

**Leicester
City Council**

2024 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: 27 June 2024

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Executive Summary: Air Quality in Our Area

Air Quality in Leicester 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. In the UK, it is estimated that the reduction in healthy life expectancy caused by air pollution is equivalent to 29,000 to 43,000 deaths a year¹.

Air pollution particularly affects the most vulnerable in society, children, the elderly, and those with existing heart and lung conditions. Additionally, people living in less affluent areas are most exposed to dangerous levels of air pollution².

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})	<p>Particulate matter is everything in the air that is not a gas.</p> <p>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.</p> <p>PM₁₀ refers to particles under 10 micrometres. Fine particulate matter or PM_{2.5} are particles under 2.5 micrometres.</p>

¹ UK Health Security Agency. Chemical Hazards and Poisons Report, Issue 28, 2022.

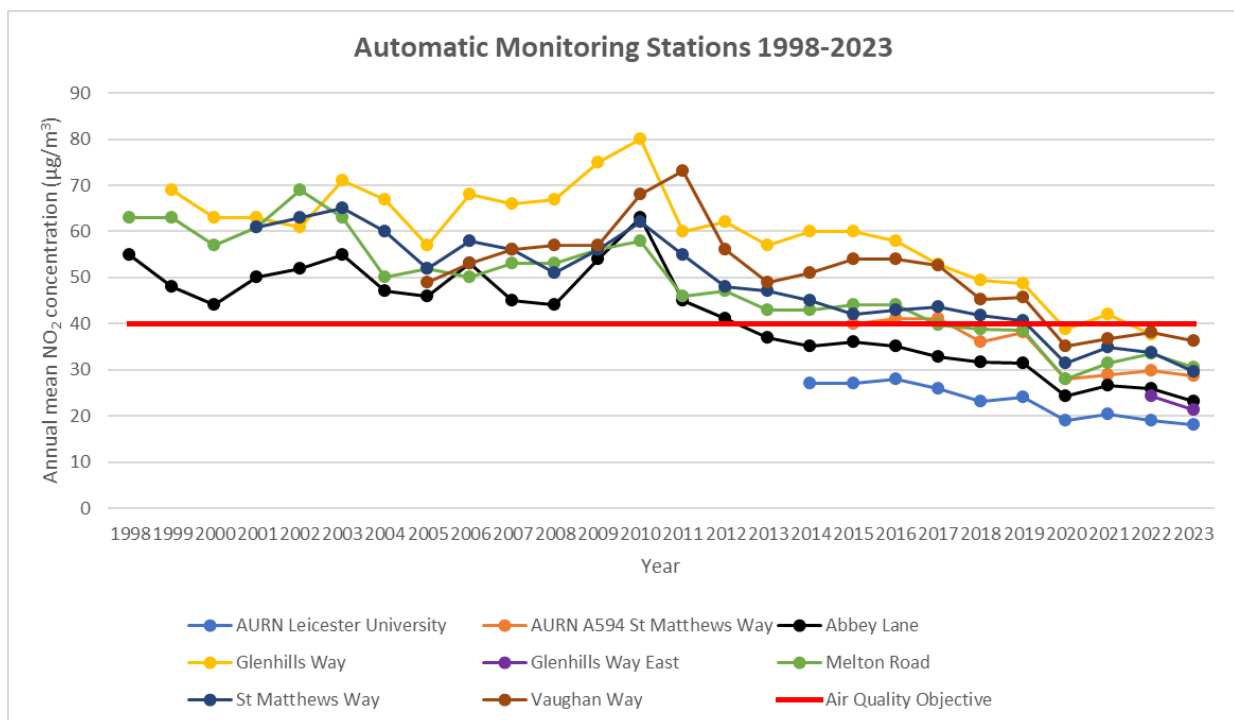
² Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

Leicester currently has one Air Quality Management Area (AQMA) which covers a large section of the City Centre, a number of key radial roads and sections of the outer ring road. It was declared on grounds of NO₂ exceedances in 2000 and was later amended in 2007.

Leicester City Council operates five air quality monitoring stations located within the AQMA, which monitor NO₂ and (except for St Matthews Way) PM₁₀ levels. These monitoring stations are located as follows:

- Vaughan Way: North side of the inner ring road
- Melton Road: Major arterial road
- St Matthews Way: North-East side of the inner ring road
- Abbey Lane: Major arterial road and large junction
- Glenhills Way East: Southern side of the outer ring road

There are also two Automatic Urban and Rural Network (AURN) monitoring sites in Leicester, one in the vicinity of the University of Leicester, and one on St Matthews Way, about 200m away from the St Matthews Way air quality monitoring station. The graph below shows 25 years of the annual mean NO₂ concentrations at all stations.

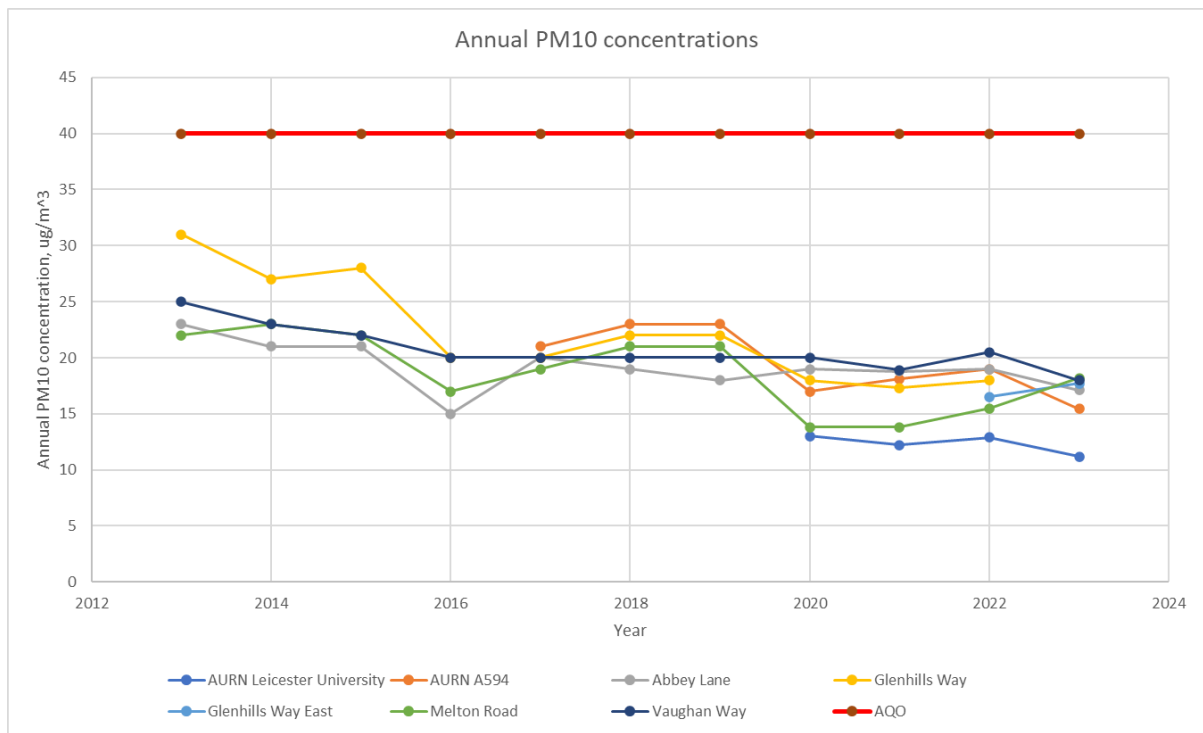


In Leicester annual mean concentrations of NO₂ have been declining since 1998, although there was a notable period of increase between 2009 and 2011 which may be partially attributed to meteorological conditions (i.e. cold winters). Since then, the levels

of NO₂ monitored by the stations and AURN sites steadily declined. A sharp reduction was observed in 2020, where the COVID-19 pandemic reduced traffic volumes to the point where all monitoring stations and AURN sites reported values of NO₂ concentrations below the national air quality objectives. Due to the pandemic, on average, the annual mean NO₂ concentrations dropped to approximately 75% of their pre-pandemic values. Between 2020 and 2022 NO₂ levels began to rise again as lockdowns were lifted and traffic levels began to rise again. However, in 2023 all stations reported a small decrease in NO₂ concentrations, and these figures will continue to be monitored closely in the coming years as we continue to implement measures to improve air quality and reduce NO₂ concentrations. It is encouraging to see that all stations seem to be stabilizing at these lower levels of NO₂ concentrations, which is possibly due to a reduction in daily commuter traffic due to an increase in homeworking, or it could also reflect a change of road composition as 'cleaner' vehicles such as electric cars and buses are permeating the fleet and replacing older, more polluting vehicles.

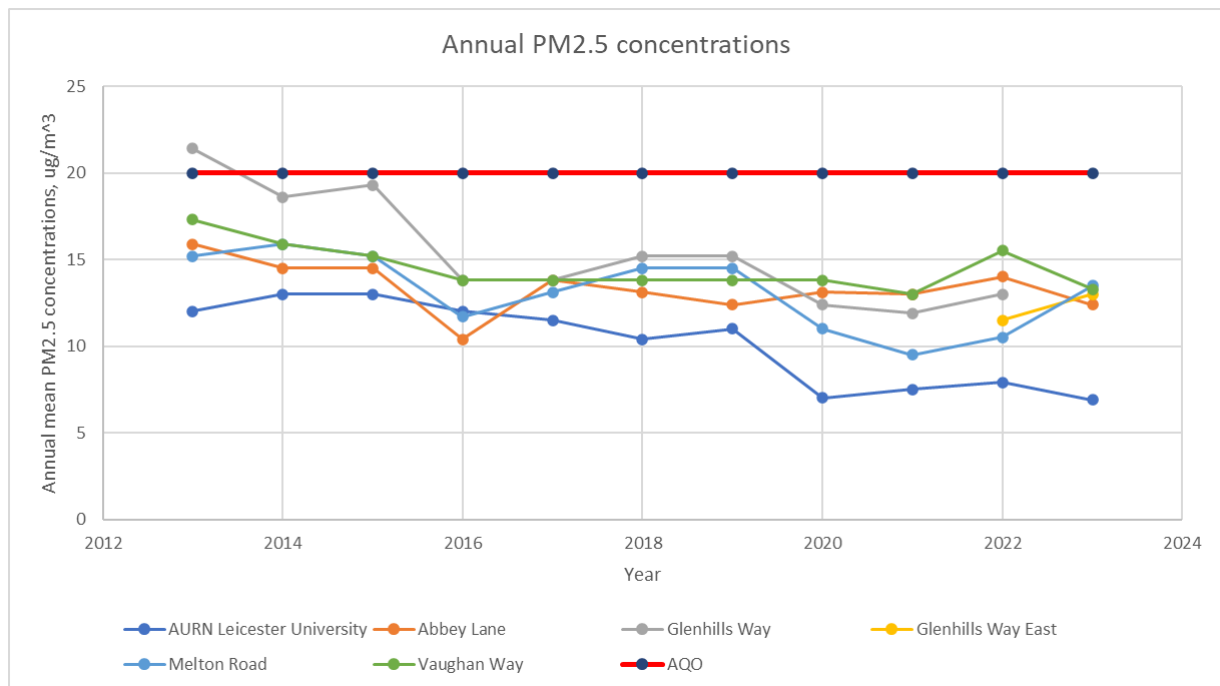
During 2023 the diffusion tube network in Leicester was not operational due to lack of funding, but we are currently working with the Joint Air Quality Unit (JAQU) to reinstate it as part of the NO₂ Exit Process.

PM₁₀ levels in Leicester are measured at four of the five monitoring stations run by Leicester City Council (excluding St Matthews Way), along with the two AURN sites. All monitoring stations are reporting compliance with the PM₁₀ annual Air Quality Objective (AQO). Below is the last 10 years of PM₁₀ annual mean concentrations across Leicester City.



The station which reported the highest levels of annual PM₁₀ concentrations in 2023 was the Melton Road station at 18.2µg/m³. PM₁₀ levels have varied in their levels since 2022, with both Melton Road and Glenhills Way East reporting increases of concentrations since last year, and the rest of the monitoring network reporting decreases. On average, PM₁₀ levels are 6% lower than in 2022, and 22% lower than pre-pandemic (2019) levels.

PM_{2.5} levels in Leicester are monitored by one AURN station at the University of Leicester, and is estimated from PM₁₀ measurements at all other stations which measure PM₁₀. The last 10 years of PM_{2.5} data, both measured and estimated, is shown in the graph below.



Due to the nature of the estimation method, PM_{2.5} concentrations follow the same trend as PM₁₀ concentrations in Leicester in 2023, with all stations estimated to be compliant with the annual mean AQO for this pollutant. The lowest PM_{2.5} level is the measured concentration at the University of Leicester AURN station, which recorded 6.9µg/m³. This is also the lowest level this station has recorded since it began measuring in 2013. The highest annual mean PM_{2.5} concentration was estimated to be 13.5µg/m³ at the Melton Road station.

Alongside the monitoring stations and AURN stations an additional network of over 20 low cost 'Zephyr' sensors are deployed across the city to monitor NO₂, PM₁₀ and PM_{2.5} levels.

To summarise:

- None of the automatic monitoring stations reported an exceedance of the NO₂ annual mean Air Quality Objective, with the highest concentration being reported as 36.3 µg/m³ at Vaughan Way, which is a 5% decrease in annual mean concentration from 2022 at the same station.
- The diffusion tube network is in the process of being reinstated for use in the NO₂ Exit Process, it was not operational in 2023 due to lack of funding, therefore there is no data for 2023.
- A decrease in annual mean NO₂ concentrations was observed at all monitoring stations when compared to 2022 levels.

- There were no reported hourly exceedances of the NO₂ hourly objective at any of the monitoring stations in Leicester, and no annual mean concentrations greater than 60µg/m³ (which may indicate an exceedance of this objective), were observed.
- Vehicular traffic remains the dominant source of NO₂ emissions in Leicester, with diesel vehicles thought to be the biggest contributor.
- No exceedances of the PM₁₀ annual mean AQO were recorded in any location in Leicester in 2023, with a maximum concentration of 18.21µg/m³ observed at the Melton Road monitoring station.
- The PM₁₀ hourly mean objective of 50µg/m³ with 35 permitted exceedances was met across all stations in Leicester in 2023.
- PM_{2.5} concentrations were estimated from PM₁₀ values at all stations except the University of Leicester AURN station, where it was measured directly. There were no exceedances of the PM_{2.5} annual mean AQO in 2023.
- Leicester City Council continue to monitor pollution levels through the use of a network of low-cost 'Zephyr' sensors manufactured by Earthsense, These sensors measure NO₂, PM₁₀ and PM_{2.5} concentrations at 23 sites across the city.
- The majority of PM_{2.5} pollution in Leicester originates from outside of the city, primarily as transboundary agricultural and industrial emissions. PM_{2.5} originating in Leicester itself is minimal and can be mostly attributed to domestic sources such as woodburning stoves, with a smaller contribution arising from transport by vehicle resuspension, brakes, and tyre wear.
- Leicester City Council continues to implement the measures outlined in the "Healthier Air for Leicester": Leicester's Air Quality Action Plan 2015-2026', with priorities to continue to reduce single car journeys and encourage the uptake of sustainable methods of transport.
- The authority is progressing with a new Leicester Transport Plan (LTP4), which addresses air quality measures.
- Leicester City Council practically evaluates pollution sources and carried out a source apportionment exercise to determine if there were any changes in source contribution to air pollution in 2023.

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 Plan³ sets out actions that will drive continued improvements to air quality and meet the new national interim and long-term targets for fine particulate matter (PM_{2.5}), the pollutant of most harm to human health. The Air Quality Strategy⁴ provides more information on local authorities' responsibilities to work towards these new targets and reduce fine particulate matter in their areas.

The Road to Zero⁵ 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.

Throughout 2023 Leicester City Council has continued to implement measures outlined in the "Healthier Air for Leicester": Air Quality Action Plan 2015-2026' document, and has built on measures outlined in the 2022 Annual Status Report.

Some of the key measures implemented in 2023 to continue to improve air quality include:

- A range of transport schemes under Connecting Leicester: Public Realm Improvements, including expansion of our cycle lane network. To date, 10km of cycle lanes have been delivered, with a further 6km planned.
- Installation of slow, fast and rapid Electric Vehicle (EV) chargers, with over 168 chargers installed to date.
- Delivery of 4 new 20mph zone schemes, covering 35 streets and 7.3km of highway in 2023. The total scheme coverage stands at 325km over 1506 streets.

³ Defra. Environmental Improvement Plan 2023, January 2023

⁴ Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

⁵ DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

- The continued securing of Travel Plans through statutory planning conditions, with 43 accepted planning applications having an associated Travel Plan attached as a condition.
- Bikeability Schools Programme working with 1533 pupils to deliver intense cycle training throughout 2023.
- Numerous schemes promoting travel alternatives including Bike Parks, Walking Programmes, Walk to School Programmes and providing Business Travel Plans
- Celebrating Clean Air Day 2023, in which 4 schools had road closures and several others had activities supported by our partner agencies Sustrans and LivingStreets.
- In 2023 all registered bus operators in Leicester used Euro VI or electric buses as part of the Leicester Enhanced Partnership Scheme- this target was achieved in April 2023. At present almost half of the fleet buses in Leicester are electric, contributing to the clean air in the city.
- The Abbey Lane, Melton Road and Anstey Lane bus lane schemes were completed in 2023, which were aimed at improving bus journeys and thus promoting sustainable travel.
- Continued implementation of the Transforming Cities Fund (TCF) programme, including the launch of the free city centre electric 'HOP!' bus being introduced in April 2023.

Image 1 – Clean Air Day play street, Folville Junior School



Image 2 – Free city centre electric ‘HOP!’ bus



Image 3 – New 20mph zone on Lomond Crescent



Air Quality officers in Leicester City Council continue to work closely with colleagues from Public Health, Traffic Management, Carbon Footprint Reduction, Active Travel and Planning to implement projects aimed at improving air quality. The authority also works closely with external partners including Leicestershire County Council, the neighbouring local authorities, and National Highways, to share knowledge and best practice in improving air quality and reducing air pollution.

Conclusions and Priorities

Leicester City Council has been fully compliant with the AQOs for NO₂, PM₁₀, and PM_{2.5} in 2023.

NO₂ concentrations across the city have decreased at all stations since 2022, including at the two AURN sites. This may be attributed to a stabilisation in the shift in work patterns due to agile working and new ways of working from home, fleet upgrades, and the range of schemes implemented by the council throughout the year to improve sustainable transport usage and reduce the number of cars on the road. There were no exceedances of the NO₂ 1-hourly objective of 200µg/m³ in 2023 at any of the monitoring stations. Overall, NO₂ concentrations appear to be stabilising at levels significantly lower than pre-pandemic levels and continue to be below the AQO. The highest recorded annual mean concentration for NO₂ was 36.3µg/m³ at the Vaughan Way station, and the lowest was 21.2µg/m³ at the Glenhills Way East Station, which was relocated in 2022.

With regards to PM₁₀, there were no exceedances of the annual mean AQO at any monitoring station in 2023. The 24-hourly mean AQO was not exceeded, although there were 11 incidences of a 24-hour average PM₁₀ concentration greater than 50µg/m³ across all stations. Overall, annual mean PM₁₀ concentrations are lower than those recorded in 2022, with only the Melton Road and Glenhills Way East stations recording slightly higher concentrations in 2023. The highest recorded annual mean PM₁₀ concentration was 18.2µg/m³ at the Melton Road station, and the lowest was 11.2µg/m³ at the University of Leicester AURN station.

PM_{2.5} levels across the city have been estimated from PM₁₀ levels using the most recent National Factor, which is currently 4.7 for roadside monitoring stations. Using this method, it has been determined that Leicester City Council has met the PM_{2.5} annual mean air quality objective. PM_{2.5} is also measured directly by the University of Leicester AURN station. The highest estimate of PM_{2.5} annual mean concentrations using the National Factor was

13.51 $\mu\text{g}/\text{m}^3$ at the Melton Road station, and the lowest value was directly measured as 6.93 $\mu\text{g}/\text{m}^3$ at the University of Leicester AURN site.

Leicester City Council runs a network of low cost 'Zephyr' sensors across the city to monitor NO₂, PM₁₀ and PM_{2.5}. While it is recognised that these are not recommended for the purposes of assessing national AQOs, they provide a valuable insight into pollution levels across the city. PM_{2.5} annual average concentrations were reported as being below the AQO at all zephyr sites in 2023, with the highest recorded average being 8.5 $\mu\text{g}/\text{m}^3$ on Blackbird Road.

Overall, both inside and outside of Leicester City Council's AQMA, there are no exceedances of any AQOs for any pollutants. Further years of compliance will be required to ensure pollutant levels remain stable before revocation (partial or full) of the AQMA is to be considered.

Leicester City Council's 'Healthier Air for Leicester': Air Quality Action Plan 2015-2026' document is in the process of being updated. The new AQAP is currently in development, scheduled for consultation in 2024.

Local Engagement and How to get Involved

Our Councillors and Officers sit on many business-related boards and forums to discuss transport matters and give the latest briefings. These include:

- The Leicester Business Improvement District
- Leicester and Leicestershire Local Enterprise Partnership
- GoTravel Solutions Business Forum on Transport
- City Centre Business Group
- Chamber of Commerce

Air quality has a high profile in Leicester, often being an item on the agenda within various ward meetings across the city. Updates to Lead members, directors and ward councillors are provided regularly on the latest monitoring results, pollution episodes, and local traffic schemes which are implemented to improve air quality.

Residents and local businesses are consulted on all transport and air quality schemes as a standard practice, giving stakeholders a chance to have their say. The authority provides

statutory planning consultation responses with regards to air quality, ensuring that development is assessed for its impact on local air quality and that proportionate mitigation is applied where required.

Leicester City Council works with many action groups such as Friends of the Earth, UK100 and the Healthier Air for Leicester Campaign to promote public understanding of air quality.

The Council hosts a number of transport citizen groups such as Public Transport User Group and Bicycle User Group to help inform our future air quality and transport strategies. As a result of these, two action plans are currently in development regarding Walking and Cycling.

The following websites and documents provide information on the various schemes the authority has deployed to promote sustainable transport and improve air quality. If you would like to read more and get involved, please follow the below links.

Leicester City Council Air Quality Webpage and Air Quality Action Plan:

[Air quality \(leicester.gov.uk\)](https://www.leicester.gov.uk/air-quality/)

Leicester City Council Public Health:

[Public health \(leicester.gov.uk\)](https://www.leicester.gov.uk/public-health/)

Leicester City Council Environment and Sustainability Policy:

[Environment and sustainability \(leicester.gov.uk\)](https://www.leicester.gov.uk/environment-and-sustainability/)

Choose How You Move (CHYM) – Public planning of sustainable journeys:

[...A smarter way to travel for Leicester and Leicestershire < Choose How You Move](https://www.choosehowyoumove.co.uk/...A-smarter-way-to-travel-for-Leicester-and-Leicestershire)

Leicester Cycle City Action Plan 2015-2024:

[leicester-cycle-city-action-plan.pdf](https://www.leicester.gov.uk/media/leicester-cycle-city-action-plan.pdf)

Leicester's Local Cycling and Walking Infrastructure Plan (LCWIP):

[Leicesters-LCWIP-document.pdf \(choosehowyoumove.co.uk\)](https://www.choosehowyoumove.co.uk/Leicesters-LCWIP-document.pdf)

Leicester City Council Consultation Hub:

[Leicester City Council - Citizen Space](https://www.leicester.gov.uk/citizen-space/)

Local Responsibilities and Commitment

This ASR was prepared by the Transport Strategy Team of Leicester City Council with the support and agreement of the following officers and departments:

Anthea Anderson – Transport Strategy Team Leader, Transport Strategy

Rob Howard – Director of Public Health

Jolanta Obszynska – Traffic Operations

This ASR has been approved by:

Councillor Geoff Whittle – Assistant City mayor for environment and transport

This ASR has been signed off by a Director of Public Health.

This ASR was sent to National Highways for comment but unfortunately no response was received prior to submission.

If you have any comments on this ASR, please send them to the Transport Strategy Team at:

Transport Strategy, City Hall, 2nd Floor, 115 Charles Street, Leicester, LE1 1FZ.

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1 Local Air Quality Management

This report provides an overview of air quality in Leicester City during 2023. 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 Leicester 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 Leicester City Council can be found in Table 2.1. The table presents a description of the AQMA that is currently designated within Leicester City. Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of the AQMA and also the air quality monitoring locations in relation to the AQMA. The air quality objectives pertinent to the current AQMA designation are as follows:

- NO₂ 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
Leicester AQMA	Declared 2000, Amended 2007	NO ₂ Annual Mean	A large section of the City Centre and along a number of radial roads and sections of the ring road	NO	52.1µg/m ³	36.3µg/m ³	2	Healthier Air for Leicester: Leicester's Air Quality Action Plan (2015-2026), 2015	Leicester's Air Quality Action Plan

- Leicester City Council confirm the information on UK-Air regarding their AQMA(s) is up to date.
- Leicester City Council confirm that all current AQAPs have been submitted to Defra.

2.2 Progress and Impact of Measures to address Air Quality in Leicester City

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

- Table 2.1 for the exceedance in the current year does not show the bias adjusted annualised NO₂ concentration. This should be amended in future reports. Furthermore, the information in the table states that the AQMA has been compliant for three consecutive years. However, automatic monitor GW (LC2) recorded a NO₂ concentration of 42.1 µg/m³ in 2021. GW is located within the City Centre AQMA. This means that the AQMA has been compliant for one year only. Exceedances of automatic monitors count toward the compliance of an AQMA. This should be considered in future reports.

Response: Years of compliance within AQMA has been acknowledged and adjusted accordingly.

- Trend graphs show annual NO₂ concentrations for monitoring locations within the AQMA and outside the AQMA which displays the trends very clearly. The Council is encouraged to continue to present their data in this way.

Response: Comment welcomed

- The Council have included detailed discussion on PM_{2.5} and have drawn links to the public health outcomes framework and fraction of mortality attributable to emissions of PM_{2.5}. Comparisons to the regional fraction, and to England as a whole, have additionally been presented. This is commended.

Response: Comment welcomed

- Mapping of the monitoring locations is very clear and detailed. This is highly commended, and encouraged for future reports.

Response: Comment welcomed

- Appendix F – Summary of Zephyr Monitoring, is a welcome addition. The inclusion of these data are encouraged in future reports.

Response: Comment welcomed

- There is an inconsistency between the text and the table A.1 regarding the number of automatic monitoring sites. In the text five automatic monitoring sites plus the two AURN sites are mentioned (equalling seven automatic monitoring sites in total), however, table A.1 lists six automatic monitoring sites plus the two AURN sites (equalling eight automatic monitoring sites in total). Consistency

across the text and tables is highly recommended for clarity and this should be considered in future reports

Response: Comment noted

- The diffusion tubes are not deployed in accordance with the DEFRA Diffusion Tube calendar, an adequate explanation to why was provided. However, if the modelling assessment exercise is completed, it should be considered whether it is possible to deploy the diffusion tubes in accordance with the DEFRA calendar. Otherwise, the correct methodology has been used throughout the report which is highly commended.

Response: Comment welcomed, no diffusion tube data obtained this year

- Chapter “QA/QC of diffusion tube monitoring” is missing the accreditation held and the participation in analysis schemes, e.g. AIR-PT, of the laboratory used to analyse the diffusion tubes. This information should be included in future reports.

Response: Noted. No diffusion tube data obtained this year

- Table C.1 is missing the annualisation factors for the three diffusion tube monitoring sites that required annualisation. Only the average annualisation factor is provided, however, it is not clear how this one was derived. This information should be included in future reports.

Response: Noted. No diffusion tube data obtained this year

- The Council decided to use the local bias adjustment factor although one month of the co-located automatic monitor had insufficient data capture. The national bias adjustment factor (0.87 as in the spreadsheet v03/23) is higher than the used local bias adjustment factor (0.84). In this situation with the insufficient data capture it would have been recommended to use the national bias adjustment factor as it would have been more conservative. The reasoning that the local bias adjustment factor was used as in previous years the local bias adjustment factor was used and they were similar is not sufficient in this case. Therefore, it is recommended to use the higher bias adjustment factor where appropriate and to provide a more detailed justification to why the bias adjustment factor was used, especially if data capture of the automatic monitor is not sufficient. Furthermore, the national bias adjustment factor should still be reported in the ASR, even if it is not used to have a comparison between the local and national bias adjustment factor.

Response: National Factor used to calculate PM_{2.5} levels this year

- The Action Plan was published in 2015 and it appears that it has not been updated since. The Action Plan should be reviewed and updated every 5 years. It is expected that the Action Plan is reviewed and updated for the next ASR. If the Action Plan has been reviewed and updated since, this information should be clearly included in the ASR.

Response: The council is working on a new Action Plan in line with correspondence with DEFRA, due out in 2025

Leicester City Council has taken forward a number of direct measures during the current reporting year of 2023 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. 45 measures are included within Table 2.2, with the type of measure and the progress Leicester City Council have made during the reporting year of 2023 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

More detail on these measures can be found in their respective Action Plans, including 'Healthier Air for Leicester': Leicester's Air Quality Action Plan (2015-2026), Leicester draft Transport Plan (2021-2036), and Leicester Climate Emergency Strategy (2020-2023).

Key completed measures are:

- Procurement of Ultra Low Emission Vehicles (ULEVs) and slow, fast and rapid EV chargers.
- 4 new 20mph schemes completed in 2023, covering 35 new streets and 7.3km of highway.
- Completion of consultations for the new Local Plan 2030-2036.
- Promotion of various travel alternatives, including the Choose How You Move Journey Planner, personalised travel planning, and the Wheels to Work electric bike scheme.
- Completion of a freight related study for the Freight Quality Partnership, with 51 businesses signed up to an ECO stars scheme.
- Working with 1,553 pupils to deliver intense cycle training via the Bikeability Schools Programme.
- Provision of 20+ 'pop-up' bike parks at festivals and events in 2023.

- Delivery of 79 walks in 2023, with 240 new walkers and 189 returning walkers as part of the ongoing Walking Programmes work package through the Access and Capability Funds.
- Clean Air Day which saw 4 schools have road closures with play streets and other activities, with several other schools performing their own activities supported by Leicester City Council and our partner organisations.
- All registered bus operators in Leicester City use Euro VI or electric buses as part of the Leicester Enhanced Partnership Scheme; this was achieved in April 2023. A total of 92 electric buses were live at the end of 2023.
- Completed the Living Roof/Solar Bus Shelters project, with all 479 shelters now installed- 30 have living roofs, 223 are solar powered.
- Continued implementation of Transforming Cities Fund (TCF) programme, including free city centre electric buses.
- Completion of Abbey Lane, Melton Road and Anstey Lane bus lane schemes.

Leicester City Council expects the following measures to be completed over the course of the next reporting year:

- Local Transport Plan 4 (Leicester Transport Plan) development, with air quality embedded within.
- Development of new Air Quality Action Plan, with schemes to reduce pollutant concentrations further and continue to comply with AQOs.
- Continued Air Quality Forum meetings between Leicester City Council and neighbouring local authorities, to allow knowledge exchange, best practice and technique development to occur.
- Clean Air Day in 2024, working with schools across the city to raise awareness of air quality.
- Expected to complete Transforming Cities Fund programme in 2024, encompassing the 4 themes:
 - 1) Free city centre electric buses
 - 2) Electrification of existing Park and Ride buses
 - 3) North West Green Growth Corridor- bus lane and highway improvement. Bus lanes and red routes on Beaumont Leys Lane/A6
 - 4) City Connectivity: real time bus information and bus stop improvements. Smart integrated ticketing system rollout

- Ongoing promotion and delivery of sustainable travel alternatives and personalised travel planning through various schemes including Leicester Car Sharing Club, the Choose How You Move Journey Planner, Wheels 2 Work, Bikeability and Tusker salary sacrifice.

Leicester City Council's priorities for the coming year are:

- Development of the Local Transport Plan 4 (Leicester Transport Plan), awaiting DfT guidance to be issued expected after 2024 general election.
- Reimplementation of diffusion tubes as part of the exit process for the Leicester Direction for NO₂ plan.
- Development of a new EV strategy in 2023, including a route of delivering a set number of new chargers by years 2025 and 2030.
- Progression of improved access to Town Hall bike park, Park and Ride sites and new city centre hubs, as well as preparation of new cycle hubs at St Margaret's Bus Station.
- Completion of the Transforming Cities Fund programme.
- Continue to work closely with neighbouring local authorities and National Highways to enact duties outlined in the Environment Act 2021.
- Continued replacement of Council fleet vehicles to EVs, reducing pollutant emissions from local authority vehicles.
- Continue to develop and implement ongoing and new measures to improve air quality across the city, with a focus on sustainable modes of transport and reducing single occupancy vehicle use.

Leicester City Council worked to implement these measures in partnership with the following stakeholders during 2023:

- Leicestershire County Council
- Neighbouring District and Borough authorities
- Developers
- Joint Air Quality Unit (JAQU)
- Tusker
- Sustrans
- Living Streets

- Bikeability
- Leicester Car Sharing Club
- Local bus and taxi operators
- Local schools and educational groups

The principal challenges and barriers to implementation that Leicester City Council anticipates facing are changes to staffing and the financial pressures associated with budget constraints.

Leicester City Council anticipates that the measures stated above and in Table 2.2 will achieve compliance in Leicester AQMA.

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	Local Transport Plan 4 (Leicester Transport Plan)	Policy Guidance and Development Control	Other Policy	2021	2036	Leicester City Council	LCC and others to be identified	NO	Partially Funded	> £10 million	Planning	> 25%	Approved plan	Consultation concluded autumn 2021. Awaiting DfT guidance expected to be issued after 2024 general election	The new LTP will be written in accordance with revised DfT guidance and is expected to be completed by November 2024
2	Leicester Direction for NO2 plan	Policy Guidance and Development Control	Low Emissions Strategy	2018	2026	Leicester City Council	JAQU	NO	Funded	£1 million - £10 million	Implementation	10%	Report delivered	Reinstatement of diffusion tubes now required to provide monitoring to start exiting the programme	A set of schemes to bring NO2 concentrations down in the shortest possible time
3	AQAP-measures to improve air quality	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2015	2026	Leicester City Council	LCC and others to be identified	NO	Partially Funded	> £10 million	Implementation	> 20%	Implemented Schemes	Work has begun to develop a new AQAP. Consultation is set for summer 2024 and final submission and adoption in 2025	Various schemes implemented to reduce pollutant concentrations and comply with the AQS objective
4	Workplace Parking Levy (WPL)	Traffic Management	Workplace Parking Levy, Parking Enforcement on highway	2021	2036	Leicester City Council	LCC	NO	Funded	£500k - £1 million	Aborted	> 25%	Implemented Scheme	Cost of living crisis (2022) means WPL will not be implemented at this time. Aborted measure	Scheme would generate £450m in first 10 years. WPL would also act as a demand management tool to deter single car use
5	Connecting Leicester Public Realm Improvements	Transport Planning and Infrastructures	Other	2012	2030	Leicester City Council	LCC, TCF, Active Travel Fund, ERDF	NO	Partially Funded	> £10 million	Implementation	> 1%	Implemented Schemes	10km of cycle lanes delivered to date, with a further 6km planned	On-going implementation of various transport schemes subject to funding/workloads
6	Procurement of ULEVs to replace diesel vans	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	2015	2040	Leicester City Council	LCC	NO	Partially Funded	£1 million - £10 million	Implementation	< 0.1%	Number of vehicles purchased	A total of 30 electric vans and 5 electric mopeds purchased to date	Lack of charging infrastructure, materials (chips/tungsten), high market demand for parts/vehicles, home charging policies required
7	Procurement of slow, fast and rapid EV chargers	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2015	2035	Leicester City Council	OZEV, LCC, European Regional Development Fund, ERDF	NO	Partially Funded	£1 million - £10 million	Implementation	< 0.1%	Number of chargers installed	22 slow (3.3kW), 140+ fast (22kW), 6+ rapid (50kW) chargers installed to date	A new EV strategy is being developed in 2024 including revised KPIs and a route map for delivering a specific number of chargers by 2025 and 2035
8	TUSKER-ULEV salary sacrifices for employees	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	2016	2040	Leicester City Council	LCC	NO	Partially Funded	£500k - £1 million	Implementation	< 0.1%	Number of vehicles purchased or leased	E-bikes delivered in 2023: 36 (50 total). EVs delivered in 2023: 13 (36 total). ULEVs delivered in 2023: 47 (150 total)	Salary sacrifice scheme for LCC employees to purchase or lease electric cars and bicycles

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	Bus retrofitting	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	2015	2030	Leicester City Council	Bus operators	NO	Partially Funded	£1 million - £10 million	Implementation	< 0.1%	Number of buses retrofitted	No buses retrofitted in 2023. Total of 250 to date.	DfT are investigating the effectiveness of bus retrofit technology to reduce NOx, hence no retrofits have been carried out in 2023
10	20mph zones	Traffic Management	Reduction of speed limits, 20mph zones	2012	2040	Leicester City Council	LCC	NO	Partially Funded	£1 million - £10 million	Implementation	< 0.1%	Number of schemes implemented	4 new schemes implemented in 2023, covering 35 new 20mph streets and 7.3km of highway	Cumulative totals 325km over 1506 streets since scheme began. 2023 issues included waiting for approvals and resourcing issues
11	Local Plan 2030-2036	Policy Guidance and Development Control	Other Policy	2020	2036	Leicester City Council	LCC and others to be identified	NO	Funded	> £10 million	Planning	> 1%	Air quality to be embedded within the plan	Consultation (Reg 19) completed in 2023. Examination in public planned for 2024	
12	Choose How You Move- Sustainable Travel Website and Brand	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2012	2040	Leicester City Council and Leicestershire County Council	Access Fund	NO	Partially Funded	£1 million - £10 million	Implementation	< 0.1%	Page views, new users and journeys planned	140,135 users to date, of which 77,579 were new users in 2023. 146,884 page views in 2023.	Statistics provided by Google Analytics who have changed the way they measure stats in June 2023.
13	Car Clubs	Promoting Travel Alternatives	Personalised Travel Planning	2015	2040	Leicester City Council, Leicester Car Sharing Club, Developers	LCC, Car Club and Developers	NO	Partially Funded	£10k - 50k	Implementation	< 0.1%	Car Club usage	LCC awarded £5k to Leicester Car Sharing Club to part fund purchase of an electric vehicle. This has replaced the existing fossil-fuelled vehicle and is now in use for car sharing	
14	Choose How You Move- Journey Planner	Promoting Travel Alternatives	Personalised Travel Planning	2012	2040	Leicester City Council	Access, Fund, JAQU	NO	Partially Funded	£50k - £100k	Implementation	< 0.1%	Continual development of Journey Planner services	Web and app-based Journey Planner launched in 2022. Development of a comms campaign to raise awareness. Identification of extra functionality to improve user experience	
15	Personalised Travel Planning	Promoting Travel Alternatives	Personalised Travel Planning	2018	2022	Leicester City Council and Leicestershire County Council	ERDF	NO	Partially Funded	£50k - £100k	Completed	< 0.1%	Engagement with households	2,600 households participated, 23% reduction in single occupancy car journeys	Work and report completed and presented in 2022
16	Wheels to Work- Field of electric bikes	Promoting Travel Alternatives	Personalised Travel Planning	2014	2040	Leicester City Council	Capability Fund, E-Cycle Extension Fund	NO	Partially Funded	£50k - £100k	Implementation	< 0.1%	Number of e-bike users	2023: 4 bikes loaned to businesses (9 total), 17 individuals joined the scheme (35 total). 11 continued on under Loan to Own scheme (27 total)	In-house delivery since 2017. The scheme now includes Loan to Own and 4-week Loan to Business. E-Cycle Extension Funding facilitates loans for school staff and hard to reach communities. Staff turnover has hindered development and expansion of this service in 2023.

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17	Car Share	Promoting Travel Alternatives	Personalised Travel Planning	2012	2040	Leicester City Council, Melton Borough Council, Leicestershire County Council	Access fund	NO	Partially Funded	£50k - £100k	Completed	< 0.1%	New members per year	Not resumed since pandemic due to loss of funding	
18	Freight Quality Partnership	Freight and Delivery Management	Delivery and Service Plans	2012	2025	Leicester City Council	LCC and JAQU	NO	Funded	£100k - £500k	Planning	< 0.1%	Engagement with Leicester freight businesses	Freight related study now completed. 51 businesses signed up to an ECO stars scheme	The ECO stars work and freight study will help inform the consideration of a new Freight Plan and associated action plan
19	Air Quality Forum	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2018	2040	Leicester City Council and neighbouring local authorities	LCC	NO	Funded	< £10k	Implementation	< 0.1%	Forum meetings	Continues AQF meetings between LCC and neighbouring local authorities	Forum to discuss issues of pollution across Leicestershire. Attended by all local authorities and other relevant bodies (eg National Highways). Knowledge exchange, development and adoption of best practice techniques.
20	Business Travel Plans	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2012	2040	Leicester City Council, but delivered through Go Travel solutions and grants from JAQU	Access Fund, JAQU	NO	Partially Funded	< £10k	Implementation	< 0.1%	Number of businesses engaged with	200+ businesses/organisations engaged in Travel Plans and associated monitoring to date	
21	Travel Plans secured through statutory planning conditions	Policy Guidance and Development Control	Other Policy	2012	2040	Leicester City Council	LCC, local businesses and developers	NO	Partially Funded	< £10k	Implementation	< 0.1%	Number of Travel Plans secured	Formal Travel Plan conditions attached to 67 decisions in 2023. Of these, 43 were granted planning consent	Overall total of planning related Travel Plans from 2002 to 2023 that have been granted planning consent stands at 729
22	Bikeability Schools Programme	Promoting Travel Alternatives	Promotion of Cycling	2012	2025	Leicester City Council and Job Centre Plus	Access Fund	NO	Partially Funded	£50k - £100k	Implementation	< 0.1%	Number of pupils worked with	Worked with 1533 pupils to deliver intensive cycle training during 2023	
23	Bike Parks	Promoting Travel Alternatives	Promotion of Cycling	2016	2025	Leicester City Council and British Cycling	Access Fund/ TCF	NO	Partially Funded	£50k - £100k	Implementation	< 0.1%	Number of Bike Parks operational	20+ 'pop-up' bike parks were provided at festivals and events in 2023. In progress of improved access to Town Hall bike park, P&R sites and new city centre hubs	Preparation continue to provide new cycle hubs at St Margaret's Bus Station
24	Bike Share/ Cycle Hire	Promoting Travel Alternatives	Promotion of Cycling	2016	2025	Leicester City Council	TCF, LCC, Bike Share operator	NO	Partially Funded	£500k - £1 million	Implementation	< 0.1%	Number of bikes in circulation and number of riders/rides	Leicester Bike Share closed as Ride On Scotland went into liquidation. Over 18 months the scheme delivered over 130k trips across 44 established stations and 500+ e-bikes.	450 e-bikes were upcycled back into private hire and stations removed. Alternative schemes for e-bikes and loans were established

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25	Walking Programmes	Promoting Travel Alternatives	Promotion of Walking	2015	2040	Leicester City Council	Access Fund/Capability Fund	NO	Partially Funded	£50k - £100k	Implementation	< 0.1%	Number of walks delivered	Delivered 79 walks in 2023. 240 new walkers, 189 returning walkers, total = 429. 9 new Walk Volunteer training attendees, with 4 going on to the volunteer pool. 23 total volunteers.	Added 3 self-guided routes on the website. Focus this year was restructuring existing content
26	Walk to School Programmes	Promoting Travel Alternatives	Promotion of Walking	2012	2040	Leicester City Council and Living Streets	Capability Fund	NO	Partially Funded	£50k - £100k	Implementation	< 0.1%	Number of schools engaged and number of pupils engages	43 schools engaged in 2023, with a total of 17,144 pupils	In Spring and Summer, 85% of all recorded journeys were active travel trips. In Autumn 86% of all journeys were recorded as active travel
27	Clean Air Day	Public Information	Other	2018	2040	Leicester City Council	LCC, DfT's Capability Fund, JAQU	NO	Partially Funded	£50k - £100k	Implementation	< 0.1%	Annual occurrence and school involvement	In 2023 4 schools had road closures on Clean Air Day with play streets and other activities, supported by LCC and partner agencies.	10 other schools took part by implementing their own road closures and performing their own Clean Air Day activities with support from LCC and partner agencies
28	Leicester City Council social media channels	Public Information	Via the Internet	2015	2040	Leicester City Council	LCC	NO	Partially Funded	£50k - £100k	Implementation	< 0.1%	Continual use of social media channels	Messages sent as and when required, linking to various campaigns and Defra AQ grant projects	Promotion of AQ issues, events and offering of support available from the Council via X and Facebook
29	Legible Leicester Wayfinding	Public Information	Other	2015	2026	Leicester City Council	LCC	NO	Partially Funded	£50k - £100k	Implementation	< 0.1%	Number of signs deployed		
30	Bus routes, cycle routes, bus timetables	Public Information	Via leaflets	2018	2040	Leicester City Council	LCC, Bus operators, County Council	NO	Partially Funded	£50k - £100k	Implementation	< 0.1%	Publication of maps		
31	Electric buses	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	2021	2025	Leicester City Council	TCF, LCC, Bike Share operator	NO	Partially Funded	£1 million - £10 million	Implementation	< 0.1%	Number of electric buses introduced	92 electric buses live at end of 2023. 24 were council funded (18 TCF and 6 Zebra funded), and 68 by First Bus (Zebra funded)	All registered operators in Leicester use Euro VI or electric buses as part of the Leicester Enhanced Partnership Scheme as of April 2023
32	Living roof / Solar bus shelters	Other	Other	2021	2030	Leicester City Council and Clear Channel	Clear Channel	NO	Funded	£1 million - £10 million	Implementation	< 0.1%	Number of shelters implemented	All 479 shelters now installed, of these 30 have Living roofs and 223 are solar powered	None
33	Traffic Sensitive Streets	Traffic Management	Other	2012	2030	Leicester City Council	LTP/LCC	NO	Partially Funded	£50k - £100k	Completed	< 0.1%	Quarterly Network Management Scorecard reports	Regulations in place	Any work carried out on the city highways has to be agreed as to not impede traffic, i.e. avoidance of rush hour. Permit scheme in place.

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34	Transforming Cities Fund (TCF)	Transport Planning and Infrastructure	Other	2018	2030	Leicester City Council	TCF	NO	Partially Funded	> £10 million	Implementation	< 20%	Continued implementation of various highway schemes (Themes 1-4) throughout 2023 and beyond	TCF programme received £32.5m, of DfT funding towards £71m programme. To date £45m spent. £32.5m of DfT funds were spent by March 2023 deadline. Programme progressing well and delivery should complete by end of 2024	Theme 1: Free city centre electric buses. Theme 2: electrification of existing Park and Ride buses. Theme 3: North West Green Growth Corridor-bus lane and highway improvement in 2023. Bus lanes and red routes on Beaumont Leys Lane/A6 in 2023. Theme 4: City Connectivity: real time bus information and bus stop improvements in 2022. Smart integrated ticketing system rollout completed March 2022
35	Anti-idling campaigns	Public Information	Other	2018	2025	Leicester City Council	LCC	NO	Partially Funded	£10k - 50k	Implementation	< 0.1%	Annual schemes/campaigns	Business engagement anti-idling campaign launched 2022- internal training launched for LCC fleet drivers and new starters-training provided. Anti-idling campaign took place at Herrick Primary School.	Staff turnover has hindered expansion of this campaign in 2023 beyond the pilot stage in businesses
36	Safer Streets Healthier Neighbourhoods (SSHNs)	Traffic Management	Other	2021	2025	Leicester City Council and Sustrans	Access Fund for experimental stage and LEW for permanent	NO	Partially Funded	£100k - £500k	Implementation	< 1%	Reduction in car traffic in scheme neighbourhoods	The experimental stage is complete. 2 SSHNs will not be taken to permanent stage. Designs are underway for 1 SSHN to be made permanent	Reduction in traffic on Knighton Drive, Craighill Road, Northford Road with no obvious increase in traffic on adjacent streets
37	Taxi Spot Checks	Promoting Low Emission Transport	Taxi Licensing conditions	2012	2040	Leicester City Council	LCC	NO	Not Funded	< £10k	Implementation	< 0.1%	Number of spot checks and vehicles inspected	8 spot checks conducted in 2023, 3 jointly with City of Wolverhampton Council. Total of 210 vehicles tested (137 licensed to LCC and 73 licensed to other authorities)	Joint operation with City of Wolverhampton Council
38	Taxi vehicle tests	Promoting Low Emission Transport	Taxi Licensing conditions	2012	2040	Leicester City Council	LCC	NO	Not Funded	< £10k	Implementation	< 0.1%	Twice yearly testing	All licensed taxis continue to have 2 tests per year. From Oct 2023, 3 tests per year have been introduced for vehicles over 11 years old.	In 2011 vehicle testing was brought in house to ensure consistent application of standards
39	Bike Maintenance Training	Promoting Travel Alternatives	Promotion of Cycling	2012	2024	Leicester City Council	Access Fund	NO	Partially Funded	£50k - £100k	Completed	< 0.1%	Delivering of training to adults and young people	Completed. Cycle city action plan is under review. No longer delivering	
40	Employment Adviser Training	Promoting Travel Alternatives	Personalised Travel Planning	2012	2040	Leicester City Council	Capability Fund	NO	Partially Funded	£50k - £100k	Completed	< 0.1%	Training of Work Coaches	Training ongoing, Wheels to Work leaflets circulated to employment agencies. Presentations given to staff/clients at several recruitment fairs	Training includes advice on smart ticketing and sustainable travel. Staff turnover has hindered provision of training in 2023

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41	FACE - internal newsletter	Public Information	Via the Internet	2012	2040	Leicester City Council	LCC	NO	Partially Funded	£50k - £100k	Implementation	< 0.1%	Weekly newsletter	Delivered to all employees at LCC	Information includes relevant AQ schemes or programmes when required
42	Bus Lanes	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2012	2040	Leicester City Council	Transport Improvement Works Programme, S106, S278, National Productivity Investment Fund, TCF	NO	Partially Funded	£1 million - £10 million	Implementation	< 0.1%	Continue to implement bus lanes as required	Abbey Lane, Melton Road and Anstey Lane schemes completed in 2023. No work yet planned for London Road. Next list of upgrades includes Saffron Lane, Welford Road and London Road	Work currently delayed following Plan for Drivers which challenges our policy of bus lanes being operational 24/7
43	SCOOT Sites	Traffic Management	UTC, Congestion management, traffic reduction	2012	2040	Leicester City Council	LTP, Connecting Leicester, LCC	NO	Partially Funded	£100k - £500k	Implementation	< 0.1%	Further install of sites	268 sites active	36 dual sites with both SCOOT and MOVA
44	Mova UTC System	Traffic Management	UTC, Congestion management, traffic reduction	2012	2040	Leicester City Council	LTP, Connecting Leicester, LCC	NO	Partially Funded	£100k - £500k	Implementation	< 0.1%	Further install of sites	113 sites active	36 dual sites with both SCOOT and MOVA
45	A2 Permit Installations	Environmental Permits	Introduction/increase of environmental funding through permit systems and economic instruments	2019	2040	Leicester City Council and Leicestershire County Council	LCC	NO	Not Funded	< £10k	Implementation	< 0.1%	Annual permit inspection and fee collection	1 permit - £1446 collected in fees from the process	Change as one of the A2 permits is no longer in production

2.3 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 Strategy⁶, 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 than 2.5 micrometres) has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

PM₁₀ is currently monitored at all but one of the automatic stations within the city, while PM_{2.5} concentrations are only monitored at the AURN site at the University of Leicester. Additionally, a network of low-cost 'Zephyr' sensors are deployed across the city and monitor PM_{2.5} also.

It has been possible to estimate PM_{2.5} concentrations at the stations it is not measured at through calculation of a PM_{coarse} fraction, as detailed in LAQM.TG22, Box 7-7. This was applied to the 2023 PM₁₀ annual means at the AURN site on the A594, Abbey Lane, Melton Road, St Matthews Way, Vaughan Way, and Glenhills Way East, to give an estimate for annual PM_{2.5} concentrations. These concentrations were all below the annual mean AQO for this pollutant and the results are presented in Appendix A.

Leicester City Council's network of 'Zephyr' sensors also monitor PM_{2.5} levels across the city, the results of which are presented in Appendix F. This network has now completed its fourth year of operation and will continue into 2024.

Further to this, Defra 2023 background maps (based on 2018 reference data) for Leicester City show that all 1 x 1 km grid squares are compliant with the annual mean AQO for PM_{2.5}. The highest concentration was found at Easting 460500, Northing 305500, and was 10.25µg/m³. This value is slightly lower than that reported from the Defra background maps last year (which was 10.4µg/m³), but is in the same place as last year. This area is in the northeast of the city, and contains a lot of commercial and industrial development as well as being in proximity to a railway line. There are also numerous terraced properties which may contain woodburning stoves and open fires. It is important to note that these

⁶ Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

concentrations are predictions based on 2018 reference data, which means that considerations for impacts the pandemic may have had on air quality are not considered.

The Public Health Outcomes Framework is a data tool compiled by Public Health England and quantifies the mortality burden of PM_{2.5} within England at various local scales. This is achieved by dispersion modelling Defra background concentrations, using background AURN PM_{2.5} concentrations as verification. Local authority boundaries and census data can then be applied to provide a population weighted PM_{2.5} concentration. The latest data available (2021) attributes a 5.5% fraction of mortality to PM_{2.5} in England. A regional average and slightly higher figure of 5.6% is applicable to the East Midlands, whilst Leicester City reported a 6.2% fraction of mortality attributable to PM_{2.5} in 2021.

Leicester City Council is taking the following measures to address PM_{2.5}:

- Declaration of a city wide Smoke Control Area (SCA) in June 2018, after consolidation of several smaller areas dating back as early as 1958. Reports of smoke are dealt with by the Pollution team, who assess the situation and take appropriate action.
- Securing of an Air Quality Grant (2018/19) to model locally based PM_{2.5} pollution, including monitoring using low cost 'Zephyr' sensors, to form an initial network of 10 units which has now increased to 20+ deployed across the city until at least December 2024. This project aims to assist in the mapping and monitoring of both PM₁₀ and PM_{2.5} using near real time data, promoting public engagement in PM_{2.5} and its health impacts through smart device applications and leaflets.
- Securing and delivery of an Air Quality Grant (2019/20) to identify transboundary sources of PM_{2.5} in Leicester using state of the art modelling and satellite data.
- Securing of an Air Quality Grant (2020/21) to implement a traffic intervention and quantify any reduction in both PM_{2.5} and NO₂. It will also address the issue of discrepancies between near real time modelling and in-situ monitoring. Furthermore, it will allow the authority to identify the best approach to create a model scheme for the purpose of reducing air pollutant concentrations that may be applicable to other parts of the city.
- A public health campaign on woodburning stoves and open fires was carried out in 2023, aiming to raise awareness around the health impacts of PM_{2.5} from woodburning, Leicester's Smoke Control Area (SCA), and to encourage a reduction in the use of polluting equipment and fuels.
- Continued work on anti-idling campaigns and Clean Air Day messaging, particularly in and around schools and their communities.

Actions to promote sustainable travel and reduce traffic emissions:

- Building on lessons from the pandemic, including the promotion and facilitation of homeworking, cutting out the need for transport.
- To continue to bring electric vehicles and bicycles into the Council's fleet.
- To continue the Connecting Leicester programme, making the city more accessible and promoting sustainable modes of transport, such as walking and cycling.
- To continue to deliver our programme of walking and cycling initiatives, including the Ride Leicester Festival, led rides and walks, the "Wheels to Work" scheme, and cycle training programmes for children and adults.
- To continue the introduction of bus priority schemes, including the use of bus gate cameras and enforcement during appropriate times of the day.
- To continue improving the city's traffic management system and address 'pinch points' or areas of congestion within the highway network.
- To continue delivering the programme of 20 mph zones, particularly around schools and in residential areas.

Collaborations:

- Working closely with Defra as part of a Local Authorities advisory group.
- To continue to lobby and work with Central Government to introduce national measures to reduce polluting emissions from vehicles and woodburning stoves, including work with UK100 and the Local Government Association (LGA).
- To work with other local authorities and agencies at regional steering groups, such as the Leicester and Leicestershire Air Quality Forum.
- To maintain a close working relationship with the local universities (University of Leicester and De Montfort University)
- Working with local companies such as Earthsense to maintain a robust monitoring network
- Working closely with neighbouring authorities of Blaby and Oadby & Wigston on transboundary sources of PM_{2.5}, the latter through a Defra Air Quality Grant project on monitoring of PM_{2.5} with a low-cost sensor located on A6 London Road.

- To continue an effective partnership with bus operators (Leicester Bus Enhanced Partnership 2022-2025), improving the quality and accessibility of bus services to promote modal shift and reduce emissions from transport.

Monitoring:

- To continue developing the monitoring network, through the purchase of additional equipment and/or the extension of existing services, and relocating of equipment with consideration for regular pollutant hotspot exercises.
- To ensure air quality considerations are embedded within Leicester's new Local Transport Plan (LTP 4), which is being developed.

Public Health:

- Leicester City Council colleagues in Public Health work closely with one another and various departments across the authority, recognising the importance of reducing PM_{2.5} emissions and the associated public health benefits.

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

This section sets out the monitoring undertaken within 2023 by Leicester City Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2019 and 2023 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Leicester City Council undertook automatic (continuous) monitoring at five sites during 2023. Table A.2 in Appendix A shows the details of the automatic monitoring sites. NB. Local authorities do not have to report annually on the following pollutants: 1,3 butadiene, benzene, carbon monoxide and lead, unless local circumstances indicate there is a problem. Leicester City Council does not have a problem with any of these pollutants. The [Leicester City Council Air Quality page](#) presents automatic monitoring results for Leicester City Council. with automatic monitoring results also available through the UK-Air website .

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

Leicester City Council also deploy a network of continuous monitors in the form of low cost 'Zephyr' sensors, monitoring NO₂, PM₁₀, and PM_{2.5} concentrations. Although these cannot strictly be used in assessment of AQOs, they provide an important indication of potential hotspot areas in Leicester. The results are presented in Appendix F.

3.1.2 Non-Automatic Monitoring Sites

Leicester City Council did not undertake any non-automatic (i.e. passive) monitoring of any pollutants in 2023. In 2022, it was proposed and agreed with JAQU that 2022 would be the final monitoring year for the diffusion tube network, as these were funded as part of the Secretary of State NO₂ direction in order to verify an air quality model. Leicester City

Council has now been asked to reinstate its diffusion tube network in 2024, due to the need to monitor as part of the NO₂ direction exit strategy.

3.2 Individual Pollutants

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

3.2.1 Nitrogen Dioxide (NO₂)

Table A.4 and Table A.5 in Appendix A compare the ratified and adjusted monitored NO₂ annual mean concentrations for the past five years with the air quality objective of 40µg/m³. 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).

Table A.5 in Appendix A compares the ratified continuous monitored NO₂ hourly mean concentrations for the past five years with the air quality objective of 200µg/m³, not to be exceeded more than 18 times per year.

All NO₂ monitoring data has been properly ratified in accordance with procedures outlined in LAQM.TG22.

There were no recorded exceedances of the annual mean NO₂ objective at any of the automatic monitoring stations within Leicester City in 2023. This includes no exceedances within the Leicester AQMA.

The highest annual mean concentration of NO₂ measured was 36.3 µg/m³ at the Vaughan Way station (VW / LC6), which is a 5% decrease in concentration for the same station in 2022 (which was recorded as 38µg/m³ and was also the highest recorded concentration in 2022). Historically (pre-pandemic), this station exceeded the AQO for annual NO₂ mean concentration due to its location: on the inner ring road of Leicester next to an eight-lane carriageway (four lanes in each direction) with queues forming regularly throughout the day due to traffic lights, junctions, and traffic volumes. The NO₂ concentrations at this site appear to be stabilizing around a 'new normal' which is below the AQO for the pollutant, although future results will be closely monitored to see if this trend will continue.

All other monitoring locations also recorded decreased levels of NO₂ levels compared to 2022. The most notable decreases in NO₂ annual concentrations were observed at St Matthews Way (SM / LC4) which had a decrease of 4µg/m³, and Glenhills Way East (GWE / LE1) and Melton Road (MR / LC3), which both recorded reductions of 3µg/m³. Glenhills Way East is located on the southern part of Leicester's outer ring road, on a stretch of carriageway which regularly experiences high volumes of traffic and regular congestion, while the Melton Road station is on one of Leicester's busiest radial roads and is placed on a stretch where there are two lanes in each direction next to a large junction. These reductions in NO₂ levels at all sites may be attributed to the stabilization of the new method of hybrid working widely adopted post-pandemic, as well as the evolution of engine standards. The large number of measures Leicester City Council implements to encourage uptake of sustainable transport and provide sustainable travel alternatives may also be contributing to the decrease in NO₂ levels across the city. It is also possible that the cap introduced by the government on bus fares promotes reduction of long journeys in private vehicles in favour of buses due to the price decrease. If this is the case then this could contribute to a reduction of passenger diesel vehicles on the roads.

There were also no reported hourly exceedances of the NO₂ hourly objective at any monitoring station in Leicester in 2023, and no annual mean concentrations greater than 60µg/m³ which may indicate an exceedance of this objective.

With regards to the low cost 'Zephyr' sensor network deployed across the city, in 2022 there were two reported exceedances of the NO₂ annual AQO; one by Z361 on Charles Street (47.8µg/m³) and one by Z409 at Troon Way (40.4µg/m³). Z361 is adjacent to a bus station, with idling buses and bus volumes likely causing elevated NO₂ concentrations. Z409 is placed on Leicester's outer ring road, and in 2022 had a data capture of only 66.3%. In 2023, these two Zephyrs reported significant reductions in NO₂ annual concentrations, with Z361 reporting an annual concentration of 37.1µg/m³, and Z409 reporting an annual concentration of 18.5µg/m³. The reduction on Charles Street may be attributed to the efforts of the Leicester Enhanced Bus Partnership Scheme: since April 2023 all registered bus operators in Leicester City use Euro VI or electric buses, with 92 electric buses being live at the end of 2023. The free city centre electric 'Hop!' bus was also introduced in 2023 as part of the Transforming Cities Fund, which may have contributed to a drop in NO₂ levels at this site.

All other Zephyr sensors reported compliance with the annual mean AQO, with the data monitored at the Charles Street unit being the highest NO₂ annual concentration value

across the potable sensor network. With these recorded values, it is unlikely that an exceedance of the 1-hourly objective was present in 2023.

3.2.2 Particulate Matter (PM₁₀)

Table A. in Appendix A: **Monitoring Results** compares the ratified and adjusted monitored PM₁₀ annual mean concentrations for the past five years with the air quality objective of 40µg/m³.

Table A. in Appendix A compares the ratified continuous monitored PM₁₀ daily mean concentrations for the past five years with the air quality objective of 50µg/m³, not to be exceeded more than 35 times per year.

PM₁₀ is currently monitored at four of the five stations managed by Leicester City Council, both of the AURN stations, and all but one of the low cost 'Zephyr' sensors. The only station which does not measure this pollutant is the St Matthews Way station (SM / LC4). None of the automatic monitoring stations recorded an exceedance of the annual mean objective value, with the highest concentration of 18.21µg/m³ being recorded at the Melton Road monitoring station (MR / LC3). This is a lower concentration than the highest recorded annual concentration in 2022, which was recorded to be 20.5µg/m³ and was at the Vaughan Way site (VW / LC6).

The highest concentration of annual PM₁₀ recorded by a Zephyr was 14.1µg/m³ by Z484, which is located on Blackbird Road, a busy road with two lanes in either direction to the north of the city centre. Full details of the Zephyr monitoring data are presented in Appendix F.

On average, there has been a 6% decrease in PM₁₀ annual concentration levels across all stations between 2022 and 2023, and levels have decreased by approximately 22% from pre-pandemic (2019) levels. The current AQMA is not declared for reasons of PM₁₀ exceedance, and it is considered unlikely that Leicester will have to declare for this pollutant. All monitoring data used in the calculation of concentrations with respect to both the annual mean and daily objectives for PM₁₀ has been conducted with the procedures outlined in LAQM.TG22.

3.2.3 Particulate Matter (PM_{2.5})

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

PM_{2.5} is monitored at a single AURN site located adjacent to the University of Leicester, and by a network of low cost Zephyr sensors deployed across the city. PM_{2.5} levels are also estimated using PM₁₀ measurements at all other monitoring stations in accordance with the procedure laid out in LAQM.TG22, Box 7-7.

At the University of Leicester AURN monitoring station, the measured annual mean PM_{2.5} concentration was recorded to be 6.9µg/m³, the lowest concentration recorded since the site began monitoring in 2013. There have been no exceedences of the annual mean concentration in the ten year period of this site's monitoring.

By using the estimation of PM_{2.5} from PM₁₀ values as expressed in LAQM.TG22, it can be shown that all estimated concentrations are below the relevant AQO for PM_{2.5}. The results of these estimations are in Table A.9 in Appendix A.

The Zephyr network deployed across the city also measures PM_{2.5} concentrations. Although it is acknowledged that these monitors are not strictly applicable to the assessment of AQOs, they are useful for providing indicative trends and potential hotspot locations.

All of the Zephyr monitoring locations are compliant with the national AQO for PM_{2.5} (20µg/m³), with the highest annual mean concentration of 8.5µg/m³ measured on Blackbird Road, the same site as the highest annual concentration of PM₁₀.

University of Leicester research indicates the main sources of PM_{2.5} impacting Leicester are transboundary in nature, with the vast majority from agricultural emissions which act to form secondary PM_{2.5} through reactions in the atmosphere, before being transported into the city. A second transboundary proportion is sourced from regional and international emissions. Smaller sources of PM_{2.5} can be attributed to the use of woodburning stoves and open fires in Leicester itself, which is thought to have increased in recent years due to the cost of living and energy crises. Transport is considered a minor contributor of total PM_{2.5} emissions in Leicester, primarily from resuspension of particles by vehicle movement and the wear of brake and tyre parts. There are no large industrial processes in Leicester or the surrounding local authority areas.

Appendix A: Monitoring Results

Table A.2 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Inlet Height (m)
AURN LU	AURN Leicester University	Urban Background	459186	302817	NO ₂ , PM ₁₀ , PM _{2.5}	NO	Chemiluminescent, FDMS	N/A	30	4
AURN A594	AURN Leicester A594 Roadside	Roadside	459358	304915	NO ₂ , PM ₁₀	YES, Leicester AQMA	Chemiluminescent, FDMS	33.5	3	2.5
AL (LC1)	Abbey Lane	Roadside	458575	306888	NO ₂ , PM ₁₀	YES, Leicester AQMA	Chemiluminescent, BAM	4.5	7	2
MR (LC3)	Melton Road	Roadside	459528	306316	NO ₂ , PM ₁₀	YES, Leicester AQMA	Chemiluminescent, BAM	0	3	2
SM (LC4)	St Matthews Way	Roadside	459210	305052	NO ₂	YES, Leicester AQMA	Chemiluminescent	10	2	2
VW (LC6)	Vaughan Way	Roadside	458507	304906	NO ₂ , PM ₁₀	YES, Leicester AQMA	Chemiluminescent, BAM	0	4	2
GWE (LE1)	Glenhills Way East	Roadside	457803	300090	NO ₂ , PM ₁₀	YES, Leicester AQMA	Chemiluminescent, BAM	38	3	2

Notes:

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

(2) N/A if not applicable

Table A.3 – 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)

No diffusion tube network in Leicester City in 2023.

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
AURN LU	459186	302817	Urban Background	99.1	99.1	24	19	20.3	18.9	18.1
AURN A594	459358	304915	Roadside	95.8	95.8	38	28	29	29.8	28.7
AL (LC1)	458575	306888	Roadside	98.7	98.4	31.5	24.3	26.6	26	23.1
MR (LC3)	459528	306316	Roadside	97.8	96.5	38.5	28	31.4	33.4	30.4
SM (LC4)	459210	305052	Roadside	97.9	97.7	40.6	31.4	34.9	33.7	29.7
VW (LC6)	458507	304906	Roadside	90.5	98.1	45.7	35.2	36.8	38	36.3
GWE (LE1)	457803	300090	Roadside	99.4	99.5	-	-	-	24.2	21.1
GW (LC2)	457085	300158	Roadside	97	-	48.6	38.8	42.1	37.7	-

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

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

Where exceedances of the NO₂ annual mean objective occur at locations not representative of relevant exposure, the fall-off with distance concentration has been calculated and reported concentration provided in brackets for 2023

Notes:

The annual mean concentrations are presented as µg/m³.

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

All means have been “annualised” as per LAQM.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%).

Table A.5 – Annual Mean NO₂ Monitoring Results: Non-Automatic Monitoring (µg/m³)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023

No diffusion tube data in Leicester City in 2023.

Figure A.1 – Trends in Annual Mean NO₂ Concentrations at Automatic Stations within the AQMA

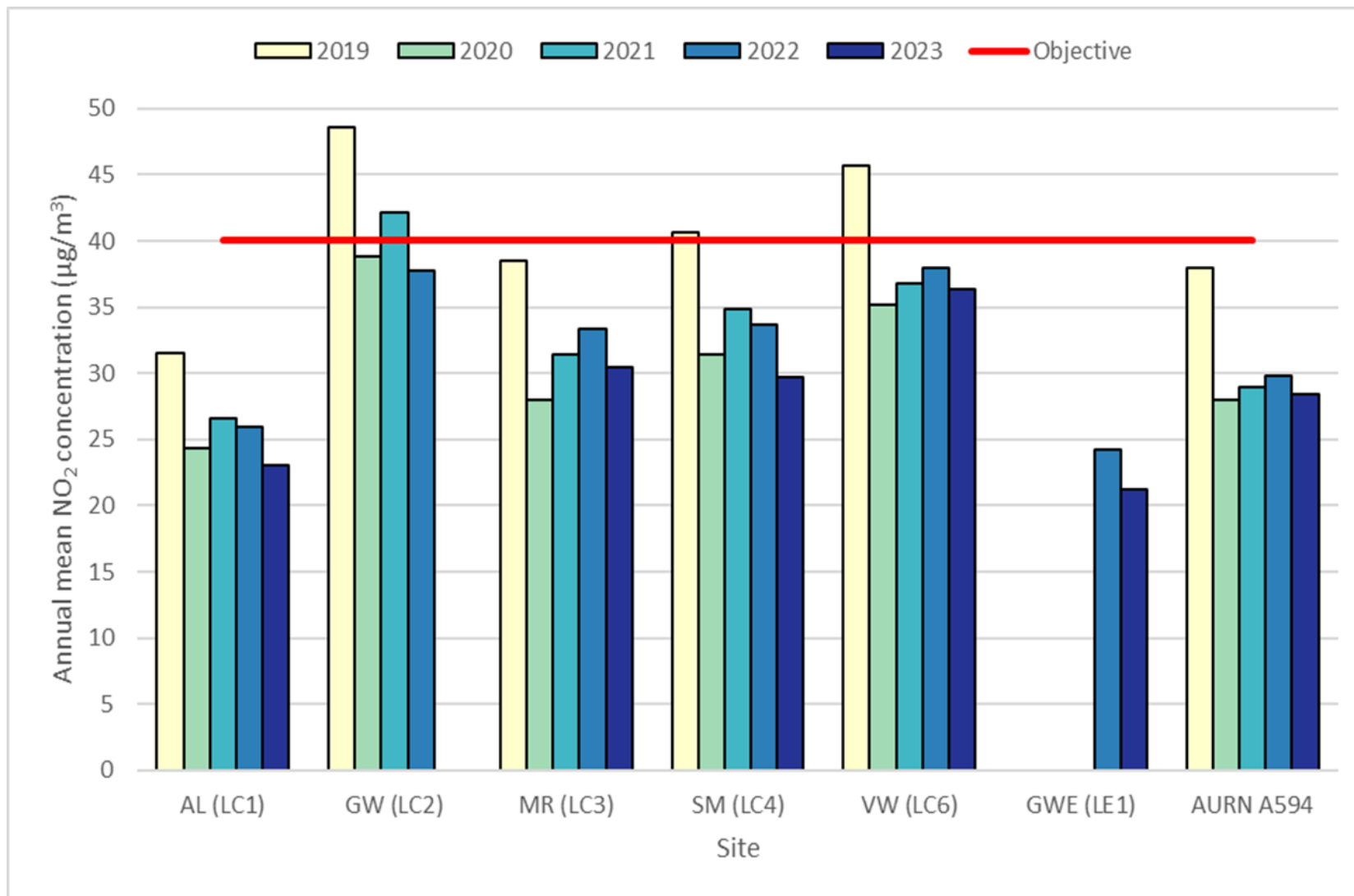


Figure A.2 – Trends in Annual Mean NO₂ Concentrations at Automatic Stations outside the AQMA

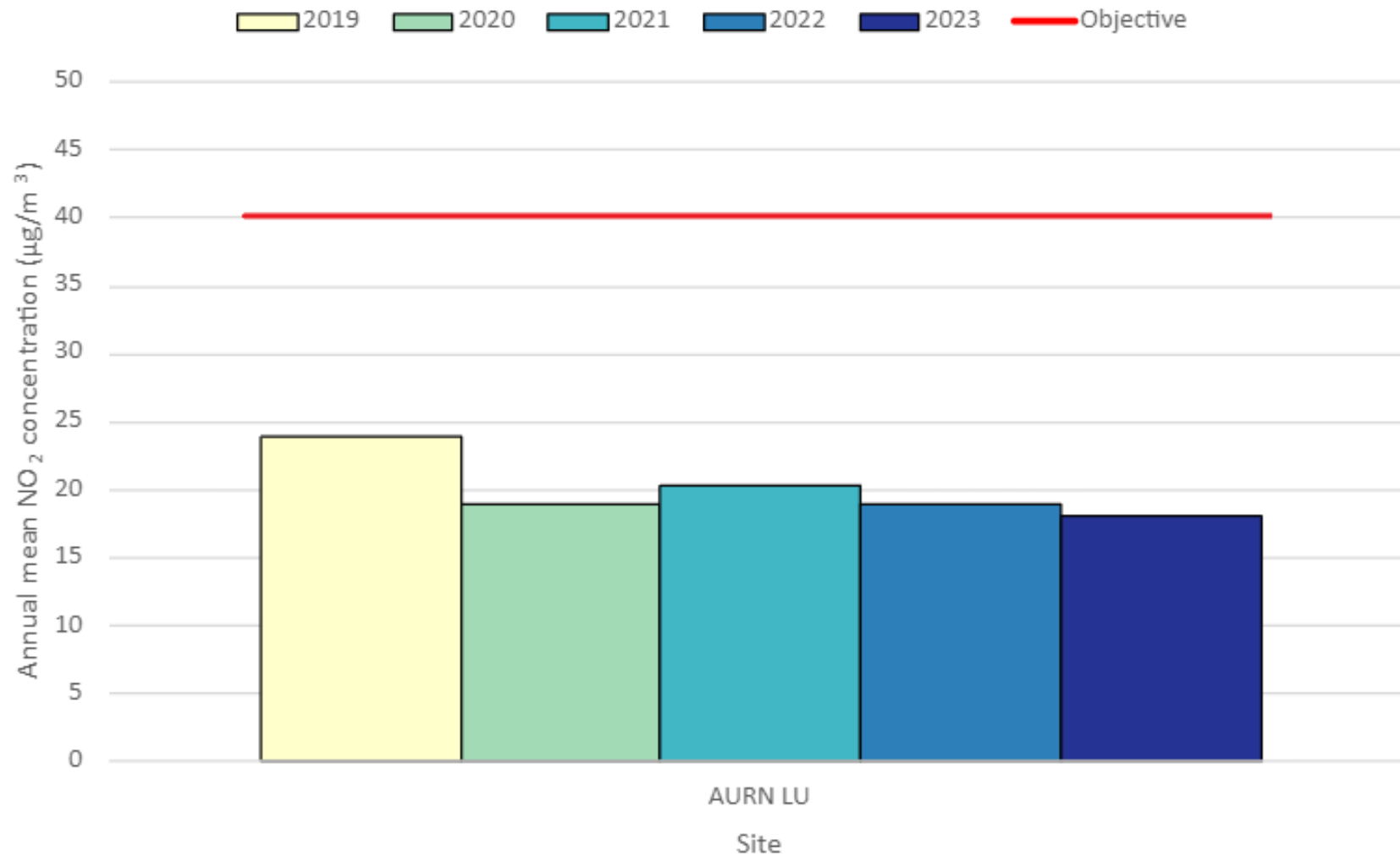


Table A.5 – 1-Hour Mean NO₂ Monitoring Results, Number of 1-Hour Means > 200µg/m³

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
AURN LU	459186	302817	Urban Background	99.1	99.1	0	0	0	0	0
AURN A594	459358	304915	Roadside	95.8	95.8	0	0	0	0	0
AL (LC1)	458575	306888	Roadside	98.7	98.4	0	0	0	0	0
GW (LC2)	457085	300158	Roadside	97	-	0	0	0	0 (127.5)	-
MR (LC3)	459528	306316	Roadside	97.8	96.5	0	0	0	0	0
SM (LC4)	459210	305052	Roadside	97.9	97.7	0	0	0	0	0
VW (LC6)	458507	304906	Roadside	90.5	98.1	0	0	0	0	0
GWE (LE1)	457803	300090	Roadside	99.4	99.5	-	-	-	0 (80.8)	0

Notes:

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

Exceedances of the NO₂ 1-hour mean objective (200µg/m³ not to be exceeded more than 18 times/year) are shown in **bold**.

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

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

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

Table A.6 – Annual Mean PM₁₀ Monitoring Results (µg/m³)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
AURN LU	459186	302817	Urban Background	99.7	99.1	-	13	12.2	12.9	11.2
AURN A594	459358	304915	Roadside	96.7	95.8	23	17	18.1	19	15.4
AL (LC1)	458575	306888	Roadside	94.6	98.4	18	19	18.8	19	17.1
GW (LC2)	457085	300158	Roadside	98.2	-	22	18	17.3	18	-
MR (LC3)	459528	306316	Roadside	97.8	96.5	21	16	13.8	15.5	18.2
VW (LC6)	458507	304906	Roadside	95.4	98.1	20	20	18.9	20.5	18
GWE (LE1)	457803	300090	Roadside	99.3	99.5	-	-	-	16.5	17.7

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

Notes:

The annual mean concentrations are presented as µg/m³.

Exceedances of the PM₁₀ annual mean objective of 40µg/m³ are shown in **bold**.

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.

(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.3 – Trends in Annual Mean PM₁₀ Concentrations

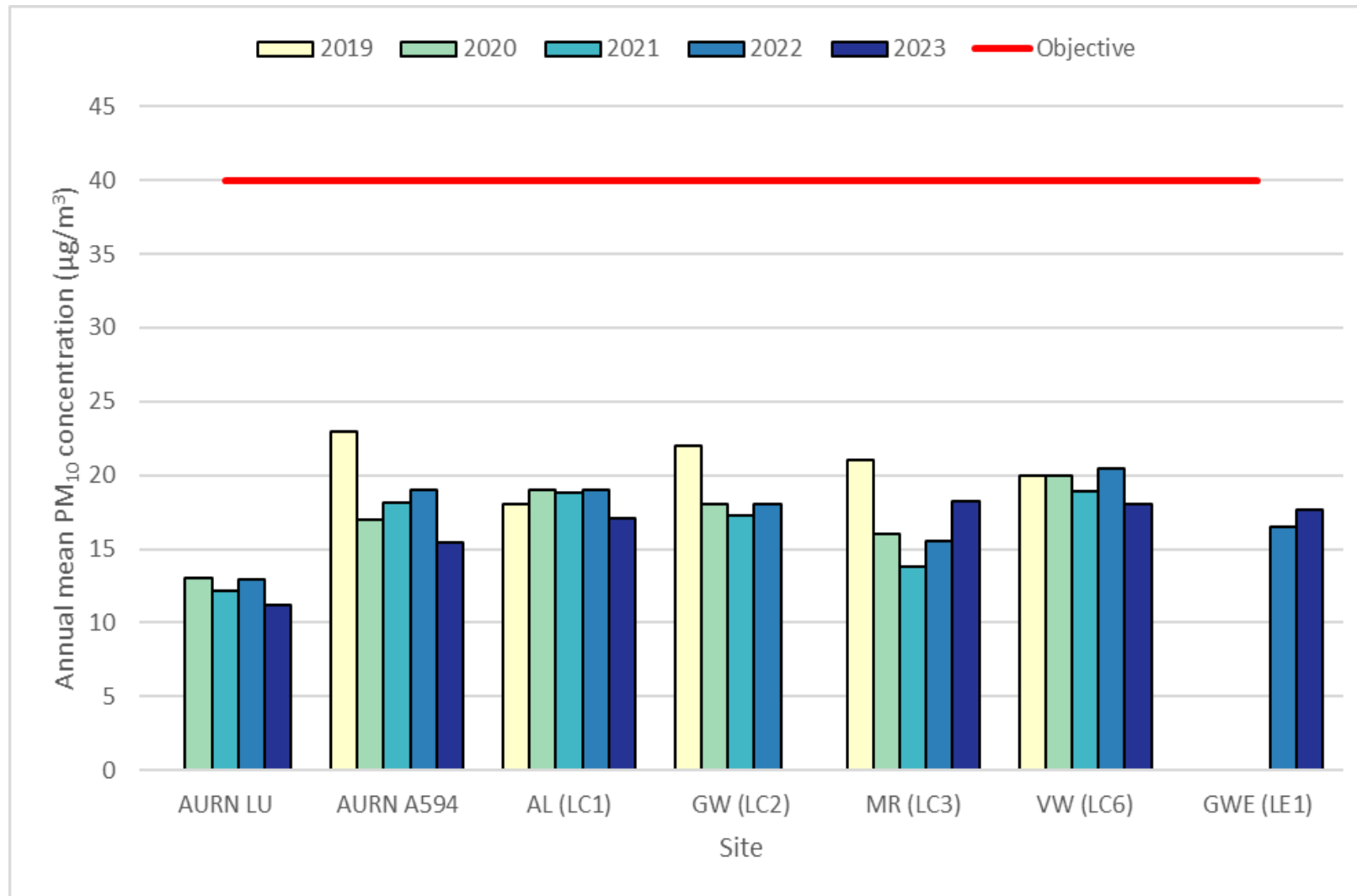


Table A.7 – 24-Hour Mean PM₁₀ Monitoring Results, Number of PM₁₀ 24-Hour Means > 50µg/m³

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
AURN LU	459186	302817	Urban Background	99.7	99.1	-	0	0	2	0
AURN A594	459358	304915	Roadside	96.7	95.8	15	3	5	5	3
AL (LC1)	458575	306888	Roadside	94.6	98.4	5	0	0	5	2
GW (LC2)	457085	300158	Roadside	98.2	-	11	2	1	3	-
MR (LC3)	459528	306316	Roadside	97.8	96.5	10	0	2	1	2
VW (LC6)	458507	304906	Roadside	95.4	98.1	8	2	1	3	3
GWE (LE1)	457803	300090	Roadside	99.3	99.5	-	-	-	-	1

Notes:

Results are presented as the number of 24-hour periods where daily mean concentrations greater than 50µg/m³ have been recorded.

Exceedances of the PM₁₀ 24-hour mean objective (50µg/m³ not to be exceeded more than 35 times/year) are shown in **bold**.

If the period of valid data is less than 85%, the 90.4th percentile of 24-hour means is provided in brackets.

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

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

Figure A.4 – Trends in Number of 24-Hour Mean PM₁₀ Results > 50µg/m³

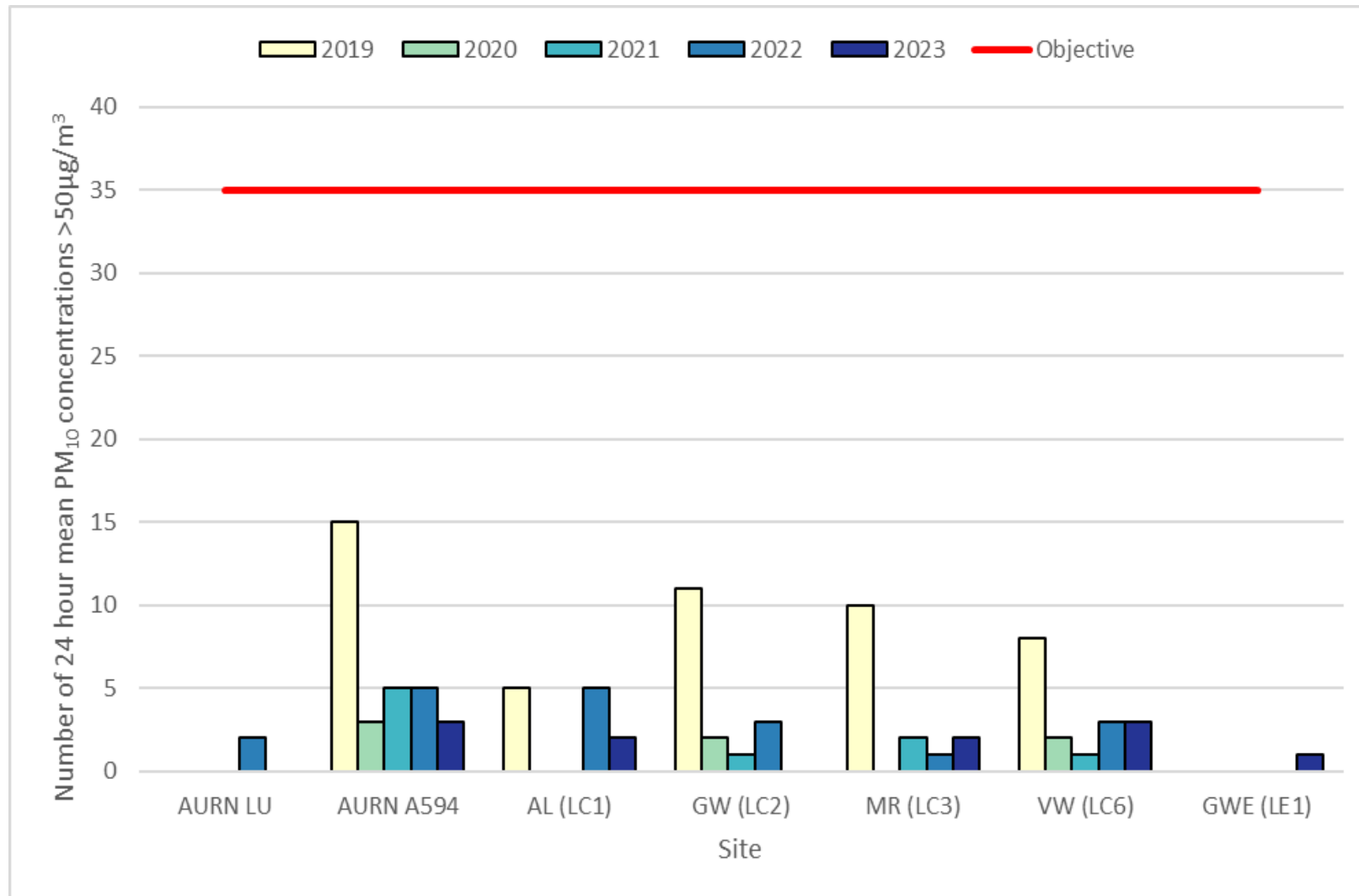


Table A.8 – Annual Mean PM_{2.5} Monitoring Results (µg/m³)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
AURN LU	459186	302817	Urban Background	99.7	99.1	11	8	7.5	7.9	6.9

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

Notes:

The annual mean concentrations are presented as µg/m³.

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.

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

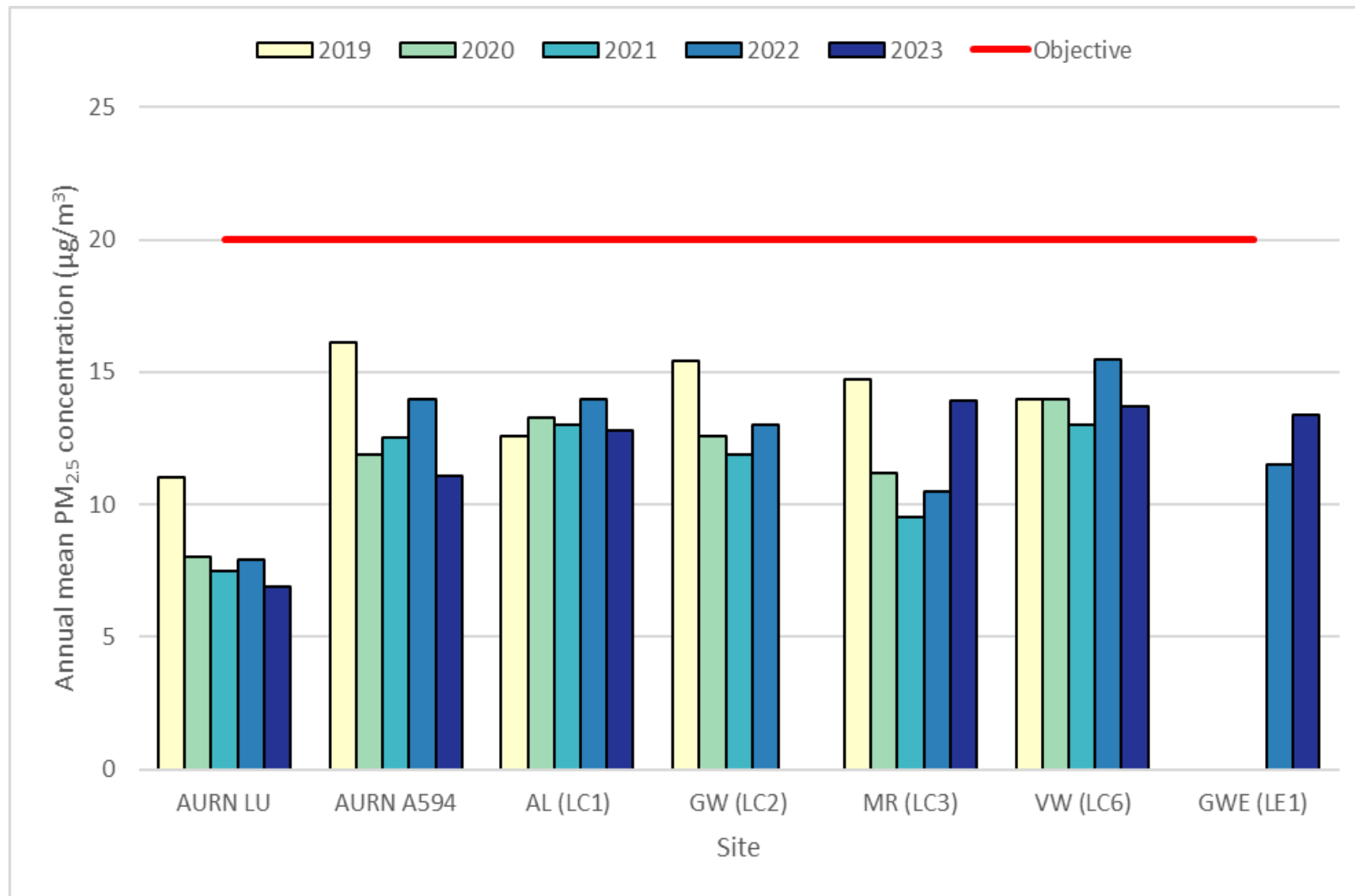
(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Table A.9 – Estimated Annual Mean PM_{2.5} Monitoring Results (µg/m³)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	2019	2020	2021	2022	2023
AURN A594	459358	304915	Roadside	16.1	11.9	12.5	14.0	11.1
AL (LC1)	458575	306888	Roadside	12.6	13.3	13.0	14.0	12.8
GW (LC2)	457085	300158	Roadside	15.4	12.6	11.9	13.0	-
MR (LC3)	459528	306316	Roadside	14.7	11.2	9.5	10.5	13.9
VW (LC6)	458507	304906	Roadside	14.0	14.0	13.0	15.5	13.7
GWE (LE1)	457803	300090	Roadside	-	-	-	11.5	13.4

For the six automatic monitoring sites that monitor PM₁₀, estimated annual mean PM_{2.5} concentrations for 2023 were calculated subtracting the PM_{Coarse} fraction (4.3 µg/m³), derived from AURN University of Leicester, from the PM₁₀ concentrations, in accordance with LAQM.TG22 and LAQM Helpdesk advice. It should be noted that the method of estimating PM_{2.5} concentrations has varied since 2018 and therefore comparisons of the above values should be conducted carefully. Further information can be found in Appendix C.

Figure A.5 – Trends in Annual Mean PM_{2.5} Concentrations



Appendix B: Full Monthly Diffusion Tube Results for 2023

Table B.1 – NO₂ 2023 Diffusion Tube Results (µg/m³)

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 <(x.x)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
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No diffusion tube data in Leicester City in 2023.

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

New or Changed Sources Identified Within Leicester City During 2023

Leicester City Council has not identified any new sources relating to air quality within the last reporting year. A source apportionment study was undertaken and no new sources were revealed as part of the study compared to previous studies.

Additional Air Quality Works Undertaken by Leicester City Council during 2023

Leicester City Council has not completed any additional works within the reporting year of 2023.

Leicester City Council continues to maintain compliance within its one AQMA, marking two full years of compliance. The authority continues to monitor NO₂, PM₁₀ and PM_{2.5} through a range of monitoring techniques including air quality monitoring stations and low- cost Zephyr sensors.

QA/QC of Diffusion Tube Monitoring

There was no diffusion tube data for 2023.

QA/QC of Automatic Monitoring

The data management for the automatic monitoring stations presented in this report was carried out by the Environmental Research Group (ERG) at Imperial College London (ICL). Data presented in this ASR has been ratified in accordance with procedures outlined in LAQM.TG22 and includes:

- Identification and removal of erroneous data, including negative and extreme values
- Analysis of data for drifts
- Application of data scaling, where required
- Consideration for data from other air quality monitoring stations

- Consideration for unusual weather patterns and traffic management incidents (e.g. lane closures)
- Noting of all Local Site Operators (LSO) visits and servicing, including the reports for each station
- Recording of data loss due to equipment malfunction

Historical ratified air pollutant concentrations are available on the [Open Leicester website](#).

LSO duties are conducted by an external organisation on a monthly basis, including calibration of NOX analysers and changing of the Beta Attenuation Monitors (BAM) tapes. After each LSO visit, a written report is provided and stored for data management purposes. A typical NOX calibration procedure can be found below.

Teledyne API NOx Analyser Calibration Procedure

Zero Calibration

- Press the CALZ button to start the Zero calibration.
- Using the <TST TST> buttons, scroll to the NOX STB parameter and wait until the NOX STB value drops below 1.0 PPB.
- Once stabilised, press ZERO followed by ENTER to confirm the new Zero offsets.
- Press EXIT to exit the Zero calibration mode.

Span Calibration

- For a span cylinder connected to the pressurised span port, press CALS, or for a cylinder connected to the sample inlet, press CAL or CALM and open the valve to output 2 Bar on the regulator.
- Using the <TST TST> buttons, scroll to the NOX STB parameter and wait until the NOX STB value drops below 1.0 PPB.
- Once stabilised, press SPAN followed by ENTER to confirm the new Span slopes.
- Press EXIT to exit the Span

PM₁₀ and PM_{2.5} Monitoring Adjustment

Leicester City Council deploy Smart Heated 1020 Beta Attenuation Monitors (BAMs) to monitor PM₁₀ concentrations and a correction factor of 1.035 was applied to the data, in accordance with LAQM.TG22. All PM₁₀ data within ASR 2023 has been corrected in this manner prior to publishing.

PM_{2.5} concentrations were estimated from the PM₁₀ concentrations at the automatic monitoring sites within Leicester. Two options are available for this calculation, either application of the Roadside national PM_{2.5} factor or use of a PMCoarse fraction derived from the AURN University of Leicester site. The current version of the National Factor was used in PM_{2.5} calculations, which is currently 4.7µg/m³ for roadside sites and 5.9µg/m³ for urban sites.

Automatic Monitoring Annualisation

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

NO₂ Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO₂ concentration at the nearest location relevant for exposure has been estimated using the NO₂ fall-off with distance calculator available on the LAQM Support website. Where appropriate, automatic annual mean NO₂ concentrations corrected for distance are presented in Table A.3.

No automatic monitoring locations within Leicester City Council required distance correction during 2023.

QA/QC of Low Cost Zephyr Sensors

Although not an official method of air quality monitoring in accordance with LAQM.TG22, the low cost 'Zephyr' sensors are useful to provide real time pollutant concentrations across the city, with the ease of portability not afforded to fully-fledged continuous (automatic) monitoring stations. Data capture loss for these sensors can be mainly attributed to analyser fault or downtime due to a lack of solar gain. Currently, no procedures exist to ratify raw low cost sensor data, but the following standard techniques were adopted before presentation of the data in this report:

- Removal of extraneous data points, including extremely high, zero, and negative values.
- Removal of data points reported at below the specified limit of detection for the sensors, enabling for calculation of more accurate (but greater overall) annual mean concentrations.

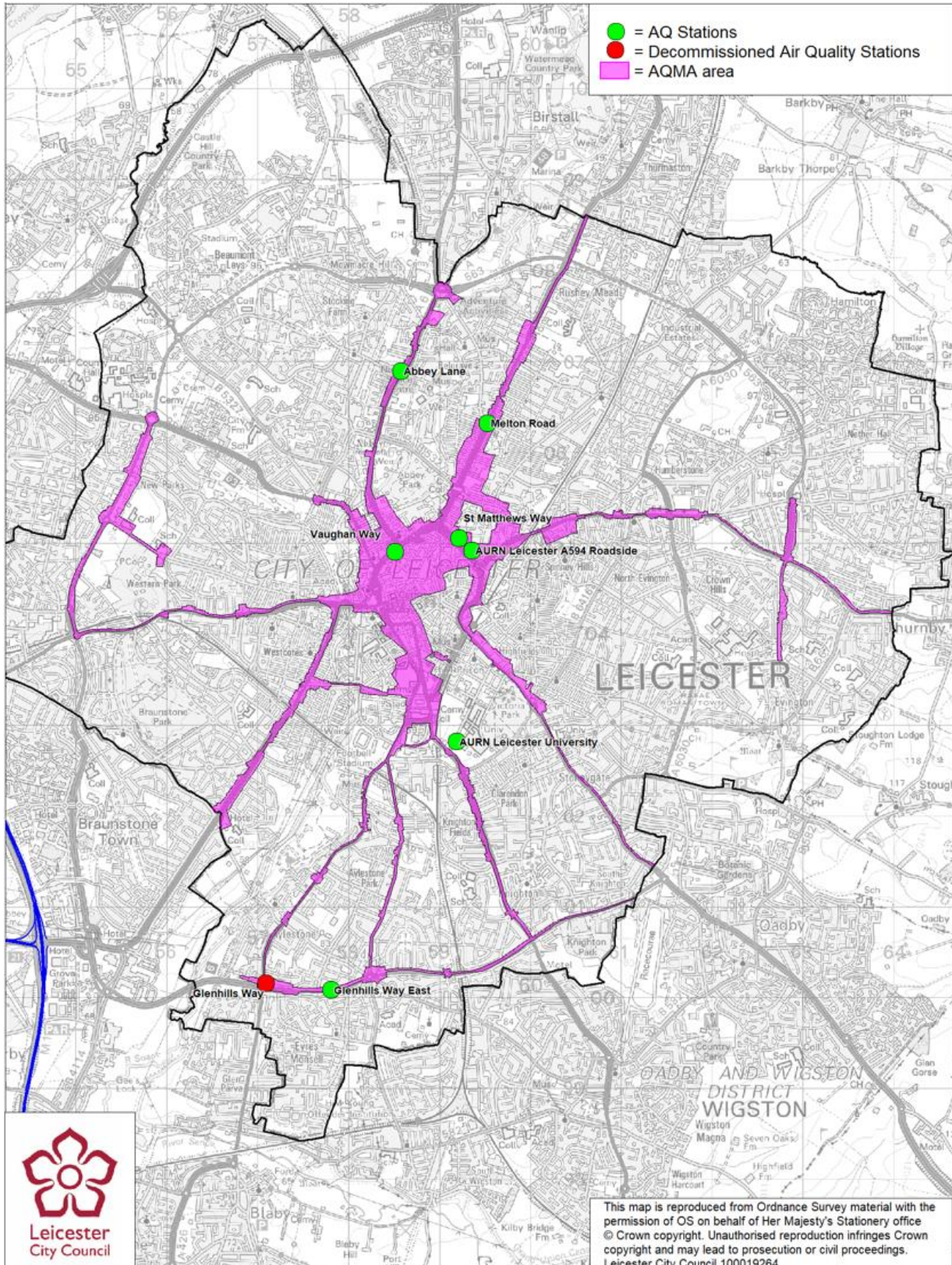
- Removal of any duplicate measurements for a given hourly period, ensuring data capture figures are as accurate as possible.
- Annualisation and distance correction calculations were not conducted on any of the low cost sensor datasets due to an absence of reference data and appropriate procedures.

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

The following maps are presented in Figures 1 to 2, displaying the monitoring locations for 2023, each with reference to the AQMA and Leicester City Council boundary:

- Air Quality Monitoring Stations
- Low cost 'Zephyr' sensor network

Figure D.1 – Map of Air Quality Monitoring Stations



I:TS/LTP3/Air quality task group/Maps/AQ AnnualStatusReport v12

Figure D.1: Map of 2023 air quality monitoring station locations in Leicester, shown in green. Decommissioned stations shown in red. Those labelled with the ‘AURN’ prefix form part of the national network and are not managed by Leicester City Council. The AQMA is shown in purple, and the local authority boundary in black. © Crown copyright – Leicester City Council 10019264.

Figure D.2 – Map of Low Cost ‘Zephyr’ Sensor Network

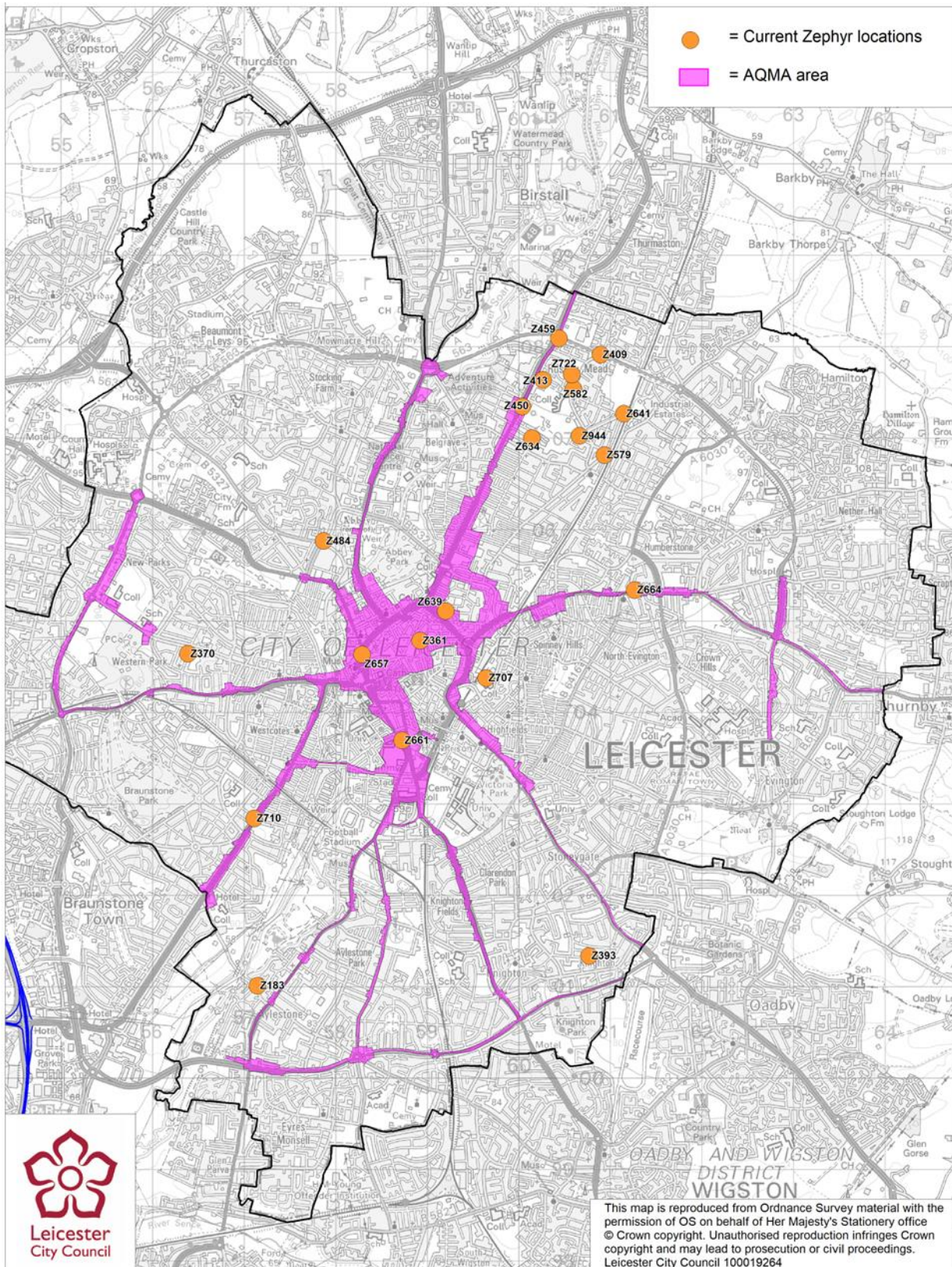


Figure D.2: Map of 2023 low cost ‘Zephyr’ sensor locations in Leicester, shown in orange. The AQMA is shown in purple, and the local authority boundary in black. © Crown copyright – Leicester City Council 10019264.

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England⁷

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

⁷ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Appendix F: Summary of Low Cost Sensor ‘Zephyr’ Monitoring

As mentioned throughout ASR 2024, Leicester City Council undertake NO₂, PM₁₀, and PM_{2.5} monitoring using the low cost ‘Zephyr’ sensors, both within and outside of the AQMA. The authority began using these sensors in 2020 and the network has now grown to over 20 units. Table F.1 below illustrates the details of the Zephyr monitoring sites, with Table F.2 to Table F.6 presenting the concentrations for NO₂, PM₁₀, and PM_{2.5} with respect to their relevant national air quality objectives. Figure F.1 to Figure F.5 also present the trends graphically. It should be noted that data is ratified but not subject to annualisation. Further information can be found in Appendix C.

Table F.1 – Details of Zephyr Monitoring Sites

Site 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)	Distance to kerb of nearest road (m)	Inlet Height (m)
Z183	Middleton Street	Roadside	457145	301012	NO ₂ , PM ₁₀ , PM _{2.5}	NO	0	1	2.5
Z361	Charles Street	Roadside	458922	304785	NO ₂ , PM ₁₀ , PM _{2.5}	YES, Leicester AQMA	0	1	2.5
Z370	Westfield Road	Roadside	456386	304642	NO ₂ , PM ₁₀ , PM _{2.5}	NO	0	1	2.5
Z393	Knighton Church Road	Roadside	460766	301337	NO ₂ , PM ₁₀ , PM _{2.5}	NO	0	1	2.5
Z409	Troon Way	Roadside	460890	307916	NO ₂ , PM ₁₀ , PM _{2.5}	NO	0	1	2.5
Z413	Rushey Close	Roadside	460262	307639	NO ₂ , PM ₁₀ , PM _{2.5}	NO	0	1	2.5
Z450	Rushey Mead	Roadside	460037	307346	NO ₂ , PM ₁₀ , PM _{2.5}	YES, Leicester AQMA	0	1	2.5

Z459	Melton Road	Roadside	460437	308091	NO ₂ , PM ₁₀ , PM _{2.5}	YES, Leicester AQMA	0	1	2.5
Z484	Blackbird Road	Roadside	457868	305875	NO ₂	NO	0	1	2.5
Z579	Barkby Road	Roadside	460933	306816	NO ₂ , PM ₁₀ , PM _{2.5}	NO	0	1	2.5
Z582	Gleneagles Avenue	Roadside	460595	307540	NO ₂ , PM ₁₀ , PM _{2.5}	NO	0	1	2.5
Z634	Harrison Road	Roadside	460142	307001	NO ₂ , PM ₁₀ , PM _{2.5}	NO	0	1	2.5
Z639	Wharf Street North	Roadside	459199	305108	NO ₂ , PM ₁₀ , PM _{2.5}	YES, Leicester AQMA	0	1	2.5
Z641	Roseneath Avenue	Roadside	461146	307268	NO ₂ , PM ₁₀ , PM _{2.5}	NO	0	1	2.5
Z657	Vaughan Way	Roadside	458288	304633	NO ₂ , PM ₁₀ , PM _{2.5}	YES, Leicester AQMA	0	1	2.5
Z661	Infirmery Road	Roadside	458725	303694	NO ₂ , PM ₁₀ , PM _{2.5}	YES, Leicester AQMA	0	1	2.5
Z664	Uppingham Road	Roadside	461264	305340	NO ₂ , PM ₁₀ , PM _{2.5}	YES, Leicester AQMA	0	1	2.5
Z707	Hutchinson Walk	Roadside	459642	304376	NO ₂ , PM ₁₀ , PM _{2.5}	NO	0	1	2.5
Z710	Narborough Road	Roadside	457110	302842	NO ₂ , PM ₁₀ , PM _{2.5}	YES, Leicester AQMA	0	1	2.5
Z722	Lockerbie Avenue	Roadside	460578	307698	NO ₂ , PM ₁₀ , PM _{2.5}	NO	0	1	2.5
Z944	Wyvern Avenue	Roadside	460660	307025	NO ₂ , PM ₁₀ , PM _{2.5}	NO	0	1	2.5

Table F.2 – Annual Mean NO₂ Monitoring Results (µg/m³): Zephyrs

Site 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⁾	2019	2020	2021	2022	2023
Z183	457145	301012	Roadside	86.8	56.7	-	21.5	17.8	21.1	16.4
Z361	458922	304785	Roadside	76.5	91.3	-	43.6	53.7	47.8	37.1
Z370	456386	304642	Roadside	62.2	68.7	-	6.2	11.3	12.4	9.4
Z393	460766	301337	Roadside	52.5	79.8	-	18.0	16.4	18.3	15.1
Z409	460890	307916	Roadside	66.3	91.5	-	-	29.4	40.4	18.5
Z413	460262	307639	Roadside	97.7	99.9	-	-	18.7	17.8	16.5
Z450	460037	307346	Roadside	95.5	97.0	-	-	23.7	19.7	19.5
Z459	460437	308091	Roadside	80	92.6	-	-	37.3	31.6	22.9
Z484	457868	305875	Roadside	100	100	-	-	35.7	33.7	22.8
Z579	460933	306816	Roadside	98.1	89.4	-	-	33.8	29.5	19.7
Z582	460595	307540	Roadside	98.4	95.3	-	-	19.7	20.5	18.3
Z634	460142	307001	Roadside	96.9	99.9	-	-	21.5	18.2	16.5
Z639	459199	305108	Roadside	96.7	93.4	-	-	22.2	25.9	24.9
Z641	461146	307268	Roadside	90.8	99.2	-	-	14.3	16.6	14
Z657	458288	304633	Roadside	98	89.2	-	-	33.8	34.1	29.9
Z661	458725	303694	Roadside	99.8	99.7	-	-	32.8	35.6	31.5
Z664	461264	305340	Roadside	99.6	100	-	-	23.4	24.1	21.7
Z707	459642	304376	Roadside	94.7	97.4	-	-	22.6	24.2	23.2
Z710	457110	302842	Roadside	93.4	85.1	-	-	21.4	20.5	17.9
Z722	460578	307698	Roadside	90	91.2	-	-	15.1	16.7	13.9
Z944	460660	307025	Roadside	75.1	84.2	-	-	41.9	31.7	16.5

Figure F.1 – Trends in Annual Mean NO₂ Concentrations at Zephyrs within the AQMA

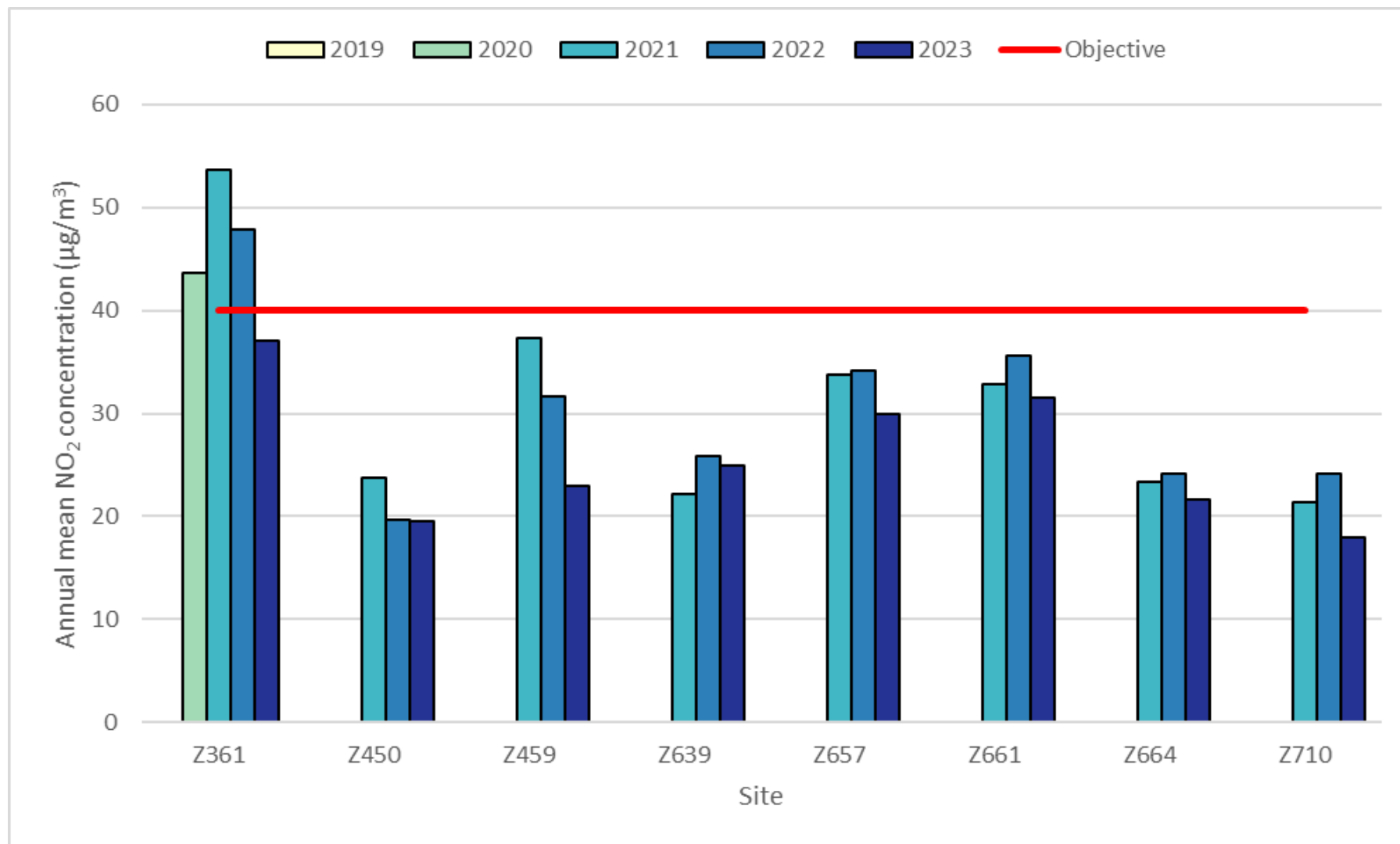


Figure F.2 – Trends in Annual Mean NO₂ Concentrations at Zephyrs outside the AQMA

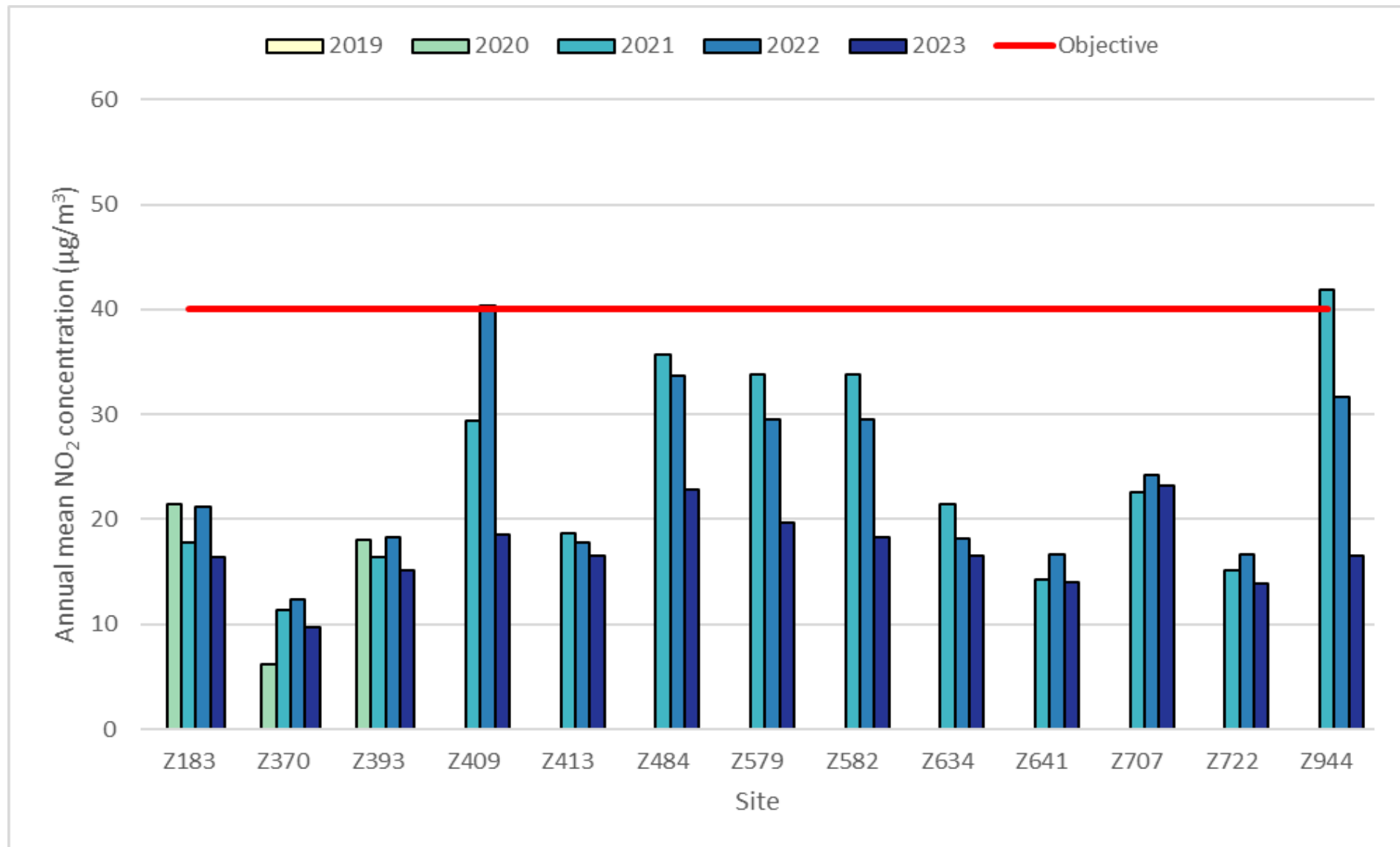


Table F.3 – 1-Hour Mean NO₂ Monitoring Results, Number of 1-Hour Means > 200µg/m³: Zephyrs

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2019	2020	2021	2022	2023
Z183	457145	301012	Roadside	86.8	56.7	-	1	0	0	0
Z361	458922	304785	Roadside	76.5	91.3	-	1	3	0 (156.0)	0
Z370	456386	304642	Roadside	62.2	68.7	-	0	9	0 (65.1)	0
Z393	460766	301337	Roadside	52.5	79.8	-	1	0	0 (66.3)	0
Z409	460890	307916	Roadside	66.3	91.5	-	-	1 (163.9)	0 (126.8)	0
Z413	460262	307639	Roadside	97.7	99.9	-	-	0 (60.0)	0	0
Z450	460037	307346	Roadside	95.5	97.0	-	-	7 (166.5)	0	18*
Z459	460437	308091	Roadside	80	92.6	-	-	22	0 (107.0)	0
Z484	457868	305875	Roadside	100	100	-	-	0	0	0
Z579	460933	306816	Roadside	98.1	89.4	-	-	0 (115.8)	0	0
Z582	460595	307540	Roadside	98.4	95.3	-	-	0	0	0
Z634	460142	307001	Roadside	96.9	99.9	-	-	0	0	0
Z639	459199	305108	Roadside	96.7	93.4	-	-	18 (215.4)	0	0
Z641	461146	307268	Roadside	90.8	99.2	-	-	0 (57.3)	0	0
Z657	458288	304633	Roadside	98	89.2	-	-	0 (107.7)	0	0
Z661	458725	303694	Roadside	99.8	99.7	-	-	2	0	0
Z664	461264	305340	Roadside	99.6	100	-	-	0 (71.8)	0	0
Z707	459642	304376	Roadside	94.7	97.4	-	-	0	0	0
Z710	457110	302842	Roadside	93.4	85.1	-	-	6	0	0
Z722	460578	307698	Roadside	90	91.2	-	-	0	0	0
Z944	460660	307025	Roadside	75.1	84.2	-	-	-	0 (84.9)	0

*It should be noted that the exceedances at Z450 do not align with the rest of the monitoring from that unit. All 18 exceedances occurred in the last two weeks of the year, during a period where the zephyr did not report any measurements except for sporadic and uncharacteristically high values.

Figure F.3 – Trends in Number of 1-Hour Mean NO₂ Concentrations >200µg/m³ at Zephyrs

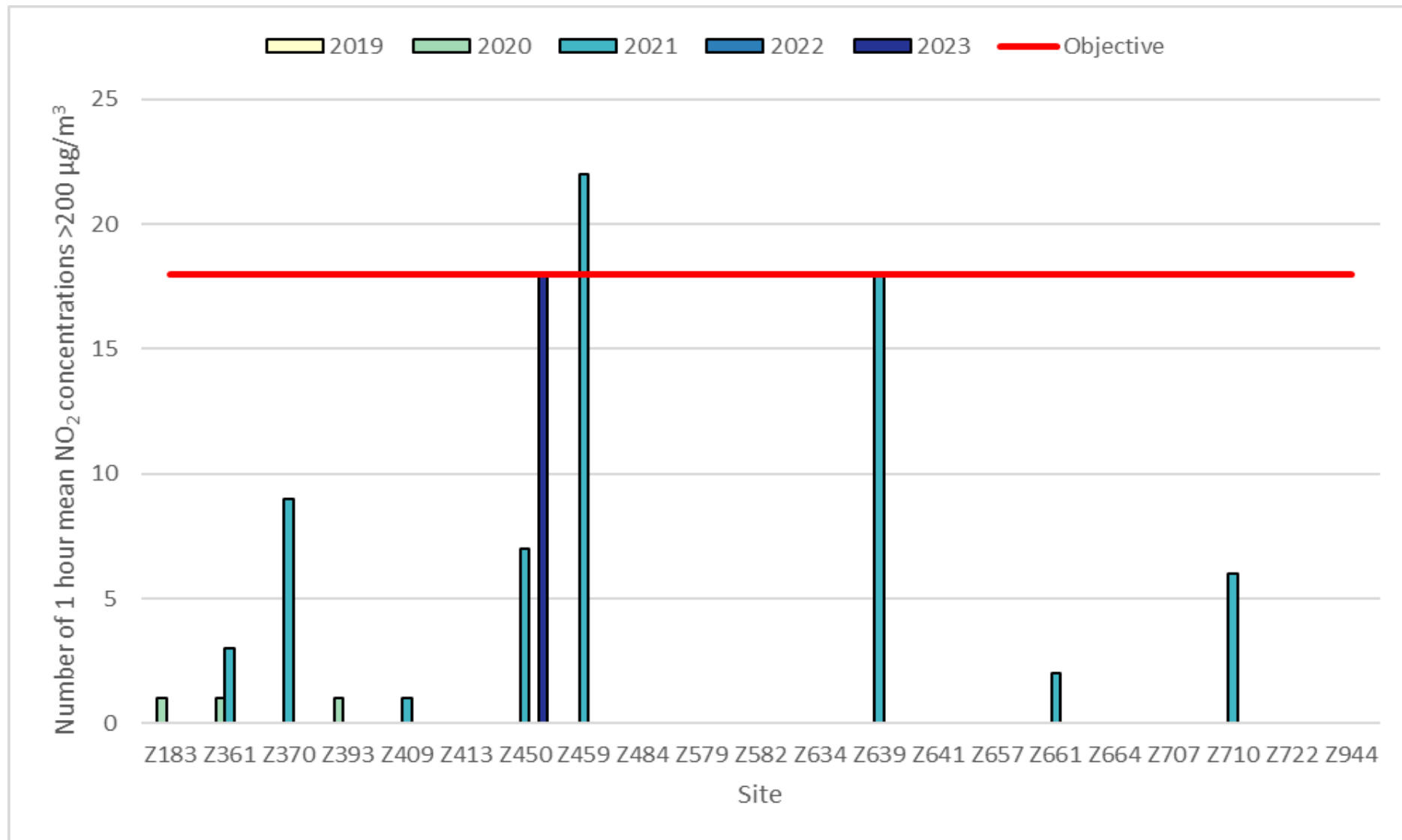


Table F.4 – Annual Mean PM₁₀ Monitoring Results (µg/m³): Zephyrs

Site 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⁾	2019	2020	2021	2022	2023
Z183	457145	301012	Roadside	100	58.5	-	12.2	13.2	13.0	10
Z361	458922	304785	Roadside	77.8	92.1	-	11.2	12.0	12.1	9
Z370	456386	304642	Roadside	98.8	100	-	13.2	13.4	12.4	9.1
Z393	460766	301337	Roadside	51.8	79.8	-	13.8	12.0	14.7	10.3
Z409	460890	307916	Roadside	66.5	92.1	-	-	14.8	12.3	9.6
Z413	460262	307639	Roadside	100	100	-	-	11.7	11.9	11.7
Z450	460037	307346	Roadside	100	97.7	-	-	13.1	12.9	12.1
Z459	460437	308091	Roadside	82.7	92.6	-	-	12.8	10.9	10.2
Z579	460933	306816	Roadside	100	89.4	-	-	11.5	11.4	10.9
Z582	460595	307540	Roadside	100	95.3	-	-	12.0	13.3	12
Z634	460142	307001	Roadside	100	100	-	-	12.5	12.6	12.2
Z639	459199	305108	Roadside	98.7	95.4	-	-	14.6	14.0	13.9
Z641	461146	307268	Roadside	100	100	-	-	11.3	10.7	9.9
Z657	458288	304633	Roadside	98.3	89.2	-	-	17.8	13.3	12.3
Z661	458725	303694	Roadside	100	99.7	-	-	16.6	13.1	11.5
Z664	461264	305340	Roadside	100	100	-	-	17.2	13.2	12.4
Z707	459642	304376	Roadside	95.8	97.5	-	-	13.4	12.3	11.1
Z710	457110	302842	Roadside	93.6	76.1	-	-	12.4	10.6	10.7
Z722	460578	307698	Roadside	97.1	92.5	-	-	11.5	11.5	10.2
Z944	460660	307025	Roadside	76.2	85.9	-	-	-	11.6	9.7

Figure F.4 – Trends in Annual Mean PM₁₀ Concentrations at Zephyrs

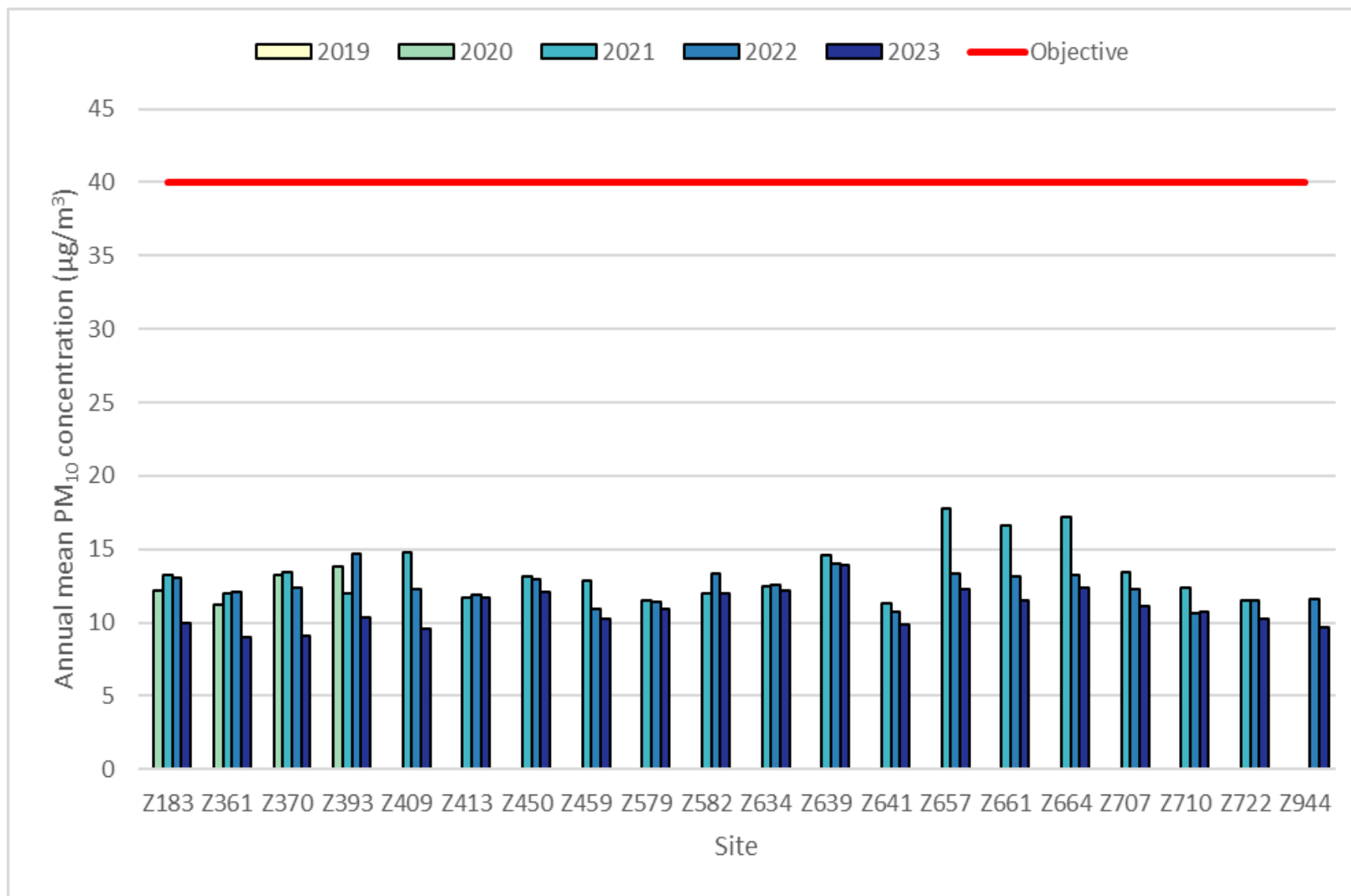


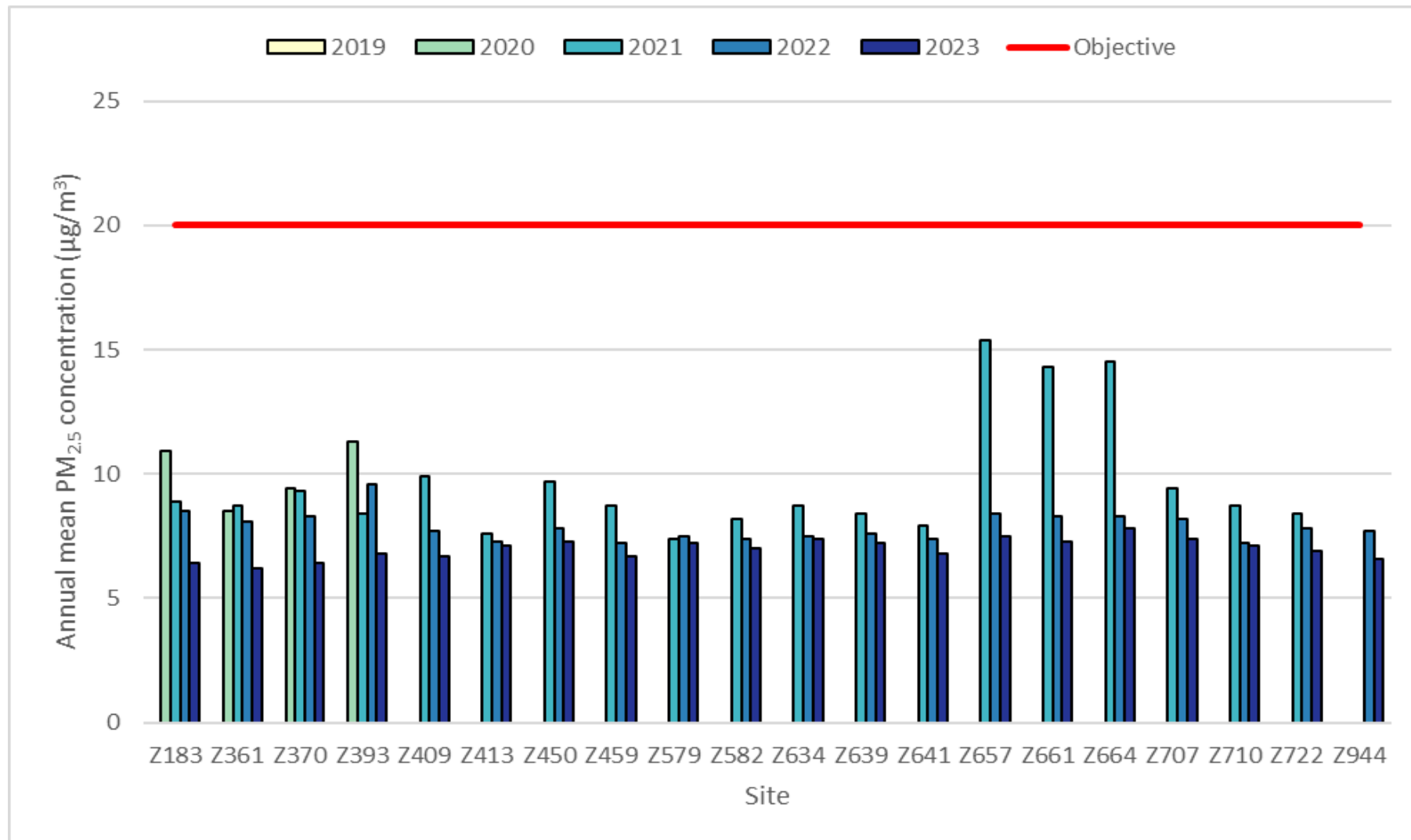
Table F.5 – 24-Hour Mean PM₁₀ Monitoring Results, Number of PM₁₀ 24-Hour Means > 50µg/m³: Zephyrs

Site 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⁾	2019	2020	2021	2022	2023
Z183	457145	301012	Roadside	100	58.5	-	1	0	0	0
Z361	458922	304785	Roadside	77.8	92.1	-	-	0	0 (25.6)	0
Z370	456386	304642	Roadside	98.8	100	-	0	0	0	0
Z393	460766	301337	Roadside	51.8	79.8	-	0	0	0	0
Z409	460890	307916	Roadside	66.5	92.1	-	-	0 (46.1)	1 (24.5)	0
Z413	460262	307639	Roadside	100	100	-	-	0 (42.1)	0	0
Z450	460037	307346	Roadside	100	97.7	-	-	0 (47.5)	0	0
Z459	460437	308091	Roadside	82.7	92.6	-	-	0	0 (21.6)	0
Z579	460933	306816	Roadside	100	89.4	-	-	0 (36.5)	0	0
Z582	460595	307540	Roadside	100	95.3	-	-	0	0	0
Z634	460142	307001	Roadside	100	100	-	-	0	0	0
Z639	459199	305108	Roadside	98.7	95.4	-	-	0 (48.5)	0	0
Z641	461146	307268	Roadside	100	100	-	-	0 (38.1)	0	0
Z657	458288	304633	Roadside	98.3	89.2	-	-	0 (48.4)	1	0
Z661	458725	303694	Roadside	100	99.7	-	-	0	0	0
Z664	461264	305340	Roadside	100	100	-	-	0 (44.8)	0	0
Z707	459642	304376	Roadside	95.8	97.5	-	-	0	0	0
Z710	457110	302842	Roadside	93.6	76.1	-	-	0	0	0
Z722	460578	307698	Roadside	97.1	92.5	-	-	0	0	0
Z944	460660	307025	Roadside	76.2	85.9	-	-	-	0	0

Table F.6 – Annual Mean PM_{2.5} Monitoring Results (µg/m³): Zephyrs

Site 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⁾	2019	2020	2021	2022	2023
Z183	457145	301012	Roadside	98.2	58.5	-	10.9	8.9	8.5	6.4
Z361	458922	304785	Roadside	76.2	92.1	-	8.5	8.7	8.1	6.2
Z370	456386	304642	Roadside	96.9	100	-	9.4	9.3	8.3	6.4
Z393	460766	301337	Roadside	50.4	79.8	-	11.3	8.4	9.6	6.8
Z409	460890	307916	Roadside	65.9	92.1	-	-	9.9	7.7	6.7
Z413	460262	307639	Roadside	98	100	-	-	7.6	7.3	7.1
Z450	460037	307346	Roadside	98	97.7	-	-	9.7	7.8	7.3
Z459	460437	308091	Roadside	81	92.6	-	-	8.7	7.2	6.7
Z579	460933	306816	Roadside	96.8	89.4	-	-	7.4	7.5	7.2
Z582	460595	307540	Roadside	98.2	95.3	-	-	8.2	7.4	7
Z634	460142	307001	Roadside	97.2	100	-	-	8.7	7.5	7.4
Z639	459199	305108	Roadside	94	95.4	-	-	8.4	7.6	7.2
Z641	461146	307268	Roadside	97.5	100	-	-	7.9	7.4	6.8
Z657	458288	304633	Roadside	93.1	89.2	-	-	15.4	8.4	7.5
Z661	458725	303694	Roadside	99	99.7	-	-	14.3	8.3	7.3
Z664	461264	305340	Roadside	98.9	100	-	-	14.5	8.3	7.8
Z707	459642	304376	Roadside	94.3	97.5	-	-	9.4	8.2	7.4
Z710	457110	302842	Roadside	92	76.1	-	-	8.7	7.2	7.1
Z722	460578	307698	Roadside	95.6	92.5	-	-	8.4	7.8	6.9
Z944	460660	307025	Roadside	75.1	85.9	-	-	-	7.7	6.6

Figure F.5 – Trends in Annual Mean PM_{2.5} Concentrations at Zephyrs



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

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- 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.