



**Bromsgrove**  
District Council  
[www.bromsgrove.gov.uk](http://www.bromsgrove.gov.uk)

Worcestershire  
**Regulatory Services**

*Supporting and protecting you*

# 2021 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995  
Local Air Quality Management

Date: [June 2021](#)

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# Executive Summary: Air Quality in Our Area

## Air Quality in Bromsgrove District

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<sup>1,2</sup>.

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

Worcestershire Regulatory Services (WRS) is a shared service formed from the Environmental Health and Licensing departments of the six Worcestershire District Councils. Responsibility for managing (monitoring and reporting of) local air quality transferred from the partnership councils to WRS in April 2011.

There are currently three Air Quality Management Areas (AQMA's) within the Bromsgrove District declared for exceedances of the annual average mean objective for nitrogen dioxide (NO<sub>2</sub>). The Kidderminster Road, Hagley AQMA was revoked in 2018 following a detailed review which identified no significant exceedances of the national objectives in over five years with measured concentrations being well below the objective.

The existing AQMAs are as follows:

- Lickey End, Bromsgrove AQMA declared 26th July 2001
- Redditch Road, Bromsgrove AMQA declared 17th February 2010
- Worcester Road, Bromsgrove AQMA declared 24th October 2011

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<sup>1</sup> Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

<sup>2</sup> Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

<sup>3</sup> Defra. Air quality appraisal: damage cost guidance, July 2020

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

Details of declaration and plans of the AQMAs can be found on the following pages of the WRS website: <http://www.worcsregservices.gov.uk/pollution/air-quality/air-quality-management-areas.aspx>

Monitoring data from 2020 does not represent a standard year with the emergence of the Covid Pandemic and first lockdown in March and subsequent lockdowns that followed. With the number of vehicle journeys massively reduced much lower concentrations of nitrogen dioxide can be seen in all locations compared to previous years.

In 2020 the highest concentrations of NO<sub>2</sub> recorded across the monitoring network was at newly established location HAG5 with a value of 29.5µg/m<sup>3</sup>. No exceedances of the annual mean objective were recorded.

Concentrations within all AQMAs were well below the objective in 2020. The highest concentration recorded within the Worcester Road AQMA was 29.4µg/m<sup>3</sup> at WR, 23.1µg/m<sup>3</sup> within the Redditch Road AQMA at 19, and 29.1µg/m<sup>3</sup> at location LE4 in the Lickey End AQMA.

No exceedances were recorded within the revoked Kidderminster Road, Hagley AQMA with highest concentrations of 19.5µg/m<sup>3</sup> recorded at both RES2 and 9 within the former boundary area. Following revocation of the AQMA four new monitoring locations were established in May 2018 further to the south along Worcester Road, West Hagley. Following annualisation of 2018 data a concentration of 47.01µg/m<sup>3</sup> was recorded at one of the new locations HAG3 however there was a level of uncertainty associated with the result as it was based upon only 7 months data. 2019 provided a full calendar years' worth of data with a value of 33.7µg/m<sup>3</sup> recorded at HAG3. Two new monitoring locations, HAG5 and HAG6, were established in the vicinity of HAG3 for the 2020 period to provide additional certainty to air quality concentrations in the area. Concentrations of 29.5µg/m<sup>3</sup> were recorded at HAG5 and 16.6µg/m<sup>3</sup> at HAG6.

3 new locations were also established along the Stourbridge Road for the start of 2020 in an area that hadn't been monitored for a number of years. These are SBR1 (lamppost outside 61 Stourbridge Road, Bromsgrove), SBR2 (lamppost outside Sainsbury Local, 189 Stourbridge Road) and SBR3 (lamppost outside 285 Stourbridge Road, near to the M42 underpass). Concentrations recorded were 24.9µg/m<sup>3</sup> at SBR1, 18.4µg/m<sup>3</sup> at SBR2, and 25.9µg/m<sup>3</sup> at SBR3 during the 2020 period.

Monitoring results within the Bromsgrove District (BDC) area demonstrate a general downward trend in concentrations across the district in 2020 and over the 5-year period 2016 – 2020.

## 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<sup>5</sup> sets out the case for action, with goals even more ambitious than EU requirements to reduce exposure to harmful pollutants. The Road to Zero<sup>6</sup> 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.

In 2013, WRS produced a countywide Air Quality Action Plan (AQAP) for Worcestershire which was adopted on 13<sup>th</sup> November 2013. WRS have produced two updates to the countywide AQAP, the latest in September 2016. For details of all measures previously completed, in progress or planned, please refer to the 'Air Quality Action Plan Progress Report for Worcestershire April 2015-2016'. A copy of this, the previous update and the AQAP is available to download from the WRS website via:

<http://www.worcsregservices.gov.uk/pollution/air-quality/air-quality-action-plan.aspx>

In 2014, WRS set up the Worcestershire Air Quality Steering Group and subsequent sub-groups to facilitate progressing implementation of prioritised actions identified in the AQAP. The Bromsgrove Urban (Steering) Sub-Group includes the Lickey End, Redditch Road, and Worcester Road AQMAs. A separate sub-group covered the Kidderminster Road, Hagley AQMA. The sub-groups comprise representatives of WRS, Worcestershire County Council, and local County and district Councilors.

Many of the prioritised actions contained within the AQAP relate to specific highways improvements or junction enhancements. Worcestershire County Council (WCC) has previously advised that none of these actions would be implemented in isolation but may be considered as part of wider schemes. A number of proposals for major highway development packages are set out in Local Transport Plan 4 (LTP4) relating to the Bromsgrove area.

WCC's LTP4 details the following schemes in relation to the Bromsgrove District highway improvements: -

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<sup>5</sup> Defra. Clean Air Strategy, 2019

<sup>6</sup> DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

- **Bromsgrove Route Enhancement Programme (BREP) Major Scheme**

The Bromsgrove Route Enhancement Programme (BREP) is currently estimated to have a value of approximately £50 million. The scheme aims to support the sustainable growth of Bromsgrove by enhancing the A38 corridor from Lydiate Ash to Hanbury Turn and includes a series of junction/island enhancements where delay and congestion is currently experienced, and where conditions are predicted to deteriorate further without intervention.

Worcestershire County Council held public information sessions in early 2020 and work to progress the outline business case continues for submission to the DfT in Autumn 2020, under the auspices of Midlands Connect. At the time of writing it is understood that the majority of Phase 1 has been completed subject to landscaping and snagging. Phase 2 A38 BREP Schemes commenced in spring 2021 with funding provided by the Worcestershire Local Enterprise Partnership. An Outline Business Case for Phase 3 is due for submission in summer 2021 to be followed by submission of the Final Business Case due in Spring 2022.

Further details can be found on Worcestershire County Council's website via the following link: -

[Phase 2 and 3 A38 BREP improvements | Phase 2 and 3 A38 BREP improvements | Worcestershire County Council](#)

- **Lickey End (M42 Junction 1) - Major Junction Enhancement Scheme**

Lickey End (M42, Junction 1) is widely recognised as operating in excess of built capacity and so is now heavily congested at peak times. The junction is the focus for an Air Quality Management Area and offers a challenging environment for non-motorised users. This scheme was included as part of Phase 1 of BREP and provides preliminary highway improvements to enhance capacity at the Junction. The Phase 1 scheme also included:-

- A38/Barley Mow Lane capacity improvements (completed)
- Improvements in capacity at M5 J4 (Lydiate Ash) – underway June/July 2020

[Phase 1 A38 BREP improvements | Phase 1 A38 BREP improvements | Worcestershire County Council](#)

- **Bromsgrove Transport Strategy**

This scheme is part of the Strategic Transport Assessment (STA) work which will identify infrastructure and services to support planned development growth. This is part of a collaborative process between Worcestershire County Council and Bromsgrove District Council.

The scheme aims to provide a package of Public Realm Enhancements in Bromsgrove Town Centre and would be integrated with other schemes in the area (such as BREP/A38 and the Strategic Active Travel Investment Programme). The scheme is to provide a comprehensive multimodal review of network efficiency and infrastructure to identify where to focus investment to improve the operation of the local transport network. This would also include a review of Bromsgrove's highway network to explore options to improve and disperse traffic flow to increase efficiency and AQMA remediation at Worcester Road.

- **Bromsgrove – Strategic Active Travel Network Investment Programme (Including Catshill, Marlbrook and Lickey End)**

The Active Travel Investment Programme is a systemic investment in walking and cycling links across the Bromsgrove area to create a safe, comprehensive, integrated network linking residential areas with key trip attractors, including schools, rail stations, town center's and employment locations. This includes surfacing, signage, lighting, and public realm improvements to create an attractive and coherent network.

It is understood that the scheme has been completed. A full list of updates can be accessed via the following link: -

[Bromsgrove Walking and Cycling Scheme Latest Updates | Worcestershire County Council](#)

In addition to the above schemes other actions have also been progressed including:-

- **Electric Vehicle Infrastructure Strategy** – The Bromsgrove Ultra Low-Emission Vehicles Strategy has been produced by officers of Bromsgrove District Council in 2019 as a framework for the development and growth of ULEV infrastructure and uptake within the district. The strategy can be viewed via:-

[Bromsgrove-District-Council-Ultra-Low-Emissions-Vehicles-Strategy.pdf](#)

- **Ultra-Low Emission Taxi Infrastructure Scheme** - In 2018 Bromsgrove District Council officers made a bid for funds to help deliver infrastructure to support existing taxi drivers using electrical vehicles and encourage further uptake. The bid was approved in early 2019. The scheme is aiming to provide a number of electric vehicle charging points for taxis and private hire vehicles equating to a total of £300,000. A ULEV Strategy for the Bromsgrove District was produced in 2019 to provide a framework for implementation of this project.

In 2020 Bromsgrove District Council appointed a company to install and operate 13 rapid chargers across the District for the next 10 years. The chargers will use 100% renewable energy purchased from UK sources. At the time of writing charging points have been installed at 6 locations with a further 2 awaiting commission.

- **All Electric Bus Town Scheme** – Worcestershire County Council submitted an Expression of Interest to the DfT All Electric Bus Town process (Phase 1) in June 2020. The bid is primarily to cover Bromsgrove but with ‘synergies’ with Redditch and the wider Worcestershire area. If the bid is shortlisted, the next stage (Phase 2), would be to develop a more detailed business case for the proposal.

## Conclusions and Priorities

Currently three AQMAs are in place within the Bromsgrove District area. The available data indicates that there were no exceedances of the annual mean objective at any monitoring locations across the district during 2020. The highest concentrations of NO<sub>2</sub> recorded was a value of 29.5µg/m<sup>3</sup>. This is not surprising given the circumstances with the emergence of the COVID-19 pandemic and subsequent lockdowns. Vehicle traffic was greatly reduced from March onwards and did not return to normal volumes throughout the rest of the year.

5 new monitoring locations were established at the start of 2020. Two were located in the Hagley area to complement existing locations and three new locations were established along the Stourbridge Road corridor where monitoring had not been conducted for a significant period. The new monitoring locations are referred to as HAG5, HAG6, SBR1, SBR2, and SBR3.

Monitoring, review and assessment of air quality will continue within the Bromsgrove District area at all existing and former AQMAs and other relevant areas. No changes to existing AQMAs are proposed at this stage.

## Local Engagement and How to get Involved

There are several ways members of the public can help to improve local air quality:

- **Walk or cycle, leave your car at home:** Leaving your car at home and walking or cycling instead will benefit in three ways - increased exercise, reduced pollution exposure and will reduce individual’s pollution emissions.
- WCC have launched a car sharing website, **LiftShare**, to help people find others journeying to the same destinations to share journeys and costs, and reduce traffic and emissions. Visit this link for more information:

[Worcestershire Liftshare community - part of the Liftshare network](#)

- **Turn off your engine when stationary or parked,** do not ‘idle’, particularly outside sensitive receptors such as schools, hospitals, care homes and residential properties.



- General **travel planning** advice is available on WCC's website (including walking, cycling and bus maps and timetables) and Government website:
  - [http://www.worcestershire.gov.uk/info/20007/travel\\_and\\_roads](http://www.worcestershire.gov.uk/info/20007/travel_and_roads)
  - <https://www.gov.uk/government/publications/smarter-choices-main-report-about-changing-the-way-we-travel>
- **Hold meetings by Conference Call** by phone or Skype rather than driving to meetings. This reduces fuel and other travel costs, vehicle maintenance and hire cost, increases productivity through reduction in hours lost through unnecessary travel.
- Facilitate **Flexible Working Arrangements** for non-front line staff to work remotely from home or nearer home facilities for one or more days a week thus removing or reducing any journey to work. This reduces congestion which has beneficial impacts for delivery times, reduced business costs and thus economic benefits. Additionally, provides social benefits through improved work life balance for employees, reduces local air quality and reduced emergency vehicle response times.
- **Switch Fleet to Low Emission Vehicles:** The government is providing £80m funding to encourage installation of EV charging points. Eligible businesses, charities, and public sector organisations with off street parking for staff or vehicles fleets can apply for vouchers to redeem costs of electric vehicle charge-points. There is a limit of 1 voucher per applicant; however, applicants with a 'franchise' may apply for up to 20 franchisees. There is an approved charge points list and a list of authorised installers.

<https://www.gov.uk/government/collections/government-grants-for-low-emission-vehicles#workplace-charging-scheme>

- If you must drive follow fuel efficient driving advice, often known as 'Smarter Driving Tips', to save on fuel and reduce your emissions. Several websites promote such advice including:
  - <http://www.energysavingtrust.org.uk/transport/driving-advice>
  - <https://www.theaa.com/driving-advice/fuels-environment/drive-smart>
  - <https://www.vehicle-certification-agency.gov.uk/fcb/smarter-driving-tips.asp>
- **Reduce air pollution from open fires and wood-burning stoves.** Advice is available from Defra on choosing the right stove, using the right fuels and maintenance enabling householders to reduce their impact on their health and air quality from open fires and wood burning stoves. Further information is available on the [Smokeless Zones](#) and [Public Advice](#) pages on WRS website.

Air pollution can affect all of us over our lifetime however certain groups will be more sensitive to the effects of air pollution. Vulnerable groups include adults and children with lung or heart conditions

such as asthma, chronic bronchitis, emphysema and chronic obstructive lung disease (COPD)<sup>7,8</sup>. Senior citizens are more likely to be affected by respiratory diseases and children are more likely to be affected by air pollution due to relatively higher breathing and metabolic rates as well as a developing lung and immune system.

**Vulnerable individuals and groups can keep informed of:**

- Current levels and forecasts of air pollution from Defra at <https://uk-air.defra.gov.uk/>.
- If you are sensitive to the effects of air pollution, it may be appropriate to limit the length of time spent in areas of local poor air quality – see advice from Defra at <https://uk-air.defra.gov.uk/air-pollution/daqj>.
- If you are on social media, sign up to the WRS Twitter feed @RegServs. WRS tweet when pollution is forecast by Defra to be moderate to very high.

Further information for the general public on reducing your family's exposure to poor air quality in Worcestershire and how individuals, business and schools can assist with reducing their impact on local air quality can currently be found at <http://www.worcsregservices.gov.uk/pollution/air-quality/public-advice.aspx> .

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<sup>7</sup> <http://www.breathelondon.org/>

<sup>8</sup> <https://www.londonair.org.uk/LondonAir/guide/MyActionsForMe.aspx>

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# 1 Local Air Quality Management

This report provides an overview of air quality in the Bromsgrove District 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 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 Bromsgrove District 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.

## 2 Actions to Improve Air Quality

### 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.

A summary of AQMAs declared by Bromsgrove District Council can be found in Table 2.1. The table presents a description of the three AQMAs that are currently designated within the Bromsgrove District. Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of AQMAs and the air quality monitoring locations in relation to the AQMAs. The air quality objectives pertinent to the current AQMA designations are as follows:

- NO<sub>2</sub> annual mean

Further information relating to declared or revoked AQMAs, including maps of AQMA boundaries are available online at

- <http://www.worcsregservices.gov.uk/pollution/air-quality/air-quality-management-areas.aspx>

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Name and Date of AQAP Publication	Web Link to AQAP
<b>Lickey End, Bromsgrove AQMA</b>	26th July 2001	NO2 Annual Mean	Residential properties along four roads emanating from the Junction 1 M42	YES	45.7	29.1	Air Quality Action Plan for Worcestershire 2013	Air Quality Action Plan for Worcestershire (2013) <a href="http://www.worcsregservices.gov.uk/pollution/air-quality/air-quality-action-plan.aspx">http://www.worcsregservices.gov.uk/pollution/air-quality/air-quality-action-plan.aspx</a>
<b>Redditch Road, Bromsgrove AQMA</b>	17th February 2010	NO2 Annual Mean	Long stretch of the A38 including a number of residential properties	YES	45.6	23.1	Air Quality Action Plan for Worcestershire 2013	
<b>Worcester Road, Bromsgrove AQMA</b>	24th October 2011	NO2 Annual Mean	Comprises mainly the B4091 Worcester Road single carriageway southwest of the town centre	NO	56	29.4	Air Quality Action Plan for Worcestershire 2013	

Bromsgrove District Council confirm the information on UK-Air regarding their AQMA(s) is up to date.

Bromsgrove District Council confirm that all current AQAPs have been submitted to Defra.

## Progress and Impact of Measures to address Air Quality in Bromsgrove District Council

Defra's appraisal of last year's ASR concluded: -

*"The report is well structured, detailed, and provides the information specified in the Guidance. The following comments are designed to help inform future reports.*

- 1. Robust and accurate QA/QC procedures were applied. Calculations for bias adjustment, annualisation and distance-correction factors were outlined in detail.*
- 2. The Council has included discussion and review of both its AQMAs and monitoring strategy, informed in large part by the extensive monitoring network in place. This demonstrates the Council's proactive and dedicated approach to improving air quality across Bromsgrove.*
- 3. Comments from last year's ASR have been mentioned and addressed with the exception of one (see point 6 below). This is welcomed, and we encourage this to continue in future ASRs.*
- 4. The Council is encouraged to adopt a revised AQAP in the next reporting year to ensure that the current measures in place are appropriate to align with and target the air pollution in the area.*
- 5. The Council has an extensive NO<sub>2</sub> monitoring strategy. Monitoring of other pollutants, while not compulsory, could be considered to better inform how to tackle other pollution present in the area.*
- 6. Regarding PM<sub>2.5</sub>, the council has provided information regarding to the measures in reducing of this pollutant. We encourage that there are links to the Public Health Outcomes Framework. The Council could consider referring specifically to indicator D01. Fraction of mortality attributable to particulate air pollution. This was mentioned in the previous appraisal also.*
- 7. Overall, the report is detailed, concise and satisfies the criteria of relevant standards. The Council should continue their good work".*

Bromsgrove District Council has taken forward several direct measures during the current reporting year of 2020 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. 34 measures are included within Table 2.2, with the type of measure and the progress Bromsgrove District Council have made during the reporting year of 2020 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.



More detail on these measures can be found in their respective Action Plans. Key measures that have been progressed since the previous 2020 ASR are:

- **Bromsgrove Route Enhancement Programme (BREP) Major Scheme**

The Bromsgrove Route Enhancement Programme (BREP) is currently estimated to have a value of approximately £50 million. The scheme aims to support the sustainable growth of Bromsgrove by enhancing the A38 corridor from Lydiate Ash to Hanbury Turn and includes a series of junction/island enhancements where delay and congestion is currently experienced, and where conditions are predicted to deteriorate further without intervention.

Worcestershire County Council held public information sessions in early 2020 and work to progress the outline business case continues for submission to the DfT in Autumn 2020, under the auspices of Midlands Connect. At the time of writing it is understood that the majority of Phase 1 has been completed subject to landscaping and snagging. Phase 2 A38 BREP Schemes commenced in spring 2021 with funding provided by the Worcestershire Local Enterprise Partnership. An Outline Business Case for Phase 3 is due for submission in summer 2021 to be followed by submission of the Final Business Case due in Spring 2022.

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[Phase 2 and 3 A38 BREP improvements | Phase 2 and 3 A38 BREP improvements | Worcestershire County Council](#)

- **Lickey End (M42 Junction 1) - Major Junction Enhancement Scheme**

Lickey End (M42, Junction 1) has been widely recognised as operating in excess of built capacity and so is now heavily congested at peak times. The junction is the focus for an Air Quality Management Area and offers a challenging environment for non-motorised users. This scheme was included as part of Phase 1 of BREP and provides preliminary highway improvements to enhance capacity at the Junction. The Phase 1 scheme also included:-

- A38/Barley Mow Lane capacity improvements (completed)
- Improvements in capacity at M5 J4 (Lydiate Ash) – underway June/July 2020

[Phase 1 A38 BREP improvements | Phase 1 A38 BREP improvements | Worcestershire County Council](#)

- **Bromsgrove Transport Strategy**

This scheme is part of the Strategic Transport Assessment (STA) work which will identify infrastructure and services to support planned development growth. This is part of a

collaborative process between Worcestershire County Council and Bromsgrove District Council.

The scheme aims to provide a package of Public Realm Enhancements in Bromsgrove Town Centre and would be integrated with other schemes in the area (such as BREP/A38 and the Strategic Active Travel Investment Programme). The scheme is to provide a comprehensive multimodal review of network efficiency and infrastructure to identify where to focus investment to improve the operation of the local transport network. This would also include a review of Bromsgrove's highway network to explore options to improve and disperse traffic flow to increase efficiency and help AQMA remediation at Worcester Road.

- **Bromsgrove – Strategic Active Travel Network Investment Programme (Including Catshill, Marlbrook and Lickey End)**

The Active Travel Investment Programme is a systemic investment in walking and cycling links across the Bromsgrove area to create a safe, comprehensive, integrated network linking residential areas with key trip attractors, including schools, rail stations, town center and employment locations. This includes surfacing, signage, lighting, and public realm improvements to create an attractive and coherent network.

It is understood that the scheme has been completed with additional provision to follow alongside the A38 that will complement and enhance the network especially the links across the town to the east and west.. A full list of updates can be accessed via the following link: -

[Bromsgrove Walking and Cycling Scheme Latest Updates | Worcestershire County Council](#)

- **Electric Vehicle Infrastructure Strategy** – The Bromsgrove Ultra Low-Emission Vehicles Strategy has been produced by officers of Bromsgrove District Council in 2019 as a framework for the development and growth of ULEV infrastructure and uptake within the district. The strategy can be viewed via:-

[Bromsgrove-District-Council-Ultra-Low-Emissions-Vehicles-Strategy.pdf](#)

- **Ultra-Low Emission Taxi Infrastructure Scheme** - In 2018 Bromsgrove District Council officers made a bid for funds to help deliver infrastructure to support existing taxi drivers using electrical vehicles and encourage further uptake. The bid was approved in early 2019. The scheme is aiming to provide a number of electric vehicle charging points for taxis and private hire vehicles equating to a total of £300,000. A ULEV Strategy for the Bromsgrove District was produced in 2019 to provide a framework for implementation of this project.

In 2020 Bromsgrove District Council appointed a company to install and operate 13 rapid chargers across the District for the next 10 years. The chargers will use 100% renewable

energy purchased from UK sources. At the time of writing charging points have been installed at 6 locations with a further 2 awaiting commission. The remaining points are likely to have been installed by the end of 2021.

- **All Electric Bus Town Scheme** – Worcestershire County Council submitted an Expression of Interest to the DfT All Electric Bus Town process (Phase 1) in June 2020. The bid is primarily to cover Bromsgrove but with ‘synergies’ with Redditch and the wider Worcestershire area. If the bid is shortlisted, the next stage (Phase 2), would be to develop a more detailed business case for the proposal.

In addition to the above a demand responsive “bus” service is being trialled between the town centre and the railway station as part of the improvements in connectivity between the town and the station.

A scheme is also being developed for Parkside Junction in the town centre, with the aim of reducing congestion through increasing capacity, reducing queuing times at the junction. Expected to commence implementation later in 2021.

Other actions that have either been completed or are ongoing are as follows:-

- **Freight Quality Partnership** - On-going work with satellite navigation companies to route HGVs around AQMAs.
- **Installing electric vehicle charging points** - Recommendations for the installation of EV Charging Points are routinely recommended by WRS to the planning authorities for planning applications meeting relevant criteria.
- **Greening Council and Business Fleets** - Worcestershire County Council Local Transport Plan (LTP4) was formally adopted in November 2017 and incorporates policy on alternative fuels and associated infrastructure:

[http://www.worcestershire.gov.uk/downloads/file/9024/worcestershire\\_s\\_local\\_transport\\_plan\\_ltp\\_2018\\_-\\_2030](http://www.worcestershire.gov.uk/downloads/file/9024/worcestershire_s_local_transport_plan_ltp_2018_-_2030)

- **Travel Planning** - Personalised travel planning program planned as part of wider health improvement drives from the County Council who have developed a “one-stop-shop” online travel portal:

[http://www.worcestershire.gov.uk/info/20007/travel\\_and\\_roads](http://www.worcestershire.gov.uk/info/20007/travel_and_roads)

- **Car Sharing** - A Liftshare scheme is currently in operation for Worcestershire

<https://liftshare.com/uk/community/worcestershire>

- **Air Quality Supplementary Planning Document (SPD)** - WRS officers drafted the SPD in 2017 and updated it in 2018 and 2020. The document includes guidance on requirements for air quality assessments, standard recommendations expected for air quality mitigation

measures, and advice relating to good practice for new development. The document has been sent to the relevant planning authorities for consideration. WRS were hopeful of formal adoption by the District Councils but this is still to take place.

The principal challenges and barriers to implementation that Bromsgrove District Council face are numerous. Some of these challenges relate to the specific site conditions at each AQMA. The Lickey End AQMA is located around the A38 where it meets Junction 1 of the M42. There are numerous properties within the vicinity of this major junction and arterial route. The Redditch Road AQMA relates to another stretch of the A38. The main measured exceedances of the objective have been recorded where properties are located very close to the carriageway. Exceedances were last recorded here in 2016 and were marginal. The area of the Worcester Road AQMA where regular exceedances of the objectives occur is best described as a 'street canyon', consisting of narrow streets with continuous buildings on either side and is a major route for traffic in and out of Bromsgrove. On average approximately 16000 vehicles use this route every day during 'normal' circumstances. Although the Kidderminster Road, Hagley AQMA has been revoked the area remains a major arterial route where congestion is still a significant issue. Approximately 36000 vehicles travel daily along this route on average. Securing funding for improvement schemes is a key factor. Ensuring uptake of greener methods of transport and changes in behaviour are also difficult to achieve without incentives or a lack of alternative options being in place.

Large scale residential development is also proposed within the Bromsgrove District and wider area in future years. Consequently, solving the problem of poor air quality at problem locations within the district is proving to be difficult. Even without further development, and increasing numbers of vehicles, the current road network is already stretched with significant congestion.

Some priority actions relevant to the three Bromsgrove AQMAs highlighted within the original action plan relate to specific highway actions. Historically the County Council have stated that these actions would not be considered for progression in isolation but may be considered as part of one of the larger schemes set out in LTP4. Now that more detail of the LTP4 scheme is known it is unlikely that some of these actions will be considered further however numerous other carriageway improvements in these areas are proposed. It is anticipated that the Action Plan for the Bromsgrove District area will need to be updated in the future to reflect these changes and to consider other viable options. The original action plan for Worcestershire was drafted in 2013 and updated in 2016. Since this time changes have occurred locally and nationally.

The coronavirus pandemic and subsequent lockdowns has obviously had a positive impact on air quality concentrations with fewer journeys being undertaken and more people working from home. It has also had an impact on rollout of some of the prescribed measures such as installation of the EV taxi charge point scheme and various highways works. However, the delays are not considered to be overly significant in respect of timeframes. Concentrations of NO<sub>2</sub> were well below national

objectives in 2020 but circumstances are not representative of previous or future years and therefore cannot be used for decision making in respect of existing AQMAs.

Whilst the measures stated above, and those listed in table 2.2, will help to contribute towards compliance, Bromsgrove District Council anticipates that further additional measures, not yet prescribed, may be required in subsequent years to achieve compliance and enable the revocation of all of the AQMAs. It is hoped that the successful bid for funds made by Bromsgrove District Council and implementation of electrical vehicle charging for taxis and future installation of suitable infrastructure will be the catalyst that helps drive a move to more sustainable modes of transport across the region.

Table 2.2 – 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
<b>LICKEY END, BROMSGROVE AQMA PRIORITY ACTIONS</b>															
BREP1	A38 Bromsgrove Route Enhancement Programme	Traffic Management	UTC, Congestion management, traffic reduction	2017	2025	WCC DFT	WLEP	NO	Partially Funded	> £10 million	Implementation	unknown	Improved traffic flow and less queuing	Phase 1 completed subject to landscaping / snagging. Phase 2 to commence Spring 2021 onwards. Phase 3 outline business case to be submitted Summer 2021, Final Business Case to be submitted spring 2022.	Phase 1 of scheme complete and funding secured for Phase 2 commencing 2021 onwards. Remaining phases of scheme subject to securing funding.
5.1.1	Alteration to phasing of traffic light systems	Traffic Management	UTC, Congestion management, traffic reduction	2013	2025	WCC DFT	WLEP	NO	Partially Funded	> £10 million	Completed	unknown	Improved traffic flow in the area	Phase 1 of the A38 improvement scheme which specifically includes changes to the A38/M42 J1 (AQMA) has been completed subject to snagging / landscaping.	Phase 1 of scheme complete and funding secured for Phase 2 commencing 2021 onwards. Remaining phases of scheme subject to securing funding.
LE4	Narrowing of two lanes into one causes bottleneck at top of A38 south	Traffic Management	UTC, Congestion management, traffic reduction	2013	2025	WCC DFT	WLEP	NO	Not Funded	> £10 million	Planning	unknown	Improved traffic flow in the area	Not included as Phase 1 of the A38 scheme but Scheme F proposes revision of road markings and road widening to provide one lane northbound and two lanes southbound to remove bottleneck.	Later part of schemes subject to funding
LE6	Traffic exiting Barnsley Hall Road right - no right turn restriction.	Traffic Management	UTC, Congestion management, traffic reduction	2013		WCC		NO	Not Funded	£50k - £100k	Aborted	unknown	Improved traffic flow in the area	Not progressed. Not part of the A38 package of enhancements.	Not part of the A38 package of enhancements.
LE7	Turn right into Harvester PH from A38 south. Action no right turn restriction.	Traffic Management	UTC, Congestion management, traffic reduction	2013		WCC		NO	Not Funded	£50k - £100k	Aborted	unknown	Improved traffic flow in the area	Not progressed. Not part of the A38 package of enhancements.	Not part of the A38 package of enhancements.
<b>REDDITCH ROAD, BROMSGROVE AQMA PRIORITY ACTIONS</b>															
5.3.4	Promote Flexible Working arrangements	Promoting Travel Alternatives	Encourage / Facilitate home-working	2013		WCC BDC	Various	NO	Not Funded	£50k - £100k	Implementation	unknown	Increase in number of people able to	County Council have pushed for maximum coverage of fibre	Reliant on uptake from private sector companies

													work from home	optic broadband. Ongoing - 96% coverage as of December 2019.	
5.1.1	Alteration to phasing of traffic light systems	Traffic Management	UTC, Congestion management, traffic reduction	2013	2030	DFT WCC	WLEP	NO	Not Funded	> £10 million	Planning	unknown	Improved traffic flow in the area	Improvements within the AQMA included within A38 enhancement package which includes 12 schemes along the A38 corridor.	Scheme B1 relates to AQMA. Subject to formal planning and funding.
RR7	Two in road bus stops on carriageway either side of central street canyon	Traffic Management	UTC, Congestion management, traffic reduction	2013	2030	DFT WCC	WLEP	NO	Not Funded	> £10 million	Planning	unknown	Improved traffic flow in the area	Improvements within the AQMA included within A38 enhancement package which includes 12 schemes along the A38 corridor.	Scheme B1 relates to AQMA. Subject to formal planning and funding.
5.3.4	Promote flexible working arrangements	Promoting Travel Alternatives	Encourage/facilitate home-working	2013		WCC BDC	Various	NO	Not Funded	£50k - £100k	Implementation	unknown	Increase in number of people able to work from home	County Council have pushed for maximum coverage of fibre optic broadband. Ongoing - 96% coverage as of December 2019.	Reliant on uptake from private sector companies
<b>WORCESTER ROAD, BROMSGROVE AQMA PRIORITY ACTIONS</b>															
5.2.2	Freight Quality Partnership	Traffic Management	UTC, Congestion management, traffic reduction	2013	2018	WCC	WCC	NO	Partially Funded	£50k - £100k	Completed	unknown	Fewer HGVs travelling through AQMA	On-going duty under Traffic Management	Can take time for information to filter down to users. HGVs may still need to travel through AQMAs on major arterial routes.
BR1	Bromsgrove Town Centre Network Review (Bromsgrove Transport Strategy)	Traffic Management	UTC, Congestion management, traffic reduction	2017	2025	WCC BDC	WCC	NO	Funded	> £10 million	Planning	unknown	Improved traffic flow through Bromsgrove town centre and improved journey times	This is now part of the Strategic Transport Assessment (STA) work which will identify infrastructure and services to support planned development growth; this is a collaborative process with WCC and BDC.	Subject to funding
5.3.8	Promote and support walking and cycling initiatives in Worcestershire	Traffic Management	Cycle network	2013	2021	WCC BDC	WCC DFT	NO	Not Funded	> £10 million	Completed	unknown	Increased uptake of alternative modes of transport	The Active Travel Investment Programme is a systemic investment in walking and cycling links across the Bromsgrove area to create a safe, comprehensive, integrated network linking residential areas with key trip attractors, including schools, rail	Scheme now complete, but the additional provision alongside the A38 will complement and enhance the network especially the links across the town to the east and west.

														stations, town centre's and employment locations	
WR3	Zebra crossing at Hanover Street/Worcester Road junction causes congestion	Traffic Management	UTC, Congestion management, traffic reduction	2013	2022	WCC BDC	WCC BDC	NO	Partially Funded	£100k - £500k	Implementation	unknown	Improved traffic flow in the area	Proposals for crossing to be upgraded to Puffin / Toucan crossing as part of improvements to walking and cycling.	
WR9	Local school traffic causes congestion exiting Shrubbery Road – requires junction review	Traffic Management	UTC, Congestion management, traffic reduction	2013	2030	WCC	WCC BDC	NO	Not Funded	£50k - £100k	Planning	unknown	Improved traffic flow in the area	County Council have included package of improvements within LTP4. WCC has commissioned a Strategic Transport Assessment (STA) to support the BDC local plan process and ultimately identify infrastructure schemes to support local plan growth.	Cost of scheme reliant on successful funding bids.
<b>GENERIC ACTIONS APPLICABLE TO ALL AQMAS</b>															
ULEVTIS	Ultra Low Emission Taxi Infrastructure Scheme	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2019	2021	BDC	ULEV taxi infrastructure grant	NO	Funded	£100k - £500k	Implementation	unknown	Increased uptake of electric taxis	BDC successful funding bid in 2018 for taxi electric vehicle charging points of £300,000. A ULEV Strategy for the Bromsgrove District was produced in 2019. Company appointed in 2020 to install/operate 13 rapid chargers for next 10 years. Sites identified and roll out of installation beginning in 2021.	Aimed for completion in 2020 but Covid-19 situation impacted delivery. Anticipated to have all charge points installed by the end of 2021.
5.2.2	Freight Quality Partnership	Traffic Management	UTC, Congestion management, traffic reduction	2013	2018	WCC	WCC	NO	Partially Funded	£50k - £100k	Completed	unknown	Fewer HGVs travelling through AQMA	On-going duty under Traffic Management	Can take time for information to filter down to users. HGVs may still need to travel through AQMA on major arterial routes.
5.2.5	Greening Council and Business Fleets	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2013	2032	BDC WCC	BDC WCC	NO			Implementation	unknown	Increase in number of Council fleet and contractors vehicles of higher Euro Standard and/or utilising alternative fuels	Ongoing	Reliant on uptake from private sector companies



5.2.10	Installing electric vehicle charging points	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2013		BDC WRS	As part of development	NO	Partially Funded	£100k - £500k	Implementation	unknown	Increase in availability of EV charging points and corresponding increase in use of electric vehicles	Standard recommendation for installation of EV Charging Points on relevant planning consents is ongoing. Formalised in SPD but not adopted by BDC planning authority. Electrical charging points for taxi scheme being installed 2021.	
5.3.2	Car Sharing	Alternatives to private car use	Car and lift sharing schemes	2013		WCC	WCC	NO	Not Funded	£10k - 50k	Implementation	unknown	Increase in number of people car sharing	Liftshare website scheme launched Autumn 2015. Currently in operation	Following an initial surge in interest from public, use of service has slowed down
5.3.4	Promote Flexible Working arrangements	Promoting Travel Alternatives	Encourage / Facilitate home-working	2013		WCC BDC	Various	NO	Not Funded	£50k - £100k	Implementation	unknown	Increase in number of people able to work from home	County Council have pushed for maximum coverage of fibre optic broadband. Ongoing - 96% coverage as of December 2019.	Reliant on uptake from private sector companies
5.5.1	Produce Air Quality Supplementary Planning Document	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2013	2018	WRS	WRS BDC	NO	Not Funded	< £10k	Completed	unknown	Formal adoption and use by BDC planning authority	SPD drafted by WRS and provided to Council late 2017. Not yet by BDC planning authority. Updated in 2018 to reflect new NPPF. Likely to be adopted by other Worcs districts. Document is live for use as technical planning and updated periodically.	Conflicting views on SPD from 6 different local authorities hampering adoption of single document.
5.5.4	Encourage developers to provide sustainable transport facilities and links serving new developments	Promoting Travel Alternatives	Personalised travel planning	2013		BDC WCC WRS	WCC BDC	NO	Not Funded	£50k - £100k	Implementation	unknown	Increased uptake of alternative modes of transport	WCC is delivering PTP services on behalf of developers. Building on best practice developed by the Council this proven tool encourages modal shift in new developments towards more sustainable and space efficient forms of transport. WRS make recommendation for standard AQ mitigation measures on all	

														relevant planning apps.	
5.6.3	Air Quality Networks	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2013		WRS CEEPG DEFRA BDC	Officer time (WRS)	NO	Not Funded	< £10k	Implementation	unknown	Improved cross boundary working between local authorities in West Midlands	WRS are member of regional environmental protection managers group (CEEPG) and member of Defra LAQM Team Local Authority Advisory Group both formed in 2017.	Differing AQ issues, priorities and resources in regional authorities. Largely on hold due to global Covid pandemic.
5.6.8	Forge closer links with local health agencies	Other	Other	2013		WRS WCC PHE	DoPH, Officer time (WRS)	NO	Not Funded	< £10k	Implementation	unknown	Increase participation of Public Health in Worcestershire Air Quality issues and action groups	County Air Quality Partnership set up May 2019 by DoPH supported by WRS	On hold due to global Covid pandemic
5.3.1	Travel Planning	Promoting Travel Alternatives	Personalised travel planning	2013		WCC	WCC	NO	Not Funded	On-going	Implementation	unknown	Increased uptake of alternative modes of transport	WCC is delivering PTP services on behalf of developers. Building on best practice developed by the Council this proven tool encourages modal shift in new developments towards more sustainable and space efficient forms of transport.	On-going
5.3.6 (5.3.8 and 5.3.9)	Improve cycling and walking routes in local areas	Promoting Travel Alternatives	Promotion of cycling	2013	2021	WCC BDC	WCC DFT	NO	Not Funded	> £10 million	Completed	unknown	Increased uptake of alternative modes of transport	The Active Travel Investment Programme is a systemic investment in walking and cycling links across the Bromsgrove area to create a safe, comprehensive, integrated network linking residential areas with key trip attractors, including schools, rail stations, town center and employment locations	Scheme now complete, but the additional provision alongside the A38 will complement and enhance the network especially the links across the town to the east and west.
5.4.4	Make air quality information more available and accessible	Public Information	Via the Internet	2013		WRS	Officer time (WRS)	NO	Not Funded	£10k - 50k	Implementation	unknown	Website hits and enquiries for information	All existing LAQM reports and details of AQMAs are available to public on WRS website. WRS use Twitter account to release information.	Ongoing

5.4.2	Provide link to real time air quality information	Public Information	Via the Internet	2013		WRS WCC PHE	Officer time (WRS)	NO	Not Funded	£10k - 50k	Implementation	unknown	Increase in WRS Twitter subscribers	System put in place at WRS to tweet alerts when Air pollution is moderate or worse in any given 5 day forecast on Defra Daily Air Quality Index and shared with County Public Health representative	Limited to Twitter users. Ongoing.
5.45	Raise the profile and increase awareness of air quality within the region	Other	Other	2013		WRS CEEPG MJAC DEFRA	Officer time (WRS)	NO	Not Funded	£10k - 50k	Implementation	unknown	Improved cross boundary knowledge sharing between local authorities in West Midlands	WRS held position of Air Quality technical coordinator for MJAC, member of CEEPG and member of Defra LAQM Team Local Authority Advisory Group both formed in 2017.	WRS was MJAC AQ Technical Coordinator 2014-17. MJAC/CEEPG Knowledge Hub group set up in 2017 delivered by joint working between WRS and Cannock Chase DC. Member of LA advisory group to Defra LAQM team following invitation 2017.
5.4.1	Smarter Driving Tips	Public Information	Via the Internet	2013		WRS & WCC	Officer time (WRS)	NO	Not Funded	£10k - 50k	Implementation	unknown	Increase in website hits	Advice page created for all groups affected by and impacting air quality and shared with County Public Health.	Created Mar 2017, Updated March 2019
<b>FORMER KIDDERMINSTER ROAD HAGLEY AQMA</b>															
5.1.1/KR5	Alteration to phasing of traffic light systems/Junction review	Traffic Management	UTC, Congestion management, traffic reduction	2013	2016	WCC	WCC	NO	Funded	Completed	Completed	Unknown	Improved traffic flow in the area	Signals have been upgraded to latest MOVA technology.	Completed
5.1.4	Variable Message Systems	Traffic Management	UTC, Congestion management, traffic reduction	2013		WCC	WCC	NO	Not Funded	£500k - £1 million	Aborted	Unknown	Raise awareness of AQMAs	AQMA Revoked in 2018/19	
5.1.8	Introduction of signals at roundabout	Public Information	Other	2013	2016	WCC	WCC	NO	Funded	Completed	Completed	Unknown	Improved traffic flow in the area	Signals installed and various revisions made to junction marking	Completed
5.2.2	Freight Quality Partnership	Traffic Management	UTC, Congestion management, traffic reduction	2013	2018	WCC	WCC	NO	Partially Funded	£50k - £100k	Completed	unknown	Fewer HGVs travelling through AQMA	On-going duty under Traffic Management	Can take time for information to filter down to users. HGVs may still need to travel through AQMAs on major arterial routes.

## PM<sub>2.5</sub> – 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<sub>2.5</sub> (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM<sub>2.5</sub> has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

There are currently no automatic PM<sub>2.5</sub> monitoring stations in Worcestershire. The nearest AURN PM<sub>2.5</sub> monitoring station is the Birmingham Acocks Green site approximately 16 miles to the north east of the Bromsgrove District Council area. WRS has reviewed the DEFRA national background maps to determine projected PM<sub>2.5</sub> concentrations within the Bromsgrove District area for the 2020 calendar year. The average total PM<sub>2.5</sub> at 218 locations (centre points of 1km x 1km grids) across the Bromsgrove District is 8.24µg/m<sup>3</sup>, with a minimum concentration of 7.52µg/m<sup>3</sup> and a maximum concentration of 9.55µg/m<sup>3</sup>. This indicates that PM<sub>2.5</sub> concentrations within the Bromsgrove District are well below the annual average EU limit value for PM<sub>2.5</sub> of 25µg/m<sup>3</sup>.

WRS has reviewed the fraction of mortality attributable to particulate air pollution (indicator 3.01) as published by Public Health England (as raised in point 6 above of Defra's appraisal of last year's ASR). The fraction of mortality attributable to particulate emissions in Worcestershire in 2019 (the most recent year available) was 4.8%. This falls below the national figure for England (5.1% in 2019) and below the figure for the West Midlands region (5.3% in 2019). Recent trend data is not available for Worcestershire due to a lack of data points with valid values.

More information on the Public Health Outcomes Frameworks that examines indicators that help us understand trends in public health can be found at:

[Public Health Outcomes Framework - PHE](#)

As outlined in Policy Guidance LAQM.PG16, WRS have discussed the role of the DoPH, and the details of PM<sub>2.5</sub> levels across the County, with the DoPH at Worcestershire County Council. In 2019 a new Air Quality Partnership led by the DoPH and supported by WRS Land and Air Quality Team was set up to discuss potential actions to improve air quality across the County and determine an action plan for implementation. The group comprised officers from the County and District authorities from public health, air quality, strategic planning, sustainability, highways and transport disciplines, and representatives from the NHS and Highways England. The group met initially in May 2019 to discuss terms and references and in September to discuss potential actions.

The group is largely driven by DoPH so, due to Covid-19 taking priority in 2020, the business of the partnership has been postponed indefinitely.

No additional actions are currently planned by Bromsgrove District Council in relation to the reduction of PM2.5 levels. It is anticipated however that any actions taken to improve NO2 levels across the District will result in a linked improvement to PM2.5 levels.

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

This section sets out the monitoring undertaken within Bromsgrove District during 2020 by 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.

### Summary of Monitoring Undertaken

#### 3.1.1 Automatic Monitoring Sites

Bromsgrove District Council did not undertake automatic (continuous) monitoring during 2020

#### 3.1.2 Non-Automatic Monitoring Sites

Bromsgrove District Council undertook non-automatic (i.e. passive) monitoring of NO<sub>2</sub> at 44 sites during 2020. Table A.1 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.

### 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 33%), and distance correction. Further details on adjustments are provided in Appendix C.

#### 3.1.3 Nitrogen Dioxide (NO<sub>2</sub>)

Table A.2 in Appendix A compares the ratified and adjusted monitored NO<sub>2</sub> annual mean concentrations for the past five years with the air quality objective of 40µg/m<sup>3</sup>. 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.

Monitoring data from 2020 does not represent a standard year with the emergence of the Coronavirus Pandemic and first lockdown in March and subsequent lockdowns that followed. With the number of vehicle journeys massively reduced much lower concentrations of nitrogen dioxide can be seen in all locations compared to previous years.

In 2020 the highest concentrations of NO<sub>2</sub> was recorded at a newly established location referred to as HAG5 with a recorded value of 29.5µg/m<sup>3</sup>. No exceedances of the annual mean objective were recorded.

Concentrations within all AQMAs were below the objective in 2020. The highest concentration recorded within the Worcester Road AQMA was 29.4µg/m<sup>3</sup> at WR, 23.1µg/m<sup>3</sup> within the Redditch Road AQMA at 19, and 29.1µg/m<sup>3</sup> at location LE4 in the Lickey End AQMA.

No exceedances were recorded within the formerly revoked Kidderminster Road, Hagley AQMA with highest concentrations of 19.5µg/m<sup>3</sup> recorded at both RES2 and 9 within the boundary area. Following revocation of the AQMA four new monitoring locations were established in May 2018 further to the south along Worcester Road, West Hagley. Following annualisation of 2018 data a concentration of 47.01µg/m<sup>3</sup> was recorded at one of the new locations HAG3 however there was a level of uncertainty associated with the result as it was based upon only 7 months data. 2019 provided a full calendar years' worth of data with a value of 33.7µg/m<sup>3</sup> recorded at HAG3. Two new monitoring locations, HAG5 and HAG6, were established in the vicinity of HAG3 for the 2020 period to provide additional certainty to air quality concentrations in the area. Concentrations of 29.5µg/m<sup>3</sup> were recorded at HAG5 and 16.6µg/m<sup>3</sup> at HAG6 in 2020.

3 new locations were also established along the Stourbridge Road for the start of 2020; SBR1 (lamppost outside 61 Stourbridge Road, Bromsgrove), SBR2 (lamppost outside Sainsbury Local, 189 Stourbridge Road) and SBR3 (lamppost outside 285 Stourbridge Road, near to the M42 underpass). Concentrations recorded were 24.9µg/m<sup>3</sup> at SBR1, 18.4µg/m<sup>3</sup> at SBR2, and 25.9µg/m<sup>3</sup> at SBR3 during the 2020 period.

A comparison of annual mean nitrogen dioxide concentrations across the Bromsgrove District between 2019 and 2020 shows a general decrease across the District at all locations. An average decrease in concentration of 19.29% (4.9 µg/m<sup>3</sup>) can be observed across the District as a whole.

A comparison of annual mean nitrogen dioxide concentrations in the three AQMAs between 2019 and 2020 shows a general decrease at all locations. An average decrease in concentration of 21.97% (6.81µg/m<sup>3</sup>) can be observed in the Worcester Road AQMA, 15.82% (3.84µg/m<sup>3</sup>) in the Redditch Road AQMA, and 24.47% (7.02 µg/m<sup>3</sup>) in the Lickey End AQMA. A decrease in

concentrations of 17.22% (4.05µg/m<sup>3</sup>) can be seen within the Hagley monitoring locations and 13.41% (2.95µg/m<sup>3</sup>) at the remaining locations.

Monitoring results within the Bromsgrove District (BDC) area demonstrate a general downward trend in concentrations across the district in 2020 and over the 5-year period 2016 – 2020.

#### **3.1.4 Particulate Matter (PM<sub>10</sub>)**

PM<sub>10</sub> has not been monitored in 2020.

#### **3.1.5 Particulate Matter (PM<sub>2.5</sub>)**

PM<sub>2.5</sub> has not been monitored in 2020.

#### **3.1.6 Sulphur Dioxide (SO<sub>2</sub>)**

SO<sub>2</sub> has not been monitored in 2020.



## Appendix A: Monitoring Results

Table A.1 – 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) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
FL1	2C Fox Lane B61 7NL behind Greyhound Pub (second house past pub)	Roadside	395079	269797	NO2	No	0.0	7.0	No	2.1
FL2	new houses close to road on Fox Lane B61 7NG near to Rock Hill junction	Roadside	395118	269721	NO2	No	4.7	1.4	No	2.1
RH1	8 Rock Hill, Bromsgrove B61 7LJ	Roadside	359243	269844	NO2	No	0.0	6.3	No	2.2
WR4	188 Worcester Road, Bromsgrove B61 7AZ	Roadside	395312	269938	NO2	Worcester Road AQMA	0.0	7.5	No	2.2
WR2	Downpipe of 159 Worcester Road, B61 7HN	Roadside	395511	270180	NO2	Worcester Road AQMA	0.0	2.2	No	2.2
WR3	Downpipe of 138 Worcester Road, B61 7AS	Roadside	395501	270190	NO2	Worcester Road AQMA	0.0	4.4	No	2.5
BC	Downpipe on Ye Olde Black Cross, 70 Worcester Road, B61 7AG	Roadside	395685	270424	NO2	Worcester Road AQMA	0.0	2.1	No	2.3
BCX	Downpipe of 16 Hanover Place, Worcester Road, B61 7AG	Roadside	395807	270549	NO2	Worcester Road AQMA	0.0	2.7	No	5.3
WR	Downpipe of 14 Hanover Street, B61 7JH	Roadside	395702	270423	NO2	Worcester Road AQMA	0.0	6.4	No	1.4

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) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
BG1	Wall of Davenal House Doctors Surgery, top of The Strand, B61 8AB	Roadside	396238	27118	NO2	No	10.0	2.6	No	2.6
BR	Downpipe on 35 Birmingham Road, B61 0DR	Roadside	396292	271210	NO2	No	0.0	3.4	No	2.2
LE7	Near 371 Birmingham Road, Lickey End B61 0EY	Urban Background	396916	273014	NO2	Lickey End AQMA	0.0	15.9	No	2.1
1	Downpipe of 3a Alcester Road, Lickey End, B60 1JT	Roadside	396999	272979	NO2	Lickey End AQMA	0.0	11.7	No	1.8
LE4	Harvester Pub Birmingham Road, Lickey End B61 0EZ. Traffic sign	Roadside	396935	272949	NO2	Lickey End AQMA	11.0	1.4	No	2.1
LIK1	288 Birmingham Road (next to Harvester)	Roadside	396939	272934	NO2	Lickey End AQMA	0.0	10.0	No	1.5
LIK 2	1 Old Birmingham Road Lickey End B60 1DD	Roadside	396995	273129	NO2	Lickey End AQMA	0.0	5.5	No	1.5
LE5	5 Old Birmingham Road, Lickey End B60 1DD	Roadside	396999	273143	NO2	Lickey End AQMA	0.0	6.5	No	1.9
LE6	308 Birmingham Road, Lickey End B61 0HJ	Urban Background	396958	273157	NO2	Lickey End AQMA	0.0	18.3	No	2.1
F1	J1 M42 roundabout, Street light LP 4957 at junction with Old B'ham Rd, B60 1DD	Kerbside	397010	273112	NO2	Lickey End AQMA	20.0	2.3	No	2.0
TS	Up past Blue Cross, The Smallholdings, off Wildmoor Lane, B61 0RJ	Rural	396613	275085	NO2	No	0.0	51.0	No	1.8
RUB 1	Library Way Way off New Road, LP at end	Roadside	398555	277200	NO2	No	12.0	2.0	No	1.6

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) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
	of Library Way backs onto A38 B45 9JS									
RES 1	26 Stourbridge Road, Hagley DY9 0QT Downpipe Front of Property	Roadside	391445	281179	NO2	No	0.0	15.0	No	2.1
RES 2	21 Birmingham Road, Hagley, DY9 9JZ	Roadside	391556	281042	NO2	No	0.0	15.0	No	2.2
9	Fence to side of 78 Kidderminster Road, DY9 0QL	Roadside	391210	280668	NO2	No	0.0	8.3	No	2.0
KR62	62 Kidderminster Rd DY9 0QL	Roadside	391182	280631	NO2	No	0.0	7.0	No	2.0
RES 3	104 Kidderminster Road South, Hagley, DY9 0JJ Downpipe Front of Property	Roadside	389827	279590	NO2	No	0.0	14.3	No	2.0
HAG 4	On Lamppost 162 by Bus Stop opposite Shell Garage on Worcester Road, West Hagley	Roadside	389850	279588	NO2	No	1.0	5.5	No	2.0
HAG 3	1 Cross Keys Mews, Worcester Road, West Hagley, DY9 0LG	Roadside	389909	279629	NO2	No	0.0	3.0	No	1.6
RES 4	23 Worcester Road, Hagley DY9 0LF Downpipe Front of Property	Roadside	390025	27965	NO2	No	0.0	14.5	No	2.1
HAG 2	69 Worcester Road, West Hagley, DY9 0LF	Roadside	390203	279945	NO2	No	0.0	13.0	No	1.8
HAG 1	79 Worcester Road, Hagley, DY9 0LF	Roadside	390247	279996	NO2	No	0.0	12.0	No	1.9

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) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
11	Downpipe on corner of 74 Worcester Road, DY9 0NJ	Roadside	390295	280043	NO2	No	0.0	2.8	No	1.9
HAG5	On low roadside road sign immediately past 4 Cross Keys Mews	Roadside	389929	279650	NO2	No	7.3	4.5	No	1.6
HAG6	On Drainpipe of 1 Spout Something Cottage, between Cross Keys Mews and Hagley Motors	Roadside	389939	279664	NO2	No	0.0	5.0	No	1.8
SBR1	On lamppost outside 61 Stourbridge Road, Bromsgrove B61 0AL	Roadside	396127	271516	NO2	No	4.8	2.2	No	1.9
SBR2	On lamppost outside Sainsbury Local 189 Stourbridge Road B61 0AR	Roadside	395996	272063	NO2	No	na	3.5	No	2.0
SBR3	On lamppost outside 285 Stourbridge Road, just before M42 underpass	Roadside	395825	272841	NO2	No	12.0	1.0	No	1.9
KEN	Lamppost 3 o/s 12 & 14 Kendal Close B60 2HW	Roadside	396683	270354	NO2	No	0.0	1.7	No	2.4
SR	Downpipe of 2 Stoke Road, Aston Fields, B60 3EJ	Roadside	396780	269450	NO2	No	0.0	4.9	No	1.9
18	Downpipe on corner of 84 Redditch Road, B60 4JR	Roadside	395180	268549	NO2	Redditch Road AQMA	0.0	1.6	No	2.0
19	Downpipe through gate at 93 Redditch Road, B60 3JP	Roadside	395188	268564	NO2	Redditch Road AQMA	0.0	2.7	No	1.9
HR	52 Hanbury Road, Stoke Heath B60 4LU	Roadside	394772	268441	NO2	Redditch Road AQMA	0.0	5.0	No	2.2
16	Downpipe of 58 Redditch Road, B60 4JN	Roadside	394701	268444	NO2	Redditch Road AQMA	0.0	2.3	No	2.2

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) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
255	255 Worcs Road (Roundabout) B61 7JD	Roadside	394408	268417	NO2	No	0.0	12.0	No	2.3

**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 – Annual Mean NO<sub>2</sub> Monitoring Results: Non-Automatic Monitoring (µg/m<sup>3</sup>)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2020 (%) <sup>(2)</sup>	2016	2017	2018	2019	2020
FL1	395079	269797	Roadside	100	51.9	22.1	17.7	21.2	16.4	13.9
FL2	395118	269721	Roadside	66.67	36.5	33.2	30.5	37.2	29.1	24.8
RH1	359243	269844	Roadside	100	51.9	34.8	27.4	31.1	23.7	20.4
WR4	395312	269938	Roadside	100	51.9	32.2	26.9	31.2	24.4	19.3
WR2	395511	270180	Roadside	100	51.9	38.7	29.3	36.7	31.0	22.4
WR3	395501	270190	Roadside	100	51.9	33.2	28.6	30.8	24.6	20.0
BC	395685	270424	Roadside	100	51.9	<b>47.3</b>	39.7	<b>44.0</b>	38.0	27.7
BCX	395807	270549	Roadside	100	51.9	<b>45.1</b>	34.5	<b>44.0</b>	36.5	26.3
WR	395702	270423	Roadside	100	51.9	38.7	32.2	37.9	31.5	29.4
BG1	396238	27118	Roadside	100	51.9	33.7	27.3	32.5	26.3	19.6
BR	396292	271210	Roadside	100	51.9	30.2	22.8	29.2	23.5	18.9
LE7	396916	273014	Urban Background	100	51.9	34.8	25.8	33.4	23.6	17.7
1	396999	272979	Roadside	100	51.9	29.4	22.3	27.0	19.4	15.4

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2020 (%) <sup>(2)</sup>	2016	2017	2018	2019	2020
LE4	396935	272949	Roadside	100	51.9	<b>58.0</b>	<b>46.4</b>	<b>50.9</b>	<b>40.1</b>	29.1
LIK1	396939	272934	Roadside	100	51.9				26.9	23.7
LIK 2	396995	273129	Roadside	100	51.9				26.2	22.0
LE5	396999	273143	Roadside	100	51.9	36.1	31.4	32.5	26.9	20.2
LE6	396958	273157	Urban Background	83.33	44.2	31.8	27.4	29.7	23.0	17.5
F1	397010	273112	Kerbside	100	51.9	<b>58.0</b>	<b>46.4</b>	<b>50.9</b>	<b>43.4</b>	27.8
TS	396613	275085	Rural	83.33	44.2	26.8	19.9	23.6	18.2	15.2
RUB 1	398555	277200	Roadside	83.33	42.3				23.6	18.5
RES 1	391445	281179	Roadside	100	51.9	22.3	17.9	20.7	17.1	13.9
RES 2	391556	281042	Roadside	100	51.9	34.7	27.8	30.7	24.6	19.5
9	391210	280668	Roadside	100	51.9	34.5	27.4	30.9	23.7	19.5
KR62	391182	280631	Roadside	100	51.9	33.9	27.7	31.1	24.0	17.8
RES 3	389827	279590	Roadside	83.33	44.2	21.7	17.0	19.6	15.7	12.1
HAG 4	389850	279588	Roadside	83.33	44.2			33.9	25.1	18.8

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2020 (%) <sup>(2)</sup>	2016	2017	2018	2019	2020
HAG 3	389909	279629	Roadside	100	51.9			<b>47.0</b>	33.7	27.2
RES 4	390025	27965	Roadside	100	51.9	35.7	27.9	32.4	24.7	20.3
HAG 2	390203	279945	Roadside	100	51.9			28.4	21.4	17.3
HAG 1	390247	279996	Roadside	100	51.9			24.5	21.3	17.1
11	390295	280043	Roadside	100	51.9	31.3	23.2	27.7	22.0	18.0
HAG5	389929	279650	Roadside	100	51.9					29.5
HAG6	389939	279664	Roadside	100	51.9					16.6
SBR1	396127	271516	Roadside	100	51.9					24.9
SBR2	395996	272063	Roadside	83.33	42.3					18.4
SBR3	395825	272841	Roadside	100	51.9					25.9
KEN	396683	270354	Roadside	83.33	44.2			21.3	17.6	15.3
SR	396780	269450	Roadside	83.33	42.3	29.9	19.6	26.4	21.7	17.2
18	395180	268549	Roadside	83.33	44.2	<b>40.5</b>	30.6	33.7	26.5	22.4
19	395188	268564	Roadside	83.33	44.2	<b>40.5</b>	33.1	35.1	27.6	23.1



Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2020 (%) <sup>(2)</sup>	2016	2017	2018	2019	2020
HR	394772	268441	Roadside	100	51.9	34.4	26.5	32.9	25.5	20.4
16	394701	268444	Roadside	83.33	44.2	35.2	28.2	28.2	25.0	20.4
255	394408	268417	Roadside	50	26.9	28.1	21.3	23.8	16.8	15.9

Annualisation has been conducted where data capture is <75% and >33% 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  $\mu\text{g}/\text{m}^3$ .

Exceedances of the NO<sub>2</sub> annual mean objective of 40 $\mu\text{g}/\text{m}^3$  are shown in **bold**.

NO<sub>2</sub> annual means exceeding 60 $\mu\text{g}/\text{m}^3$ , indicating a potential exceedance of the NO<sub>2</sub> 1-hour mean objective are shown in **bold and underlined**.

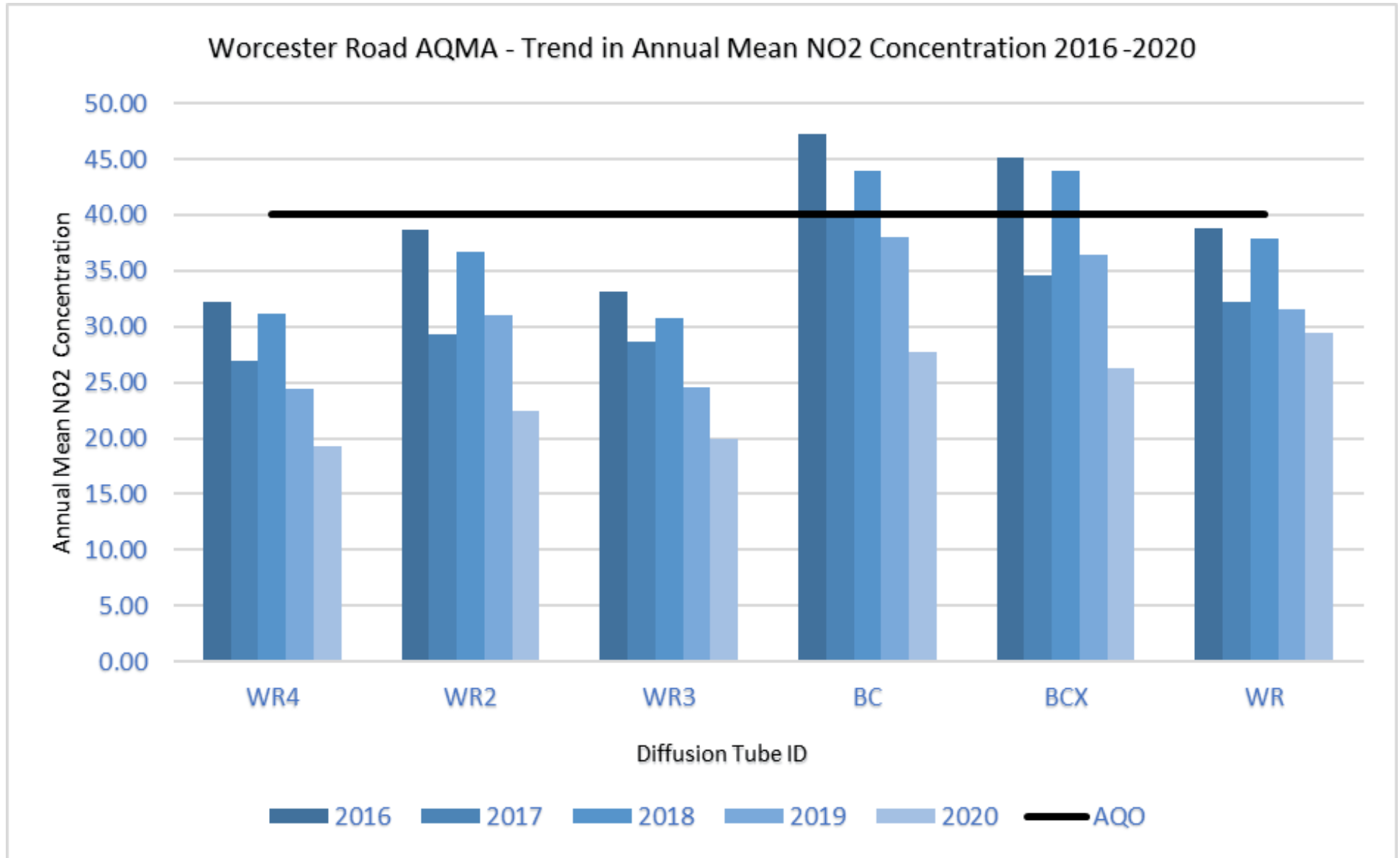
Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

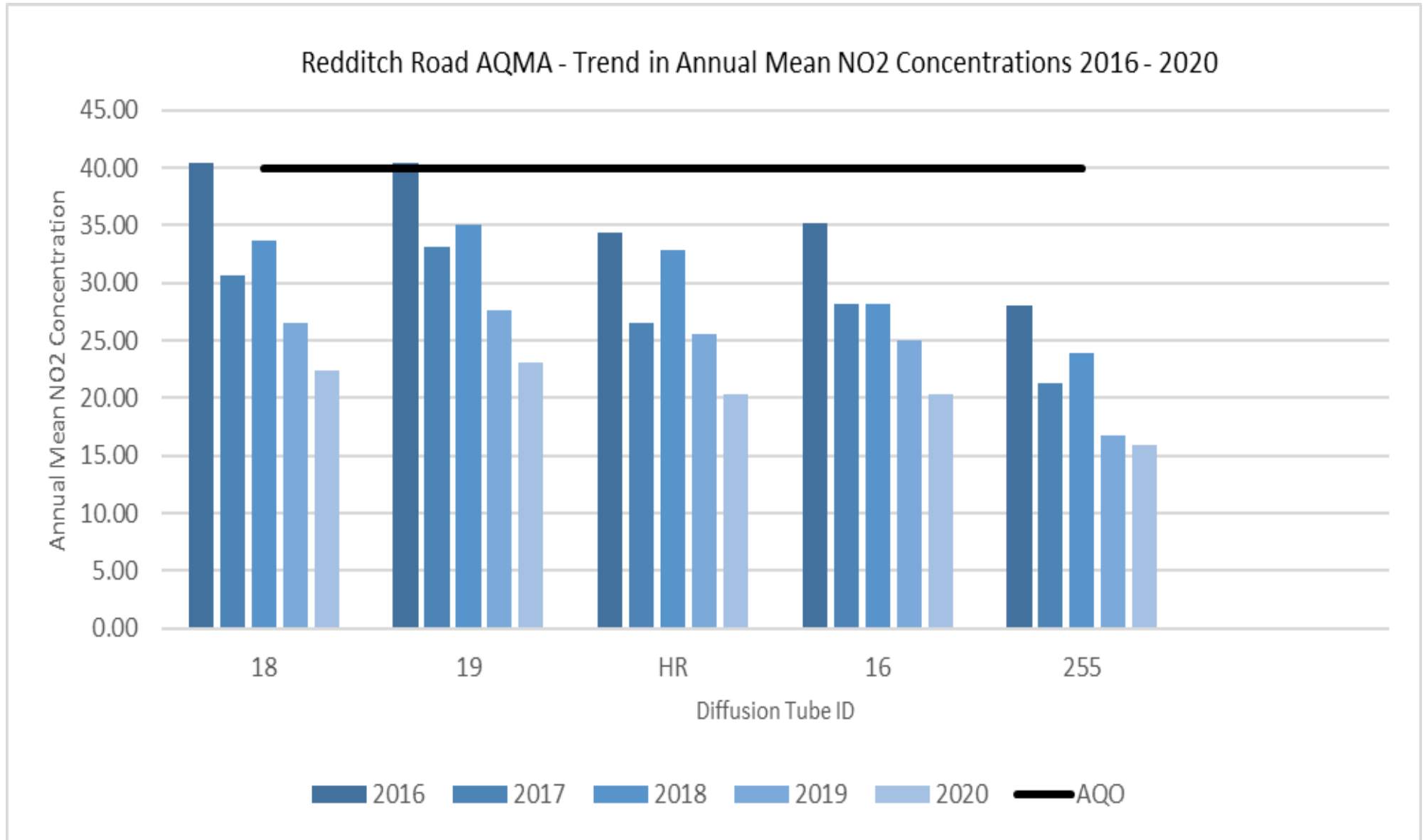
Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

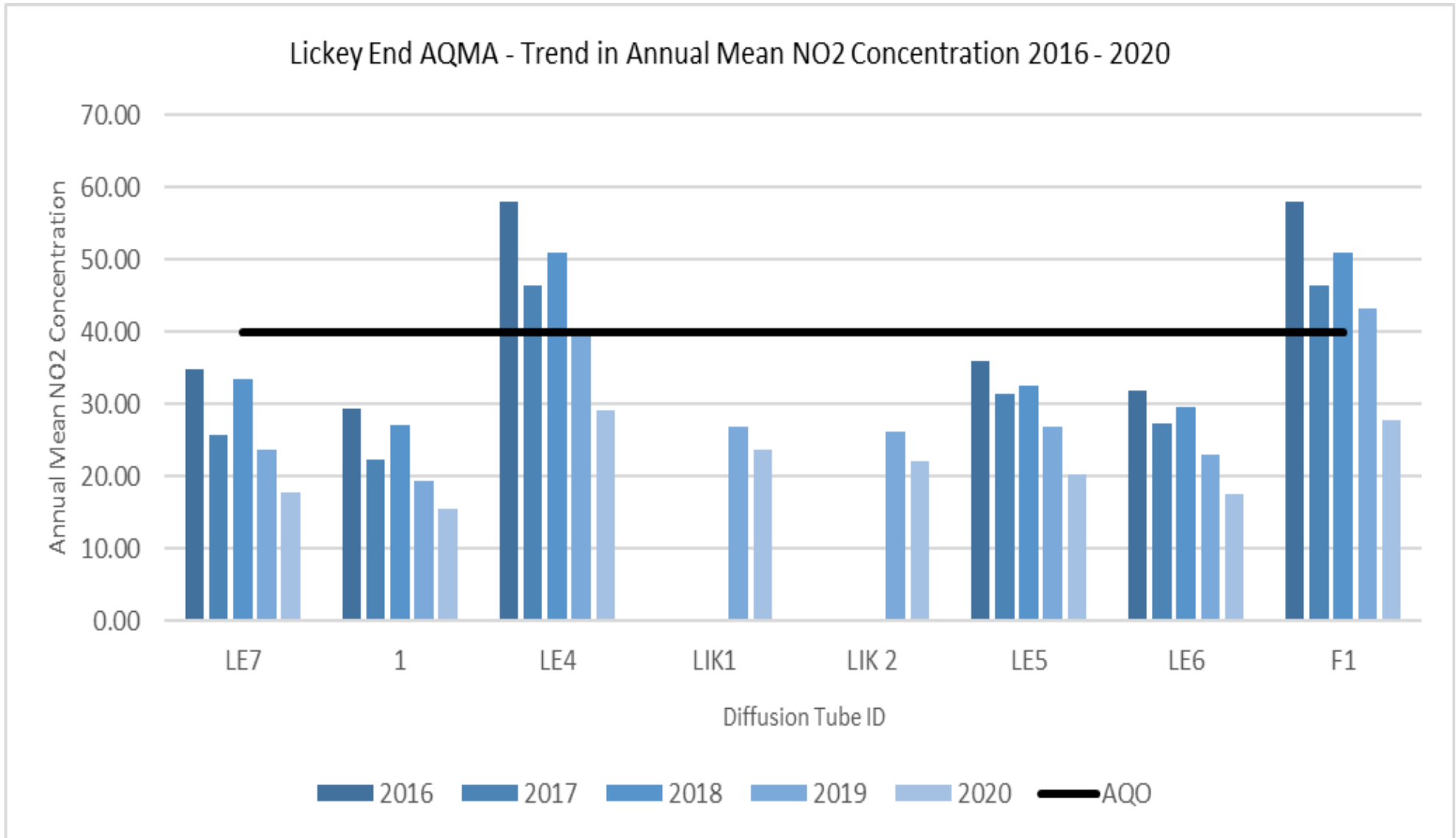
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

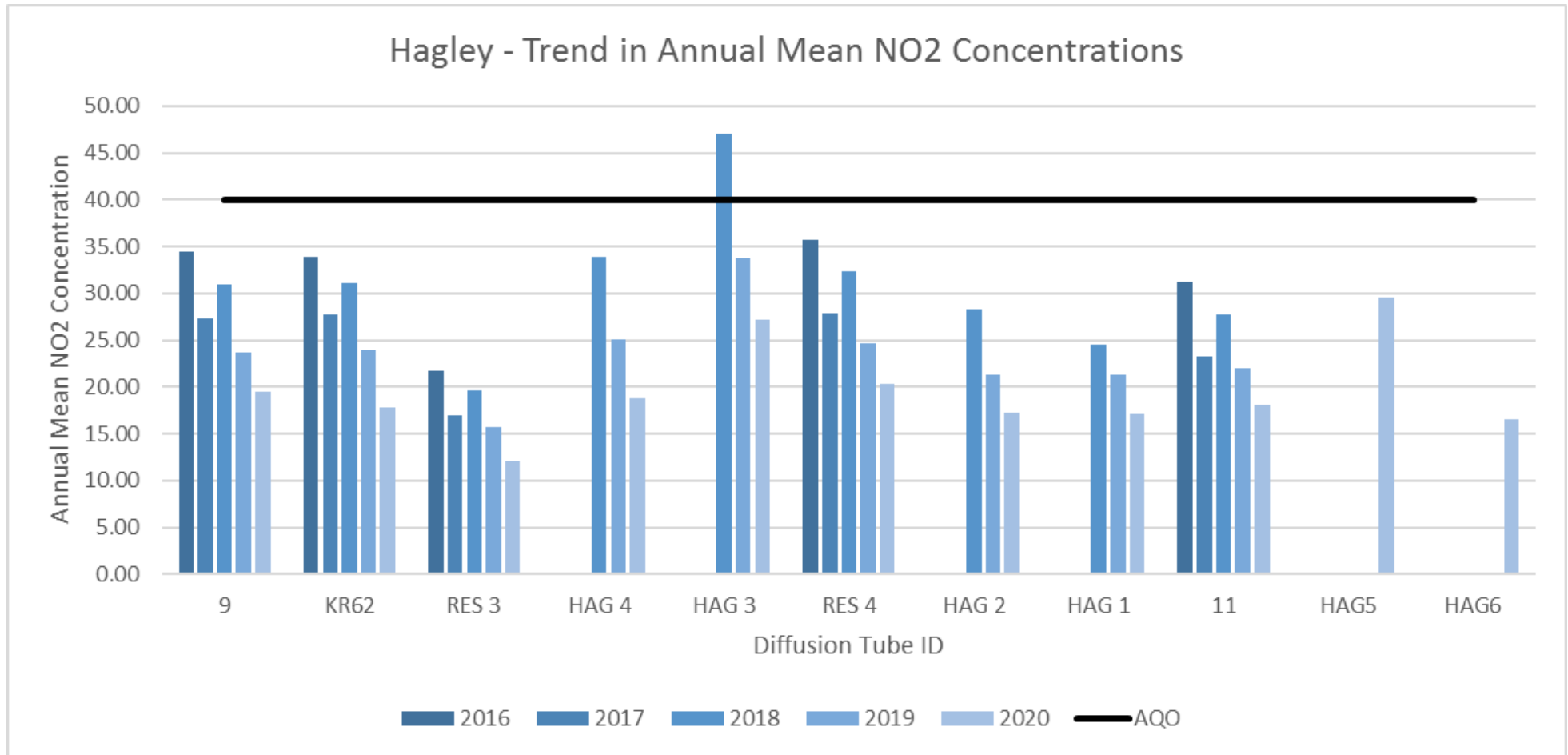
(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

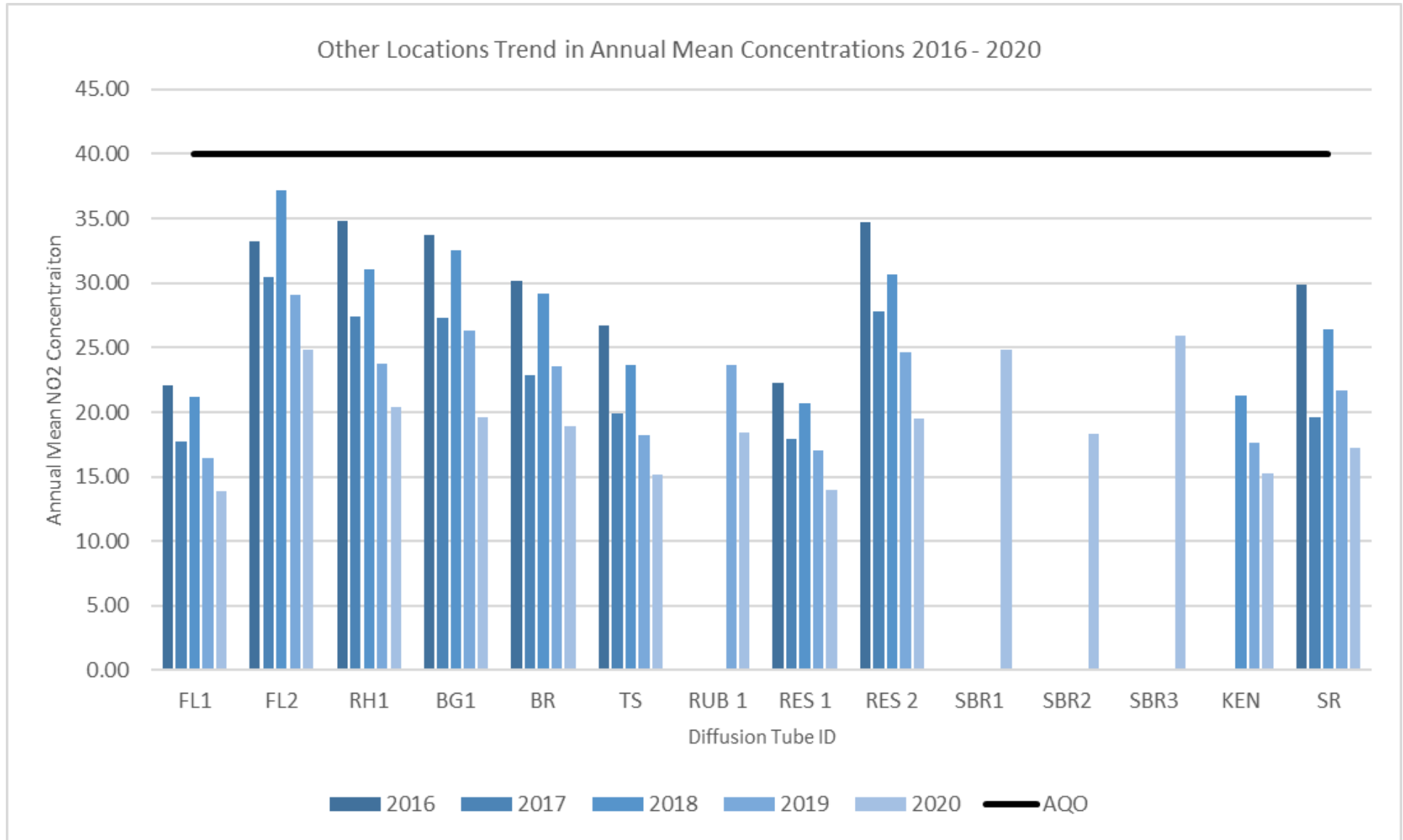
Figure A.1 – Trends in Annual Mean NO<sub>2</sub> Concentrations











## Appendix B: Full Monthly Diffusion Tube Results for 2020

Table B.1 – NO<sub>2</sub> 2020 Diffusion Tube Results (µg/m<sup>3</sup>)

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 (0.81)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
FL1	395079	269797							10.6	14.5	18.5	17.4	23.5	23.3	17.9	13.9	-	
FL2	395118	269721								29.6	33.3	31.5		34.8	32.3	24.8	-	
RH1	359243	269844							20.5	23.3	25.7	27.2	31.7	29.5	26.3	20.4	-	
WR4	395312	269938							18.0	21.9	25.6	24.9	30.3	29.2	25.0	19.3	-	
WR2	395511	270180							18.8	27.8	30.4	30.9	37.1	29.0	29.0	22.4	-	
WR3	395501	270190							17.5	20.8	25.7	27.4	27.4	36.3	25.8	20.0	-	
BC	395685	270424							23.4	30.2	42.1	44.7	33.0	41.5	35.8	27.7	-	
BCX	395807	270549							20.6	33.6	33.6	33.4	46.5	35.9	33.9	26.3	-	
WR	395702	270423							30.0	33.2	38.8	37.0	43.6	45.6	38.0	29.4	-	
BG1	396238	27118							16.6	21.0	28.3	20.2	32.8	33.1	25.3	19.6	-	
BR	396292	271210							16.0	22.3	25.3	24.1	29.9	29.0	24.4	18.9	-	
LE7	396916	273014							13.0	22.6	24.8	22.6	27.2	27.0	22.9	17.7	-	
1	396999	272979							16.0	15.8	22.0	19.4	24.1	22.2	19.9	15.4	-	
LE4	396935	272949							32.9	24.9	44.6	44.0	41.8	37.7	37.6	29.1	-	
LIK1	396939	272934							24.3	38.6	30.7	29.4	29.7	30.8	30.6	23.7	-	
LIK 2	396995	273129							21.0	22.6	26.0	27.3	31.1	43.0	28.5	22.0	-	
LE5	396999	273143							20.5	21.8	25.4	28.4	30.6	30.1	26.1	20.2	-	
LE6	396958	273157								19.2	24.0	25.5	28.9	25.9	24.7	17.5	-	

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 (0.81)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
F1	397010	273112							19.8	37.3	43.0	40.2	45.6	29.4	35.9	27.8	-	
TS	396613	275085								18.8	20.4	19.0	25.5	23.8	21.5	15.2	-	
RUB 1	398555	277200							20.0		28.0	23.6	29.2	26.6	25.5	18.5	-	
RES 1	391445	281179							12.4	15.5	18.3	19.8	22.2	19.8	18.0	13.9	-	
RES 2	391556	281042							22.0	22.6	27.9	24.4	28.0	26.3	25.2	19.5	-	
9	391210	280668							19.9	23.8	26.8	27.4	28.0	25.6	25.2	19.5	-	
KR62	391182	280631							21.3	20.6	24.2	24.1	20.9	26.6	23.0	17.8	-	
RES 3	389827	279590							9.1	14.7		15.6	19.5	19.8	15.7	12.1	-	
HAG 4	389850	279588							19.8	24.6		25.6	26.4	26.2	24.5	18.8	-	
HAG 3	389909	279629							29.9	36.3	42.0	35.7	32.6	34.4	35.1	27.2	-	
RES 4	390025	27965							21.7	22.7	28.7	26.2	28.6	29.5	26.2	20.3	-	
HAG 2	390203	279945							17.0	21.6	24.9	22.3	21.5	26.4	22.3	17.3	-	
HAG 1	390247	279996							17.2	19.5	24.1	23.2	24.0	24.6	22.1	17.1	-	
11	390295	280043							15.3	21.9	25.9	23.4	26.6	26.9	23.3	18.0	-	
HAG5	389929	279650							37.6	43.7	29.0	38.8	38.1	41.7	38.1	29.5	-	
HAG6	389939	279664							15.9	25.0	17.2	22.1	22.2	26.1	21.4	16.6	-	
SBR1	396127	271516							27.2	27.4	34.2	33.6	36.3	34.3	32.2	24.9	-	
SBR2	395996	272063							16.2	20.1	24.8		29.1	28.1	23.7	18.4	-	
SBR3	395825	272841							22.3	31.0	38.7	33.7	36.4	39.2	33.5	25.9	-	
KEN	396683	270354							11.6	12.9		27.3	23.9	23.8	19.9	15.3	-	
SR	396780	269450							16.5	19.1	23.1		25.9	26.5	22.2	17.2	-	



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 (0.81)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
18	395180	268549							19.1	25.7		31.2	37.3	32.5	29.1	22.4	-	
19	395188	268564							23.8	26.5		31.0	37.3	32.0	30.1	23.1	-	
HR	394772	268441							21.0	25.9	29.4	24.8	27.6	29.1	26.3	20.4	-	
16	394701	268444							18.6	23.5		29.7	30.8	30.1	26.5	20.4	-	
255	394408	268417							13.5	16.2				23.1	17.6	15.9	-	

- All erroneous data has been removed from the NO<sub>2</sub> diffusion tube dataset presented in Table B.1.
- Annualisation has been conducted where data capture is <75% and >33% in line with LAQM.TG16.
- Local bias adjustment factor used.
- National bias adjustment factor used.
- Where applicable, data has been distance corrected for relevant exposure in the final column.
- Bromsgrove District Council confirm that all 2020 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.

**Notes:**

Exceedances of the NO<sub>2</sub> annual mean objective of 40µg/m<sup>3</sup> are shown in **bold**.

NO<sub>2</sub> annual means exceeding 60µg/m<sup>3</sup>, indicating a potential exceedance of the NO<sub>2</sub> 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 Bromsgrove District Council During 2020

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

### Additional Air Quality Works Undertaken by Bromsgrove District Council During 2020

Bromsgrove District Council has not completed any additional works within the reporting year of 2020.

### QA/QC of Diffusion Tube Monitoring

#### Excluded Diffusion Tube Data

In 2020 Bromsgrove District Council changed diffusion tube supplier part way through the calendar year. Additionally, there were several months where diffusion tubes were not exposed due to the impact of the Covid-19 pandemic.

Tubes were exposed as follows:

Months	Tubes Exposed?	Tube Supplier
Jan- Feb	Yes	Somerset Scientific Services
March – June	No	n/a
July – December	Yes	Gradko International Limited

Diffusion tube data for January to February 2020 has been omitted from diffusion tube data processing and reporting. Data capture for tubes supplied by Somerset Scientific Services during 2020 is less than 33% and as such it cannot be annualised in accordance with the methodology

outlined in LAQM.TG.16 and subsequently cannot be bias-adjusted in accordance with the methodology for bias-adjusting data from two laboratories as outlined in LAQM.TG.16.

Clarification regarding this was sought from the LAQM Helpdesk which confirmed via email on 20<sup>th</sup> May 2021 that the January to February diffusion tube data for 2020 should be omitted from data processing and reporting as a result of insufficient data capture.

For information the raw diffusion tube data for January to February 2020 is provided below:

Diffusion Tube ID	Raw Nitrogen Dioxide Concentration ( $\mu\text{g}/\text{m}^3$ )	
	January 2020	February 2020
FL1	-	-
FL2	40.04	38.38
RH1	33.57	24.93
WR4	34.05	28.34
WR2	38.01	27.18
WR3	33.63	28.53
BC	54.90	52.02
BCX	46.81	43.78
WR	42.02	38.51
BG1	34.65	25.90
BR	31.12	21.71
LE7	24.83	16.37
1	24.59	19.98
LE4	56.40	48.35
LIK1	39.92	30.34
LIK 2	37.11	32.39
LE5	38.61	33.68
LE6	34.89	30.21
F1	58.13	47.19
TS	23.45	18.05
RUB 1	28.84	25.51
RES 1	23.03	18.63
RES 2	30.64	25.51
9	29.62	26.48
KR62	31.30	27.44
RES 3	19.14	13.93
HAG 4	28.84	26.35
HAG 3	42.50	37.61
RES 4	28.40	29.95
HAG 2	28.94	28.08
HAG 1	24.57	26.60
11	27.92	44.94
HAG5	-	27.03
HAG6	27.58	26.15

SBR1	42.14	32.59
SBR2	-	24.80
SBR3	38.97	27.63
KEN	23.61	18.15
SR	27.94	21.56
18	35.60	27.86
19	36.44	27.08
HR	32.57	-
16	34.99	22.99
255	23.83	20.94

Tube data for July to December 2020 represents greater than 33% data capture for tubes supplied by a single laboratory and as such has been annualised and bias-adjusted in accordance with the methodologies prescribed by LAQM.TG.16.

The following UKAS accredited company provides Bromsgrove District Council with nitrogen dioxide diffusion tubes and analysis:

Gradko International Ltd

St. Martins House

77 Wales Street

Winchester

SO23 0RH

01962 860 331

[Diffusion@gradko.com](mailto:Diffusion@gradko.com)

The 20% Triethanolamine (TEA) / De-ionised Water preparation method was used. Under the AIR NO2 Proficiency Testing Scheme, Gradko International Ltd performed 75% satisfactory for January to February and September to October 2020. Results for May to June and July to August were not reported due to the pandemic. Tube precision was 'Good' throughout 2020. Monitoring has been completed in adherence with the 2020 Diffusion Tube Monitoring Calendar.

### Diffusion Tube Annualisation

Annualisation was required for all non-automatic monitoring sites in Bromsgrove District Council area as only six months monitoring data was gathered for 2020. Data from four AURN monitoring sites; West Bromwich Kendrick Park, Birmingham Ladywood, Leominster, and Leamington Spa, was used to provide location specific diffusion tube average annualisation factors to apply to the raw data annual mean giving an annualised annual mean for each location.

## Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2020 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 regarding the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO<sub>x</sub>/NO<sub>2</sub> continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Bromsgrove District Council have applied a national bias adjustment factor of 0.81 to the 2020 monitoring data. A summary of bias adjustment factors used by Bromsgrove District Council over the past five years is presented in Table C.1.

The national factor bias adjustment factor used was taken from the 03/21 version of the national spreadsheet, derived from eighteen studies by Gradko International Ltd.

**Table C.1 – Bias Adjustment Factor**

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2020	National	03/21	0.81
2019	National	03/20	0.78
2018	National	03/19	0.89
2017	National	09/18	0.77
2016	Local	-	0.89

## NO<sub>2</sub> 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<sub>2</sub> concentration at the nearest location relevant for exposure should be estimated using the Diffusion Tube Data Processing Tool/NO<sub>2</sub> fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO<sub>2</sub> concentrations corrected for distance are presented in Table B.1.

No diffusion tube NO<sub>2</sub> monitoring locations within Bromsgrove District area required distance correction during 2020.

## **QA/QC of Automatic Monitoring**

### **Automatic Monitoring Annualisation**

No automatic monitoring was undertaken within the Bromsgrove District during 2020.

C.2 – Annualisation Summary (concentrations presented in  $\mu\text{g}/\text{m}^3$ )

Site ID	Annualisation Factor West Bromwich Kendrick Park	Annualisation Factor Birmingham Ladywood	Annualisation Factor Leominster	Annualisation Factor Leamington Spa	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
FL1	0.9527	0.9260	1.0074	0.9352	0.9553	17.9	17.1	
FL2	0.9411	0.9225	0.9978	0.9317	0.9483	32.3	30.6	
RH1	0.9527	0.9260	1.0074	0.9352	0.9553	26.3	25.1	
WR4	0.9527	0.9260	1.0074	0.9352	0.9553	25.0	23.8	
WR2	0.9527	0.9260	1.0074	0.9352	0.9553	29.0	27.7	
WR3	0.9527	0.9260	1.0074	0.9352	0.9553	25.8	24.7	
BC	0.9527	0.9260	1.0074	0.9352	0.9553	35.8	34.2	
BCX	0.9527	0.9260	1.0074	0.9352	0.9553	33.9	32.4	
WR	0.9527	0.9260	1.0074	0.9352	0.9553	38.0	36.3	
BG1	0.9527	0.9260	1.0074	0.9352	0.9553	25.3	24.2	
BR	0.9527	0.9260	1.0074	0.9352	0.9553	24.4	23.3	
LE7	0.9527	0.9260	1.0074	0.9352	0.9553	22.9	21.8	
1	0.9527	0.9260	1.0074	0.9352	0.9553	19.9	19.0	
LE4	0.9527	0.9260	1.0074	0.9352	0.9553	37.6	36.0	
LIK1	0.9527	0.9260	1.0074	0.9352	0.9553	30.6	29.2	
LIK 2	0.9527	0.9260	1.0074	0.9352	0.9553	28.5	27.2	
LE5	0.9527	0.9260	1.0074	0.9352	0.9553	26.1	25.0	
LE6	0.8752	0.8489	0.9006	0.8653	0.8725	24.7	21.6	
F1	0.9527	0.9260	1.0074	0.9352	0.9553	35.9	34.3	
TS	0.8752	0.8489	0.9006	0.8653	0.8725	21.5	18.8	
RUB 1	0.9015	0.8657	0.9563	0.8551	0.8946	25.5	22.8	
RES 1	0.9527	0.9260	1.0074	0.9352	0.9553	18.0	17.2	
RES 2	0.9527	0.9260	1.0074	0.9352	0.9553	25.2	24.1	
9	0.9527	0.9260	1.0074	0.9352	0.9553	25.2	24.1	
KR62	0.9527	0.9260	1.0074	0.9352	0.9553	23.0	21.9	
RES 3	0.9558	0.9234	0.9942	0.9183	0.9479	15.7	14.9	
HAG 4	0.9558	0.9234	0.9942	0.9183	0.9479	24.5	23.3	
HAG 3	0.9527	0.9260	1.0074	0.9352	0.9553	35.1	33.6	
RES 4	0.9527	0.9260	1.0074	0.9352	0.9553	26.2	25.1	
HAG 2	0.9527	0.9260	1.0074	0.9352	0.9553	22.3	21.3	
HAG 1	0.9527	0.9260	1.0074	0.9352	0.9553	22.1	21.1	
11	0.9527	0.9260	1.0074	0.9352	0.9553	23.3	22.3	

Site ID	Annualisation Factor West Bromwich Kendrick Park	Annualisation Factor Birmingham Ladywood	Annualisation Factor Leominster	Annualisation Factor Leamington Spa	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
HAG5	0.9527	0.9260	1.0074	0.9352	0.9553	38.1	36.4	
HAG6	0.9527	0.9260	1.0074	0.9352	0.9553	21.4	20.4	
SBR1	0.9527	0.9260	1.0074	0.9352	0.9553	32.2	30.7	
SBR2	0.9621	0.9171	0.9980	0.9561	0.9583	23.7	22.7	
SBR3	0.9527	0.9260	1.0074	0.9352	0.9553	33.5	32.0	
KEN	0.9558	0.9234	0.9942	0.9183	0.9479	19.9	18.9	
SR	0.9621	0.9171	0.9980	0.9561	0.9583	22.2	21.3	
18	0.9558	0.9234	0.9942	0.9183	0.9479	29.1	27.6	
19	0.9558	0.9234	0.9942	0.9183	0.9479	30.1	28.6	
HR	0.9527	0.9260	1.0074	0.9352	0.9553	26.3	25.1	
16	0.9558	0.9234	0.9942	0.9183	0.9479	26.5	25.2	
255	1.1321	1.0577	1.1793	1.0772	1.1116	17.6	19.6	

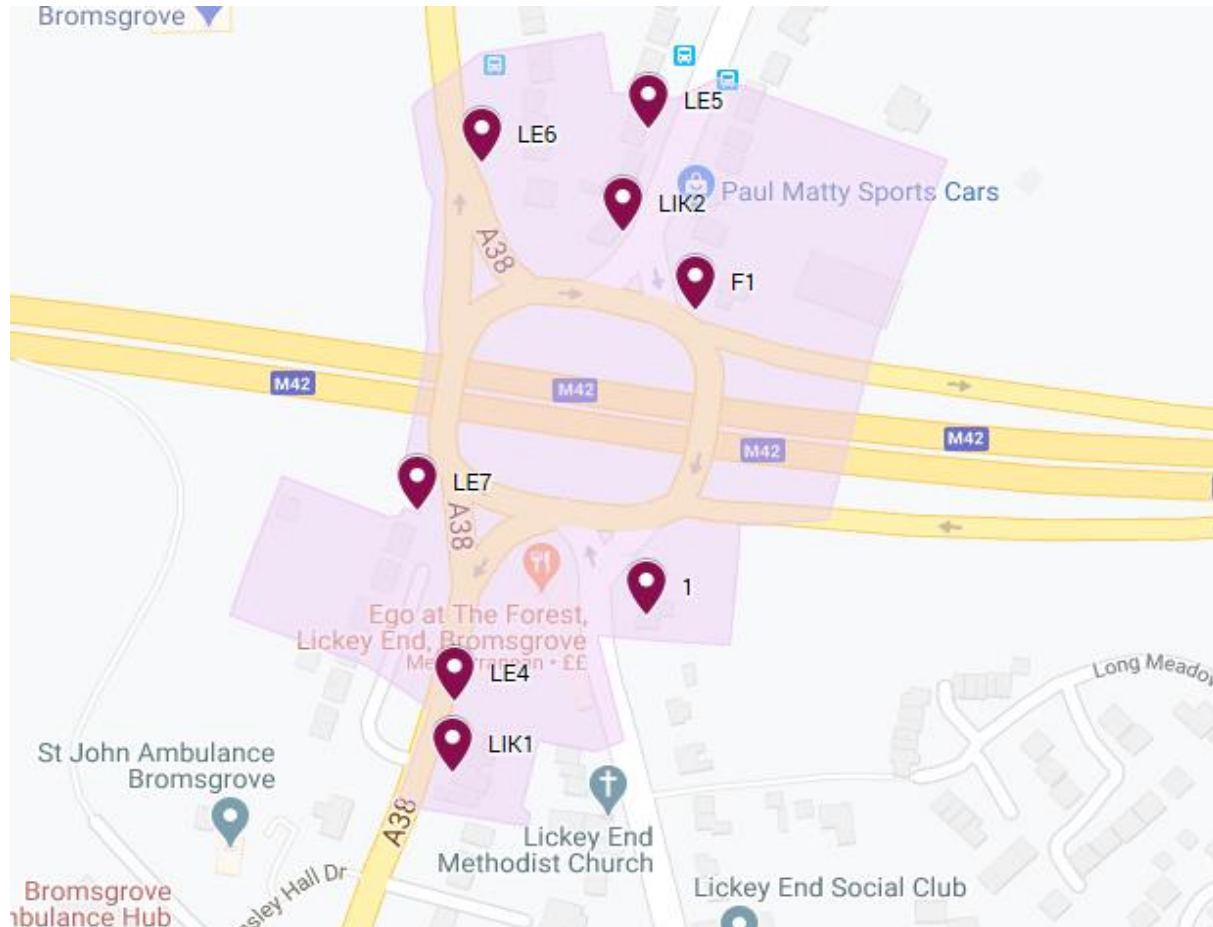


## Appendix D: Map(s) of Monitoring Locations and AQMAs

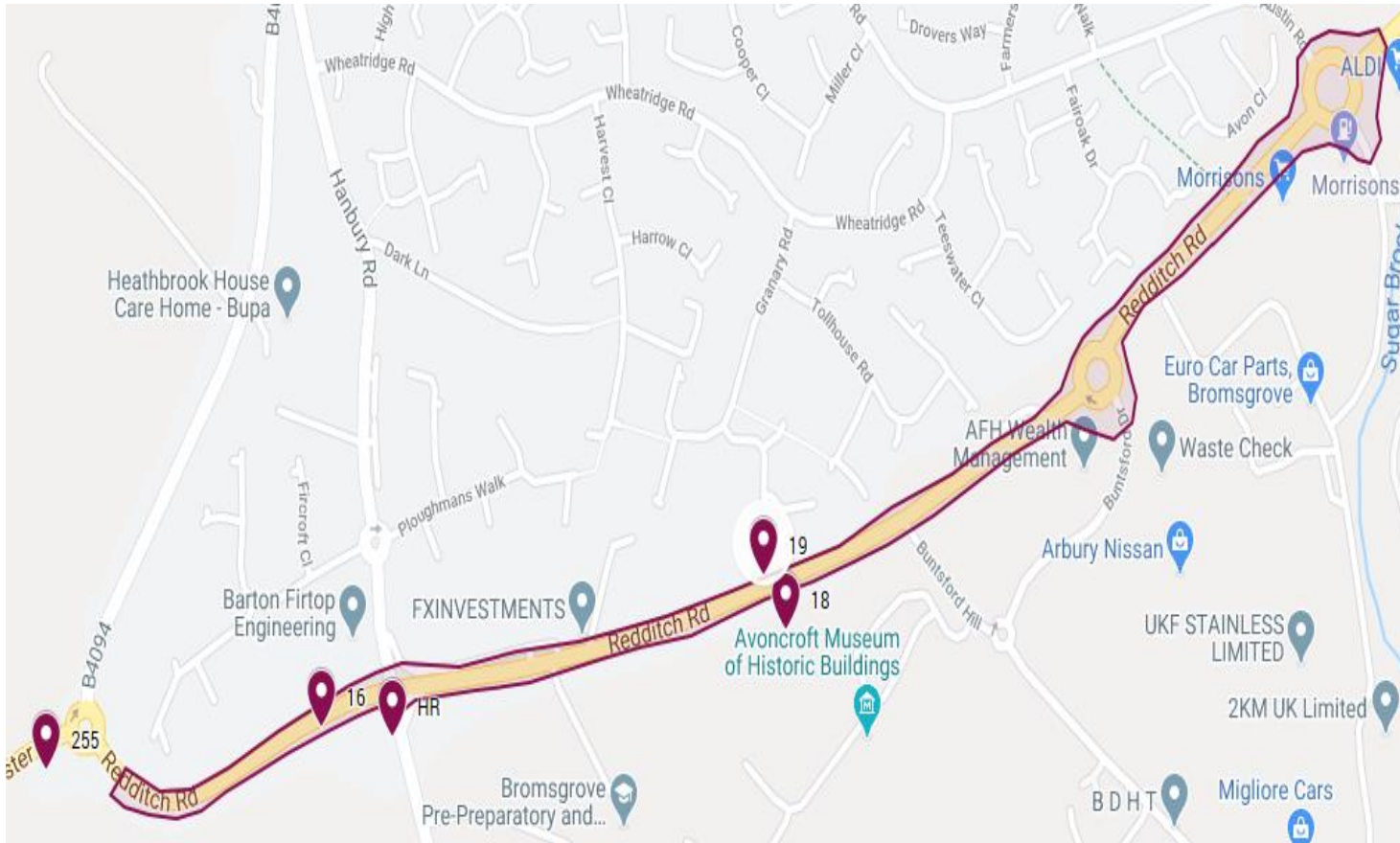
Figure D.1 – Map of Non-Automatic Monitoring Site



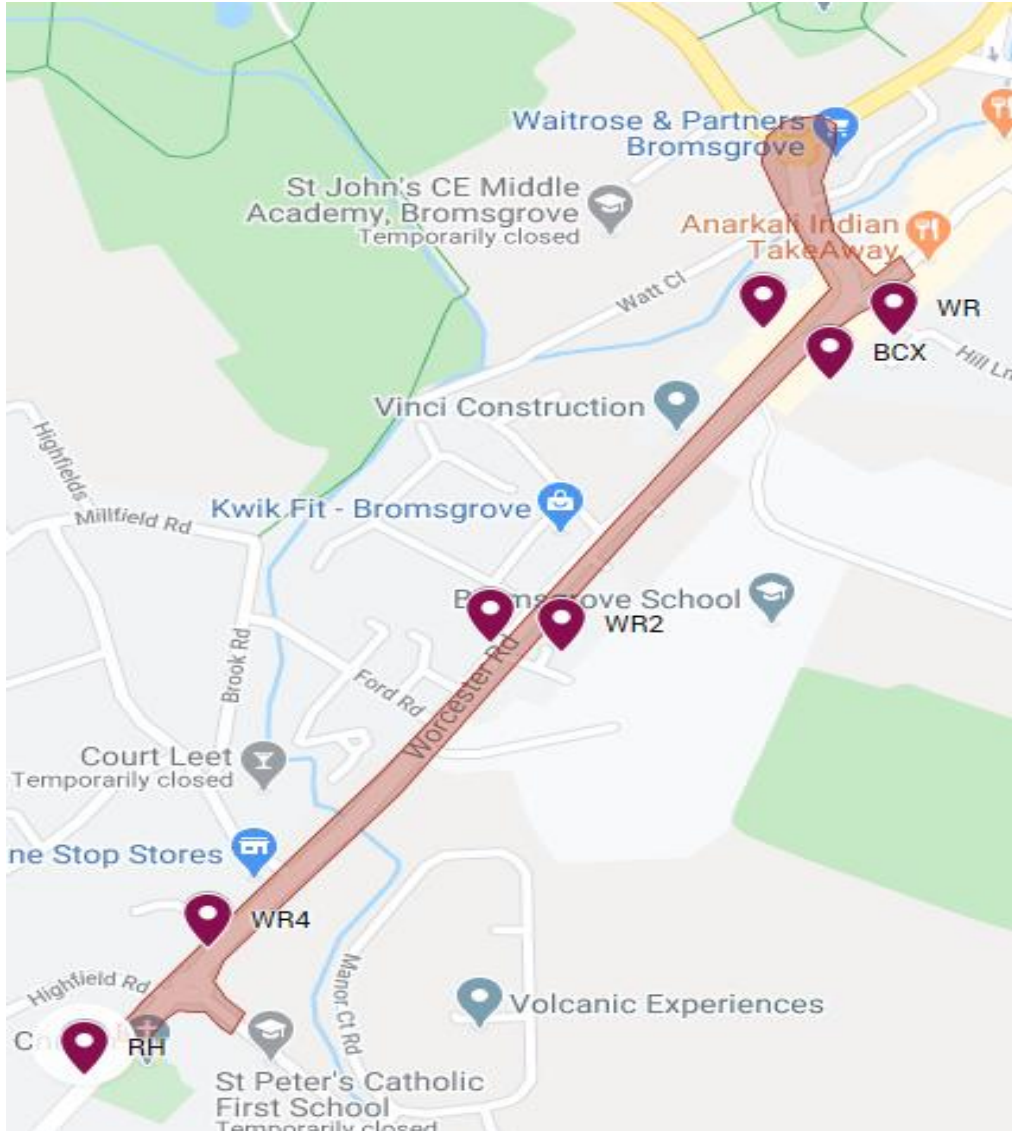
All Monitoring Locations within Bromsgrove District (fig D.1a)



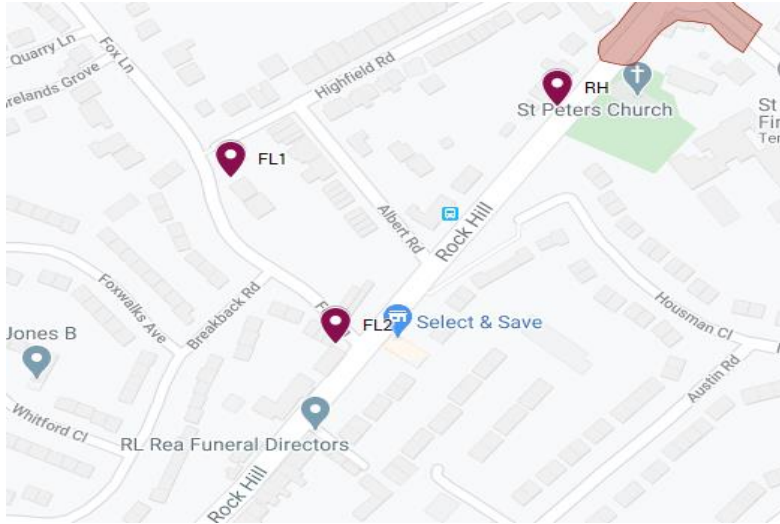
Lickey End AQMA and Monitoring Locations (LE5, LE6, LIK2, F1, LE7, 1, LE4, LIK1) (fig D.1b)



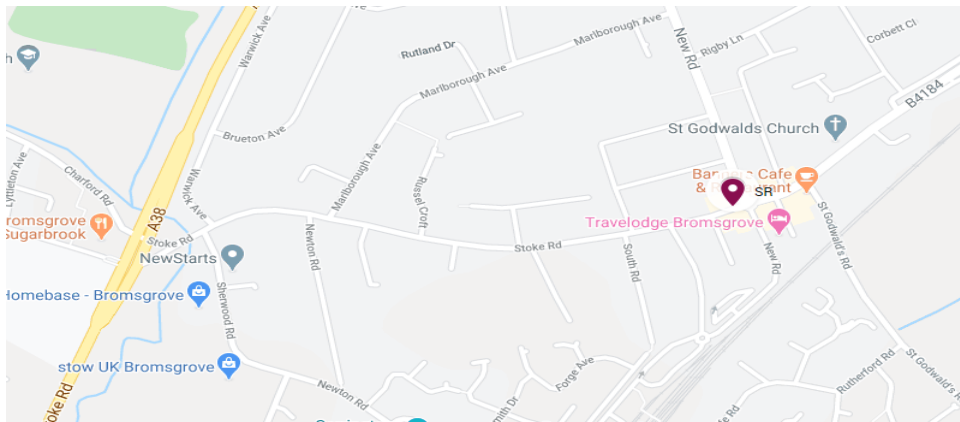
Redditch Road AQMA and Monitoring Locations (19, 18, HR, 16, 255) (fig D.1c)



Worcester Road AQMA and Monitoring Locations (WR, BC, BCX, WR2, WR3, WR4, RH) (fig D.1d)



Rock Hill, Bromsgrove Monitoring Locations (FL1, FL2, RH) (fid D.1e)



Aston Fields, Bromsgrove Monitoring Location (SR) (Fig D.2f)





Bromsgrove Monitoring Locations (BR, BG1, KEN) (fig D.1g)



Wildmoor, Bromsgrove Monitoring Location (TS) (fig D.1h)



Monitoring Locations Former Hagley AQMA (RES1, RES2, 9, KR62) (fig D.1i)



West Hagley Monitoring Locations (HAG6, HAG5, HAG3, HAG4, RES3) (fig D.1j)



West Hagley Monitoring Locations (11, HAG1, HAG2, RES4) (fig D.1k)



Rubery Monitoring Location (RUB1) (fig D.1l)





Stourbridge Road, Bromsgrove Monitoring Locations (SBR1, SBR2, SBR3) (fig D.1m)

## Appendix E: Summary of Air Quality Objectives in England

**Table E.1 – Air Quality Objectives in England<sup>9</sup>**

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO <sub>2</sub> )	200µg/m <sup>3</sup> not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO <sub>2</sub> )	40µg/m <sup>3</sup>	Annual mean
Particulate Matter (PM <sub>10</sub> )	50µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM <sub>10</sub> )	40µg/m <sup>3</sup>	Annual mean
Sulphur Dioxide (SO <sub>2</sub> )	350µg/m <sup>3</sup> , not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO <sub>2</sub> )	125µg/m <sup>3</sup> , not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO <sub>2</sub> )	266µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	15-minute mean

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<sup>9</sup> The units are in microgrammes of pollutant per cubic metre of air (µg/m<sup>3</sup>).

## 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<sub>2</sub>) 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<sup>10</sup> 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<sub>x</sub>), and exhaust and non-exhaust particulates (PM). The Air Quality Expert Group (AQEG)<sup>11</sup> has estimated that during the initial lockdown period in 2020, within urbanised areas of the UK reductions in NO<sub>2</sub> annual mean concentrations were between 20 and 30% relative to pre-pandemic levels, which represents an absolute reduction of between 10 to 20µg/m<sup>3</sup> if expressed relative to annual mean averages. During this period, changes in PM<sub>2.5</sub> concentrations were less marked than those of NO<sub>2</sub>. PM<sub>2.5</sub> 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<sub>2.5</sub>

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<sup>10</sup> Prime Minister's Office, COVID-19 briefing on the 31<sup>st</sup> of May 2020

<sup>11</sup> 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 during the initial lockdown period are of the order 2 to  $5\mu\text{g}/\text{m}^3$  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 Bromsgrove District Council

Nitrogen Dioxide concentrations in the Bromsgrove District Council area, including the AQMAs, are largely linked to road traffic. During the Covid-19 pandemic Worcestershire County Council has collated travel and traffic data for the County. This data has been compared with normal baseline data to give an indication of the impact of Covid-19 lockdowns and restrictions on traffic flows and travel behaviours. Data was gathered from County and DfT sources and included nine live traffic monitors in the Worcester City area and nine further monitors across the County.

Countywide traffic data shows that changes in traffic flows and patterns largely followed the trends seen nationally. Traffic volumes across the County dropped to as low as 34% of normal baseline conditions during the March/April 2020 lockdown and as low as 63% of normal baseline conditions during December 2020 (Figure F.1 below).

Due to a combination of Covid-19 restrictions and a change of laboratory diffusion tube data for January to June 2020 is not available for the Bromsgrove District area and as such it is not possible to comment on any monthly changes in nitrogen dioxide concentrations for the first six months of 2020; including any changes experienced as a result of reductions in traffic associated with the first national lockdown.

A comparison of annual mean nitrogen dioxide concentrations across the Bromsgrove District between 2019 and 2020 shows a general decrease across the District at all locations. An average decrease in concentration of 19.29% ( $4.9\mu\text{g}/\text{m}^3$ ) can be observed across the District as a whole.

A comparison of annual mean nitrogen dioxide concentrations in the three AQMAs between 2019 and 2020 shows a general decrease at all locations. An average decrease in concentration of 21.97% ( $6.81\mu\text{g}/\text{m}^3$ ) can be observed in the Worcester Road AQMA, 15.82% ( $3.84\mu\text{g}/\text{m}^3$ ) in the Redditch Road AQMA, and 24.47% ( $7.02\mu\text{g}/\text{m}^3$ ) in the Lickey End AQMA. A decrease in concentrations of 17.22% ( $4.05\mu\text{g}/\text{m}^3$ ) can be seen within the Hagley monitoring locations and 13.41% ( $2.95\mu\text{g}/\text{m}^3$ ) at the remaining locations.

Whilst Covid-19 restrictions and subsequent reductions in traffic volumes will have influenced nitrogen dioxide concentrations, there is a general downward trend in annual mean nitrogen dioxide concentrations over the period 2016 to 2019 and as such it is not possible to quantify the

impact of traffic changes as a result of Covid-19 restrictions on nitrogen dioxide concentrations locally with the data available.

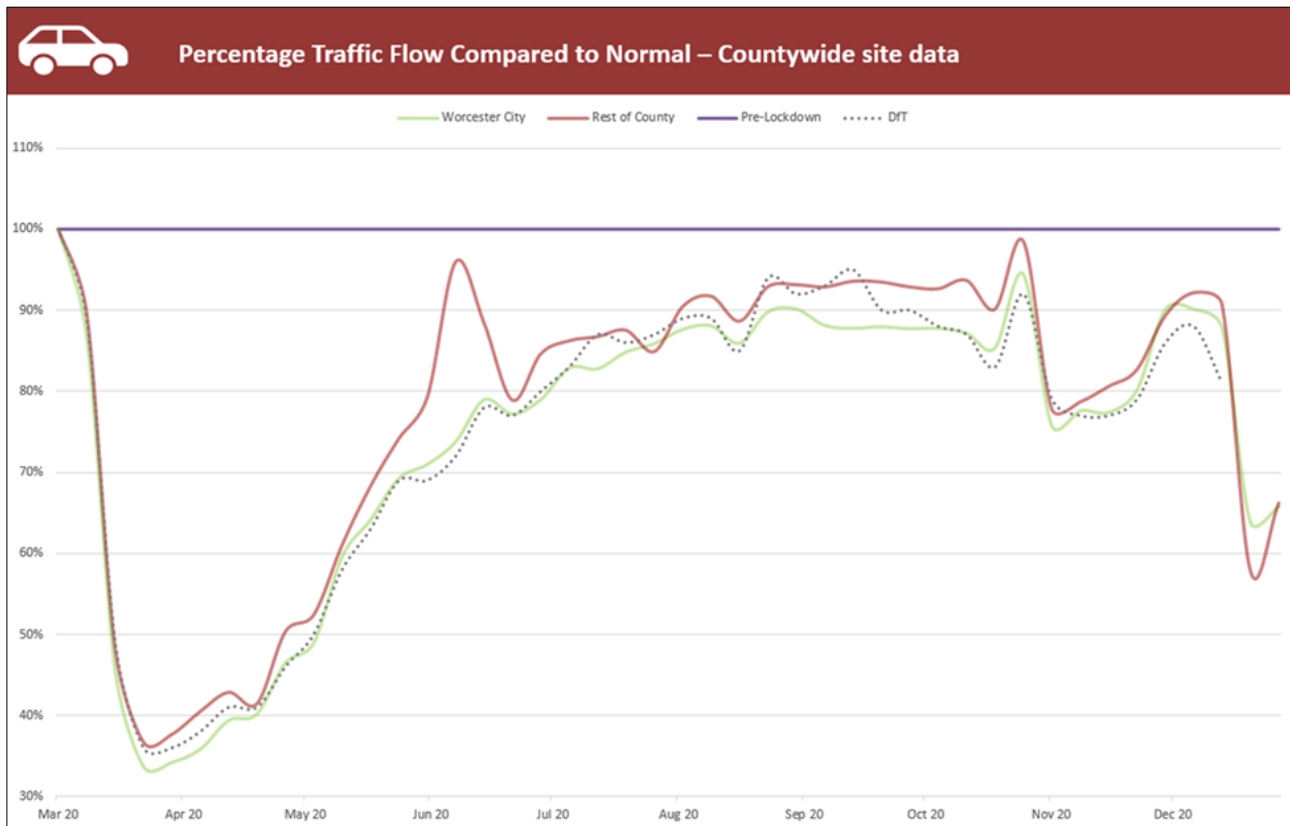


Figure F.1 Showing Worcestershire 2020 Percentage Traffic Flow Compared to Normal

## Opportunities Presented by COVID-19 upon LAQM within Bromsgrove District Council

No LAQM specific related opportunities have arisen as a consequence of Covid-19 within the area.

## Challenges and Constraints Imposed by COVID-19 upon LAQM within Bromsgrove District Council

The following challenges and constraints imposed by Covid-19 impacted the LAQM work of the Council:

- Passive monitoring Data Capture – diffusion tubes were not exposed for the month's March 2020 to June 2020 due to a combination of laboratory closures and a Council decision not to deploy officers to change tubes due to Covid-19 restrictions. This has affected data

capture during 2020, resulting in data from all monitoring sites having to be annualised.

**Small/Medium impact**

- Defra Diffusion Tube Exposure Calendar - during months where diffusion tubes were exposed the calendar was adhered to. **No impact**
- Diffusion Tube Storage - during months where diffusion tubes were sent for analysis they were stored and analysed in accordance with laboratory guidance. **No impact**
- Diffusion tube bias-adjustment - in 2019 diffusion tubes were supplied and analysed by Somerset Scientific Services and the national bias-adjustment factor for that laboratory used. The 2019 bias-adjustment factor for Somerset Scientific Services was based on 2 studies. Between July and December 2020 diffusion tubes were supplied and analysed by Gradko International Limited and the national bias-adjustment factor for Gradko used. The 2020 bias-adjustment factor for Gradko is based on 18 studies. **No impact**
- The work of the Worcestershire Air Quality Partnership was due to continue in 2020 however at the time of report writing the work of the group has been postponed indefinitely due to the Covid-19 pandemic. **Small/Medium impact.**

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
BDC	Bromsgrove District Council
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 <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Nitrogen Oxides
PM <sub>10</sub>	Airborne particulate matter with an aerodynamic diameter of 10µm or less
PM <sub>2.5</sub>	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO <sub>2</sub>	Sulphur Dioxide
WCC	Worcestershire County Council
WRS	Worcestershire Regulatory Services



## References

- 1) 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.
- 2) 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.
- 3) DEFRA (2021) Covid-19: Supplementary Guidance. Local Air Quality Management Reporting in 2021 v.1
- 4) DEFRA (2021) National Diffusion Tube Bias Adjustment Factor Spreadsheet v.03/21
- 5) DEFRA (2013) Background Mapping for Local Authorities
- 6) Worcestershire Regulatory Services (2013) 'Air Quality Action Plan for Worcestershire'
- 7) Worcestershire Regulatory Services (2015) 'Air Quality Action Plan Progress Report for Worcestershire April 2013-April 2015'
- 8) Worcestershire Regulatory Services (2016) 'Air Quality Action Plan Progress Report for Worcestershire April 2015 – April 2016'
- 9) Worcestershire Regulatory Services (2020) Air Quality Annual Status Report for Bromsgrove District Council
- 10) Worcestershire Regulatory Services Website  
<http://www.worcsregservices.gov.uk/pollution/air-quality/>