Gloucester City Council

Transforming Your City

2025 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management, as amended by the Environment Act 2021

Date: June 2025

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Executive Summary: Air Quality in Our Area

Air Quality in Gloucester City

Breathing in polluted air affects our health and costs the NHS and our society billions of pounds each year. Air pollution is recognised as a contributing factor in the onset of heart disease and cancer and can cause a range of health impacts, including effects on lung function, exacerbation of asthma, increases in hospital admissions and mortality.

Air pollution particularly affects the most vulnerable in society, children, the elderly, and those with existing heart and lung conditions. Low-income communities are also disproportionately impacted by poor air quality, exacerbating health and social inequalities. Table ES 1 provides a brief explanation of the key pollutants relevant to Local Air Quality Management and the kind of activities they might arise from.

Table ES 1 - Description of Key Pollutants

Pollutant	Description
Nitrogen Dioxide (NO_2)	Nitrogen dioxide is a gas which is generally emitted from high-temperature combustion processes such as road transport or energy generation.
Sulphur Dioxide (SO_2)	Sulphur dioxide (SO_2) is a corrosive gas which is predominantly produced from the combustion of coal or crude oil.
Particulate Matter (PM_{10} and $PM_{2.5}$)	Particulate matter is everything in the air that is not a gas. Particles can come from natural sources such as pollen, as well as human made sources such as smoke from fires, emissions from industry and dust from tyres and brakes. PM_{10} refers to particles under 10 micrometres. Fine particulate matter or $PM_{2.5}$ are particles under 2.5 micrometres.

Gloucester is a small city of approximately 150,000 inhabitants situated on the eastern bank of the River Severn, between the Cotswolds to the east and the Forest of Dean to the west.

The key pollutants of concern in Gloucester are nitrogen dioxide (NO_2) and fine particulates ($PM_{2.5}$ and PM_{10}), with road traffic emissions being the principal local emission source. There are several major roads in Gloucester, notably the A40, A417, A430 and the A38 that connect Gloucester City with the strategic highway in Gloucestershire. The M5 motorway demarcates the city's eastern border and is a major emission source.

Other sources include pollution/emissions from both inside and outside the district. Those inside the district will include bonfires and local industry.

Gloucester City Council has a network of passive diffusion tubes across the city, which measured NO_2 at 24 locations during 2024. Although Gloucester City Council does not carry out monitoring for PM_{10} or $PM_{2.5}$ Defra installed a monitor in Tredworth as part of their nationwide network. The results can be seen on the Defra website, here.

Air pollution levels in Gloucester are acceptable and in 2024, there were no recorded exceedances of the UK Air Quality Objectives. Nationally, there is a long-term trend showing a decline in concentrations of NO_2 at roadsides, which we can also demonstrate in our district. For example, in 2024, annual mean concentrations of NO_2 were lower than those measured at the same sites in 2023. Measured concentrations were also at all locations except site 14, lower than in 2020, which had previously been the lowest recorded year due to the Covid-19 pandemic and associated lockdowns. (Site 14 recorded an annual mean concentration of 32.2 $\mu g/m^3$ in 2024 compared to 31.5 $\mu g/m^3$ in 2020.)

The main reason that air quality is improving across much of the UK, where road traffic is the major source of emissions, is due to the replacement of older, "dirtier" vehicles with those with "cleaner" engines, including electric vehicles.

Due to historic exceedances of the 40$\mu g/m^3$ annual mean objective for NO_2, three Air Quality Management Areas (AQMAs) (i.e. known pollutant hotspots) have been declared in Gloucester. These are:

- Barton Street AQMA (in the city centre) declared in 2005.
- Priory Road AQMA (on the A417) also declared in 2005.
- Painswick Road AQMA (in the city centre, consisting of a section of the B4073 between the railway line and the A38) declared in 2007.

Gloucester City Council has implemented an draft Air Quality Action Plan (AQAP) that describes the actions being taken to reduce pollution concentrations in the AQMAs and

across the district. All three AQMAs have been compliant with the objectives for at least the last four years, so a detailed air quality assessment has been made and a report written which provides supporting evidence for an application to revoke these AQMAs.(Appendix F) Orders have been drafted and it is hoped the AQMAs will be revoked during 2025. When they are revoked then following Defra guidance, the Council will develop and publish an Air Quality Strategy which will ensure continued attention to air quality compliance and improvements for the whole district. The AQAP measures which have been consulted upon and agreed, will be used in the formulation of the new Air Quality Strategy.

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades, there are some areas where local action is needed to protect people and the environment from the effects of air pollution.

The Environmental Improvement Plan (Defra. Environmental Improvement Plan 2023, January 2023) sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term targets for fine particulate matter ($PM_{2.5}$), the most harmful pollutant to human health. The Air Quality Strategy provides more information on local authorities' responsibilities to work towards these new targets and reduce fine particulate matter in their areas.

The Road to Zero (DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018) details the Government's approach to reduce exhaust emissions from road transport through a number of mechanisms, in balance with the needs of the local community. This is extremely important given that cars are the most popular mode of personal travel, and the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

Gloucester City Council prepared a new Air Quality Action Plan (AQAP) in 2024. As part of the AQAP development, a review of the AQMAs was completed and stakeholder workshops were held in 2023 to inform air quality improvement measures. The draft of the revised AQAP has now been completed and has gone through County Council Public Health and District Council consultation. There was a delay in public consultation (which

took place in the first quarter of 2025) as Gloucester City Council had to wait for the publication of the County Council's Climate Action Plan and the two pre-election periods.

The measures from the extant Air Quality Action Plan are included within this document, along with the progress that has been made on implementation. Note: Measures listed in the previous draft of the AQAP that have been completed, have been removed from the new AQAP. The extant measures can be summarised as follows:

- Highways improvements
- The continued development of the cycle lane network
- Encouraging Stagecoach to buy new vehicles for bus services
- A city-wide anti-idling campaign
- Implementation of a fleet recognition scheme
- Low emission vehicle procurement
- Scooter/ cycle rental schemes
- The provision of electric vehicle charging infrastructure
- The promotion of active travel
- Raising public awareness about air quality; and
- Specific initiatives focusing on schools.

Gloucester City Council and Gloucestershire County Council work together on our aligned Air Quality and Health strategies and will continue to do so moving forward. The strategies aim to improve air quality across the county and reduce the impact of air pollution on human health and the environment.

The District Air Quality Group (DAQG) comprising a representative from each of the district councils and County council in Gloucestershire, continues to meet quarterly and share expertise. The group discuss relevant issues arising, such as air quality projects, monitoring results and new information. It also formulates joint responses to local plan and neighbourhood development plans where appropriate and any other consultation document relating to air quality.

Conclusions and Priorities

In 2024, no exceedances of the NO_2 annual mean objective were recorded within or outside our AQMAs. Furthermore, there has been at least four years since an exceedance

of the annual mean objective in any AQMA, was measured. There are, however, no safe levels of some pollutants and as such, Gloucester City Council continues to be committed to minimising pollution concentrations across the city.

The following actions are key priorities for Gloucester City Council in 2025:

- Draft the new Air Quality Strategy for use when the AQMAs are revoked.
- Continue to review the monitoring locations across the city, particularly in vicinity of new development and highly sensitive uses.
- Support Gloucestershire County Council to deliver the draft Air Quality and Health Strategy.
- Implement the recommendations of the Smoke Control Area (SCA) review; ie revoke the existing SCA by order and implement a new district wide SCA.

Gloucester City Council anticipate that these measures will further contribute to achieving continued compliance with the NO_2 annual mean objective within the existing AQMAs, as well as contributing to an improved understanding of pollution across the city.

Local Engagement and How To Get Involved

The public can engage with Gloucester City Council via their website which contains further information on the following:

- Air quality monitoring;
- Declared AQMAs;
- Public electric vehicle charging points;
- Industrial activities permitted by Gloucester City Council;
- Smoke Control Area
  and
- Defra guidance on the use of open fires, wood burning stoves and bonfires.

  Live consultations can be found on the website when the public are able to get involved: https://www.gloucester.gov.uk/about-the-council/consultations-and-feedback/have-your-say/

In addition, Gloucestershire County Council host the Think Travel website which provides further information about the sustainable travel options available across the county of Gloucestershire, such as:

- Local walking maps;
- Cycle routes;
- Public transport journey planner
- Park & Ride facilities;
- Eco driving;
- Car sharing; and
- Electric vehicles

Road vehicles are the principal source of many pollutants in urban areas, including in Gloucester. As such, before using your car, ask yourself:

- Do I really need to make this journey?
- Could I walk or cycle instead of taking the car?
- Could I take a bus, or train or carpool?
- Are the levels of air pollution already too high today?

If you must drive:

- Drive smoothly. You'll save fuel (and money), and your engine will also pollute less.
- Don't rev your engine unnecessarily.
- Maintain your car. Keep the engine properly maintained and the tyres at the right pressure; and
- Turn off the engine when your car is stationary.

At home:

- Buy water-based or low-solvent paints, varnishes, glues and wood preservatives;
- Avoid burning solid fuels (wood, coal and charcoal), where possible;
- Avoid lighting bonfires;
- Only burn dry material and never burn household waste, especially plastic, rubber, foam or paint;

- Levels of pollution can be quite high on bonfire night and other events/festivals with bonfires, and sensitive people, including people with respiratory conditions, may notice some effects;
- However, exposure can be considerably reduced by remaining indoors and keeping windows closed;
- Be aware of internal sources of pollution (e.g. candles, cleaning products and gas stoves) and make sure that your home is sufficiently ventilated when using these products,

Further information on the health effects of air pollution can be found on the Government's website.

Local Responsibilities and Commitment

This ASR was prepared by the Community Wellbeing Department of Gloucester City Council with the support and agreement of Gloucestershire County Council Public Health and climate change teams.

This ASR has been approved by:

Gloucestershire County Council Director of Public Health – Siobhan Farmer

Signature:

Cabinet Member for the Environment (with responsibility for Community Wellbeing)

Signature: 

If you have any comments on this ASR please send them to Community Wellbeing at:

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1 Local Air Quality Management

This report provides an overview of air quality in Gloucester City Council during 2024. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995), as amended by the Environment Act (2021), and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in order to achieve and maintain the objectives and the dates by which each measure will be carried out. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Gloucester City 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

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 18 months. The AQAP should specify how air quality targets will be achieved and maintained, and provide dates by which measures will be carried out.

A summary of AQMAs declared by Gloucester City Council can be found in Table 2.1. The table presents a description of the three AQMAs that are currently designated within Gloucester City Council.

All three AQMAs have been compliant with the objectives for at least the last four years so a detailed air quality assessment has been made and a report written which provides supporting evidence for an application to revoke these AQMAs. Orders have been drafted and it is hoped the AQMAs will be revoked during 2025. If they are revoked then, following Defra guidance, the Council will develop and publish an Air Quality Strategy which will ensure continued air quality compliance and improvements for the whole district. The AQAP measures which have been consulted upon and agreed, will be used in the formulation of the new Air Quality Strategy.

- Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of the AQMAs and also the air quality monitoring locations in relation to the AQMAs. The air quality objective pertinent to the current AQMA designations is NO_2 annual mean.

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	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
Painswick Road AQMA	5/10/2007	NO2 Annual Mean	An area encompassing a number of properties on either side of Painswick Road, Gloucester.	No	48 µg/m^3	No exceedance 25 µg/m^3	>5	AQAP 2008 (2011 Review) + 2023 AQAP	Adopted: https://www.gloucester.gov.uk/media/jjcbgnok/gloucester-city-aqap-2011.pdf New: https://democracy.gloucester.gov.uk/documents/s60864/AQAP%20report%202024.pdf
Barton Street AQMA	8/8/2005	NO2 Annual Mean	An area encompassing Barton Street, Gloucester from its junction with Trier Way/Bruton Way to the northwest and Upton Street to the southeast.	No	47 µg/m^3	No exceedance 32 µg/m^3	4	AQAP 2008 (2011 Review) + 2023 AQAP	Adopted: https://www.gloucester.gov.uk/media/jjcbgnok/gloucester-city-aqap-2011.pdf New: https://democracy.gloucester.gov.uk/documents/s60864/AQAP%20report%202024.pdf
Priory Road AQMA	8/8/2005	NO2 Annual Mean	An area encompassing the junction of St Oswalds Road and Priory Road.	No	48 µg/m^3	No exceedance 31 µg/m^3	4	AQAP 2008 (2011 Review) + 2023 AQAP	Adopted: https://www.gloucester.gov.uk/media/jjcbgnok/gloucester-city-aqap-2011.pdf New: https://democracy.gloucester.gov.uk/documents/s60864/AQAP%20report%202024.pdf

☒ **Gloucester City Council confirm the information on UK-Air regarding their AQMA(s) is up to date**

☒ **Gloucester City Council confirm that all current AQAPs have been submitted to Defra**

2.2 Progress and Impact of Measures to Address Air Quality in Gloucester City

Defra's appraisal of our 2023 ASR noted:

The Council has three Air Quality Management Areas (AQMA's) located at Painswick Road, Barton Street and Priory Road. All AQMA's declared have been compliant with the air quality objectives for the past four years, consecutively, and as such, should be considered for revocation. Painswick Road in particular, has been compliant for more than 5 years, therefore plans to revoke this AQMA must be put in place.

The revocation of an AQMA should be considered following three consecutive years of compliance with the relevant objective as evidenced through monitoring. Where there have been no exceedances for the past five years, local authorities must proceed with plans to revoke the AQMA. The LAQM Technical Guidance 2022 is clear in this respect:

"There should not be any declared AQMAs for which compliance with the relevant objective has been achieved for a consecutive five-year period." (Point 3.57, page 50).

AQMAs should identify areas where air quality objectives are not being met or are likely to be at risk of not meeting them. Keeping AQMAs in place longer than required risks diluting their meaning and impacting public trust in LAQM.

Gloucester City Council has undertaken the required detailed assessment to support the revocation of these AQMAs, to be submitted to Defra with this ASR. (See Appendix F)

Furthermore, Gloucester City Council continues to work towards the goals of the draft Gloucestershire County Council Air Quality and Health Strategy.

Gloucester City Council has taken forward a number of direct measures during the current reporting year of 2024 in pursuit of improving local air quality. Details of all measures completed in 2024, in progress or planned are set out in Table 2.2. The table includes the type of measure, as well as the progress Gloucester City Council have made during the reporting year of 2024. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within the table.

Gloucester City Council does not expect any of the measures to be completed over the course of the next reporting year, as they are ongoing measures. Regardless, the

following milestones relating to air quality management are expected before the next Air Quality Status report:

- Continue to review the monitoring locations across the city, particularly in vicinity of new development and highly sensitive uses.
- Formulate and adopt a new Air Quality Strategy, incorporating the measures from our consulted and approved AQAP, for use when the AQMAs have been revoked.
- Implement a district wide Smoke Control Area by Order.

Gloucester City Council worked to implement improvements in air quality in partnership with the following stakeholders during 2024:

- Gloucestershire County Council
- Gloucester City Climate Change manager
- Countywide Climate Change coordinator
- Planning team

The principal challenges and barriers to implementation that Gloucester City Council anticipates facing, relate to funding and resourcing pressures within our stakeholder and partner organisations.

Gloucester City Council anticipates that the measures stated above and in Table 2.2 will improve air quality across Gloucester, including in the current AQMAs.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Continue to explore highways infrastructure based improvements.	Transport Planning and Infrastructure	Other	TBC	TBC	City Council / County Council	TBC	NO	TBC	£100k - £500k	Gloucestershire Arle Court Transport Hub delivered	Moderate	Less congestion and reduction in NO_2 concentration in AQMAs	Arle Court Transport Hub has been delivered to reduce car usage between Cheltenham, Gloucester and surrounding districts.	The County Council have ongoing feasibility studies for other options which are likely to improve transport links and reduce air pollution in Gloucestershire County
2	Vehicle restrictions to be enforced on the B4073	Traffic Management	Other	TBC	TBC	City Council / County Council	TBC	NO	TBC	£50k - £100k	Completed	Low	Reduction in NO_2 concentration along Barton Street.	Restricting the size of vehicles travelling down Barton Street has been mooted. To reduce the number of larger, more polluting vehicles travelling through the AQMA.	The project would lead to redirection of these vehicles and could create a traffic congestion problem elsewhere or potentially stunt economic development, making this option unattractive. Additionally, the AQMA has complied with national AQ objectives for a number of years and therefore radical traffic change in this location is unnecessary
3	Development of the Gloucestershire Cycle Spine: expansion of cycle lane network	Transport Planning and Infrastructure	Cycle network	Completed	Completed/ TBC	City Council / County Council/ Cheltenham BC	Completed for London Road/ Cycle Spine ongoing	No	Completed for London Road/ Cycle Spine ongoing	£100k - £500k	Implementation	Moderate	Number of users.	Improvements include expansion of the cycle lane network connecting with neighbouring districts Cheltenham and the boundary of Stroud	Using the London Road example identify additional areas where lane closure may be feasible. Running several trials to check feasibility and uptake. A permanent cycle route from Gloucester to Cheltenham is under construction. Gloucestershire cycle spine | Highways
4	Collaborating with bus operators (Stagecoach).	Transport Planning and Infrastructure	Other	Ongoing	Estimated that by late 2025/early 2026 the first electric buses will be in service	City Council / County Council	DfT grant secured	NO	Government grant secured (DfT)	£6 million	Implementation	Moderate	Engagement with bus operators.	Ongoing	1) Electrification of 20% of the fleet, which equates to 58 buses across the county; vehicle replacement and retrofitting. 2) Routing of buses; the busiest bus routes are likely to be targeted

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	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
5	Develop Barton and Tredworth anti-idling campaign.	Traffic Management	Anti-idling enforcement	TBC	TBC	City Council / County Council	TBC	NO	TBC	£10k - 50k	Planning	Low	Increased awareness.	Ongoing Information on County Council website: Anti idling | Gloucestershire County Council	Reducing vehicle idling within Barton and Tredworth
6	Procurement of low emission vehicles	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	Complete	Available to all staff through HR managed lease scheme	City Council / County Council	In progress	NO	In progress	£100k - £500k	Implementation	Moderate	Number of users.	Ongoing	Inclusive of a salary sacrifice scheme to promote LEV take-up within council staff - tax breaks etc. In progress
7	Scooter/cycle rental.	Promoting Travel Alternatives	Promotion of cycling	Continued	Ongoing	City Council / County Council / Cheltenham Borough Council	Continued	NO	Continued	£50k - £100k	e-scooters and E bikes available within Gloucester and Cheltenham.	Moderate	Number of users.	Ongoing	
8	Installation of electric charging points within Council car parks throughout the city.	Promoting Low Emission Transport	Other	Ongoing	TBC	City Council / County Council / Office for Zero Emission Vehicles	TBC	NO	TBC	£100k - £500k	A few have been installed	Moderate	Number of charging points.	Ongoing The new upgraded train station and Gloucester Quays have installed electric charging points. Additionally, some supermarkets have installed electric charging points for customer use	Policy in Local Plan – electric charging point in every new development where it is feasible. Barriers to implementation include infrastructure limitations and economic considerations. (weight of evs and space taken within car park for charging points)

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	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
9	Travel planning / Behavioural Change Campaigns	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	Ongoing	Open Ended	City Council / County Council	TBC	NO	TBC	< £10k	Planning	Low	Number of plans implemented.	Ongoing	The measures that have been discussed within 3 and 4 should be moulded into a suite of works that can be developed and implemented over a set timeline. Would include Travel Plans / Journey Planning Promotion of sustainable / active travel Cycle to work schemes Family cycling schemes Working from home. Travel plans can be tailored to: Schools Job seekers Businesses Specific to geographical areas
10	Public Awareness / Information Accessibility	Public Information	Via the Internet, consultations and engagement	TBC	TBC	City Council / County Council	TBC	NO	TBC	< £10k	Implemented – carried out recent consultation on AQMA and SCA	NA	Increased awareness.	Dovetailed with the measure above, the amount and the quality of information available to the general public should be increased. Emphasis on information on sustainable travel options.	Our recent consultation highlighted a desire for more opportunities for the public to learn about air quality
11	Schools Initiatives	Promoting Travel Alternatives	School Travel Plans	TBC	TBC	City Council / County Council	TBC	NO	TBC	< £10k	Planning	NA	Number of schools involved.	A diffusion tube monitoring for NO2 exercise was carried out over 2023- 2024 – it showed that levels were very low.	Specifically related to the schools within Gloucester. The County Council will continue to encourage active travel

$PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG22 (Chapter 8) and the Air Quality Strategy, (Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023) local authorities are expected to work towards reducing emissions and/or concentrations of fine particulate matter ($PM_{2.5}$). There is clear evidence that $PM_{2.5}$ (particulate matter smaller 2.5 micrometres) has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

A regional estimate of the fraction of mortality attributable to $PM_{2.5}$ has been estimated from work carried out by UK Health Security Agency (UKHSA) and the Office for Health Improvements and Disparities (OHID). UKHSA estimates 6.0% of all mortality was attributable with particulate air pollution in 2022. This is greater than both the Southwest (4.6%) and England's average (5.8%). This information is available from OHID's Public Health Data webpage.

Through monitoring NO_2 levels, Gloucester City Council has found the national AQ objectives are now met in the AQMAs as well as the rest of the district. The initiatives aimed at reducing NO_2 levels in Gloucester will also have a positive impact on reducing the levels of PM_{10} and $PM_{2.5}$ since particulate matter is also linked to road traffic through direct emissions (exhaust emissions, brake and tyre wear and road abrasion) and secondary formation.

According to the Defra background mapped data for Gloucester, based on the reference year of 2021, all the 2024 background concentrations of $PM_{2.5}$ were significantly below the annual mean AQS objective of 20µg/m^3 for $PM_{2.5}$. The highest concentration, predicted to be 8.1 µg/m^3, was found within a 1km x 1km grid square located south of the city centre with a centroid grid reference of 383500, 217500. It is worth noting that all the modelled results for our district meet the UK's 2040 Air Quality Target of 10µg/m3.

Although predicted background $PM_{2.5}$ levels are below the Air Quality Objective and 2040 target value, it is noted concentrations may be higher in close proximity to emissions sources, such as roads and industry. Secondary $PM_{2.5}$, of which some would be formed in-

situ through reactions associated with local NO_X, makes up the greatest proportion of $PM_{2.5}$ in the city. Domestic emissions and industry are also a significant local source.

Gloucester has had a small smoke control area since the 1960's. The area includes the Cathedral, the old Gaol and the County Council offices. Housing built before the area was designated is excluded from control, as it was expected that the area would be redeveloped. This has indeed taken place over the years, so that the only excluded housing today is in Priory Road, Mount Street and Pitt Street. Gloucester's smoke control order means you cannot emit smoke from a chimney unless you're burning an authorised fuel or using exempt appliances, for example burners or stoves. The aim is to prevent air pollution, particularly emissions of smoke and hence fine particulates (including $PM_{2.5}$). As such, the enforcement of the smoke control area is helping to minimise emissions of $PM_{2.5}$. In 2024 a review of our Smoke Control Area was carried out and a recommendation to revoke it and replace it with a district wide Smoke Control Area was presented to the Cabinet. This was approved and draft orders made. The necessary administration for Secretary of State's approval will be made as soon as possible.

The LA-PPC environmental permitting regime and nuisance investigations associated with the 1990 Environmental Act are also tools that manage emissions of $PM_{2.5}$.

Although Gloucester City Council does not carry out monitoring for PM_{10} or $PM_{2.5}$ Defra recently installed a monitor in Tredworth as part of their nationwide network. The results can be seen on the Defra website, here: https://uk-air.defra.gov.uk/networks/site-info?uka_id=UKA01102

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

This section sets out the monitoring undertaken within 2024 by Gloucester City Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2020 and 2024 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

Automatic Monitoring Sites

Gloucester City Council did not undertake automatic (continuous) monitoring during 2024. Defra have recently installed a continuous PM2.5 and PM10 monitor in Tredworth, which monitors background levels; the results can be found here: https://uk-air.defra.gov.uk/networks/site-info?uka_id=UKA01102

Non-Automatic Monitoring Sites

Gloucester City Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 24 sites during 2024. Table A.22 in Appendix A presents the details of the non-automatic sites.

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

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualisation (where the annual mean data capture is below 75% and greater

than 25%), and distance correction. Further details on adjustments are provided in Appendix C.

Nitrogen Dioxide (NO_2)

Table A. in Appendix A compare the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2024 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.

Data capture for most of the diffusion tubes was above 75% and therefore annualisation (short-term to long-term adjustment) was not necessary. However the monitoring at Sweetbriar Street only achieved 66.7% data capture, as tubes were compromised on 4 occasions (February, March, July and November), so annualisation calculations were necessary to obtain the annual average result at this site, the details of which can be seen in Appendix C.

The NO_2 results for 2024 have been bias adjusted using a national bias adjustment factor of 0.84. Full details of the annualisation, bias adjustment, and QA/QC monitoring procedures are provided in Appendix C.

Gloucester City Council have analysed the 2024 monitoring data, breaking down the analysis by AQMA, below.

Barton Street AQMA

Monitored concentrations are presented in Table A.2 and Figure A.2. There are six diffusion tube locations within the Barton Street AQMA.

All measurements were below the annual mean air quality objective in 2024. The highest concentration, in 2024, was recorded at site 14 (32.2 µg/m^3). All measured annual mean concentrations have been at least 10% below the 40.0 µg/m^3 objective for five years.

The results of the detailed air quality assessment support the revocation of this AQMA. As there is little likelihood of any exceedance of the objective in the foreseeable future, this AQMA will be revoked by order as soon as practicable.

Priory Road AQMA

Monitored concentrations are presented in Table A.2 and Figure A.3. There are three diffusion tube locations within the Priory Road AQMA.

All measurements were below the annual mean air quality objective in 2024. The highest concentration, in 2024, was recorded at site 25 (30.7 µg/m^3). All measured annual mean concentrations in Priory Road AQMA have been below the 40.0 µg/m^3 objective and below 10% of the annual objective (within the uncertainty of diffusion tubes) for at least three years. The last time a concentration within 10% of the objective was measured was in 2021 (37.6 µg/m^3). Defra usually requires three years of measurements below 10% of the AQS to consider revocation, so this site has been included in the detailed assessment which supports revocation. As there is little likelihood of any exceedance of the objective in the foreseeable future, this AQMA will be revoked by order as soon as practicable.

Site 27 is located at 38 Priory Road, just outside of the Priory Road AQMA. The concentration monitored at this site during 2024 was 14.9µg/m^3. This is well below the NO_2 annual mean objective and more than 10 µg/m^3 below the levels measured within the designated AQMA area, providing evidence to support the current boundary of the AQMA.

Painswick Road AQMA

Monitored concentrations are presented in Table A.2 and Figure A.4.

There are three diffusion tube locations within the Painswick Road AQMA. All measurements were below the annual mean air quality objective in 2024. The highest concentration, in 2024, was recorded at site 8 (24.8 µg/m^3). All measured annual mean concentrations in Painswick Road AQMA have been at least 10% below the 40.0 µg/m^3 objective for at least five years and the detailed assessment states that there is little likelihood of any exceedance of the objective in the foreseeable future. This AQMA will be revoked by order as soon as practicable.

Diffusion Tubes Outside of Existing AQMAs

Monitored concentrations are presented in Table A.2 and Figure A.1.

There were 12 diffusion tube monitoring sites located outside of the existing AQMAs in 2024. Sites 27, 28, 29 and 30 were added in 2021. In April 2022, sites 31, 32 and 33 were added to monitor at schools and at a new block of flats.

All measurements were below the annual mean air quality objective in 2024. The highest concentration at a site outside of the AQMA was recorded at site 19 (29.8µg/m^3).

The sites outside of the AQMAs also measure concentrations at background sites (21, 28, 31 and 33), giving a good indication of average exposure across the city. The highest background measurement in 2024 was at site 21 (14.5µg/m^3).

The annual mean NO_2 concentrations across the city were not greater than 60µg/m^3 at and therefore, as per LAQM.TG(22) guidance, it is unlikely there were any exceedances of the NO_2 1-hour mean objective at any of the sites.

Due to all monitoring locations reporting concentrations below the annual mean objective, no new AQMAs need to be designated within Gloucester at the current time.

Appendix A: Monitoring Results

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

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
3	35 Buscombe Gardens	Roadside	387670	217250	NO2	No	0.0	26.8	No	2.6
5	97 Painswick Road	Roadside	384558	216946	NO2	Yes - Painswick Road	0.0	4.6	No	2.6
7	76 Painswick Road	Roadside	384490	217027	NO2	Yes - Painswick Road	0.0	3.5	No	2.7
8	88 Painswick Road	Roadside	384509	216998	NO2	Yes - Painswick Road	0.0	3.5	No	2.5
12	219A Barton Street (gutter) and (post)	Roadside	384000	217863	NO2	Yes - Barton Street	0.0	2.0	No	2.6
13	99 Barton Street	Roadside	383717	218094	NO2	Yes - Barton Street	0.0	2.0	No	2.5
14	124 Barton Street	Roadside	383726	218074	NO2	Yes - Barton Street	0.0	1.5	No	2.6
15	196 Barton Street (Lamppost)	Roadside	383989	217857	NO2	Yes - Barton Street	0.0	2.5	No	2.6

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) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
16	229 Barton Street Lamppost outside flat no. 7	Roadside	384340	217294	NO2	Yes - Barton Street	0.3	1.0	No	2.2
17	316 Barton Street	Roadside	384175	217501	NO2	Yes - Barton Street	0.0	2.3	No	2.6
18	79 Millbrook Street	Roadside	384190	218160	NO2	No	0.0	1.0	No	2.6
19	61 Barnwood Road	Roadside	385130	218585	NO2	No	0.0	5.0	No	2.6
20	53 Barnwood Road	Roadside	385113	218595	NO2	No	0.0	2.3	No	2.5
21	Elmbridge Road	Urban Background	385430	218870	NO2	No	9.5	101.6	No	2.6
23	46 Priory Road	Roadside	382898	219029	NO2	Yes - Priory Road	0.0	4.5	No	2.5
24	56 Priory Road	Roadside	382921	219034	NO2	Yes - Priory Road	0.0	4.4	No	2.5
25	66 Priory Road	Roadside	382950	219040	NO2	Yes - Priory Road	0.0	5.4	No	2.7
26	16 London Road	Roadside	383560	218775	NO2	No	30.0	2.7	No	2.5
27	38 Priory Road	Roadside	382818	218993	NO2	Yes – Priory Road	0.0	10.0	No	2.2
28	Sweetbriar Street	Urban Background	383639	219134	NO2	No	3.0	2.5	No	2.3

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
29	21 Parliament Street	Kerbside	383027	218253	NO2	No	10.0	0.5	No	2.2
31	3 The Elms Church Road Longlevens	Urban Background	385366	219777	NO2	No	2.5	1.1	No	2.2
32	Tanners Hall Gouda Way	Roadside	383357	218909	NO2	No	0.0	4.5	No	2.2
33	Widden Primary School	Urban Background	383911	218195	NO2	No	6.5	1.1	No	2.0

Notes:

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

(2) N/A if not applicable.

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Table A.4 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2020	2021	2022	2023	2024
3	387670	217250	Roadside	91.7	90.4	16.9	19.4	18.0	16.1	16.7
5	384558	216946	Roadside	83.3	82.7	21.6	25.4	22.7	22.2	23.0
7	384490	217027	Roadside	100	100.0	23.8	27.8	25.6	25.5	26.4
8	384509	216998	Roadside	100	100.0	27.9	29.9	26.3	26.5	27.5
12	384000	217863	Roadside	91.7	92.3	27.8	32.3	29.6	27.2	28.2
13	383717	218094	Roadside	91.7	92.3	31.7	30.9	28.3	29.0	30.1
14	383726	218074	Roadside	100	100.0	31.5	35.1	32.9	32.6	33.8
15	383989	217857	Roadside	100	100.0	30.1	32.5	29.0	30.6	31.7
16	384340	217294	Roadside	83.3	82.7	21.6	24.8	22.4	21.9	22.7
17	384175	217501	Roadside	83.3	82.7	26.1	29.9	23.7	27.3	28.3
18	384190	218160	Roadside	91.7	92.3	21.8	25.5	23.9	24.2	25.1
19	385130	218585	Roadside	83.3	84.6	25.8	29.8	24.9	27.6	28.7
20	385113	218595	Roadside	91.7	90.4	24.8	28.3	25.7	26.2	27.2
21	385430	218870	Urban Background	100	100.0	17.2	18.7	17.1	16.4	17.0

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2020	2021	2022	2023	2024
23	382898	219029	Roadside	100	100.0	29.5	34.1	31.1	28.4	29.4
24	382921	219034	Roadside	100	100.0	32.5	37.6	33.4	33.0	34.2
25	382950	219040	Roadside	100	100.0	31.9	35.1	33.2	30.8	31.9
26	383560	218775	Roadside	83.3	80.8	26.5	27.2	25.5	25.1	26.0
27	382818	218993	Roadside	91.7	92.3	-	25.1	20.7	17.2	17.8
28	383639	219134	Urban Background	75	75.0	-	14.0	13.6	12.9	13.4
29	383027	218253	Kerbside	100	100.0	-	21.4	19.3	18.9	19.6
31	385366	219777	Urban Background	100	100.0	-	-	12.2	12.7	20.3
32	383357	218909	Roadside	100	100.0	-	-	19.9	19.6	13.7
33	383911	218195	Urban Background	83.3	82.7	-	-	13.0	13.2	34.2

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22**

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

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

Notes:

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

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.

Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG22 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_2 Concentrations (Outside AQMAs)

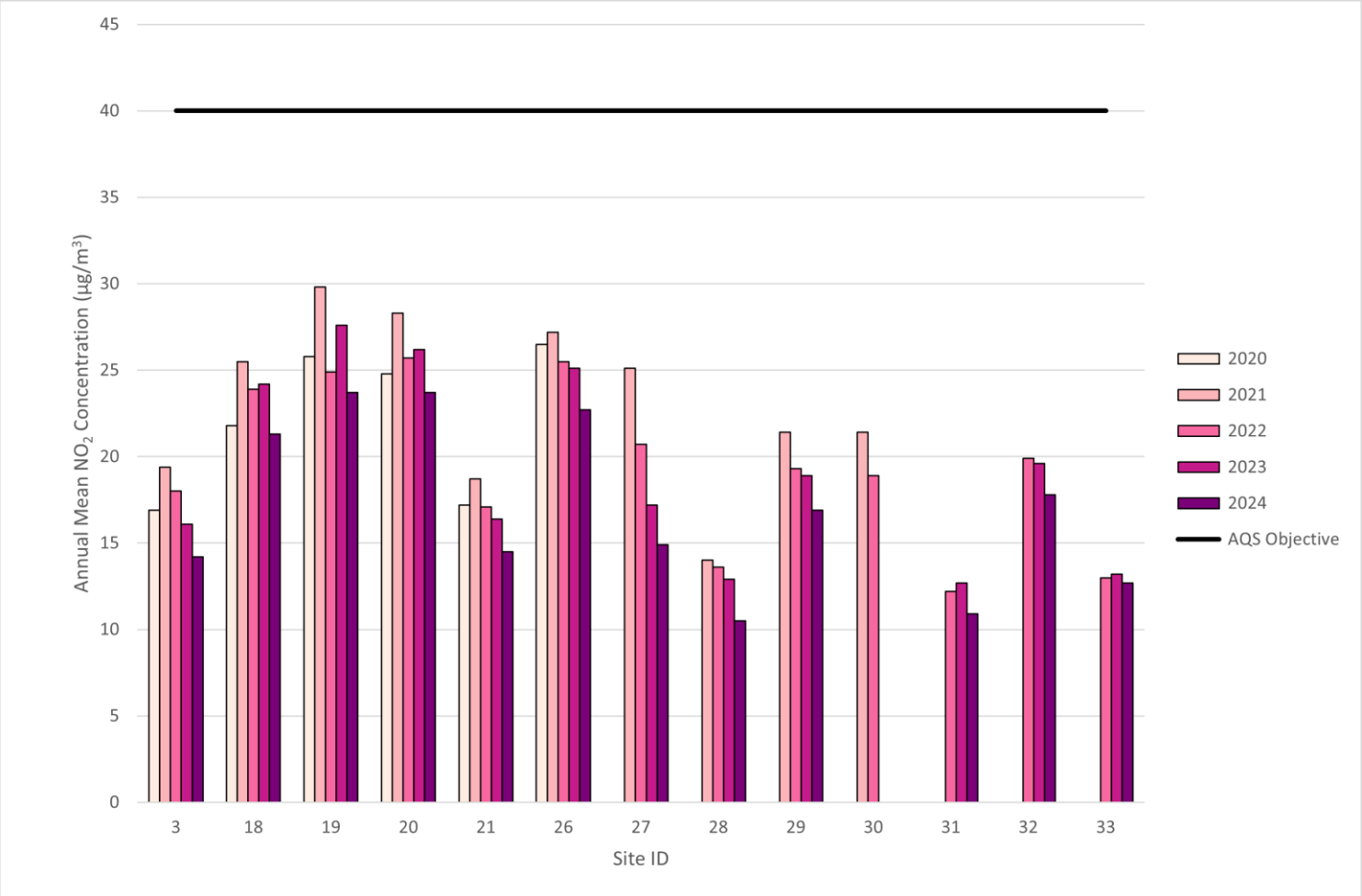


Figure A.2 – Trends in Annual Mean NO2 Concentrations (Barton Street AQMA)

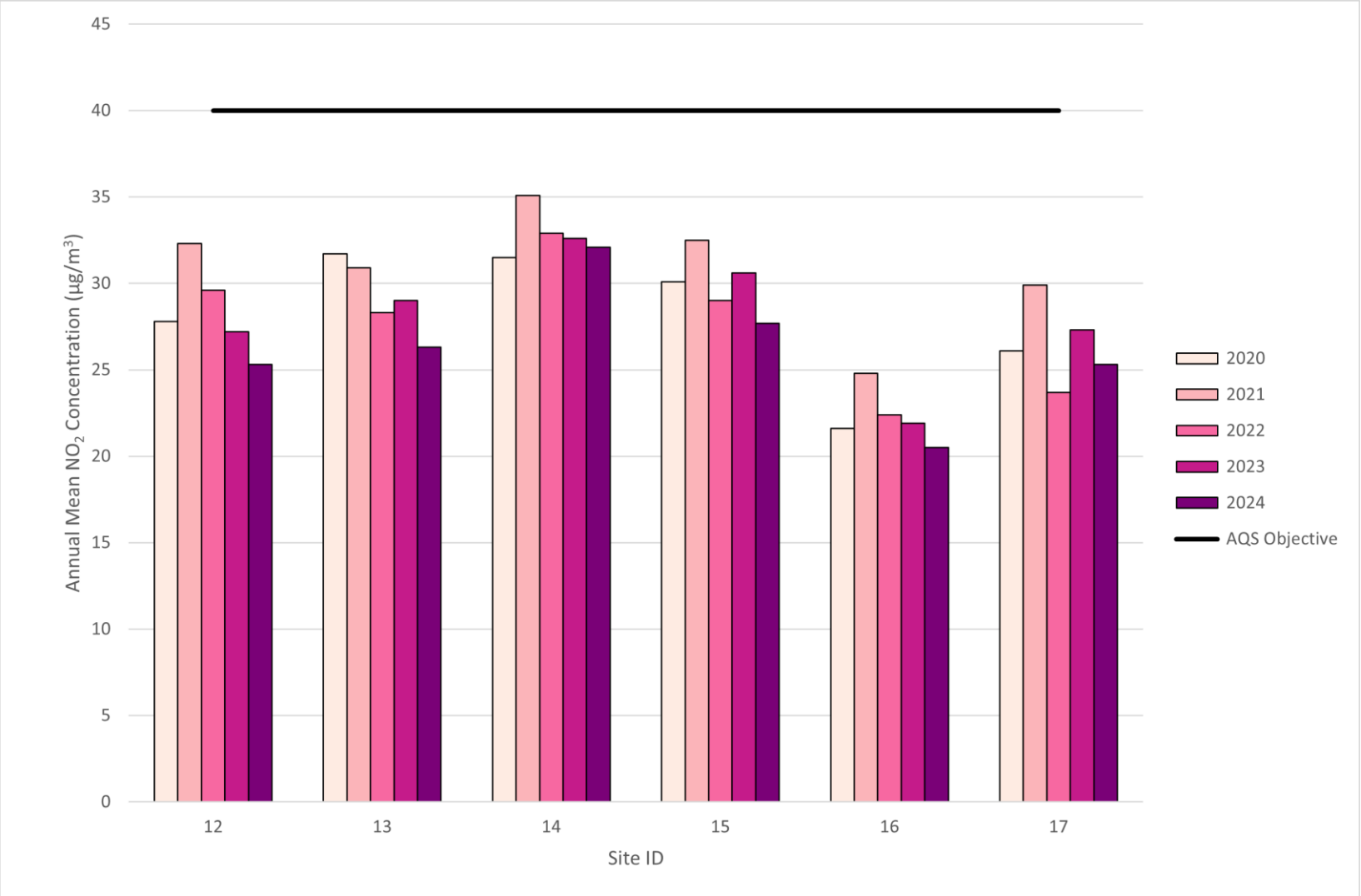


Figure A.3 – Trends in Annual Mean NO2 Concentrations (Priory Road AQMA)

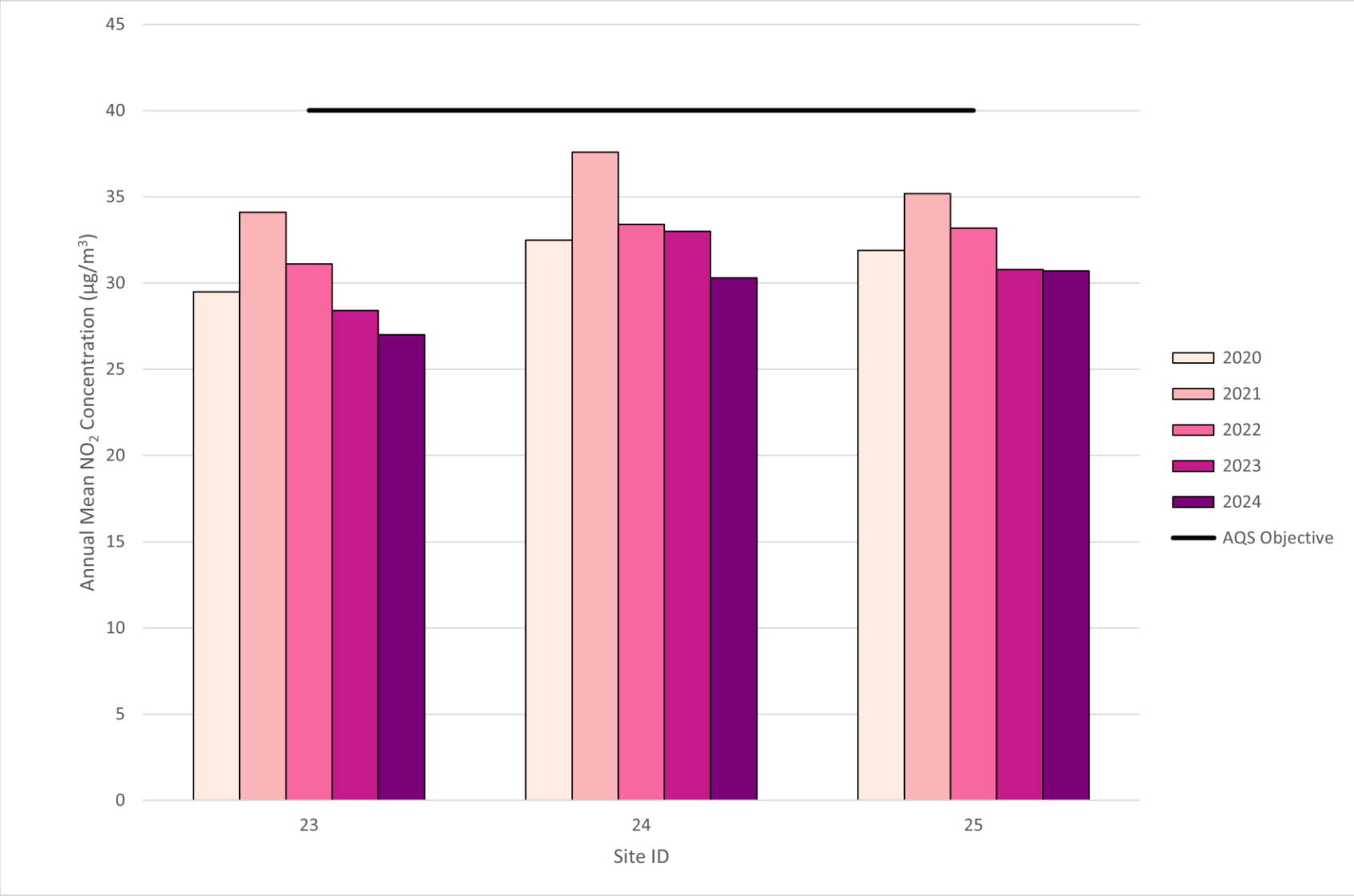
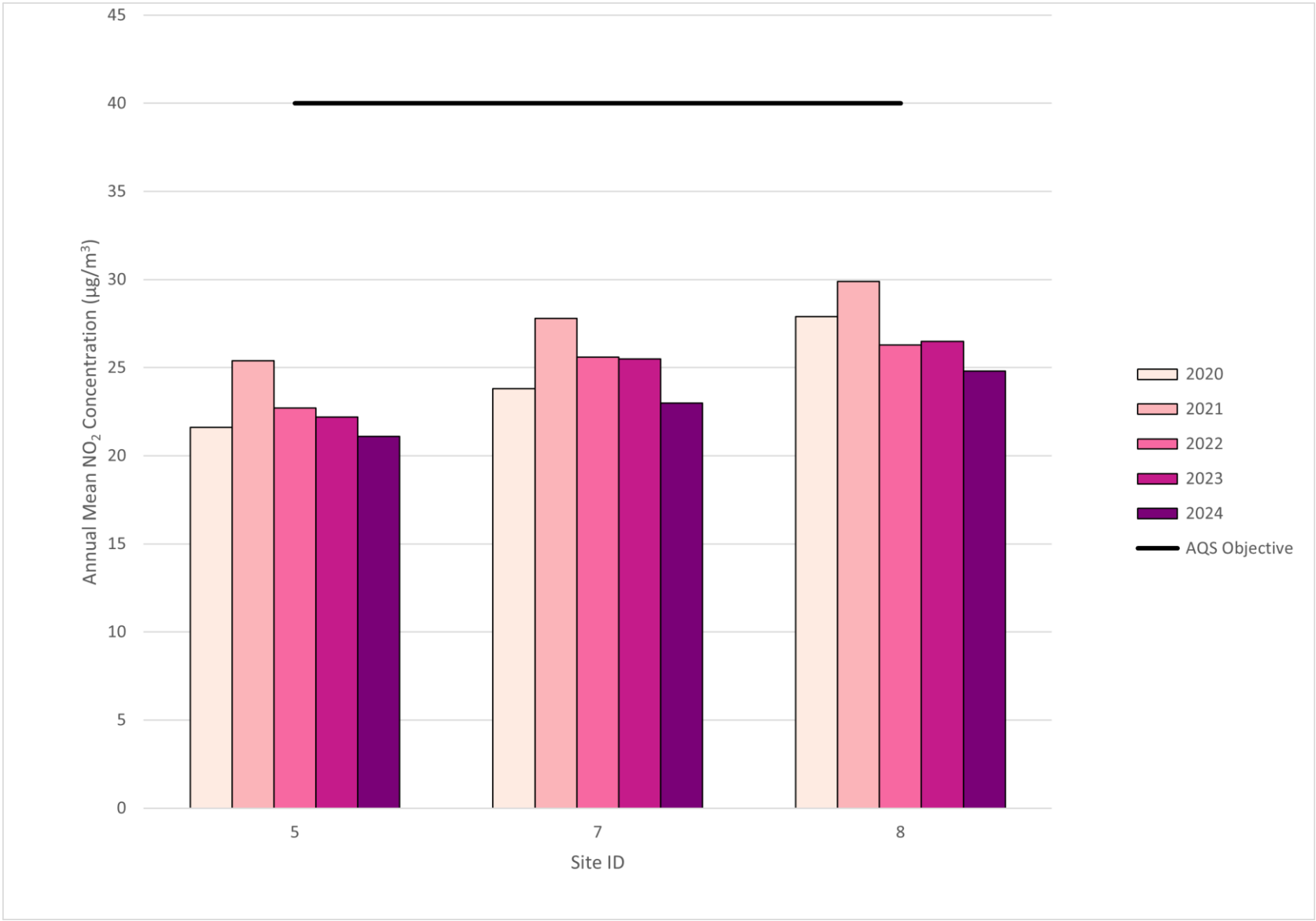


Figure A.4 –

Trends in Annual Mean NO_2 Concentrations (Painswick Road AQMA)



Appendix B: Full Monthly Diffusion Tube Results for 2024

Table B.1 – NO_2 2024 Diffusion Tube Results ($\mu g/m^3$)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted <(0.84)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
3	387670	217250	24.8	25.8	21.2	21.4	16.8	16.7	14.8	18.9	21.2	21.6		15.7	19.9	16.7	-	
5	384558	216946	30.7			29.9	31.0	27.7	19.0	24.6	29.2	31.0	30.5	20.7	27.4	23.0	-	
7	384490	217027	41.0	40.5	31.1	31.3	23.0	25.2	26.2	27.3	32.4	34.0	37.3	27.9	31.4	26.4	-	
8	384509	216998	40.9	42.0	31.4	32.5	25.5	29.4	27.5	30.8	33.9	35.5	34.8	29.1	32.8	27.5	-	
12	384000	217863	40.3		33.3	41.2	31.6	35.5	25.6	32.7	33.4	29.2	39.6	26.9	33.6	28.2	-	
13	383717	218094	41.3	43.1	35.1	38.0	37.0	33.8		32.8	33.8	34.6	39.1	25.8	35.8	30.1	-	
14	383726	218074	49.8	47.3	37.6	40.0	36.0	35.4	33.4	36.3	42.6	41.5	46.2	36.9	40.2	33.8	-	
15	383989	217857	48.6	45.2	34.6	37.1	38.4	33.0	30.6	32.9	39.9	39.6	41.1	32.3	37.8	31.7	-	
16	384340	217294	32.9		27.2	30.8	26.1		15.4	23.6	27.2	34.0	33.0	20.5	27.1	22.7	-	
17	384175	217501	41.0	41.1			27.0	26.8	27.9	30.7	35.8	37.5	39.3	29.7	33.7	28.3	-	
18	384190	218160	36.8	37.4	27.7	30.5	28.4	27.5	19.0	23.9	28.8	30.7	37.6		29.8	25.1	-	
19	385130	218585	36.3	41.9	32.3	37.6	36.1	34.3		28.5	31.9	32.7	29.5		34.1	28.7	-	
20	385113	218595	38.1	40.0		36.2	31.5	30.9	24.2	28.2	33.5	34.5	35.5	23.4	32.4	27.2	-	
21	385430	218870	28.5	29.5	20.9	19.6	15.0	14.7	12.3	14.4	20.7	22.5	27.9	17.5	20.3	17.0	-	
23	382898	219029	34.5	41.9	36.1	38.8	35.8	33.4	26.4	31.9	37.6	38.4	37.4	27.9	35.0	29.4	-	
24	382921	219034	41.9	46.8	39.3	45.3	39.0	39.9	34.9	43.7	39.7	42.7	39.7	36.2	40.8	34.2	-	
25	382950	219040	46.6	48.2	39.7	43.5	38.2	40.4	20.2	35.3	29.1	41.8	40.7	32.6	38.0	31.9	-	
26	383560	218775	40.5	38.7	28.4	29.8	20.2		26.8	24.1	34.0	36.2		30.7	30.9	26.0	-	
27	382818	218993	27.3	29.0	21.2		19.1	19.7	11.1	17.7	21.2	23.8	27.6	15.6	21.2	17.8	-	
28	383639	219134	24.8	23.1	9.0	13.3			10.0	10.1		17.0	21.5	14.8	15.9	13.4	-	
29	383027	218253	30.6	30.4	23.1	24.6	19.9	19.1	14.9	20.8	23.2	26.1	28.5	18.3	23.3	19.6	-	
31	385366	219777	25.0	23.6	14.8	13.2	9.9	9.5	10.4	10.6	15.3	17.9	22.9	14.9	15.7	13.2	-	
32	383357	218909	32.5	30.4	23.8	24.0	16.9	17.5	18.0	19.5	26.5	28.9	30.5	21.8	24.2	20.3	-	
33	383911	218195	26.3	23.7	17.5	4.7	12.7	11.9	10.3		15.1	17.6	23.8		16.4	13.7	-	

☒ **All erroneous data has been removed from the NO_2 diffusion tube dataset presented in Table B.1**

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22**

☐ **Local bias adjustment factor used**

☒ **National bias adjustment factor used**

☒ **Where applicable, data has been distance corrected for relevant exposure in the final column**

☒ **Gloucester City Council confirm that all 2024 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System**

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **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 Gloucester City Council During 2024

Gloucester City Council has not identified any new major sources relating to air quality within the reporting year of 2024.

Additional Air Quality Works Undertaken by Gloucester City Council During 2024

Gloucester City Council has not carried out any additional works relating to air quality within the reporting year of 2024.

QA/QC of Diffusion Tube Monitoring

Gloucester City Council's diffusion tubes are prepared and analysed by Gradko International Ltd. using the 20% TEA in water method. This laboratory takes part in the QA/QC Field Intercomparison, operated on behalf of Defra. Gradko International Ltd are a UKAS accredited laboratory.

Diffusion tube monitoring during 2024 was undertaken in line with the 2024 Diffusion Tube Monitoring Calendar.

Diffusion Tube Annualisation

As per LAQM.TG(22), annualisation is required for any site which has a data capture of less than 75%, but greater than 25%. All the diffusion tubes had data capture of greater than 75% other than site 28, Sweetbriar Street, which had 66.67% data capture.

Annualisation for this site was carried out using NO_2 concentration data from other local background monitoring sites to assist in estimating the annual mean, using the methodology described in Technical Guidance LAQM.TG(22).

The background sites used to establish the necessary annualization factor were:

- 21 Elmbridge Road, Site No.21
- 6 The Elms, Site No. 31 and
- Widden Primary School, Site No.33

Each of these sites had 100% data capture.

The calculations comparing the average concentration at each site over the 12 month period (Am) with the average over the 8 months that Sweetbriar Road had valid result (Pm), yielded the following results (in µg/m$^{3)}$:

Site 21 Am = 17.27, Pm = 16.65 Am/Pm=1.04

Site 31 Am = 12.94, Pm = 12.48 Am/Pm=1.04

Site 33 Am = 15.14, Pm = 14.96 Am/Pm=1.01

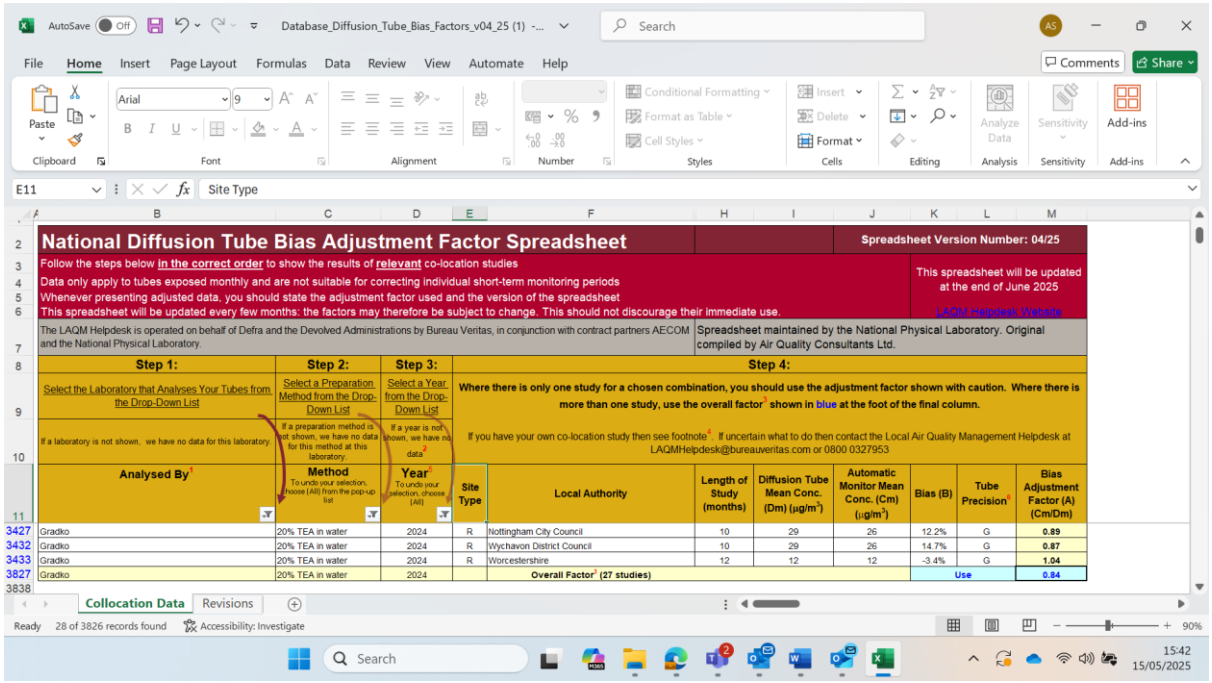
Taking the average Am/Pm from these 3 sites provided an annualization factor of 1.01

The average of 12.09 at Sweetbriar Street, when annualised, gave an annual mean result for that location of 12.45 µg/m^3.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2024 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.TG22 provides guidance with regard to 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_x/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

The national bias adjustment factor for Gradko 20% TEA in water is 0.84 for the year 2024 (based on 27 studies) as derived from the National Bias Adjustment Factor Spreadsheet (version 04/25). This is the adjustment factor used by Gloucester City Council in this report for the 2024 collected data.



A summary of bias adjustment factors used by Gloucester City Council over the past five years is presented in

Table C.1.

Table C.1 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2024	National	04/25	0.84
2023	National	03/24	0.81
2022	National	03/23	0.83
2021	National	06/22	0.84
2020	National	03/21	0.81

NO_2 Fall-off with Distance from the Road

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

No diffusion tube NO_2 monitoring locations within Gloucester City Council required distance correction during 2024

Appendix D: Map(s) of Monitoring Locations and AQMAsFigure

D.1 – Map of Non-Automatic Monitoring Site (Painswick AQMA)

Figure D.2 – Map of Non-Automatic Monitoring Site (Barton Street AQMA)

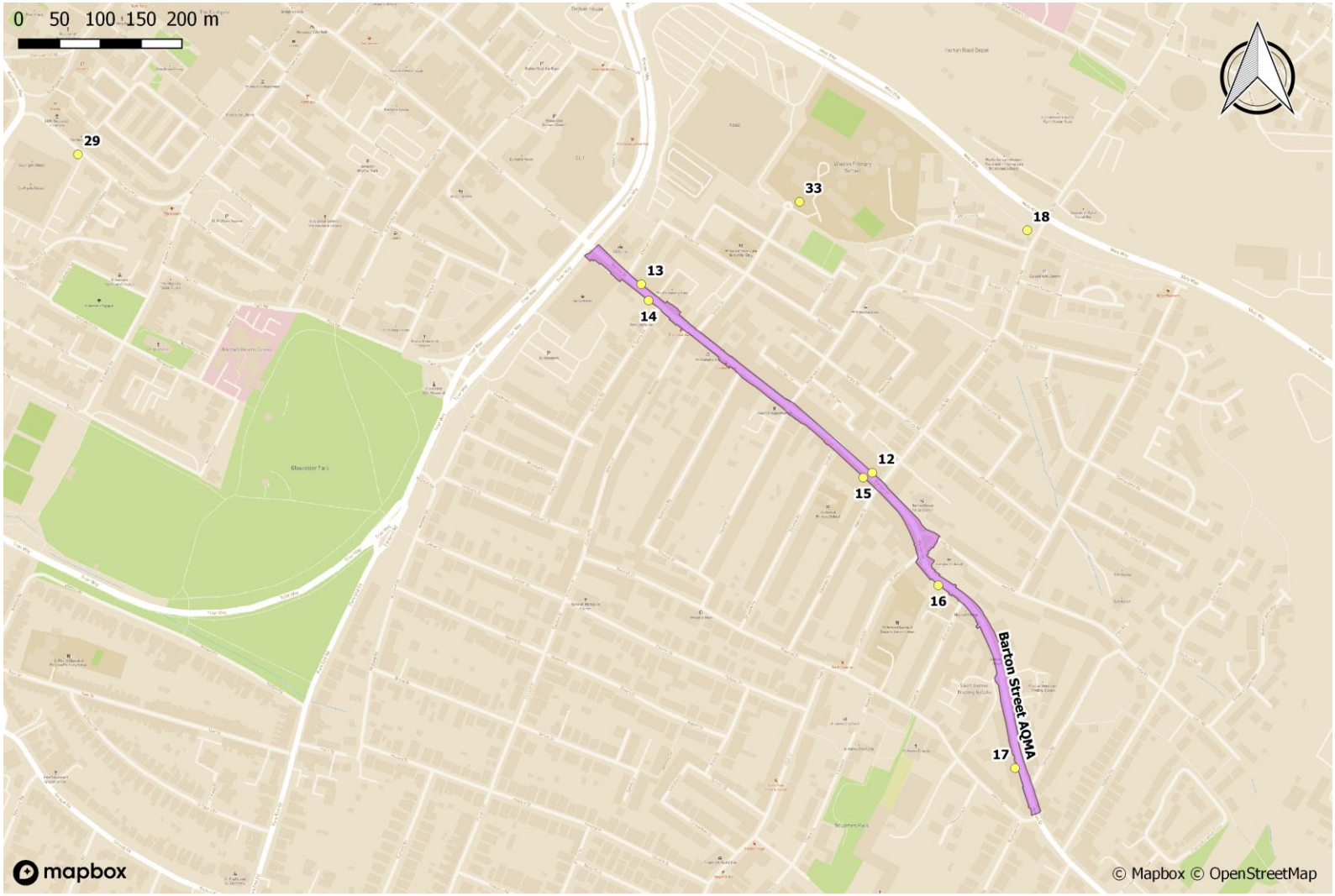


Figure D.3 – Map of Non-Automatic Monitoring Site (All Sites)

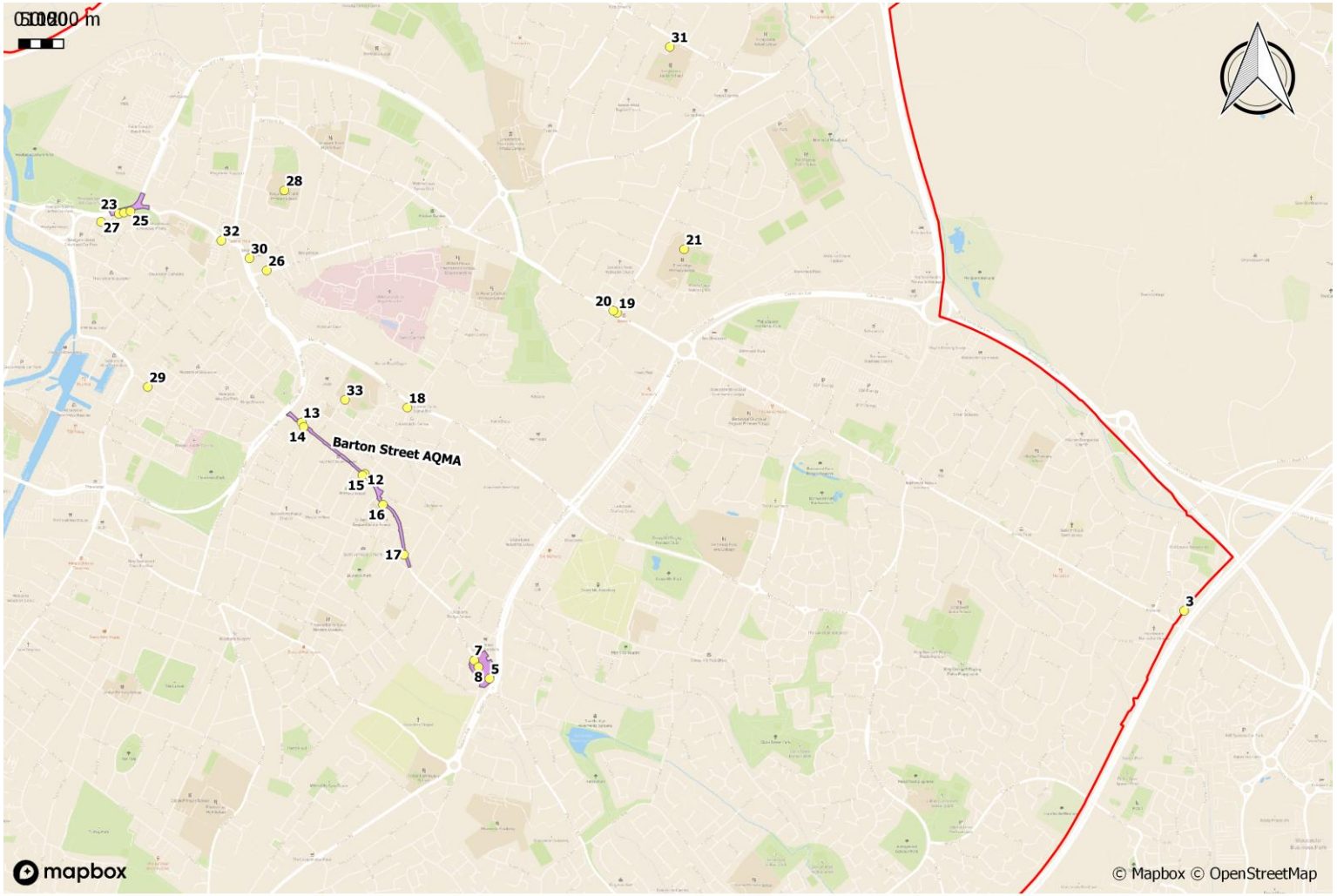
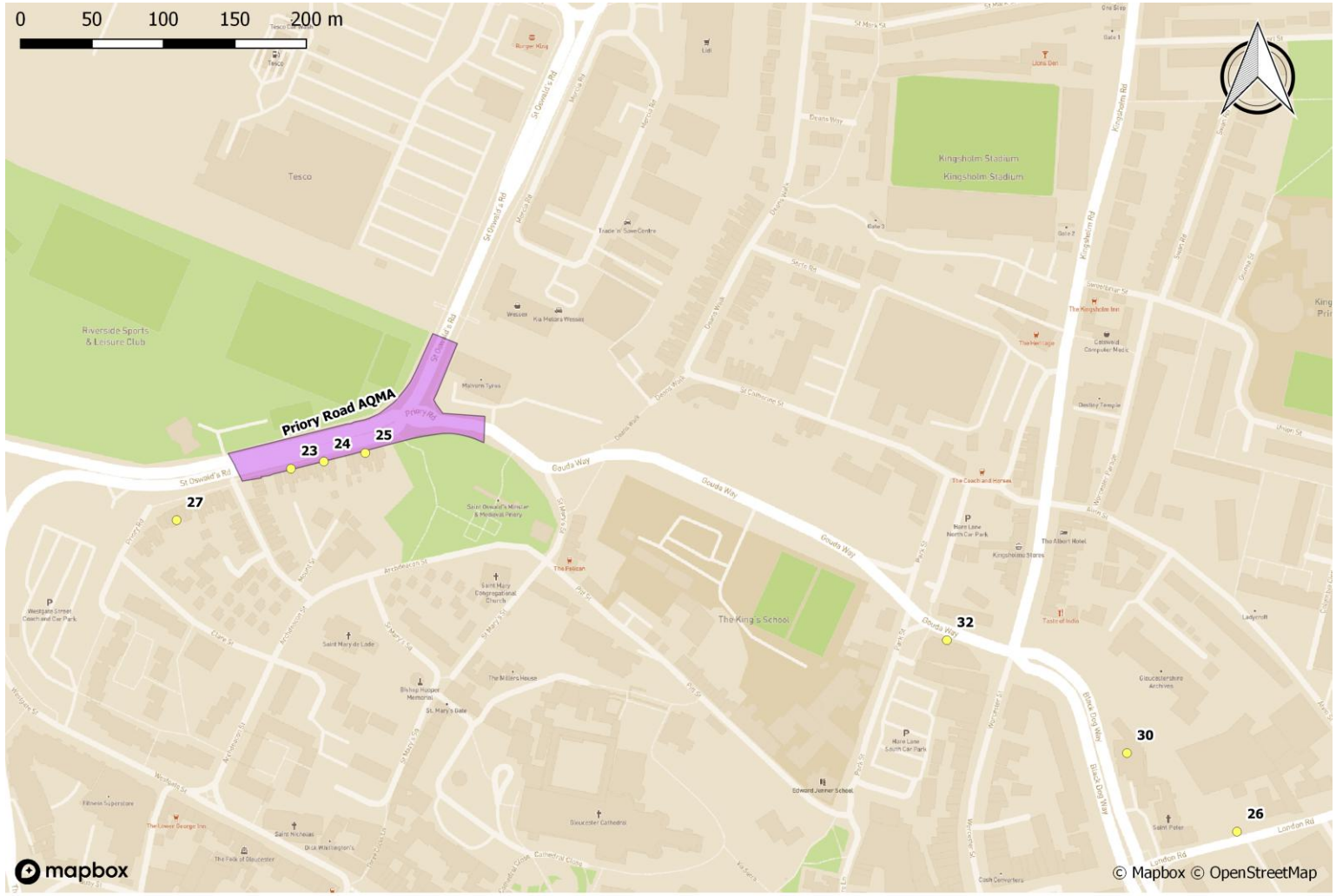


Figure D.4 – Map of Non-Automatic Monitoring Site (Priory Road AQMA)



Appendix E: Summary of Air Quality Objectives in England

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

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

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

Appendix F: Detailed Assessment of AQMA's

2024 Air Quality Management Areas – Revocation Assessment

In fulfilment of Part IV of the Environment Act 1995 Local Air Quality Management, as amended by the Environment Act 2021

Date: June 2025

Introduction

This report provides an assessment of air quality in the three Gloucester City Council's Air Quality Management Areas (AQMAs); Barton Street AQMA (in the city centre) declared in 2005, Priory Road AQMA (on the A417) also declared in 2005 and Painswick Road AQMA (in the city centre, consisting of a section of the B4073 between the railway line and the A38) declared in 2007.

Evidence is provided herein, to support the revocation of each of the AQMAs.

The report considers:

• The monitoring data obtained over a number of years within each AQMA;

• The projected roadside NO2 concentration;

• Local and national trends in NO2 emissions; and

• Local and regional factors that may impact on the AQMA.

Part IV of the Environment Act 1995 (as amended 2021) requires Local Authorities to review air quality and assess whether national air quality objective levels are achieved in areas where residents are likely to be impacted such as residential areas, hospitals, schools etc. Where it has been shown that the objectives are not achieved, or are unlikely to be achieved, then the Local Authority must declare an AQMA and put an Air Quality Action Plan in place to bring air quality within acceptable levels. Where it can be subsequently demonstrated that air quality objectives are being and will continue to be met, a Local Authority can revoke an AQMA by Order under the Environment Act 1995 (as amended 2021).

The three Gloucester City Council AQMAs were each declared following exceedance of the annual mean nitrogen dioxide (NO2) national objective, due to emissions from road traffic. Since that time, monitoring has shown a continued reduction in pollutant values and levels have been consistently below the national objectives for a few years.

Implementation of national, regional and local policies have led to a reduction in polluting emissions within the AQMAs and it is reasonable to expect that further reductions will be achieved through the increasing use of ultra-low and zero emission vehicles.

Having considered the historical monitoring data, the national trends in emissions and any planned developments that might impact on the air quality within the AQMAs, the Council is satisfied that the three AQMAs can now be revoked.

Review & Assessment

Part IV of the Environment Act 1995 (as amended 2021) (the Act) introduced the Local Air Quality Management regime that places a legal duty on local authorities to regularly review and assess air quality in their areas against Air Quality (AQ) objectives which describe the required pollutant concentrations that should not be exceeded.

Local authorities must declare an AQMA where any of the AQ objectives are exceeded and subsequently develop an Air Quality Action Plan (AQAP), which sets out the measures they intend to put in place to secure compliance. With effective implementation of the Action Plan combined with national policies aimed at reducing the emission of pollutants, it is expected that the air quality within AQMAs should improve so that the AQ objectives are met.

Each year, the Council prepares an Annual Status Report (ASR) describing air quality in the area, detailing the measures employed to improve air quality and any progress that has been made. The most recent ASRs are available on the Council's website at: www.gloucester.gov.uk/environment-waste-recycling /pollution/air-quality.

Revoking an AQMA: The Legal Framework & Guidance

The Environment Act 1995 (as amended 2021)

Section 83 (2b) of the Environment Act (1995) states that an AQMA: "…..may, as a result of a subsequent air quality review, be revoked by such an order, if it appears on that subsequent air quality review that the air quality standards and objectives are being achieved, and are likely throughout the relevant period to be achieved, within the designated area".

Statutory Guidance

Guidance on the requirements for revoking an AQMA are set out in statutory guidance LAQM PG 22 and LAQM TG 22.

PG 22 states that:

• "Authorities wishing to revoke or reduce an AQMA can do so following review. For revocation this should demonstrate that air quality objectives are being met and will continue to do so. In other

words they should have confidence that the improvements will be sustained. Further information is provided in the Technical Guidance, but typically this is after three years or more compliance. It is not advisable for the revocation of an AQMA to be based solely upon compliance in a year not representative of long-term trends. For example, compliance being reached in 2020 may not be representative of long-term trends in pollutant concentrations due to the change in activity observed across the UK as a result of COVID-19. Where 2020 is one of many consecutive years of compliance, this may be considered for revocation. If authorities wish to make any changes to AQMAs, whether declaration, amendment or revocation, based upon 2020 data, please contact the LAQM helpdesk to discuss your approach.

• Where an Order is revised, a copy of the revocation or amendment Order should be submitted to Defra via the LAQM portal and other statutory consultees and made publicly available to ensure the public and local businesses are aware of the situation. It is expected that the local authority will take the relevant action imposed by the Order within four months following receipt of comments from Defra.

• Following a revocation, from 2023 (where this would result in that local authority no longer having any AQMA) the local authority should put in place a local air quality strategy (paragraph 2.15) to ensure air quality remains a high profile issue and to ensure it is able to respond quickly should there be any deterioration in condition."

TG 22 goes on to state that:

• "In most cases the decision to amend or revoke an AQMA should only be taken following a detailed study, to be appended to the ASR/APR as additional supporting technical information. A modelling study may allow compliance to be assessed over a wider geographical area than when compared to monitoring alone. This should set out in detail all the available information used to reach the decision, with the same degree of confidence as was provided for the original declaration. If the conclusions of the study are suitably robust to allow an assessment of compliance to be determined, either an amendment or revocation can be taken forward. Due to the inherent uncertainties of dispersion modelling, consideration should be given to predicted concentrations being 10% below the relevant objective before an amendment or revocation of an AQMA is completed.

• It is not advisable for the revocation of an AQMA to be based solely upon compliance in a year not representative of long-term trends. For example, compliance being reached in 2020 may not be representative of long-term trends in pollutant concentrations due to the change in activity observed across the UK as a result of COVID-19 and associated lock down measures. Where 2020 is one of many consecutive years of compliance, this may be considered for revocation.

• However, in some instances if compelling evidence exists, detailed modelling to support the decision to amend/revoke an AQMA may not be necessary and an AQMA may be amended or revoked following a screening assessment or on the basis of robust monitoring evidence.

• However, pollutant concentrations may vary significantly from one year to the next, due to the influence of meteorological conditions, and it is important that authorities avoid cycling between declaring, revoking and declaring again, due simply to these variations. Therefore, before revoking an AQMA on the basis of measured pollutant concentrations, the authority therefore needs to be reasonably certain that any future exceedances (that might occur in more adverse meteorological conditions) are unlikely. For this reason, it is expected that authorities will need to consider measurements carried out over several years or more, national trends in emissions, as well as local factors that may affect the AQMA, including measures introduced as part of an Air Quality Action Plan, together with information from national monitoring on high and low pollution years.

• The revocation of an AQMA should be considered following three consecutive years of compliance with the relevant objective as evidenced through monitoring. Where NO2 monitoring is completed using diffusion tubes, to account for the inherent uncertainty associated with the monitoring method, it is recommended that revocation of an AQMA should be considered following three consecutive years of annual mean NO2 concentrations being lower than 36 µg/m3 (i.e. within 10% of the annual mean NO2 objective). There should not be any declared AQMAs for which compliance with the relevant objective has been achieved for a consecutive five year period."

Therefore, where compelling evidence exists, an AQMA can be revoked following at least three consecutive years of compliance with the objective without the need for detailed modelling as would traditionally have been required under the technical guidance. That is to say that NO2 concentrations monitored using diffusion tubes should have been lower than 36 µg/m3 to account for the uncertainty inherent with the method for a period of three years or more, acknowledging wider trends or new sources that might impact continued compliance.

This report compiles the evidence required to revoke the Gloucester City Council AQMAs.

Air Quality Management Areas

Barton Street

The Barton Street AQMA (in the city centre) was declared in 2005 in order to address road traffic related nitrogen dioxide (NO2) affecting residential properties in Barton Street, from its junction with Trier Way/Bruton Way to the North West and Upton Street to the South West. At the time of declaration, annual mean NO2 was measured at 47 micrograms per cubic metre (µg/m3), compared to the national air quality objective of 40 µg/m3 .

Over time the concentration of NO2 in the AQMA has gradually reduced such that, in 2023 (the last full calendar year for which ratified monitoring results are available), the highest NO2 concentration monitored at any of the sites was 32.6 µg/m3.

A map of the Barton Street AQMA, with the six diffusion tube monitoring locations (nos.12, 13,14,15,16 and 17) is shown in Appendix D above.

Priory Road

Priory Road AQMA (on the A417) was also declared in 2005 due to NO2 from road vehicle emissions; the AQMA covers an area encompassing the junction of St Oswalds Road and Priory Road. Annual mean NO2 levels of 48 µg/m3 at declaration have declined to a maximum of 33.0 µg/m3 in 2023.

A map of the Priory Road AQMA, with the 3 diffusion tube monitoring locations (nos. 23, 24 and 25) is shown in Appendix D above.

Painswick Road

The Painswick Road AQMA (in the city centre, consisting of a section of the B4073 between the railway line and the A38) was declared in 2007, due to NO2 from road vehicles, and covers a number of residential properties on either side of Painswick Road. Annual mean NO2 levels of 48 µg/m3 at declaration have declined to a maximum of 26.5 µg/m3 in 2023.

A map of the Painswick Road AQMA, with the 3 diffusion tube monitoring locations (nos.5,7 and 8) is shown below is shown in Appendix D above.

National Influence

National strategies, policies and plans have been implemented to improve air quality and will continue to influence polluting emissions. Total UK emissions of NOx fell by over 40% between 1990 and 2021. Emissions from several specific sources, notably public energy and heat production, passenger cars and heavy-duty vehicles, have shown substantial decreases over this period. Future influence on emissions is considered in a Clean Air Strategy with a major transport emission objective that states:

"We will end the sale of new conventional petrol and diesel cars and vans by 2040. We will position the UK as the best place in the world to develop, manufacture and use zero exhaust emissions vehicles and, during the transition, we will ensure that the cleanest conventional vehicles are driven on our roads".

This transition to ultra-low and zero emission vehicles presents the largest potential for the reduction of road traffic emissions in the three GCC AQMAs. Department for Transport (DfT) road

traffic forecasts provide future numbers, compositions and emissions across the UK based on seven scenarios (to account for the broad range of possibilities and uncertainties in predicting up to 2060) linked to changing population, economic and social well-being and technological changes.

The findings include:

• From 2025, traffic is projected to grow between 8% and 54% by 2060;

• Traffic on minor roads and A-roads is expected to grow by 21% and 20% respectively, while motorway traffic is projected to increase by 27% between 2025 and 2060;

• Between 2025 and 2050 NOx emissions are projected to reduce by 65%, due mainly to the uptake of Euro 6 engines. However, as the uptake of Euro 6 engines flattens off the impact of greater travel increases NOx by 1% between 2050 and 2060;

• Heavy Goods Vehicles (HGV) traffic is projected to have a moderate increase from 16 Billion (Bn) vehicle miles in 2025 to 18 Bn vehicle miles in 2060;

• Light Goods Vehicles (LGV) growth is stronger starting at 57 Bn vehicle miles in 2025 rising to 77 Bn by 2060; and

• Congestion (measured in delay per mile) is also projected to increase, with the average delay per mile projected to increase around 27% between 2025 and 2060.

The national transport model (NTM) produces forecasts of emissions of carbon dioxide (CO2), NOx and PM10. It enables the DfT to estimate the impact of transport policies or forecasting assumptions on key travel indicators such as levels of traffic, congestion and vehicle emissions. The projections illustrate that a wide range of traffic growth is possible in the long term, with the scenarios suggesting an 8% to 54% increase in distance driven between 2025 and 2060, though in this context the uncertainty in these figures should be noted. (There is uncertainty in the overall results reported, as the cost of fuel and the cost of living will have an impact on the outcomes and these are unpredictable at this time.)

Even if this nationally predicted increase in traffic growth is realised at the local level within Gloucester City Council AQMAs, associated NOx emissions are also projected to reduce by between 61% (in the High Economy Scenario) and 98% (in the Mode-balanced Decarbonisation Scenario) between 2025 and 2060, primarily due to fleet turnover.

The above considered, it is therefore likely that despite uncertainty in predicting such trends, the nationally projected reductions in overall NOx emissions will continue to contribute toward reducing concentrations within the AQMAs.

Regional Influence

Local Policies, Strategies and Initiatives

The Gloucester City Plan (GCP) combined with the Joint Core Strategy (JCS) adopted by a partnership of three neighbouring Councils (Cheltenham Borough, Gloucester City and Tewkesbury Borough) set out a shared vision for the communities of the area up to 2031. The GCP and JCS seek to improve air quality not only in AQMAs but across the wider area. Development proposals are expected to minimise and mitigate air pollution and to contribute towards the achievement of national air quality objectives. The area comprises both urban and rural settlements and within certain parts there are limited public transport opportunities, resulting in a heavy reliance on private cars as a form of transport. Due to this, there is a focus on sustainable transport mechanisms.

The Gloucestershire Local Transport Plan 2020-2041 (LTP), identifies changes that aim to secure an improved transport infrastructure and services across Gloucestershire, contributing to the shared priority of improving air quality.

www.gloucestershire.gov.uk/media/p5melmok/ltp-policy-document-final-v132-2.pdf

The Gloucestershire Air Quality and Health Strategy has been developed to be delivered through a partnership approach across agencies, professionals and members of the public in Gloucestershire. It describes the strategic approach to improving air quality and mitigating its impact on health.

Air Quality Action Plan

In 2019, Gloucester City Council commissioned an update to the 2008 Air Quality Action Plan (AQAP) (last updated in 2011).

The draft of the updated AQAP has been widely consulted upon and consists of a number of measures designed to improve air quality. Details of all measures in progress or planned are set out in the 2024 Annual Status Report.

The extant measures can be summarised as follows:

- Highways improvements
- The continued development of the cycle lane network
- Encouraging Stagecoach to buy new vehicles for bus services
- A city-wide anti-idling campaign
- Implementation of a fleet recognition scheme

- Low emission vehicle procurement
- Scooter/ cycle rental schemes
- The provision of electric vehicle charging infrastructure
- The promotion of active travel
- Raising public awareness about air quality; and
- Specific initiatives focusing on schools.

Air Quality Strategy

If a local authority in England no longer has any declared AQMAs remaining, the local authority should put in place a local air quality strategy to ensure air quality remains a high profile issue and to ensure it is able to respond quickly should there be any deterioration in condition. (Paragraph 3.59 of LAQM.PG(22))

In anticipation of our AQMAs being revoked in 2025, Gloucester City Council will use the most recent draft AQAP in the formulation of its new Air Quality Strategy, which aims to:

- Raise public awareness of the importance of air quality;
- Reduce emissions of PM2.5 within the district;
- Ensure continued compliance with the national air quality objectives;
- Encourage and enable active travel to benefit air quality and improve public health;
- Document the efforts made to improve air quality across the different areas of the Council.

By setting a strategic direction on air quality across the district, it is anticipated that greater improvements can be made, including within the areas that were once AQMAs.

The strategy will set out a number of statutory and non-statutory obligations, ranging from sustainable transport to public information, that set the agenda the Council will be working towards in the coming years.

When the Air Quality Strategy is in place, it should serve to ensure that compliance with the national air quality objectives, where achieved, can be continually maintained.

Air quality within the AQMAs

The Council currently monitors NO2 at 6 locations (Nos. 12,13,14,15,16,17) within the Barton Street AQMA, and at three sites in each of the Priory Road and Painswick Road AQMAs (Nos.

23,24,25 and 5,7,8 respectively). Details of the monitoring sites can be found in the latest version of the Annual Status Report above.

A comparison of the annual mean AQS objective for NO2 against the long-term monitoring results between 2019 and 2023 from diffusion tubes located within the AQMAs can be seen in Appendix D of the ASR. The 2023 results are the most recent validated figures that we have available. (The 2024 NOx diffusion tube monitoring results will be submitted to Defra in the ASR dated June 2025).

There have been no exceedances of the objectives at any of the monitored locations for at least five years, and the maximum levels have been more than 10% below the annual objective for three years. It is worth noting that levels were significantly lower than would have been expected in 2020 due to suppressed traffic movements during the pandemic lockdowns, and this can be clearly discerned from the graphs. However, subsequent to this, concentrations did not return to pre-pandemic levels but in fact continued to follow the earlier downward trend.

Figure 5 - Trends in annual mean NO2 concentrations at Barton Street AQMA diffusion tube sites (2019 to 2023)

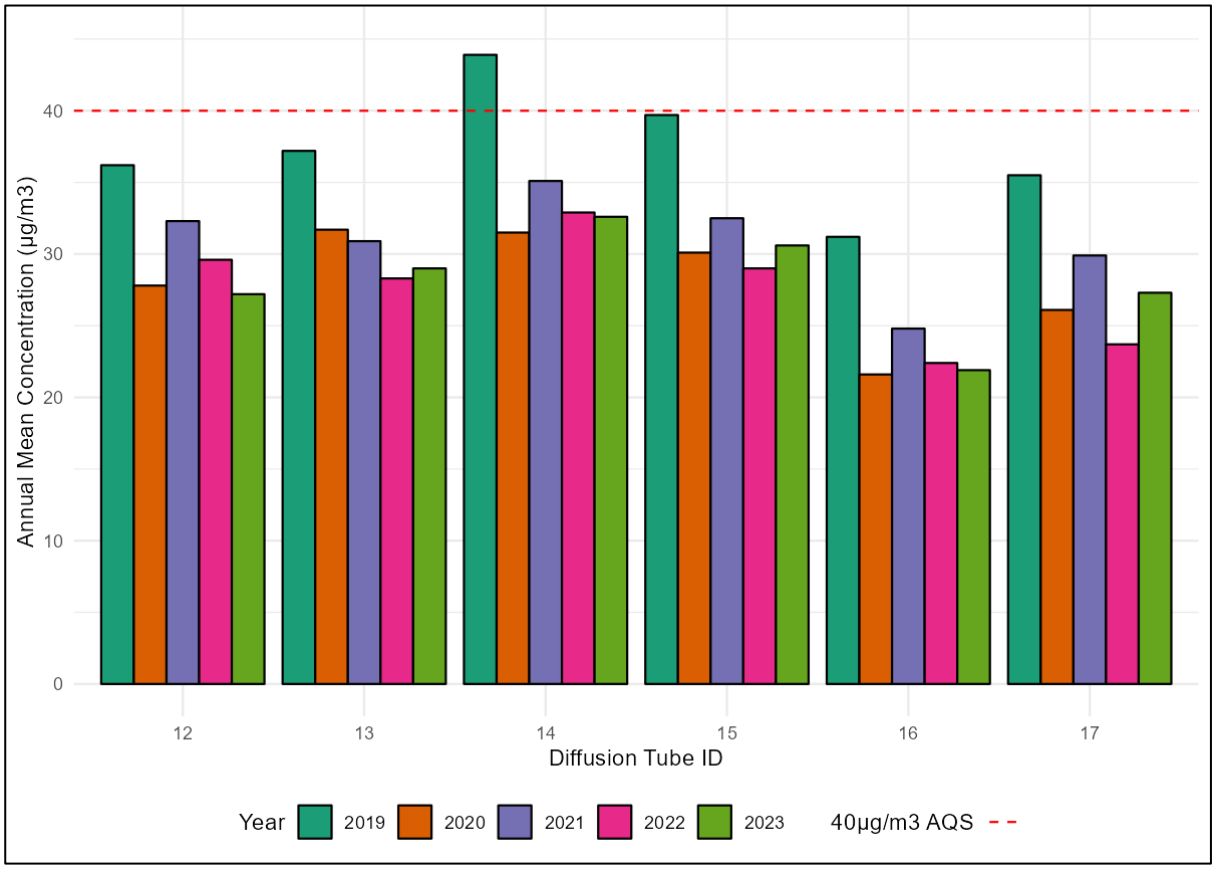


Figure 5 shows that the six monitoring locations within the Barton Street AQMA recorded NO2 concentrations that have been consistently below 36 µg/m³ (ie at least 10% below the annual mean AQS objective of 40 µg/m³) for four years, since 2020.

The Barton Street AQMA last saw an exceedance of the annual mean NO2 objective in 2019, at site 14, measuring 43.9 µg/m3. None of the other sites within the AQMA exceeded the annual mean objective in 2019.

Measurements in 2020 across all the AQMA monitoring sites were low as expected due to the impacts of the Covid-19 lockdowns reducing traffic flows using this route. The highest concentration in 2020 was 31.7 µg/m3 at site 13.

The highest annual mean NO2 concentration in Barton Street AQMA in 2021 was 35.1 µg/m3, in 2022 was 32.9 µg/m3 and in 2023 was 32.6 µg/m3 – all of these were results from site 14.

Figure 6 - Trends in annual mean NO2 concentrations at Priory Road AQMA diffusion tube sites (2019 to 2023)

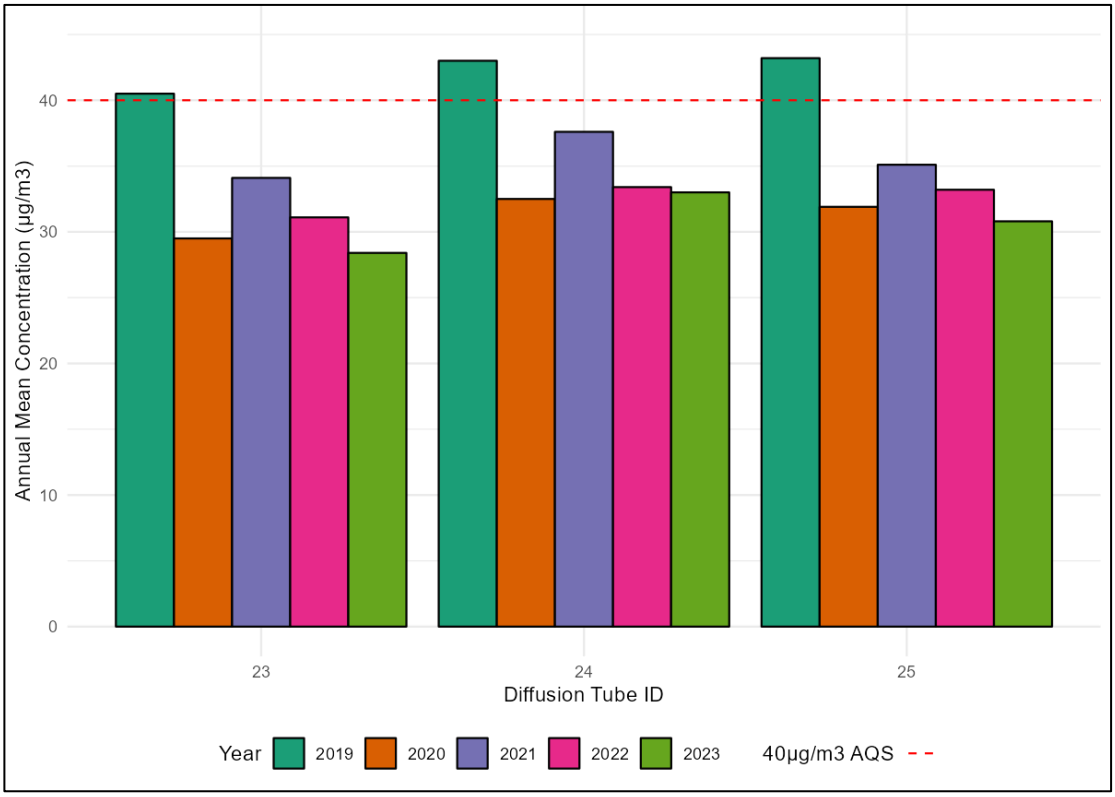


Figure 6 shows that by 2023, two of the three monitoring locations within the Priory Road AQMA recorded NO2 concentrations that have been consistently at least 10% below the annual mean

AQS objective of 40 µg/m³ for four years (ie below 36 µg/m³ since 2020). Site 24 recorded a concentration of 37.6 µg/m3 in 2021.

The AQMA last saw exceedances of the annual mean NO2 objective in 2019, when sites 23, 24 and 25 recorded concentrations of 40.5 µg/m³ , 43.0 µg/m³ and 43.2 µg/m³ respectively.

Measurements in 2020 across all the AQMA monitoring sites were all very low as expected due to the impacts of the Covid-19 lockdowns reducing traffic flows using this route. The highest concentration in 2020 was 32.5 µg/m3 at site 24.

The highest annual mean NO2 concentration in Priory Road AQMA in 2021 was 37.6 µg/m3, in 2022 was 33.4 µg/m3 and in 2023 was 33.0 µg/m3 – all of these were results from site 24. Sites 23 and 25 all had results lower than 36 µg/m3 for this duration.

Figure 7 - Trends in annual mean NO2 concentrations at Painswick Road AQMA diffusion tube sites (2019 to 2023)

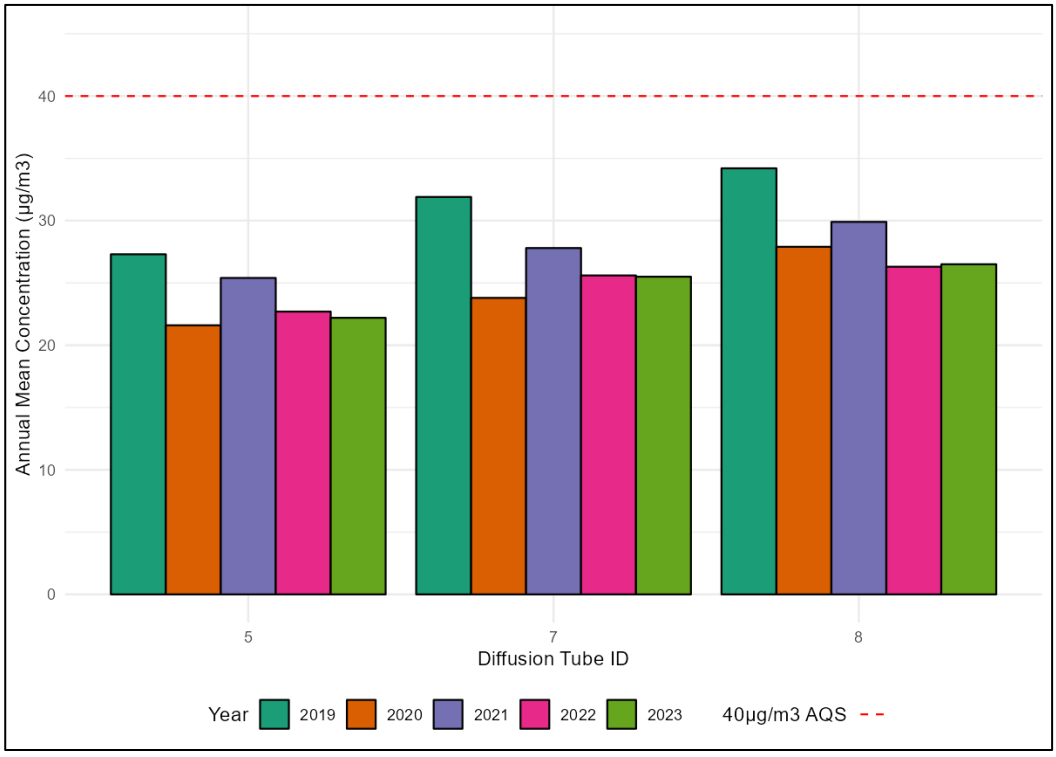


Figure 7 shows that the three monitoring locations within the Painswick Road AQMA recorded NO2 concentrations that have been consistently below 36 µg/m³ (ie at least 10% below the annual mean AQS objective of 40 µg/m³) for five years, since 2019. In fact the historical ASR reports for

this AQMA show that the last recorded result above 36 µg/m³, was in 2016 at site 8, when the concentration was 36.7 µg/m³. All the results in this AQMA have been lower than that since then.

Measurements in 2020 across all the AQMA monitoring sites were low as expected due to the impacts of the Covid-19 lockdowns reducing traffic flows using this route. The highest concentration in 2020 was 27.9 µg/m3 at site 8.

The highest annual mean NO2 concentration in Painswick Road AQMA in 2021 was 29.9 µg/m3, in 2022 was 26.3 µg/m3 and in 2023 was 26.5 µg/m3 – all of these were results from site 8.

Air Quality Monitoring – National Network

The trends in NO2 observed locally are also reflected in data generated by Defra's national monitoring network. Available on the Defra webpage, Nitrogen dioxide (NO2) - GOV.UK , the position is that:

"Roadside NO2 pollution has reduced in the long-term and in recent years, having been stable for most of the 2000s

The annual mean concentration of NO2at the roadside has decreased over the time series to 21.8 µg/m3 in 2023. The annual mean NO2concentration in 2023 is greater at roadside sites compared to urban background sites. This is most likely due to substantial emissions of nitrogen oxides from road transport sources, as the majority of concentrations at the roadside come from local road traffic.

For most of the 2000s, the annual mean NO2concentration was relatively stable, likely as a result of the increased ownership of diesel-fueled vehicles which emit far more nitrogen oxides compared to equivalent petrol-fueled vehicles. This may have offset the impact of reduced emissions from other sources.

Between 2006 and 2019 inclusive, the annual mean NO2 concentration at roadside sites decreased by an average of 1.8 µg/m3 each year. This reduction was observed at most long-running monitoring sites across the UK and could be a consequence of the large reduction in road transport emissions of NO2 over the same period in the UK, as newer vehicles subject to stricter emissions standards enter the transport fleet.

In 2020, the annual mean NO2concentration at the roadside decreased by 8.2 µg/m3 (a decrease of 26 per cent). It is likely that a reduction in traffic as a result of COVID-19 restrictions was a contributing factor to this relatively large decrease. From 2020 to 2021, the annual mean NO2 concentration at the roadside increased by 1.8 µg/m3, an increase of 8 per cent. This is likely a result of increased road traffic following the removal of lockdown restrictions.

Since 2021, NO2 concentrations at the roadside have fallen each year to reach the lowest point in the time series in 2023. Concentrations in 2023 are lower than they were before and during lockdown restrictions, with 2023 concentrations (21.8 µg/m3) being 30 per cent lower than 2019 levels (31.1 µg/m3). As for urban background, this is likely at least partially attributable to the continued decline in NO2 emissions from road transport and power generation.

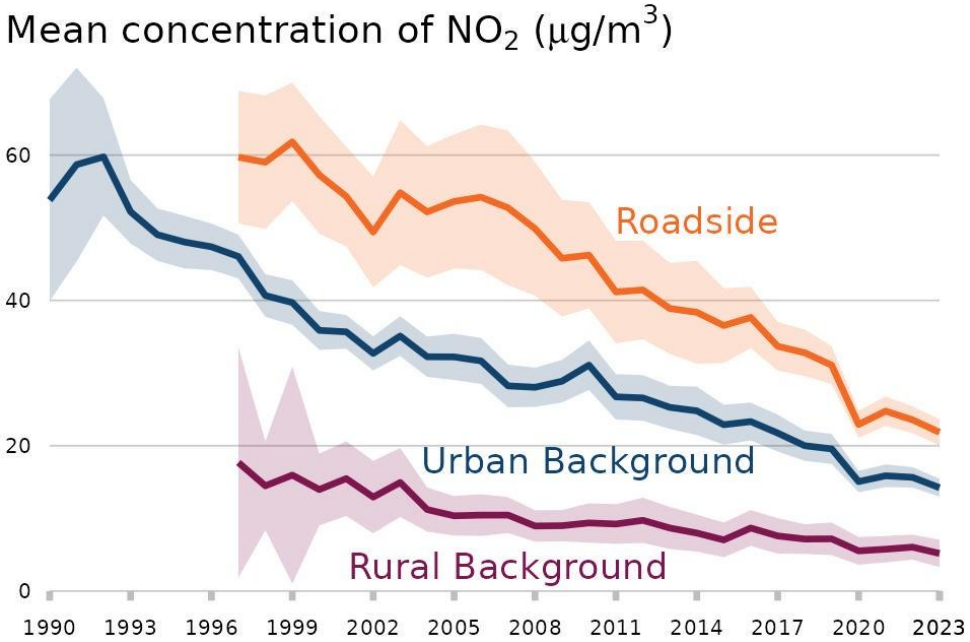
The annual mean concentration of NO2at urban background sites was 14.2 µg/m3 in 2023, the lowest point in the time series. This is a decrease of 9 per cent since 2022.

Between 1992 and 2002 inclusive, the annual mean NO2 concentration at urban background sites rapidly decreased by an average of 2.7 µg/m3 each year. This reduction was observed at most monitoring sites across the UK and could be a consequence of the large reduction in emissions of nitrogen oxides over this time period in the UK and in Europe.

The annual mean concentration of NO2 at rural background sites has shown a decrease of 71 per cent from 1997, to 5.2 µg/m3 in 2023. Since the start of the time series in 1997, the annual mean NO2 concentration at rural background sites has decreased by an average of 0.5 µg/m3 (or 3 per cent) each year. This reduction was observed at most monitoring sites across the UK; which could be a consequence of the large reduction in emissions of nitrogen oxides over the same period in the UK."

Figure 8

Annual mean concentrations of NO2 in the UK, 1990 to 2023



Forecast NO2 Trends

It has been shown that the levels of NO2 (and indeed NOx (oxides of nitrogen, that includes both NO2 and nitric oxide (NO)) have reduced significantly in recent years. But to be confident that levels will remain below the objective, and that revocation of the AQMAs is justified, it is necessary to predict future trends in NO2. Defra's Roadside NO2 Projection factors tool6

Roadside NO2 Projection Factors | LAQM

enables future levels of roadside NO2 to be estimated. Using a base year of 2021, local monitoring data have been projected forwards to 2030. (Tool accessed on 06/06/2025)

LAQM-TG22-May-25-v2.0.pdf

The table below provides the year adjustment factors for roadside NO2 concentrations for "Rest of UK (HDV =<10%)". The adjustment factors can be used to estimate the annual mean NO2 concentration in future years from current monitoring data. The factors have been calculated as the average of modelled concentrations across approximately 1,900 road links in London, and 7,000 links elsewhere, taking into account the changes in traffic activity, and emission factors for NOx and primary NO2 (f-NO2). The number represents the adjustment factor to be applied to our data.

Year	Adjustment factor
2021	1
2022	0.965
2023	0.93
2024	0.874
2025	0.819
2026	0.775
2027	0.729
2028	0.684
2029	0.641
2030	0.592

Applying the adjustment factor to our roadside monitoring data, using 2021 as a base year (adjustment factor =1), shows a steady reduction in NO2 concentrations is forecast, such that by 2030 concentrations are predicted to be almost half of the 2021 levels.

Beyond 2030 there is more uncertainty about the anticipated levels of roadside NOx due to unknowns such as: socio-economic factors; technological advances; adoption rates of cleaner vehicles; and policy-led interventions. However, the Department of Transport's National Road Traffic Projections 2022 report7

National Road Traffic Projections 2022 (accessed 06/06/25)

provides a strategic view of future road travel demand. Employing the National Transport Model, a number of scenarios have been produced, all of which predict an increase in traffic and congestion but at the same time forecast continued reductions in vehicular emissions. The report says: "Between 2025 and 2050 NOx are projected to reduce by 65%, driven by the uptake of Euro 6 engines. However, as the uptake of Euro 6 engines flattens off the impact of greater travel increases the NOx by 1% between 2050 and 2060."

The graph below (Figure 9) "shows the downward trajectory of tailpipe NOx emissions across all the scenarios. The high EV uptake scenarios reduce to almost zero by 2050 due to the electrification of the vehicle fleet.

Figure 9

National Road Traffic Projections 2022

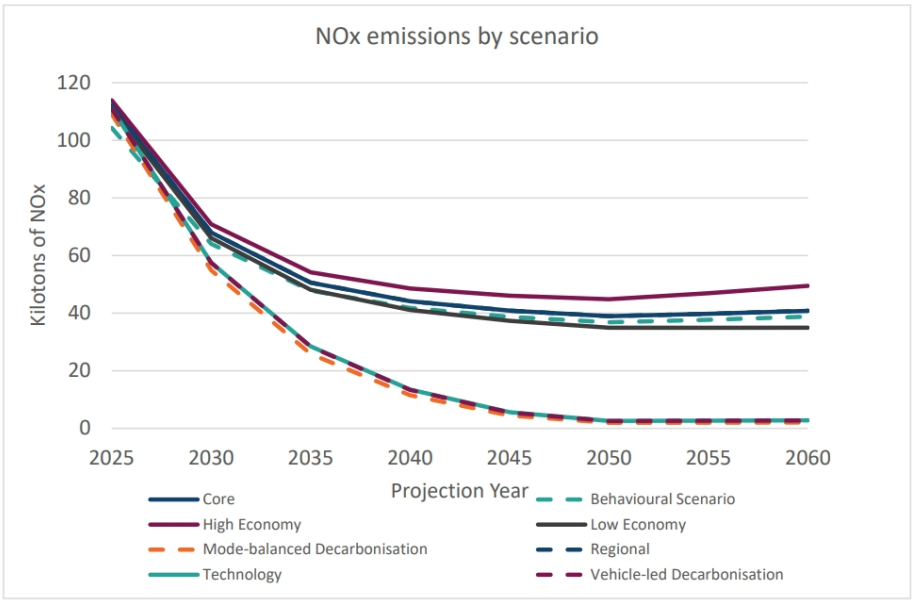


Figure 12 Projected total NOx emissions by scenario and year

Local Development

The Planning team work closely with the Community and Wellbeing team using policies designed to ensure that potential impacts on air quality are addressed and mitigated early in the planning process.

There are no major residential or industrial developments currently planned in the Gloucester City area that are anticipated to have an adverse impact on air quality in our AQMAs in the future.

Improvements in the railway station and bus station and surrounding environment have been made and are still under development, to encourage more people to use public transport.

Summary, Conclusion and Recommendations

This assessment sets out the evidence relied upon by Gloucester City Council in seeking to revoke the Gloucester City Council AQMAs.

Part IV of the Environment Act 1995 (as amended 2021) requires Local Authorities to review air quality in its area and assess whether AQS objectives will be achieved. Where it has been shown that the AQS objectives will not be achieved Local Authorities must declare an AQMA and put an AQAP in place to bring air quality within acceptable levels.

According to the Environment Act and associated statutory guidance, an AQMA can be revoked where a review demonstrates that air quality objectives are being met and there is confidence that this will continue to be the case.

This review has considered current and historical monitoring data and has shown that the roadside concentrations of NO2 have declined significantly since the initial declaration of the Gloucester City Council AQMAs.

National, regional and local policies have influenced the reduction in polluting emissions within the AQMA alongside actions identified within the draft AQAP, and it is reasonable to expect that further reductions will be achieved through the increasing use of ultra-low and zero emission vehicles in the coming years.

Having considered the historical monitoring data associated with Gloucester City Council AQMAs, national trends in emissions and any likely local impacts on the air quality within the AQMAs, the Council is satisfied that the AQMAs can be revoked.

Air quality in the AQMAs is demonstrably compliant with the objectives as there have been no exceedances for 4 years, since 2019. National air quality monitoring data follows a similar trend to that observed locally and predictions of future trends in NO2 from traffic show that recurrence of exceedances of the objectives in the AQMAs is unlikely.

The Council has confidence therefore that compliance has been and will continue to be achieved and is satisfied that its decision to revoke all three AQMAs in 2025 is justified.

Monitoring of NO2 will continue at worst-case locations in the current AQMAs to confirm that ambient levels of the pollutant remain compliant with the national objectives and to gauge improvements in local air quality over time.

Formal revocation of all three AQMAs is recommended. This should proceed as soon as practicable in order to comply with statutory obligations.

A draft Revocation Order for each of the AQMAs is presented in Appendix 1: Draft AQMA Revocation Order.

Following revocation, as per paragraph 4.12 of LAQM.PG(22), the Council will develop and publish their Air Quality Strategy which will ensure continued air quality compliance and improvements.

Appendix 1: Draft AQMA Revocation Order

Draft AQMA Revocation Order

Gloucester City Council Order 2025

Environment Act 1995 Part IV Section 83(2)(b)

Order Revoking an Air Quality Management Area

Gloucester City Council, in exercise of the powers conferred on it by Section 83(2)(b) of the Environment Act 1995 hereby makes the following order:

1. This Order shall revoke the area known as the Barton Street AQMA (as shown in the attached map) declared for the nitrogen dioxide (NO2) annual mean on 08/08/2005.

2. This Order shall come into force on XX MONTH 2025.

The Common Seal of Gloucester City Council was hereunto affixed

In the presence of:

……..

Dated: …….

Draft AQMA Revocation Order

Gloucester City Council Order 2025

Environment Act 1995 Part IV Section 83(2)(b)

Order Revoking an Air Quality Management Area

Gloucester City Council, in exercise of the powers conferred on it by Section 83(2)(b) of the Environment Act 1995 hereby makes the following order:

1. This Order shall revoke the area known as the Priory Road AQMA (as shown in the attached map) declared for the nitrogen dioxide (NO2) annual mean on 08/08/2005.

2. This Order shall come into force on XX MONTH 2025.

The Common Seal of Gloucester City Council was hereunto affixed

In the presence of:

……..

Dated: …….

Draft AQMA Revocation Order

Gloucester City Council Order 2025

Environment Act 1995 Part IV Section 83(2)(b)

Order Revoking an Air Quality Management Area

Gloucester City Council, in exercise of the powers conferred on it by Section 83(2)(b) of the Environment Act 1995 hereby makes the following order:

1. This Order shall revoke the area known as the Painswick Road AQMA (as shown in the attached map) declared for the nitrogen dioxide (NO2) annual mean on 05/10/2007.

2.This Order shall come into force on XX MONTH 2025.

The Common Seal of Gloucester City Council was hereunto affixed

In the presence of:

……..

Dated: ……

Glossary of Terms

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

References

- Local Air Quality Management Technical Guidance LAQM.TG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Chemical hazards and poisons report: Issue 28. June 2022. Published by UK Health Security Agency
- Air Quality Strategy – Framework for Local Authority Delivery. August 2023. Published by Defra.