automatic Monitoring (µg/m³)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
AQMS2	523923	224327	Roadside	97.94%	97.94%	-	-	28.0	25.0	26.1

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16**

☒ **Reported concentrations are those at the location of the monitoring Site (annualised, as required), i.e. prior to any fall-off with distance correction**

Notes:

The annual mean concentrations are presented as µg/m³.

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

All means have been "annualised" as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

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

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Table A.4 – Annual Mean NO₂ Monitoring Results: Non-Automatic Monitoring (µg/m³)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2020 (%) [2]	2016	2017	2018	2019	2020
1	523771	224090	Roadside	92.3	92.3	33.2	33.0	30.6	31.8	25.5
3	524345	224468	Suburban	100.0	100.0	22.1	22.4	18.7	20.9	17.1
4	525373	226985	Kerbside	100.0	100.0	21.5	20.4	19.8	19.5	14.6
7	523278	225479	Roadside	100.0	100.0	31.5	30.2	30.5	29.5	21.9
9	526652	223438	Kerbside	100.0	90.4	26.6	25.0	25.1	22.7	17.2
10	522075	225568	Roadside	100.0	90.4	26.5	27.2	26.1	25.6	18.7
11	522126	224862	Suburban	100.0	100.0	20.8	20.3	19.2	19.5	13.8
12	522955	223335	Suburban	100.0	100.0	19.5	16.6	19.0	17.9	12.4
13	523070	226070	Suburban	100.0	100.0	22.4	22.2	21.2	21.1	15.8
17	522700	226550	Roadside	100.0	100.0	**44.4**	**48.6**	**42.2**	**42.7**	32.6
18	525425	224183	Background	100.0	100.0	16.3	15.3	14.5	14.3	10.1
19	522700	226570	Roadside	100.0	90.4	37.0	37.0	35.1	31.9	26.3
21	523128	225677	Roadside	100.0	92.3	26.5	25.4	24.3	23.2	17.3
22	523360	224786	Roadside	100.0	82.7	27.0	23.2	23.2	22.5	17.6
23	523014	226029	Roadside	100.0	90.4	36.3	31.5	33.5	33.1	24.4
24	525987	226368	Kerbside	100.0	100.0	29.8	32.0	31.4	30.3	23.5
26	524542	225654	Roadside	92.3	92.3	20.8	21.1	21.0	21.2	14.1
28	526078	224818	Roadside	100.0	100.0	24.2	23.0	22.4	22.2	17.0
31	525160	223069	Roadside	100.0	90.4	23.3	22.2	23.3	21.8	15.8
34	523697	225920	Kerbside	100.0	100.0	-	**57.3**	**49.5**	**50.7**	37.4
35	527020	221097	Kerbside	100.0	92.3	-	24.6	28.3	24.6	17.6
36	523923	224329	Roadside	100.0	100.0	-	-	27.4	25.6	20.4
37	522608	225880	Roadside	100.0	80.8	-	-	-	21.5	16.8
38	523406	225035	Roadside	90.0	75.0	-	-	-	26.6	18.3
39	523319	225021	Roadside	100.0	100.0	-	-	-	27.2	21.0
40	524097	222765	Kerbside	100.0	90.4	-	-	-	32.1	21.4

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16.**

☒ **Diffusion tube data has been bias adjusted.**

☒ **Reported concentrations are those at the location of the monitoring Site (bias adjusted and annualised, as required), i.e. prior to any fall-off with distance correction.**

Notes:

The annual mean concentrations are presented as µg/m^3.

Exceedances of the NO$_2$ annual mean objective of 40µg/m^3 are shown in **bold**.

NO$_2$ annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO$_2$ 1-hour mean objective are shown in **<u>bold and underlined</u>**.

Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

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

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Figure A.1 – Trends in Annual Mean NO₂ concentrations at roadside monitoring sites over the past 5 years

Figure A.2 – Trends in Annual Mean NO₂ concentrations at kerbside monitoring sites over the past 5 years

Figure A.3 – Trends in Annual Mean NO₂ concentrations at suburban and urban background monitoring sites over the past 5 years

Table A.5 – 1-Hour Mean NO₂ Monitoring Results, Number of 1-Hour Means > 200µg/m³

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2020 (%) [2]	2016	2017	2018	2019	2020
AQMS2	523923	224327	Roadside	Automatic	97.94%	-	-	0	1	0

Notes:

Results are presented as the number of 1-hour periods where concentrations greater than 200µg/m³ have been recorded.

Exceedances of the NO₂ 1-hour mean objective (200µg/m³ not to be exceeded more than 18 times/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.

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

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).
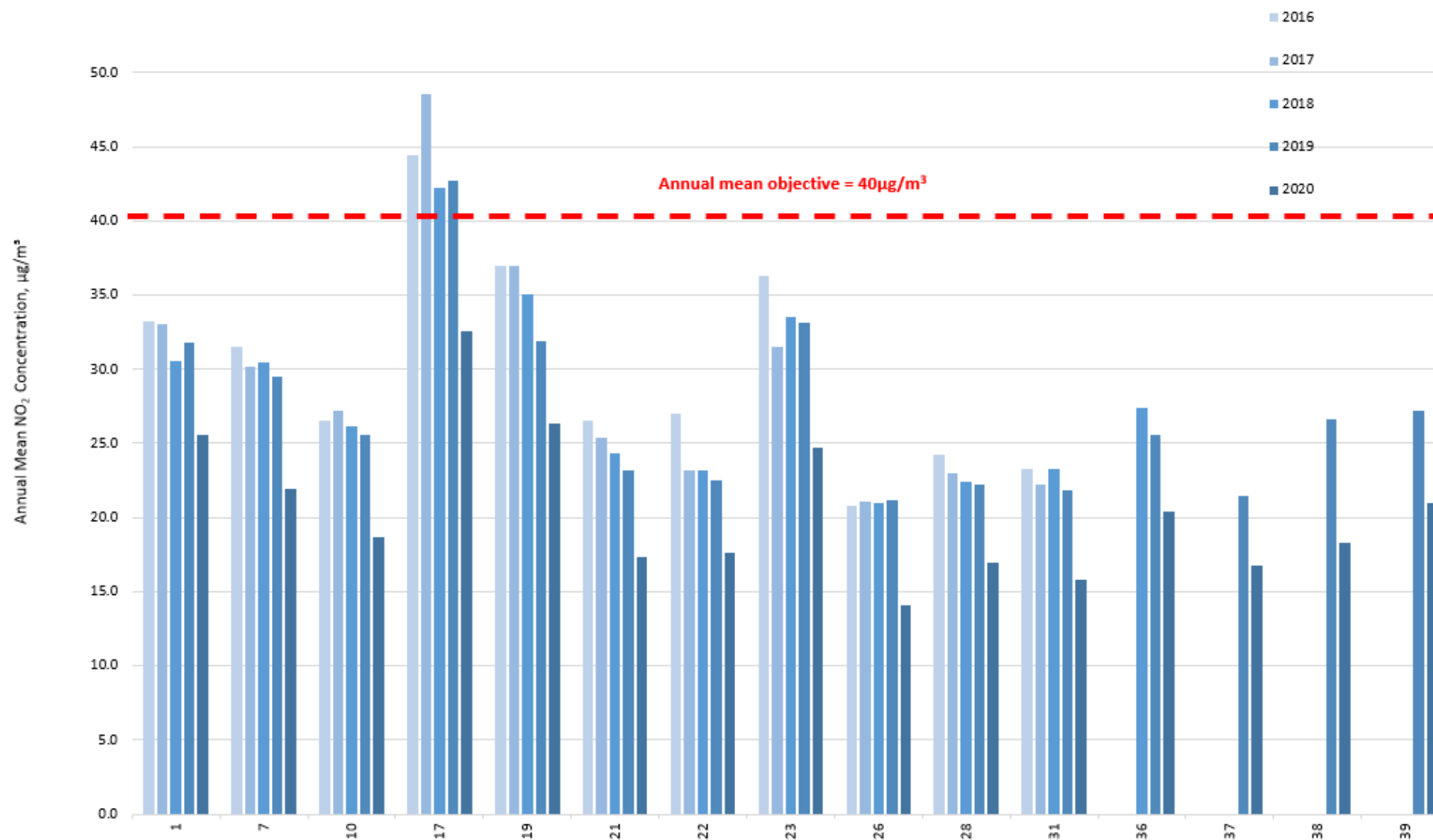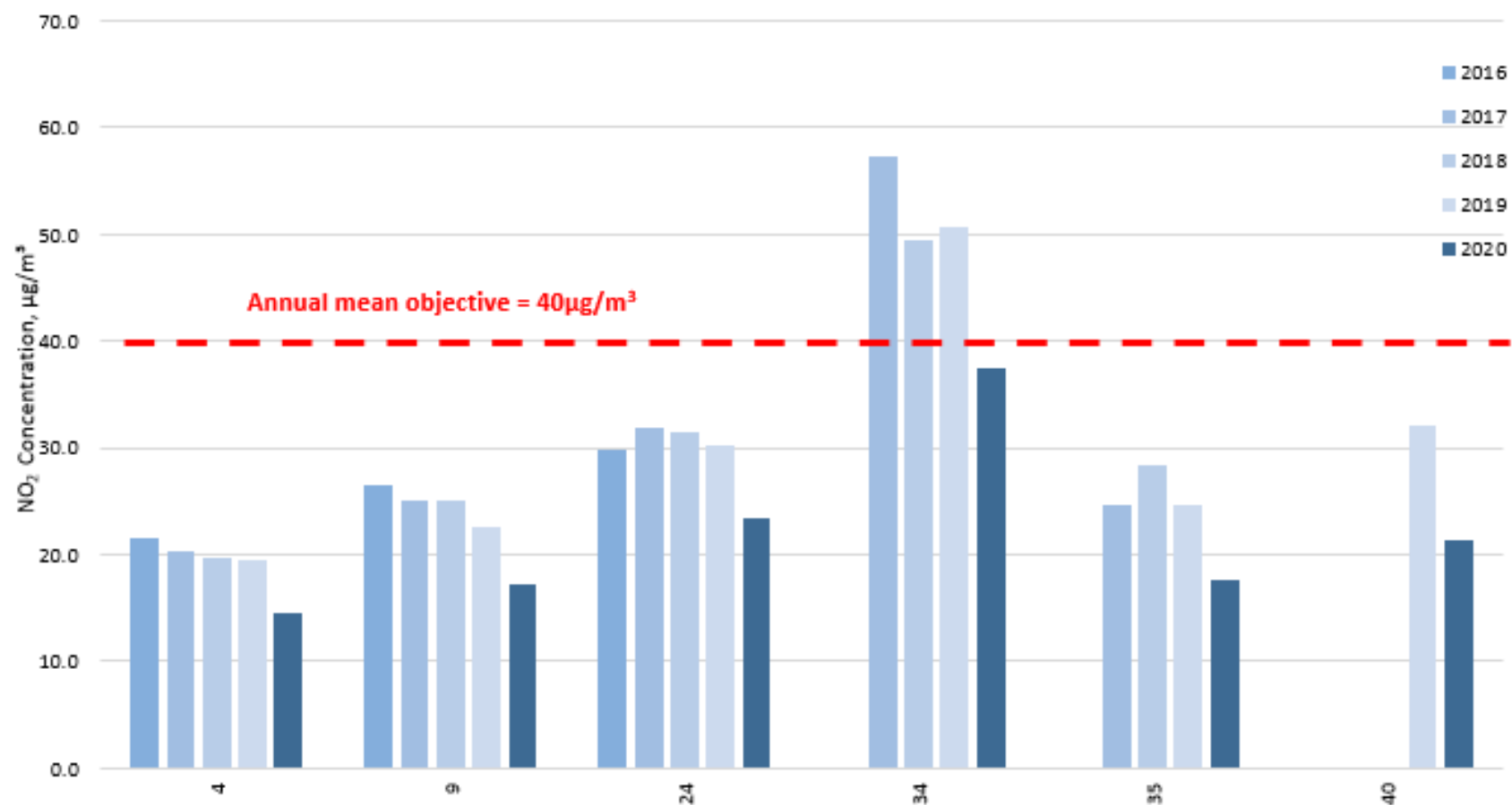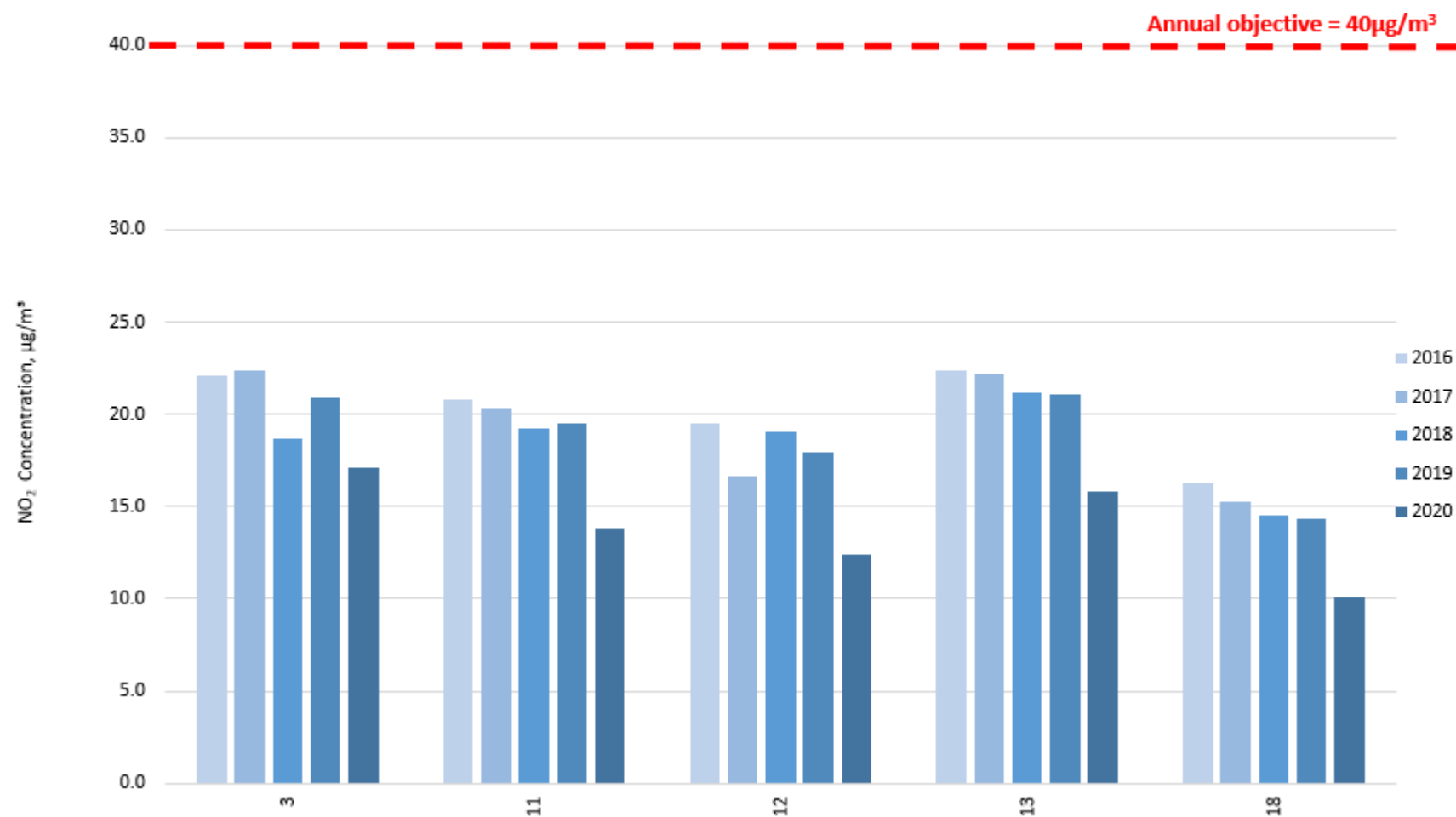
Table A.6 – Annual Mean PM$_{2.5}$ Monitoring Results (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2020 (%) [2]	2016	2017	2018	2019	2020
AQMS2	523923	224327	Roadside	96.70%	96.70%	-	-	9	9	9

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16.**

Notes:

The annual mean concentrations are presented as µg/m^3.

All means have been "annualised" as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Appendix B: Full Monthly Diffusion Tube Results for 2020

Table B.1 – NO₂ 2020 Diffusion Tube Results (µg/m³)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.83)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
1	523771	224090	38.3	38.6	30.9	17.5	17.4	-	29.8	28.7	33.8	32.7	37.7	33.3	30.8	25.5	-	
3	524345	224468	30.3	25.7	18.0	13.6	10.9	17.0	12.8	18.2	20.1	23.6	30.7	26.1	20.6	17.1	-	
4	525373	226985	22.3	18.5	16.7	13.8	11.4	12.4	11.9	15.7	18.1	17.7	29.6	22.5	17.5	14.6	-	
7	523278	225479	37.4	28.9	20.5	19.6	17.0	21.1	21.3	26.0	27.6	29.6	38.3	29.5	26.4	21.9	-	
9	526652	223438	27.5	25.7	19.6	16.8	13.8	16.3	15.6	18.3	21.2	21.7	28.3	23.4	20.7	17.2	-	
10	522075	225568	29.3	27.3	20.5	12.9	15.0	16.1	20.0	20.3	23.3	27.0	31.9	26.4	22.5	18.7	-	
11	522126	224862	21.5	19.3	14.5	13.4	10.8	11.0	12.0	15.4	15.0	18.6	26.3	21.9	16.6	13.8	-	
12	522955	223335	19.5	12.9	14.8	13.2	11.0	12.8	7.8	14.9	13.2	15.2	21.6	22.3	14.9	12.4	-	
13	523070	226070	28.2	24.3	17.3	11.5	10.8	12.1	14.6	15.7	19.1	20.4	30.2	24.5	19.1	15.8	-	
17	522700	226550	54.3	47.1	39.6	23.9	31.5	32.2	35.9	35.8	42.7	42.7	46.8	38.9	39.3	32.6	-	
18	525425	224183	19.4	16.0	10.8	7.0	6.4	7.4	6.7	9.2	11.4	12.3	22.0	17.3	12.2	10.1	-	
19	522700	226570	45.6	32.1	34.0	25.8	25.0	25.7	27.9	29.4	34.9	34.3	34.1	32.4	31.7	26.3	-	
21	523128	225677	30.4	23.0	16.8	15.2	15.9	17.6	14.0	19.9	21.2	20.7	27.9	27.8	20.9	17.3	-	
22	523360	224786	28.0	25.7	19.0	16.2	12.7	15.1	12.9	20.0	21.3	25.4	30.8	27.1	21.2	17.6	-	
23	523014	226029	32.3	25.6	26.8	30.7	25.1	31.5	16.5	31.4	30.7	28.7	39.5	34.5	29.4	24.4	-	
24	525987	226368	37.2	33.2	23.8	20.7	21.1	24.8	24.1	30.2	32.3	30.7	35.2	27.0	28.3	23.5	-	
26	524542	225654	26.9	25.3	17.7	12.7	9.5	10.8	11.8	15.5	13.9	19.9		22.7	17.0	14.1	-	
28	526078	224818	29.8	24.4	17.3	14.8	14.1	16.9	14.2	18.3	18.3	20.2	31.3	25.8	20.4	17.0	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.83)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
31	525160	223069	22.0	25.1	16.1	12.9	13.0	14.5	13.8	17.0	18.7	22.4	28.7	25.0	19.1	15.8	-	
34	523697	225920	60.6	59.2	21.2	29.7	36.2	46.5	42.4	49.8	44.5	49.5	57.7	43.8	**45.1**	37.4	-	
35	527020	221097	26.4	23.1	19.1	18.0	16.5	18.2	17.6	21.6	22.9	21.8	25.6	23.7	21.2	17.6	-	
36	523923	224329	31.6	27.1	42.2	16.7	14.7	15.0	15.8	20.7	23.2	25.5	33.2	29.5	24.6	20.4	-	
37	522608	225880	26.6	23.3	18.2	16.3	13.3	13.5	12.1	17.3	20.2	21.4	30.0	31.4	20.3	16.8	-	
38	523406	225035	-	24.4	21.9	20.1	17.6	19.7	17.3	25.0	-	21.5	31.2	-	22.1	18.3	-	
39	523319	225021	36.4	30.2	22.4	16.9	16.8	19.6	20.0	26.9	23.5	27.3	35.2	28.5	25.3	21.0	-	
40	524097	222765	34.6	26.2	22.0	20.8	22.2	19.4	22.6	25.8	29.3	25.4	30.8	29.6	25.7	21.4	-	

☒ **All erroneous data has been removed from the** NO₂ **diffusion tube dataset presented in Table B.1** (confirm by selecting in box).

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16** (confirm by selecting in box).

☐ **Local bias adjustment factor used** (confirm by selecting in box).

☒ **National bias adjustment factor used** (confirm by selecting in box).

☒ **Where applicable, data has been distance corrected for relevant exposure in the final column** (confirm by selecting in box).

☐ **Stevenage Borough Council confirm that all 2020 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System** (confirm by selecting in box).

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and annualisation.

Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC

New or Changed Sources Identified Within Stevenage Borough Council During 2020

Stevenage Borough Council has not identified any new sources relating to air quality within the reporting year of 2020.

Additional Air Quality Works Undertaken by Stevenage Borough Council During 2020

Stevenage Borough Council has not completed any additional works within the reporting year of 2020.

QA/QC of Diffusion Tube Monitoring

The diffusion tubes are supplied and analysed by Gradko International Ltd. Tubes are all 50% TEA in acetone.

The Stevenage nitrogen dioxide diffusion tube programme is operated through an approved laboratory (Gradko International Ltd) with formal accreditation to BS standards, and one that participates in the AIR-PT programme.

Diffusion Tube Annualisation

All diffusion tube monitoring locations within Stevenage Borough Council recorded data capture of 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2021 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG16 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube

monitoring. Stevenage Borough Council have applied a national bias adjustment factor of 0.83 to the 2020 monitoring data. A summary of bias adjustment factors used by Stevenage Borough Council over the past five years is presented in Table C.1.

Table C.1 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2020	National	06/21	0.83
2019	National	09/20	0.87
2018	National	06/19	0.89
2017	National	09/18	0.97
2016	National	06/17	0.98

NO_2 Fall-off with Distance from the Road

Wherever possible, local authorities should ensure that monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure should be estimated using the Diffusion Tube Data Processing Tool/NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO_2 concentrations corrected for distance are presented in Table B.1.

No diffusion tube NO_2 monitoring locations within Stevenage Borough Council required distance correction during 2020.

QA/QC of Automatic Monitoring

Automatic measurements of $PM_{2.5}$ were made using a BAM-1020, a beta attenuation mass monitor.

Measurements of NOx were made using an Enviro Technology Model 200E, a chemiluminescent method analyser.

All measurements were logged by the instruments themselves and collected by Enviro Technology hourly. Measurements from the monitoring Site were validated by Ricardo using the most up to date calibration factors and publicly disseminated in near real time on the HBAQN web page http://www.airqualityengland.co.uk/local-authority/?la_id=408

PM$_{10}$ and PM$_{2.5}$ Monitoring Adjustment

The type of PM$_{2.5}$ monitor utilised within Stevenage Borough Council do not required the application of a correction factor.

Automatic Monitoring Annualisation

All automatic monitoring locations within Stevenage Borough Council recorded data capture of greater than 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

NO$_2$ Fall-off with Distance from the Road

Wherever possible, local authorities should ensure that monitoring locations are representative of exposure. However, where this is not possible, the NO$_2$ concentration at the nearest location relevant for exposure should be estimated using the NO$_2$ fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO$_2$ concentrations corrected for distance are presented in Table B.1.
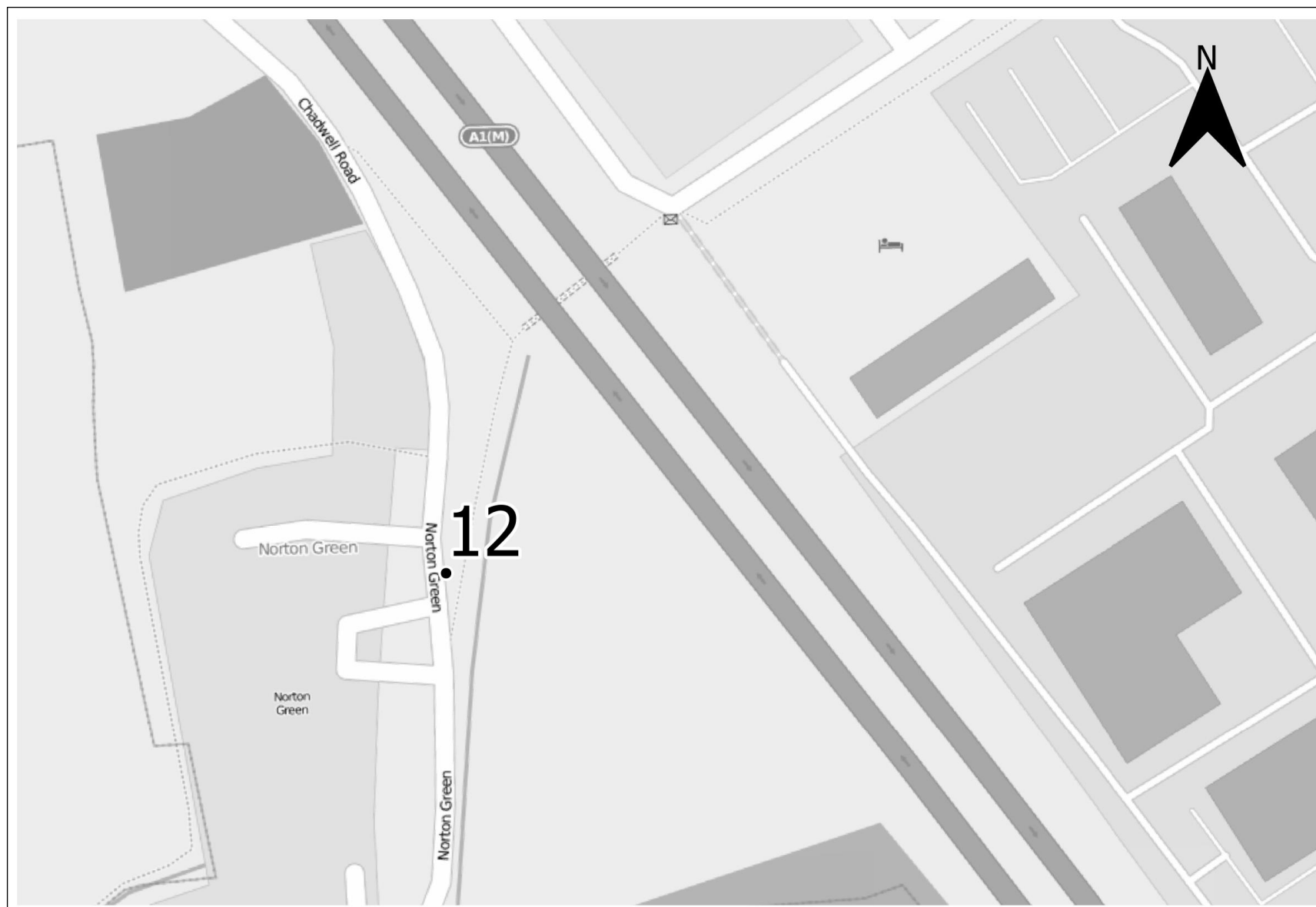
No automatic NO$_2$ monitoring locations within Stevenage Borough Council required distance correction during 2020.

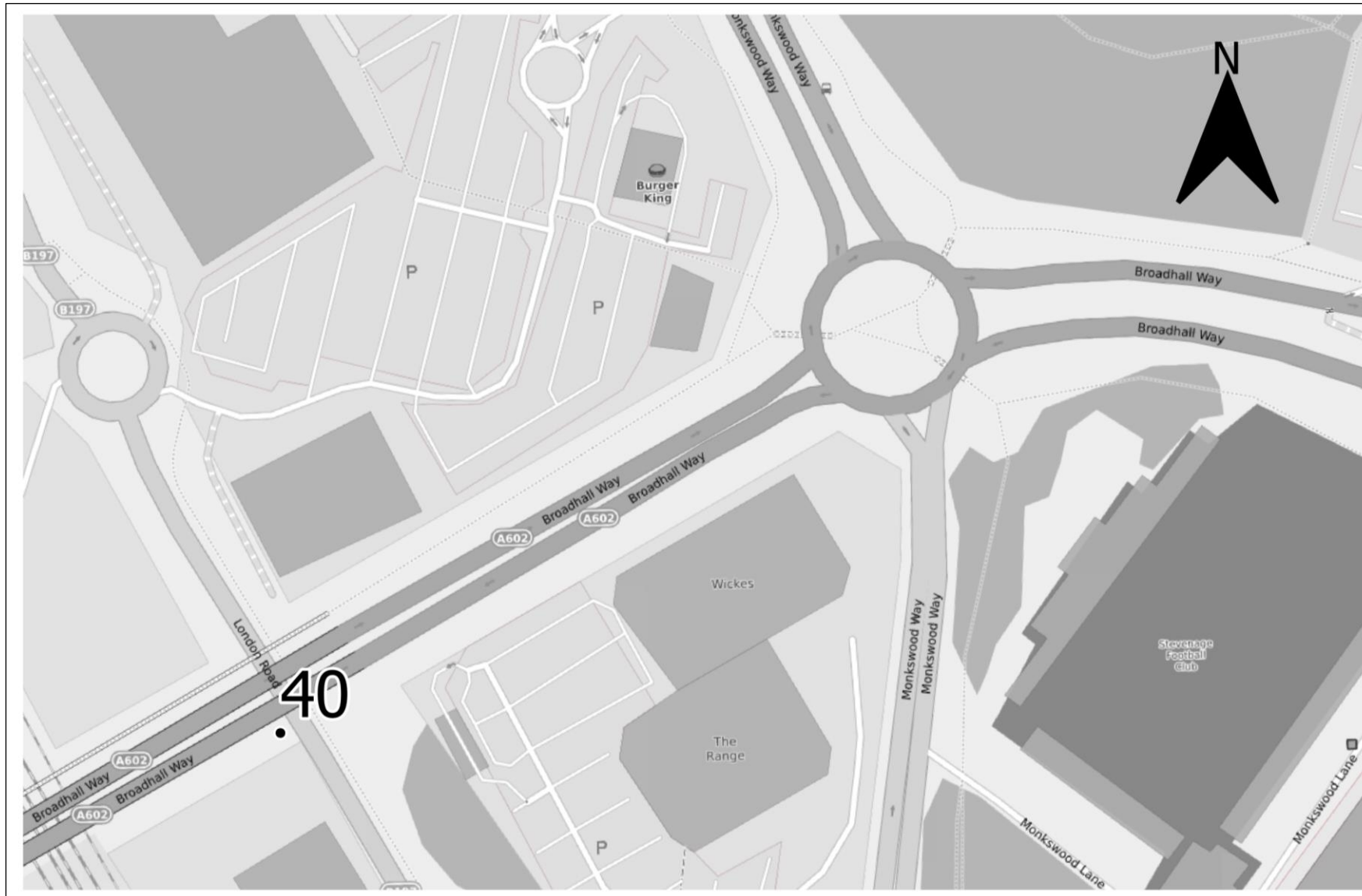# Appendix D: Map(s) of Monitoring Locations and AQMAs

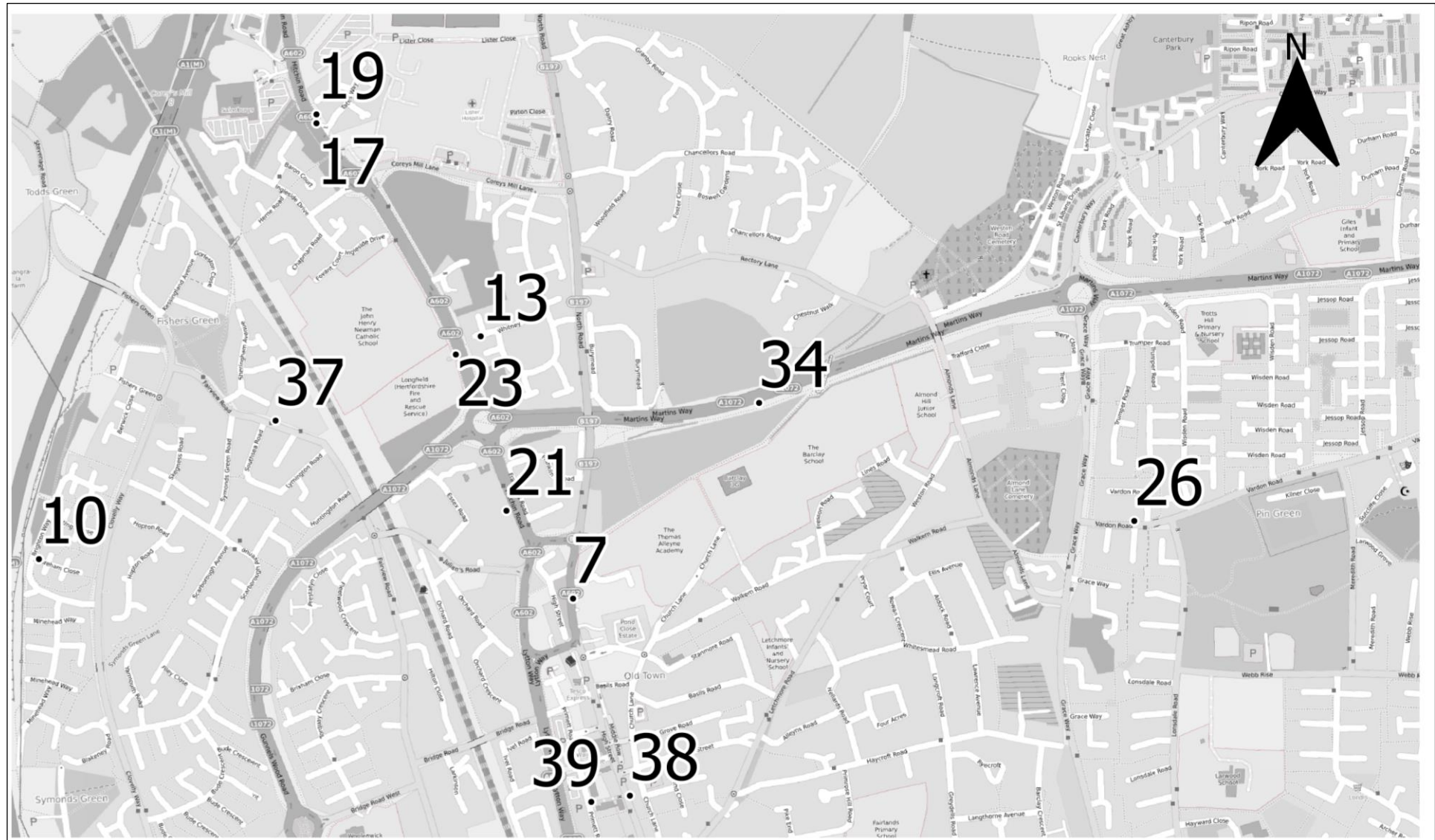**Figure D.1 – Maps of Non-Automatic Monitoring Site**
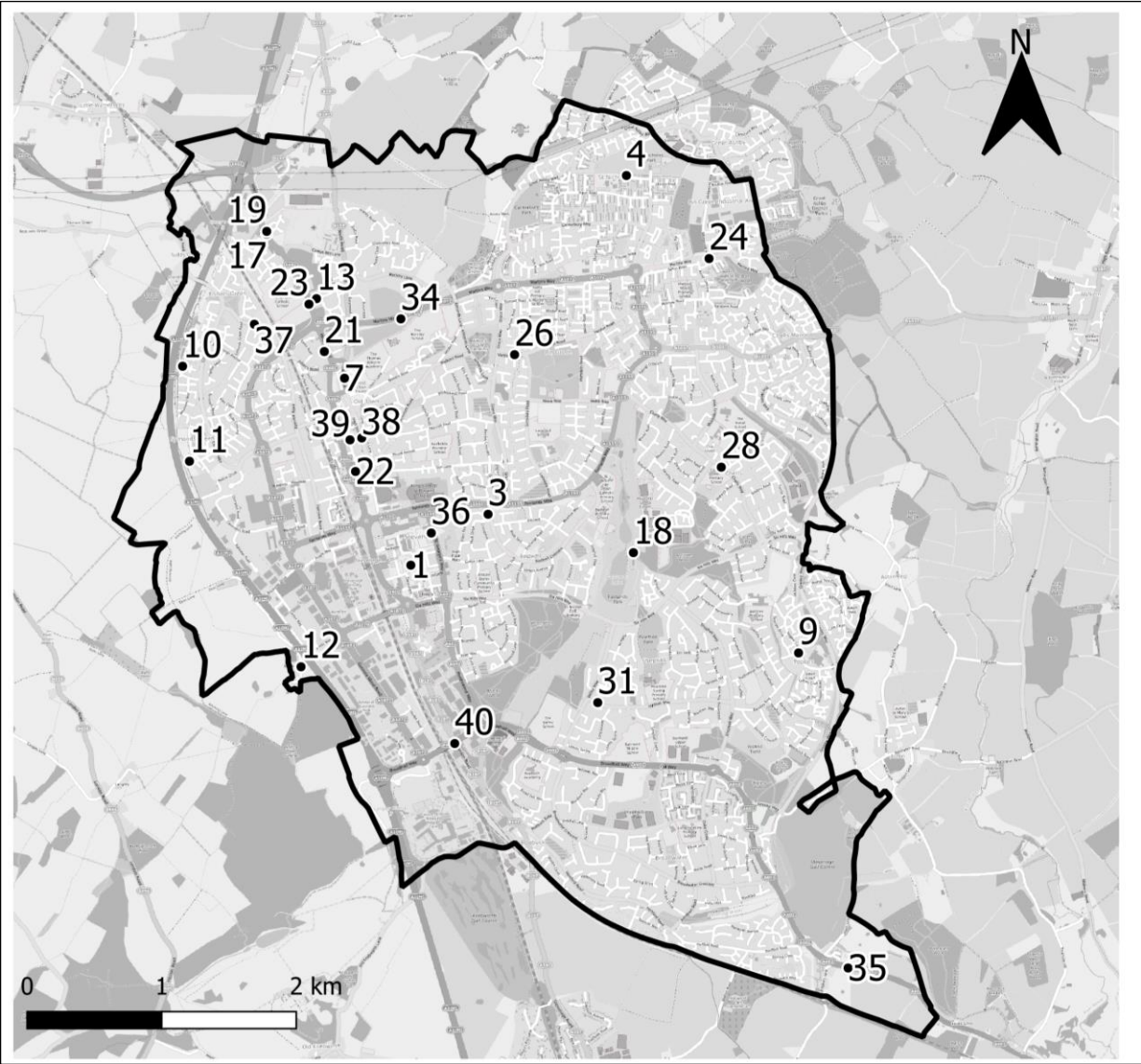
Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[7]

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO_2)	200µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO_2)	40µg/m^3	Annual mean
Particulate Matter (PM_{10})	50µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM_{10})	40µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO_2)	125µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO_2)	266µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

---

[7] The units are in microgrammes of pollutant per cubic metre of air (µg/m^3).

Appendix F: Impact of COVID-19 upon LAQM

COVID-19 has had a significant impact on society. Inevitably, COVID-19 has also had an impact on the environment, with implications to air quality at local, regional and national scales.

COVID-19 has presented various challenges for Local Authorities with respect to undertaking their statutory LAQM duties in the 2021 reporting year. Recognising this, Defra provided various advice updates throughout 2020 to English authorities, particularly concerning the potential disruption to air quality monitoring programmes, implementation of Air Quality Action Plans (AQAPs) and LAQM statutory reporting requirements. Defra has also issued supplementary guidance for LAQM reporting in 2021 to assist local authorities in preparing their 2021 ASR. Where applicable, this advice has been followed.

Despite the challenges that the pandemic has given rise to, the events of 2020 have also provided Local Authorities with an opportunity to quantify the air quality impacts associated with wide-scale and extreme intervention, most notably in relation to emissions of air pollutants arising from road traffic. The vast majority (>95%) of AQMAs declared within the UK are related to road traffic emissions, where attainment of the annual mean objective for nitrogen dioxide (NO_2) is considered unlikely. On 23rd March 2020, the UK Government released official guidance advising all members of public to stay at home, with work-related travel only permitted when absolutely necessary. During this initial national lockdown (and to a lesser extent other national and regional lockdowns that followed), marked reductions in vehicle traffic were observed; Department for Transport (DfT) data[8] suggests reductions in vehicle traffic of up to 70% were experienced across the UK by mid-April, relative to pre COVID-19 levels.

This reduction in travel in turn gave rise to a change of air pollutant emissions associated with road traffic, i.e. nitrous oxides (NO_x), and exhaust and non-exhaust particulates (PM). The Air Quality Expert Group (AQEG)[9] has estimated that during the initial lockdown period in 2020, within urbanised areas of the UK reductions in NO_2 annual mean

---

[8] Prime Minister's Office, COVID-19 briefing on the 31st of May 2020

[9] Air Quality Expert Group, Estimation of changes in air pollution emissions, concentrations and exposure during the COVID-19 outbreak in the UK, June 2020

concentrations were between 20 and 30% relative to pre-pandemic levels, which represents an absolute reduction of between 10 to 20µg/m^3 if expressed relative to annual mean averages. During this period, changes in PM$_{2.5}$ concentrations were less marked than those of NO$_2$. PM$_{2.5}$ concentrations are affected by both local sources and the transport of pollution from wider regions, often from well beyond the UK. Through analysis of AURN monitoring data for 2018-2020, AQEG have detailed that PM$_{2.5}$ concentrations during the initial lockdown period are of the order 2 to 5µg/m^3 lower relative to those that would be expected under business-as-usual conditions.

As restrictions are gradually lifted, the challenge is to understand how these air quality improvements can benefit the long-term health of the population.

Impacts of COVID-19 on Air Quality within Stevenage Borough Council

Reductions of NO$_2$ concentrations of between 20 and 30% were experienced at roadside diffusion tube monitoring sites during 2020. It is likely that this affect is associated with reduced traffic levels caused by travel restrictions during the lockdowns implemented to reduced the spread of COVID-19.

Opportunities Presented by COVID-19 upon LAQM within Stevenage Borough Council

No LAQM related opportunities have arisen as a consequence of COVID-19 within Stevenage Borough Council

Challenges and Constraints Imposed by COVID-19 upon LAQM within Stevenage Borough Council

No challenges or constraints relating to LAQM have arisen during 2020 as a consequence of COVID-19 within Stevenage Borough Council.

Table F 1 – Impact Matrix

Category	Impact Rating: None	Impact Rating: Small	Impact Rating: Medium	Impact Rating: High
Automatic Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Automatic Monitoring – QA/QC Regime	Adherence to requirements as defined in LAQM.TG16	Routine calibrations taken place frequently but not to normal regime. Audits undertaken alongside service and maintenance programmes	Routine calibrations taken place infrequently and service and maintenance regimes adhered to. No audit achieved	Routine calibrations not undertaken within extended period (e.g. 3 to 4 months). Interruption to service and maintenance regime and no audit achieved
Passive Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Passive Monitoring – Bias Adjustment Factor	Bias adjustment undertaken as normal	<25% impact on normal number of available bias adjustment colocation studies (2020 vs 2019)	25-50% impact on normal number of available bias adjustment studies (2020 vs 2019)	>50% impact on normal number of available bias adjustment studies (2020 vs 2019) and/or applied bias adjustment factor studies not considered representative of local regime
Passive Monitoring – Adherence to Changeover Dates	Defra diffusion tube exposure calendar adhered to	Tubes left out for two exposure periods	Tubes left out for three exposure periods	Tubes left out for more than three exposure periods
Passive Monitoring – Storage of Tubes	Tubes stored in accordance with laboratory guidance and analysed promptly.	Tubes stored for longer than normal but adhering to laboratory guidance	Tubes unable to be stored according to be laboratory guidance but analysed prior to expiry date	Tubes stored for so long that they were unable to be analysed prior to expiry date. Data unable to be used
AQAP – Measure Implementation	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP
AQAP – New AQAP Development	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

References

- Local Air Quality Management Technical Guidance LAQM.TG16. April 2021. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG16. May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Stevenage Borough Council Green Travel Plan 2013 to 2018
- Stevenage Air Quality Strategy
- Local Plan Mobility Strategy
- Diffusion Tubes for Ambient NO_2 Monitoring: Practical Guidance