

**Exeter**  
City Council

## **2022 Air Quality Annual Status Report (ASR)**

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

Date: June, 2022

<b>Information</b>	<b>Exeter City Council Details</b>
<b>Local Authority Officer</b>	Alex Bulleid and Jonathan Knight
<b>Department</b>	Environmental Health & Community Safety
<b>Address</b>	Civic Centre, Paris Street, Exeter, EX1 1 RQ
<b>Telephone</b>	01392 265147
<b>E-mail</b>	Environmental.Health@exeter.gov.uk
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## Executive Summary: Air Quality in Our Area

### Air Quality in Exeter

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

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

Public Health England's Public Health Outcomes Framework tool shows that in Exeter in 2020 the fraction of mortality attributable to particulate air pollution was 5.2%. This is equal to the regional figure for the south west (5.2%) and below the national level of 5.6%.

Exeter therefore has levels of particulate matter which are causing harm, but this problem is less severe than in over half the country. The data is available at [this link](#).

Exeter City Council has a monitoring network that is designed to identify the areas with the highest levels of nitrogen dioxide, at the locations where the objectives apply. Most of the monitoring sites are therefore on residential properties in close proximity to the busiest roads and junctions in the city. The results of the monitoring conducted by the City Council is not generally representative of typical or average conditions across the city. Instead it is indicative of the worst case locations.

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

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

<sup>3</sup> Defra. Air quality appraisal: damage cost guidance, July 2021

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

Prior to 2020 the annual average objective was regularly exceeded at a number of places in the city. These were at Alphington Street and along the Heavitree corridor into the city. The highest levels measured have typically been on the Heavitree corridor, at East Wonford Hill. Here levels historically were close to or above the level which indicates an exceedance of the hourly objective.

The measured results for 2021 can be found in Table A.3 of this report. Trends in annual nitrogen dioxide concentrations can also be seen in Figure A.1. These show that in 2021 levels of nitrogen dioxide were below the objective at every site except East Wonford Hill. The significant fall seen in 2020 as a result of a reduction in traffic flows during COVID-19 has rebounded in 2021 but not back to pre-pandemic levels. This is likely to be caused by a combination of traffic flows still being slightly below those seen before Covid but also the ongoing improvement in vehicle emissions technologies.

Some sites have levels between 35 and 40  $\mu\text{g}/\text{m}^3$  (i.e. close to but not above the objective level of 40). In 2021 this was the case at Alphington Street, Salutory Mount and Honiton Road, with all other sites having levels below 35. Most locations along the busy routes into and around the city had concentrations of nitrogen dioxide in the range between 25 and 35  $\mu\text{g}/\text{m}^3$  during last year.

As you move away from busy roads, levels fall below 25  $\mu\text{g}/\text{m}^3$ . In 2021, levels in these areas were typically between 10 and 15  $\mu\text{g}/\text{m}^3$  for purely suburban streets and between 15 and 20  $\mu\text{g}/\text{m}^3$  for local through routes. The majority of the population of Exeter therefore live in locations with concentrations of nitrogen dioxide well below the objective, but a small number are still exposed at home to levels above the objective. No schools in Exeter experience levels above the objective.

The data shows that no locations measured an exceedance of the proxy for the hourly nitrogen dioxide objective in 2021 (an annual average of 60 $\mu\text{g}/\text{m}^3$ ).

2020 was exceptional, in terms of the change in traffic flows, so the Council had no plans to amend the AQMA as a result of the changes to NO<sub>2</sub> concentrations seen in that year. The last Annual Status Report (published in 2021) recommended that longer term trends were monitored to confirm which exceedances have indeed been permanently resolved. There will also always be natural variation between years as a result of local small changes in traffic flows (road works etc) and weather patterns which makes identifying any trend difficult over short periods of time even where other factors are stable.

Given that traffic flows did not fully return in 2021 to pre-pandemic levels (Table 15.1) it is again recommended that the AQMA order and boundary remain unchanged for now. It seems highly likely that previous exceedences at locations such as the Blackboy Road / Pinhoe Road junction (DT42 and DT43) have been permanently resolved given that they had fallen below  $40 \mu\text{g}/\text{m}^3$  in 2018 and there have therefore been below the objective for 4 years. However the Council does not intend to review the AQMA order or AQMA boundary until 2024 when the current AQAP terminates. Before this date action to improve air quality will continue to be focussed on those areas within the AQMA where exceedences have been measured recently (East Wonford Hill). A complete review will commence in 2024 together with the necessary reports and consultation for an amended AQMA (if required) and subsequently a new AQAP.

The Annual Status Report also summarises the results of particulate pollution measurements ( $\text{PM}_{10}$  and  $\text{PM}_{2.5}$ ). No areas in the city are thought to exceed the objectives for this type of air pollution. Measured  $\text{PM}_{2.5}$  concentrations were well below the relevant objective level and  $\text{PM}_{10}$  concentrations have shown a steady decline since 2006.

The current AQAP covers the period 2019-2024. It was published following a significant consultation and engagement process which reached nearly 3000 people. The plan is available online at [this link](#). Exeter City Council will work with Devon County Council Highways team, neighbouring authorities, Exeter City Futures and Sport England to deliver the measures in this plan.

## Actions to Improve Air Quality

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

The 2019 Clean Air Strategy<sup>5</sup> sets out the case for action, with goals to reduce exposure to harmful pollutants. The Road to Zero<sup>6</sup> sets out the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely

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

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

important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

Exeter City Council has taken forward a number of direct measures during the current reporting year of 2021 in pursuit of improving local air quality. Further details are provided later in the report but key completed measures include:

1. Implementation of the Physical Activity Strategy. The strategy focusses on getting the least active members of the community moving more (including active travel) with a key focus being to normalise and increase active travel in everyday life.
2. An options appraisal has been prepared to consult in 2022 with the Newtown community on public realm improvements, parklets and highway interventions which will enable and encourage more people to use active travel modes within the local area.
3. The Sport England Local Delivery Pilot team has developed and tested the governance and application structure for communities to be able to implement localised, regular closures of roads within their neighbourhoods. For specific periods this will provide sections of roads where the priority will be given to activity (play) rather than travel.
4. Work has continued at Water Lane, where the Council is building a large solar array with battery storage which will power a fleet of electric refuse collection vehicles (to be delivered in 2022).
5. Scrutiny of planning applications for air quality impacts, including making objections to developments on air quality grounds where this is justified and the negotiation of mitigation in accordance with Council and national planning policy.
6. From 1<sup>st</sup> Jan 2020 adopted policy required the Hackney carriage fleet to be 50% Euro 6 wheelchair accessible vehicles and 50% ULEV saloon cars with a stated emission level of 75g km CO<sub>2</sub> or below. This policy continues to be implemented.
7. A reduction in NO<sub>x</sub> emissions from buildings as a result of a variety of measures intended primarily to address fuel poverty and carbon emissions.
8. The new bus station was opened, which provides improved facilities for public transport users in the city.
9. The City Council is partners with Devon County Council and Co Delivery in a scheme which secured £80,000 of grant funding from the Department for Transport

Energy Saving Trust to expand the capabilities of e-cargo bikes for business travel. Nine electric cargo bikes have been secured for use within the partner organisations, Devon County Council, Exeter City Council, University of Exeter and Royal Devon & Exeter NHS Foundation Trust (RD&E).

10. Devon County Council published a new Transport Strategy in 2020 with three themes: Greater Connectivity, Greater Places for People and Greater Innovation. Devon County Council are now working through implementation plans for this and working closely with Exeter City Council to link with the Liveable Exeter sites and vision.

Key targets within the strategy include:

- 50% of trips by foot or cycle within the city;
- Removal of air quality exceedances in the city.

11. Work has continued on a draft Exeter Local Cycling and Walking Infrastructure Plan.
12. Pop up measures to facilitate social distancing and active travel were introduced in 2020. The changes include the introduction of a new 5km cross city route (E9 Newcourt/Pynes Hill to City centre), supplemented with new crossings (eg at Russell Way). Some of these pop-up measures have been made permanent in 2021, such as the road closures and modal filters on Ludwell Lane, Dryden Road and Wonford Road. Work to make the Magdalen Street section permanent was ongoing during 2021.
13. Permanent school streets introduced at Whipton Barton School and Ladysmith School.
14. Filtered permeability plans for the whole Heavitree area are still under development although some elements have been delivered already, including the modal filter on Homefield Road and contra-flow cycle lane on Park Place.
15. Work was completed on a new Park and Change site at the Science Park and the site has been opened.
16. Work continues on a new station at Marsh Barton.
17. Work commenced to re-open the Okehampton railway line to daily services. This will provide a valuable alternative to car travel for people coming into the city from the area north of Dartmoor and increased service frequency from Crediton.

18. The local Co-Cars car club now includes 27 locations including 36 cars and one van (23 of which are electric). Car Clubs are expected to expand further in 2022 with more electric car clubs as part of the Rapid Charging Exeter project.
19. Continued expansion of Co-Bikes (the local on-street e-cycle hire scheme) to now include 26 hire and docking locations.
20. Further development of the cycle network in and around the city, particularly plans for route E4 where detailed designs are being worked up for the Stoke Hill roundabout and Union Road section.
21. New cycle parking provision in the city's parks and open spaces (funded by DCC).
22. DCC restarted their Travel Planning service provided to new residential developments.
23. Bus patronage recovered to some extent from the effect of Covid 19 lockdowns. Total patronage on Devon's bus network in 2018/19 (the last year for which data is unaffected by the pandemic) was approximately 23.7 million passenger journeys. There was already a downward trend prior to Covid because this was a 10% reduction on the 2011/12 figure of 26.3 million. In 2019/20 patronage reduced slightly to 23.3 million, partially due to the national lockdown in March 2020, but 2020/21 figures were most markedly impacted, with total patronage falling to just 8.1 million. Figures improved slightly in 21/22 but whole year figures were below what would otherwise have been expected. Figures for 21/22 were just below 15 million (previous predictions cited this at 16.5 million).
24. Tour of Britain. A stage of the race finished in Exeter with successful events being run alongside to inspire the next generations of cyclists and also encourage greater participation within the sport.
25. Supporting Ride-On cycling to deliver 25 days of free public Dr-Bike sessions in the City Centre, enabling members of the public to get a bike maintenance check and therefore ride it more frequently.
26. Delivering 5 Cycle Celebration events across the city (and Cranbrook) which engaged with 600-750 people. These events enable members of the community to try cycling, to re-engage with cycling or to just meet up with other people around the shared aspect of community activity. The longer-term output of these events will be to inspire the community to take up cycling or perhaps return to cycling.



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

- Further refinement of the net zero plan for Exeter, in conjunction with Exeter City Futures.
- Implementation of the Transport Strategy by DCC, in conjunction with the Active and Healthy People Programme team.
- Devon County Council's residential travel planning services to be integrated with the Sport England Local Delivery Pilot work.
- An Exeter Local Cycling and Walking Infrastructure Plan is being developed for publication in 22/23 (to be incorporated into the Exeter Plan and future Devon Local Transport Plan).
- Sport England Project work will continue; including on the Wonford Health and Wellbeing Centre, Newtown active neighbourhood, enabling road closures for play streets and community events, community builders and social prescribing.
- Work to enable the delivery of a Water Lane low traffic neighbourhood through redevelopment of brownfield land.
- Three electric bin lorries will be delivered in summer 2022.
- All new vehicles entering the Council's fleet are likely to be electric (unless operational requirements make this impossible).
- Education projects such as Junior Life Skills will re-start after Covid-19.
- 10 new Co-Cars sites are planned.
- A decision will be made on an experimental traffic order for the Heavitree area filtered permeability project.
- Marsh Barton station to be opened.
- The Okehampton railway line will operate an hourly service in 2022 and feasibility work will commence on a possible future Okehampton Parkway station.
- Further improvements will take place to the E4 cycle route linking the new development areas at Monkerton, Tithebarn and Cranbrook with the University. This will make it safer and easier to make journeys by bike.
- The highway changes to make Magdalen Road one way and widen the cycle route will be made permanent.

- £14m of funding (over 3yrs) has been received by Devon County Council for its Bus Service Improvement Plan across the County.

## Conclusions and Priorities

Nitrogen dioxide levels in Exeter in 2021 were slightly above those measured in 2020 but still show a noticeable reduction on pre-pandemic levels such that only one location was above the objective (East Wonford Hill). Trends will be monitored over the coming years to identify whether the area of exceedance remains small or whether further post-Covid rebound in traffic might cause an increase in levels during 2022. Exeter City Council does not intend to review the AQMA order or AQMA boundary until 2024 when the current AQAP terminates. Before this date action to improve air quality will continue to be focussed on those areas within the AQMA where exceedences have been measured recently. A complete review will commence in 2024 together with the necessary reports and consultation for an amended AQMA (if required) and subsequently a new AQAP.

No areas in the city are thought to exceed the objectives for particulate air pollution. Measured PM<sub>2.5</sub> concentrations were well below the relevant objective level and PM<sub>10</sub> concentrations have shown a steady decline since 2006.

The priorities and challenges for 2022 are to implement the Physical Activity Strategy and Transport Strategy, to deliver the Local Cycling and Walking Implementation Plan and to deliver robust planning policy; all in the face of challenging and uncertain conditions.

## Local Engagement and How to get Involved

Local air pollution currently has a high profile within the city. For example it is one of Exeter City Futures' 12 goals, nearly 3000 people were involved in the consultation on the current AQAP and Devon County Council have committed in their Transportation Strategy to resolve exceedances of the objective.

Exeter City Futures welcomes proposals from community and interest groups who wish to improve air quality in their local area. The Wellbeing Exeter Community Builders are actively engaging with local communities to increase active travel, social inclusion, improve the public realm for walking and cycling and to benefit air quality.

Exeter City Council

Further enquiries about pollution levels and actions to improve air quality should be made to [environmental.protection@exeter.gov.uk](mailto:environmental.protection@exeter.gov.uk).

## Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health Department of Exeter City Council with the support and agreement of the following officers and departments:

Exeter City Council - City Development

Exeter City Council – Active and Healthy People Programme

Devon County Council - Highways

This ASR has been approved by:

Service Lead (Environmental Health & Community Safety). Once the report has been checked by DEFRA it will be presented to members at committee.

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

If you have any comments on this ASR please send them for the attention of Alex Bulleid and Jonathan Knight at:

Exeter City Council

Environmental Health and Community Safety

Civic Centre

Paris Street

Exeter

EX1 1 RQ

01392 265147

Exeter City Council

Environmental.Protection@exeter.gov.uk

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## 1 Local Air Quality Management

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

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Exeter City Council and partners 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 12 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMAs declared by Exeter City Council can be found in Table 2.1. The table presents a description of the one AQMA that is currently designated within Exeter. 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:

- NO<sub>2</sub> annual mean;
- NO<sub>2</sub> hourly 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 National Highways?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Name and Date of AQAP Publication	Web Link to AQAP
Exeter AQMA	Declared 2007, Amended 2011	NO2 Annual Mean	An area encompassing the radial routes into the city and other major routes	NO	70 µg/m3	42.2 µg/m3	Exeter AQAP 2019-2024	<a href="http://www.exeter.gov.uk/airpollution">www.exeter.gov.uk/airpollution</a>
Exeter AQMA	Declared 2007, Amended 2010	NO2 1 Hour Mean	An area encompassing the radial routes into the city and other major routes	NO	65 µg/m3	N/A	Exeter AQAP 2019-2024	<a href="http://www.exeter.gov.uk/airpollution">www.exeter.gov.uk/airpollution</a>

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

Exeter City Council confirm that all current AQAPs have been submitted to Defra.

## 2.2 Progress and Impact of Measures to address Air Quality in Exeter

Defra's appraisal of last year's ASR concluded that "Overall, the report is detailed, concise and satisfies the criteria of relevant standards. The Council should maintain their good and thorough work."

Exeter City Council has taken forward a number of direct measures during the current reporting year of 2021 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. Seventeen measures are included within Table 2.2, with the type of measure and the progress Exeter City Council has made during the reporting year of 2021 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

More detail on these measures can be found in the Air Quality Action Plan, Physical Activity Strategy and Transportation Strategy. Key completed measures are:

1. Exeter City Council has started to implement its Physical Activity Strategy. The strategy focusses on getting the least active members of the community moving more (including active travel) with a key focus being to normalise and increase active travel in everyday life. It also prioritises development projects for the Wonford Health & Wellbeing Centre to include a cycling hub on Exeter's Green Circle and family activity trails around the Ludwell valley. The team is working to submit a planning application for the scheme in 2022/23.
2. In 2020, a consultation in the Newtown area engaged with the local community to discuss and explore perceptions towards walking and cycling. An options appraisal has been developed in 2021 which will be consulted on in 2022. The community will be asked for their opinions on a range of public realm improvements, parklets and highway interventions which will enable and encourage more people to use active travel modes within the Newtown area.
3. The Sport England Local Delivery Pilot team has developed and tested the governance and application structure for communities to be able to implement localised, regular closures of roads within their neighbourhoods. For specific periods this will provide sections of roads where the priority will be given to activity

(play) rather than travel.. The SELDP team was also involved in the school streets projects discussed below.

4. Work has continued at Water Lane, where the Council is building a large solar array with battery storage which will power a fleet of electric refuse collection vehicles (to be delivered in 2022).
5. Scrutiny of planning applications for air quality impacts, including making objections to developments on air quality grounds where this is justified and the negotiation of mitigation in accordance with Council and national planning policy.
6. From 1<sup>st</sup> Jan 2020 adopted policy required the Hackney carriage fleet to be 50% Euro 6 wheelchair accessible vehicles and 50% ULEV saloon cars with a stated emission level of 75g km CO<sub>2</sub> or below. This policy continues to be implemented.
7. A reduction in NOx emissions from buildings as a result of a variety of measures intended primarily to address fuel poverty and carbon emissions. These include progressing plans for the next phase of PassivHaus standard homes by Exeter City Council, completion of an Extra Care facility and a leisure centre and swimming pool both meeting the PassivHaus standard and continued implementation of district heating schemes to provide heating and hot water to 2800 homes at Monkerton, Tithebarn, Mosshayne, Pinn Court and Park Farm, and Exeter Science Park.
8. The new bus station was opened, which provides improved facilities for public transport users in the city.
9. The City Council is partners with Devon County Council and Co Delivery in a scheme which secured an £80,000 grant from the Department for Transport Energy Saving Trust to expand the capabilities of e-cargo bikes for business travel. Nine electric cargo bikes have been secured for use within the partner organisations, Devon County Council, Exeter City Council, University of Exeter and Royal Devon & Exeter NHS Foundation Trust (RD&E). These are now all operational including at the City Council where three bikes are used by the Environmental Health and Community Safety team to replace vehicle trips. Four bikes have expanded the eCargo Co Delivery courier service in Exeter, enabling more businesses to deliver goods across the city sustainably. This pilot project seeks to encourage the transition to carbon neutral modes of business travel. It's estimated the scheme will

help to save more than 20,000 miles a year that are currently made by petrol and diesel vehicles.

10. Devon County Council published a new Transport Strategy in 2020 with three themes: Greater Connectivity, Greater Places for People and Greater Innovation. Devon County Council are now working through implementation plans for this and working closely with Exeter City Council to link with the Liveable Exeter sites and vision.

Key targets within the strategy include:

- 50% of trips by foot or cycle within the city;
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21. New cycle parking provision in the city's parks and open spaces (funded by DCC).
22. DCC restarted their Travel Planning service provided to new residential developments.
23. Bus patronage recovered to some extent from the effect of Covid 19 lockdowns. Total patronage on Devon's bus network in 2018/19 (the last year for which data is unaffected by the pandemic) was approximately 23.7 million passenger journeys. There was already a downward trend prior to Covid because this was a 10% reduction on the 2011/12 figure of 26.3 million. In 2019/20 patronage this reduced slightly to 23.3 million, partially due to the national lockdown in March 2020, but 2020/21 figures were most markedly impacted, with total patronage falling to just 8.1 million. Figures improved slightly in 21/22 but whole year figures were below what would otherwise have been expected. Figures for 21/22 were just below 15 million (previous predictions cited this at 16.5 million).
24. Tour of Britain. A stage of the race finished in Exeter with successful events being run alongside to inspire the next generations of cyclists and also encourage greater participation within the sport.
25. Supporting Ride-On cycling to deliver 25 days of free public Dr-Bike sessions in the City Centre, enabling members of the public to get a bike maintenance check and therefore ride it more frequently.
26. Delivering 5 Cycle Celebration events across the city (and Cranbrook), engaging with between 600 and 750 people. These events enable members of the community to try cycling, to re-engage with cycling or to just meet up with other people around the shared aspect of community activity. The longer-term output of these events will be to inspire the community to take up cycling or perhaps return to cycling.

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Exeter City worked to implement these measures in partnership with the following stakeholders during 2021:

- Neighbouring authorities
- Devon County Council
- Sport England
- Exeter City Futures

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

- Further refinement of the net zero plan for Exeter, in conjunction with Exeter City Futures.
- Implementation of the Transport Strategy by DCC, in conjunction with the Active and Healthy People Programme team.
- Devon County Council's residential travel planning services to be integrated with the Sport England Local Development Pilot work.
- An Exeter Local Cycling and Walking Infrastructure Plan is being developed for publication in 22/23 (to be incorporated into the Exeter Plan and future Devon Local Transport Plan).
- Sport England Project work will continue; including on the Wonford Health and Wellbeing Centre, Newtown active neighbourhood, enabling road closures for play streets and community events, community builders and social prescribing.
- Work to enable the delivery of a Water Lane low traffic neighbourhood through redevelopment of brownfield land.
- Three electric bin lorries will be delivered in summer 2022.
- All new vehicles entering the Council's fleet are likely to be electric (unless operational requirements make this impossible).
- Education projects such as Junior Life Skills will re-start after Covid-19.
- 10 new Co-Cars sites are planned.
- A decision will be made on an experimental traffic order for the Heavitree area filtered permeability project.
- Marsh Barton station to be opened.

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- The Okehampton railway line will operate an hourly service in 2022 and feasibility work will commence on a possible future Okehampton Parkway station.
- Further improvements will take place to the E4 cycle route linking the new development areas at Monkerton, Tithebarn and Cranbrook with the University. This will make it safer and easier to make journeys by bike.
- The highway changes to make Magdalen Road one way and widen the cycle route will be made permanent in 22/23.
- £14m of funding (over 3yrs) has been received by Devon County Council for its Bus Service Improvement Plan across the County.

Exeter City Council's priorities for the coming year are to continue to progress the AQAP, in conjunction with the development and implementation of the city and county's Climate Emergency plans and in the context of economic conditions.

The principal challenges and barriers to implementation that Exeter City Council anticipates facing are further funding constraints within Local Government, available officer time, and public, business and political appetite for measures that may be perceived as potentially harming or delaying economic growth (even if this is not the case).

Progress on the following measures has been slower than expected due to:

- Changes to the proposed planning policy framework. The authorities within the Greater Exeter area are no longer working together on shared planning policy (GESp) but are instead producing individual plans. The Exeter Plan will include the same transport aspirations that would have been in the GESp and will align with the Transport Strategy for the city. Cross-boundary issues will now be addressed in an East Devon, Exeter, Mid Devon and Teignbridge Joint Strategy.
- Use of public transport reduced as a result of the pandemic. The future of public transport and the measures needed to encourage passengers back safely will be considered in 2022 and beyond in Devon County Council's Bus Service Improvement Plan.

Exeter City Council anticipates that the measures stated above and in **Error! Reference source not found.** will achieve compliance in the Exeter AQMA although the full impact of Covid-19 and recovery (including financial pressures on local authorities) is not yet understood. Progress with implementing the priority measures and all the actions listed in Table 2.2 will be reported on in the next Annual Status Report in 2023 and changes can be made to the AQAP if required by the mechanism of future ASRs.



Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1 (green measure)	Filtered permeability projects to be considered for the city with an initial focus on the Heavitree corridor area and including a feasibility study for corridor improvements	Policy Guidance and Development Control	Other policy	2019	Rolling Programme	DCC via Transport Strategy and Exeter City Futures, Sport England Local Delivery Pilot	SELDP, DCC, Developer Contributions, Grant Funding where available and ECC	NO	Partially Funded	£50k - £100k	Implementation	The target for design of changes to the Heavitree corridor area will be to eliminate exceedences. Details will be finalised as the design emerges, but it is currently expected that a reduction in emissions of between 39 and 78% will be required	Implementation of scheme(s)	Pop up cycle routes and road closures in Heavitree and around the RD&E hospital introduced in 2020 have been made permanent. School Street introduced at Ladysmith school. A decision on an experimental traffic order for the Heavitree area scheme will be made in 2022. A wider package of measures, including play streets is being developed by the Sport England team.	Plans will be developed for individual areas in consultation with communities.

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
2 (amber measure)	Consider access restrictions which will reduce the dominance of private cars, including in the city centre	Policy Guidance and Development Control	Other policy	2019	Ongoing Programme, next phases to be implemented 2021	DCC via Transport Strategy and Exeter City Futures	DCC, grant funding as available and developer contributions	NO	Partially Funded	£100k - £500k	Planning	4% reduction in emissions at East Wonford Hill (shared across all measures which will in combination achieve the targeted reduction in private car commutes)	Implementation of scheme(s)	Traffic reduction scheme for Bartholomew Street West implemented and lane closure on Queen Street in place. Roadside interviews in the city centre undertaken to inform a city centre traffic strategy. Liveable Exeter vision for the city published, which includes development on car parks, and a reduction in road space for cars. Initial work on South Street project is progressing, to include improved cycle routes, and connections between the city centre and the Quay area but requires updating in light of post-Covid changes. Local Walking and Cycling Implementation plan to be published 2022/3.	Consultation and obtaining relevant permissions, consents and traffic orders as well as bringing together necessary funding. Draft City Centre Strategy requires review in light of post Covid changes.
3 (amber measure)	New transport links and Park & Change facilities to make it easier for those living outside the city to choose active and sustainable travel modes	Transport Planning and Infrastructure	Other	2019	Ongoing Programme	DCC via Transport Strategy	DCC, grant funding as available and developer contributions	NO	Partially Funded	£100k - £500k	Implementation	4% reduction in emissions at East Wonford Hill (shared across all measures which will in combination achieve the targeted reduction in private car commutes)	Implementation of schemes	Pinhoe Park and Change to be delivered as part of residential development in area. Park and Change at Science Park opened.	Consultation and obtaining relevant permissions, consents and traffic orders as well as bringing together necessary funding

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
4 (yellow measure)	Changes to parking charges to discourage car travel in peak times, encourage longer stays in the city centre and support other measures in this plan, such as active travel	Traffic Management	Other	2019	2021	ECC via Local Plan	ECC	NO	Not Funded	£100k - £500k	Planning	<1% reduction in emissions. This measure is expected to have an indirect effect on emissions, such that it is not possible to reliably quantify the impact of this measure alone.	Implementation of changes	This was being actively pursued with ECCs equipment providers but future structure of parking charges and plans for city centre car parks are being considered post Covid.	Draft City Centre Strategy requires review in light of post Covid changes.
5	Maximise efficiency of existing highway network	Transport Planning and Infrastructure	Other	2019	Ongoing programme	DCC via Transport Strategy and Exeter City Futures	DCC, ECC, grant funding as available and developer contributions	NO	Partially Funded	£500k - £1 million	Planning	TBC, based on predicted changes to traffic parameters provided by DCC as plans for specific locations emerge and are consulted upon	Implementation of scheme(s)	In planning phase	Consultation and obtaining relevant permissions, consents and traffic orders as well as bringing together necessary funding
6 (amber measure)	Access Fund and cycle/walking network, Local Walking and Cycling Infrastructure Plan (LCWIP)	Transport Planning and Infrastructure	Other	2019	Ongoing, as DCC have current plans for upgrades to cycling and walking infrastructure which will evolve as the LCWIP develops	DCC via Transport Strategy	Access Fund	NO	Partially Funded	£1 million - £10 million	Planning	4% reduction in emissions at East Wonford Hill (shared across all measures which will in combination achieve the targeted reduction in private car commutes)	Adoption of LCWIP	Planned E4 Cycle Route improvements ongoing and E9 route made permanent. The LCWIP document will be consulted on in 2022	Consultation and obtaining relevant permissions, consents and traffic orders as well as bringing together necessary funding
7 (amber measure)	Expand school and community projects, car free events and events promoting active travel, building on the success of the Heavitree pilot	Promoting Travel Alternatives	Other	2019	Ongoing programme, which evolves as previous events and projects are evaluated	ECC via Sport England Local Delivery Pilot & Exeter City Futures	Sport England funding	NO	Partially Funded	£50k - £100k	Implementation	4% reduction in emissions at East Wonford Hill (shared across all measures which will in combination achieve the targeted reduction in private car commutes)	School Streets introduced	Trials at three primary schools in 2020, two made permanent (Whipton Barton and Ladysmith). Community Builders and SELDP local Physical Activity Organisers delivered play street 'non car events'	Plans will be developed in individual areas with local communities. Increased community cohesion and activism as a result of Covid may benefit this work.

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
8 (amber measure)	Use social prescribing and community building to help individuals get and stay active	Public Information	Other	2019	Ongoing programme, which evolves as previous events and projects are evaluated	ECC via Sport England Local Delivery Pilot and local Health Service providers	Sport England funding	NO	Partially Funded	£100k - £500k	Implementation	4% reduction in emissions at East Wonford Hill (shared across all measures which will in combination achieve the targeted reduction in private car commutes)	Implementation of scheme	Behaviour change training delivered for all Community Builders and Community Connectors to provide support to people to lead active lifestyles. New social prescribing posts recruited to support health & wellbeing of Children and Young Families.	The Covid recovery plans seek to retain and enhance the increase in activity levels, community activism, volunteering and contact with nature seen during lockdown.
9 (amber measure)	High quality parks, play areas, sport and leisure facilities	Promoting Travel Alternatives	Other	2019	Ongoing programme	ECC via Physical Activity Strategy, Sport England Local Delivery Pilot & Local Plan	Sport England funding	NO	Partially Funded	£50k - £100k	Planning	4% reduction in emissions at East Wonford Hill (shared across all measures which will in combination achieve the targeted reduction in private car commutes)	Implementation of scheme(s)	Physical Activity Strategy published and flagship programmes in development - Wonford Health & Wellbeing Centre to be delivered first. Focus on sites becoming more accessible for sustainable transport and increased active travel infrastructure	Obtaining necessary permissions and consents, and funding
10 (yellow measure)	Communications plan, to support measures that will achieve modal shift	Public Information	Other	2019	Ongoing (iterative process of developing and implementing communications / messages)	ECC via Sport England Local Delivery Pilot & Exeter City Futures	ECC via existing internal budgets, Sport England Local Delivery Pilot & Exeter City Futures	NO	Partially Funded	£10k - 50k	Implementation	<1% reduction in emissions. The purpose of this measure is to enable the Council to explain why it is taking action. The measure itself is unlikely to have significant impact on its own.		Communications strategy developed through SELDP - 'Let's Move'. Focus on small steps for 'least active' residents and communities to move more in their local neighbourhoods. Walking & Cycling central to this communications strategy	

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
11 (yellow measure)	Promote and expand Co-Bikes network, and support the roll out of electric car club vehicles to more locations	Promoting Travel Alternatives	Other	2019	Ongoing programme	DCC, ECC via Transport Strategy, Sport England Local Delivery Pilot & Exeter City Futures	Ongoing programme, dependent on funding availability	NO	Partially Funded	£100k - £500k	Implementation	<1% reduction in emissions. This measure will have indirect benefits for air quality by facilitating active travel and supporting a change in car ownership patterns. It is not possible to reliably model the impact of this measure alone on emissions	Implementation of expansions to schemes, as funding is obtained	Significant upgrades to the Co-Bikes and Co-Cars networks have taken place and are planned	Dependent on funding availability
12 (amber measure)	An improved multi-modal public transport network, incorporating cleaner bus technologies	Transport Planning and Infrastructure	Other	2019	Ongoing programme	DCC via GESp, Transport Strategy and Exeter City Futures	TBC	NO	Partially Funded	> £10 million	Planning	4% reduction in emissions at East Wonford Hill (shared across all measures which will in combination achieve the targeted reduction in private car commutes). As an example, 33% bus electrification would achieve 5% fall in emissions at East Wonford Hill and 66% electrification would achieve 10% reduction.	Implementation of agreed plans	14 Euro 6 busses have entered the fleet and significant new additions to the city's bus network. Plans to be reviewed in light of £14m of funding (over 3yrs) which has been received by Devon County Council for its Bus Service Improvement Plan across the County	Dependent on funding availability and future demand for public transport.

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
13	Developers to mitigate the effects of their development on air quality	Policy Guidance and Development Control	Other policy	2019	Ongoing	GESP team, ECC via GESP & Local Plan	Resourced by the GESP authorities	NO	Partially Funded	£50k - £100k	Planning	The purpose of this measure is to limit the impact of new development. It is not intended to reduce emissions on the current baseline (although some reduction may be achieved as a result in practice)	Developments delivered	Continue to implement policy in a robust manner eg when considering retail park applications and new housing.	The GESP timetable has been subject to some delay from when the AQAP was published. The Transportation Strategy describes what the future of Transport in Exeter should look like, but without a matching local plan in all the District Council areas, the necessary contributions and infrastructure will have to be negotiated on a site by site basis as each application is decided.
14	Policies deliver development where private car use is not the only realistic travel choice	Policy Guidance and Development Control	Other policy	2019	Ongoing	GESP team, ECC via GESP & Local Plan	Resourced by the GESP authorities	NO	Partially Funded	£50k - £100k	Planning	The purpose of this measure is to limit the impact of new development. It is not intended to reduce emissions on the current baseline (although some reduction may be achieved as a result in practice)	Developments delivered	Liveable Exeter vision for development in the city which is not reliant on car travel.	Work on the Liveable Exeter project continues but the GESP timetable has been subject to some delay from when the AQAP was published. (see measure 13).

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
15 (yellow measure)	More things to see/do in the City Centre, encouraging longer stays and supporting events which promote sustainable travel, active and healthy lifestyles.	Policy Guidance and Development Control	Other policy	2019	Ongoing programme	ECC via Local Plan	TBC once strategy adopted	NO	Partially Funded		Planning	<1% reduction in emissions. This measure will not have a significant direct impact on emissions, but will support the step change in behaviour which will be required to meet the City Council's aspirations for active and healthy travel.	Completion of Strategy and then implementation	St Sidwells Point leisure centre open. Consultants are reviewing draft City Centre Strategy in light of post-Covid changes.	The impact of Covid-19 on the city centre and travel to the city centre will be better understood as the year progresses
16	Better information to raise awareness and improve the level of understanding of air pollution and transport issues within communities	Public Information	Other	2019	Ongoing (iterative process of developing and implementing communications / messages).	ECC	Internal ECC budgets	NO	Partially Funded	£10k - 50k	Planning	Enable the Council to explain why it is taking action. Measure itself is unlikely to have significant impact on its own.		Baseline evidence report completed subject to annual review following publication of each year's measurement data and any new research, national guidance etc.	Future communications may be brought under the umbrella of the Net Zero plans
17	An air pollution monitoring network that supports the measures in this action plan	Public Information	Other	2019	Ongoing evolution of network may be required, as needs change	ECC	Internal ECC budgets or grant funding if available	NO	Funded	< £10k	Implementation	This measure would not in itself deliver reductions in emissions, but would support the other measures in this plan	monitoring equipment operational	Diffusion tube monitoring network remains under review. The potential benefits of new sensor technologies has been evaluated, but no projects have currently been identified where these types of equipment would provide added value.	

## 2.3 PM<sub>2.5</sub> – Local Authority Approach to Reducing Emissions and/or Concentrations

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

Public Health England's Public Health Outcomes Framework tool shows that in Exeter in 2020 the fraction of mortality attributable to particulate air pollution was 5.2%. This is equal to the regional figure for the south west (5.2%) and below the national level of 5.6%. Exeter therefore has levels of particulate matter which are causing harm, but this problem is less severe than in over half the country. The data is available at [this link](#).

There is now a capacity for direct monitoring of PM<sub>2.5</sub> in Exeter, since August 2018. This showed PM<sub>2.5</sub> concentrations of 8.4 µg/m<sup>3</sup> at RAMM and 7.5 µg/m<sup>3</sup> at Alphington Street in 2021. National modelling by PHE (available via the website above) suggests that for 2020 (the most recent data available), the average figure for the city as a whole was 6.2 µg/m<sup>3</sup>. The annual average EU limit value for PM<sub>2.5</sub> is 25 µg/m<sup>3</sup> so there is no suggestion that this level is being exceeded in Exeter. However the council still has a duty to reduce emissions of and exposure to this pollutant.

During 2022, Exeter City Council will be taking the measures described in Table 2.2 that will address PM<sub>2.5</sub> as well as NO<sub>2</sub>.

Approximately 60% of Exeter is designated as Smoke Control Areas. Controls on solid fuel combustion appliances and fuels are likely to have restricted PM<sub>2.5</sub> emissions in these areas to some extent.



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

This section sets out the monitoring undertaken within 2021 by Exeter City Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2017 and 2021 to allow trends to be identified and discussed.

### 3.1 Summary of Monitoring Undertaken

#### 3.1.1 Automatic Monitoring Sites

Exeter City Council undertook automatic (continuous) monitoring at two sites during 2021. Table A.1 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. This [page](#) presents automatic monitoring results for Exeter 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.

#### 3.1.2 Non-Automatic Monitoring Sites

Exeter City Council undertook non- automatic (i.e. passive) monitoring of NO<sub>2</sub> at 83 sites during 2021. Table A.2 in Appendix A presents the details of the non-automatic sites.

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

## 3.2 Individual Pollutants

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

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

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO<sub>2</sub> annual mean concentrations for the past five years with the air quality objective of 40µg/m<sup>3</sup>. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2021 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

Table A.5 in Appendix A compares the ratified continuous monitored NO<sub>2</sub> hourly mean concentrations for the past five years with the air quality objective of 200µg/m<sup>3</sup>, not to be exceeded more than 18 times per year.

The national bias adjustment figure (0.84) has been used this year as a result of low data capture at the co-located diffusion tube site. The local Exeter bias factor (0.76) is lower than the national one so if that had been used the final reported concentrations would have been slightly lower. The Council has followed DEFRA guidance in choosing to use the national factor and it is considered robust but the choice of factors does not greatly affect the conclusions drawn.

The data shows that no locations measured an exceedence of the proxy for the hourly objective in 2021 (an annual average of 60µg/m<sup>3</sup>).

Only one site exceeded the objective for annual average concentrations. This was East Wonford Hill (DT57) where concentrations were slightly above the limit (42.2 µg/m<sup>3</sup> against an objective of 40). The data for all the monitoring sites shows a significant fall in concentrations between 2019 and 2020 with a partial rebound in 2021 (see Figure A.1 and the data in Table A.4). This can be attributed in large part to changes in traffic flows as a

result of lockdowns and COVID-19 (see table 15.1). Ongoing improvements in vehicle emission technologies will also have played a part however.

Table 15.1 Traffic Flow Data (24 hour average)

Site Name	2015	2020	2021	% change from 2015 to 2020	% change from 2015 to 2021
Pinhoe Road (Whipton)	20830	16538	17,218	-21%	-17%
Heavitree Road	17507	14832	16,632	-15%	-5%
Honiton Road	26832	22789	23,936	-15%	-11%
Topsham Road (King George)	26057	20702	23,635	-21%	-9%
Alphington St	28799	22012	23,401	-24%	-19%
Cowick St	14840	10913	11,916	-26%	-20%
<b>Total</b>	<b>134865</b>	<b>107786</b>	<b>116,738</b>	<b>-20%</b>	<b>-13%</b>

2016 count data is shown for Heavitree Road because the 2015 data was faulty

2021 count data for Pinhoe Road is estimated because of incomplete data

2020 was exceptional, in terms of the change in traffic flows, so the Council had no plans to amend the AQMA as a result of changes to NO<sub>2</sub> concentrations seen in that year. The last Annual Status Report (published in 2021) recommended that longer term trends were monitored to confirm which exceedences have indeed been permanently resolved. There will also always be natural variation between years as a result of local small changes in traffic flows (road works etc) and weather patterns which make identifying any trend difficult over short periods of time even where other factors are stable.

Given that traffic flows did not fully return in 2021 to pre-pandemic levels (table 15.1) it is again recommended that the AQMA order and boundary remain unchanged. It seems highly likely that exceedences at locations such as the Blackboy Road / Pinhoe Road junction (DT42 and DT43) have been permanently resolved given that they had fallen below 40 µg/m<sup>3</sup> in 2018 and therefore have been below the objective for 4 years. However the Council does not intend to review the AQMA order or AQMA boundary until 2024 when the current AQAP terminates. Before this date action to improve air quality will continue to be focussed on those areas within the AQMA where exceedences have been measured recently (East Wonford Hill). A complete review will commence in 2024 together with the necessary reports and consultation for an amended AQMA (if required) and subsequently a new AQAP.

There were no changes to the monitoring network in 2021. The Council considers that it has good coverage of all areas where exceedences might occur at a relevant location as well as any areas which might be expected to see significant traffic growth (as a result of new development etc). Monitoring is focused at expected hot spots and relevant worst-case locations. No further revision to the monitoring network is therefore currently proposed in order to identify suspected exceedences, although regular review of the network will continue to ensure that monitoring is taking place at all areas of potential exceedance at locations of relevant exposure.

### 3.2.2 Particulate Matter (PM<sub>10</sub>)

Table A.6 in Appendix A: Monitoring Results compares the ratified and adjusted monitored PM<sub>10</sub> annual mean concentrations for the past five years with the air quality objective of 40µg/m<sup>3</sup>.

Table A.7 in Appendix A compares the ratified continuous monitored PM<sub>10</sub> daily mean concentrations for the past five years with the air quality objective of 50µg/m<sup>3</sup>, not to be exceeded more than 35 times per year.

There were no measured exceedences of the PM<sub>10</sub> air quality objectives in Exeter in 2021. Data capture at CM2 (Alphington Street) was below 90% (because of equipment breakdowns) but above the 75% threshold where annualisation is required. Annual average concentrations have been broadly consistent over the last five years, with some interannual variability, and there was just one exceedence of an hourly mean of 50µg/m<sup>3</sup> in 2021 (at RAMM). The longer-term trend in annual concentrations is a decline since 2005 or 2006.

### 3.2.3 Particulate Matter (PM<sub>2.5</sub>)

Table A.8 in Appendix A presents the ratified and adjusted monitored PM<sub>2.5</sub> annual mean concentrations for the past five years.

There were no measured exceedences of the PM<sub>2.5</sub> air quality objectives in Exeter in 2020. Data capture at CM2 (Alphington Street) was below 90% (because of equipment breakdowns) but above the 75% threshold where annualisation is required. There is no obvious trend in concentrations over the period when data has been collected.

## 3.2.4 Ozone (O<sub>3</sub>)

Table A.9 in Appendix A presents the ratified continuous monitored O<sub>3</sub> 8-hour mean concentrations for the past 5 years with the air quality objective of 100µg/m<sup>3</sup>, not to be exceeded more than 10 times per year.

Although not a local air pollutant, Exeter City Council has the facility to measure ozone (O<sub>3</sub>) levels. Table A.9 in Appendix A compares the ratified continuous monitored O<sub>3</sub> concentrations for 2021 with the nationally applied air quality objective for this pollutant. The objective was exceeded in Exeter in 2019, which may be a result of the fine summer. In 2020, the number of occasions when there was an 8 hour running mean of >100 micrograms per cubic meter increased significantly. This could have been caused by the interaction between NO<sub>x</sub> and ozone in the atmosphere. With lower concentrations of NO being emitted during lockdowns, less ozone would be converted to oxygen (O<sub>2</sub>). There were no exceedances in 2021. As stated above, ozone is not a local air pollutant so Exeter City Council is not responsible for reporting on, or mitigating, exceedances of this objective. This is the responsibility of DEFRA.

## Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Inlet Height (m)
CM1	Exeter Roadside	Kerbside	291939	92830	NO <sub>2</sub> ; O <sub>3</sub> ; PM <sub>10</sub> ; PM <sub>2.5</sub>	YES	Chemiluminescent; UVA; Optical Light Scattering	0	1	1.7
CM2	Alphington Street	Roadside	291670	91773	PM <sub>10</sub> ; PM <sub>2.5</sub>	NO	Optical Light Scattering	12	3	1.7

**Notes:**

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

(2) N/A if not applicable

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

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT1	High Street /Castle Street	Kerbside	292199	92814	NO2	YES, Exeter AQMA	50.0	0.5	No	2.0
DT2	Longbrook Street	Kerbside	292315	93016	NO2	NO	0.0	1.0	No	1.7
DT3	New North Road	Kerbside	292185	93049	NO2	YES, Exeter AQMA	0.0	1.0	No	2.0
DT4	Queen Street	Kerbside	291779	93011	NO2	YES, Exeter AQMA	0.0	1.5	No	2.0
DT5, DT6	RAMM 2	Kerbside	291944	92826	NO2	YES, Exeter AQMA	0.0	1.0	Yes	1.7
DT7	High Street Guildhall	Roadside	291984	92626	NO2	YES, Exeter AQMA	0.0	2.0	No	2.0
DT8	North Street	Kerbside	291895	92569	NO2	YES, Exeter AQMA	0.0	1.0	No	1.7
DT9	South Street	Roadside	291943	92511	NO2	YES, Exeter AQMA	4.0	2.5	No	2.0
DT10	Market Street	Kerbside	291833	92433	NO2	YES, Exeter AQMA	0.0	1.0	No	1.7
DT11	Magdalen Street	Kerbside	292291	92292	NO2	YES, Exeter AQMA	6.0	2.0	No	1.7
DT12	Magdalen Street façade	Kerbside	292422	92320	NO2	YES, Exeter AQMA	0.0	1.0	No	1.7
DT13	Archibald Road	Roadside	292590	92743	NO2	NO	0.0	1.5	No	1.7

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT14	Heavitree Road inbound	Roadside	292832	92731	NO2	YES, Exeter AQMA	0.0	10.0	No	2.0
DT15	Heavitree Road outbound	Kerbside	292703	92807	NO2	YES, Exeter AQMA	0.0	1.0	No	1.7
DT16	Holloway Street	Kerbside	292378	92039	NO2	YES, Exeter AQMA	0.0	1.0	No	1.7
DT17	Carder's Court, Shilhay	Roadside	291699	92091	NO2	NO	0.0	15.0	No	1.7
DT18	Rear of Gervase Avenue	Roadside	291657	91973	NO2	YES, Exeter AQMA	5.0	18.0	No	2.0
DT19	Alphington Street	Kerbside	291669	91812	NO2	YES, Exeter AQMA	0.0	1.0	No	2.0
DT20	Alphington Road inbound	Roadside	291532	91349	NO2	YES, Exeter AQMA	0.0	2.0	No	1.7
DT21	Queen's Road	Urban Background	291460	91390	NO2	NO	8.0	2.0	No	1.7
DT22	Alphington Road outbound	Roadside	291509	91151	NO2	YES, Exeter AQMA	0.0	8.0	No	1.7
DT23	Alphington Road outer	Roadside	291518	90813	NO2	YES, Exeter AQMA	15.0	2.0	No	1.7
DT24	Church Road Alphington	Roadside	291691	90425	NO2	YES, Exeter AQMA	0.0	1.5	No	1.7
DT25	Church Road II	Kerbside	291767	90160	NO2	YES, Exeter AQMA	0.0	1.0	No	1.7
DT26	Alphington Cross	Roadside	291520	90531	NO2	YES, Exeter AQMA	0.0	1.8	No	1.7



Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT27	Cowick Street (Cowick Lane)	Kerbside	290864	91725	NO2	YES, Exeter AQMA	0.0	1.0	No	1.7
DT28	Cowick Street (inbound)	Roadside	291249	91874	NO2	YES, Exeter AQMA	0.0	4.0	No	1.7
DT29	Cowick Street (outbound)	Roadside	291376	91944	NO2	YES, Exeter AQMA	0.0	1.5	No	1.7
DT30	Cowick Street (Exe Bridges)	Roadside	291500	92055	NO2	YES, Exeter AQMA	0.0	2.0	No	1.7
DT31	Okehampton Street	Roadside	291351	92169	NO2	YES, Exeter AQMA	0.0	4.0	No	1.7
DT32	Station Road	Roadside	290826	93598	NO2	NO	0.0	2.1	No	1.7
DT33	Bonhay Road (St Clements Lane)	Roadside	291253	93299	NO2	YES, Exeter AQMA	0.0	2.0	No	2.0
DT34	Red Cow Village	Kerbside	291242	93483	NO2	YES, Exeter AQMA	0.0	1.0	No	1.7
DT35	Red Cow II	Kerbside	291272	93468	NO2	YES, Exeter AQMA	0.0	1.0	No	1.7
DT36	Cowley Bridge Road	Roadside	291054	94399	NO2	YES, Exeter AQMA	0.0	4.0	No	1.7
DT37	Pennsylvania Road	Roadside	292391	93291	NO2	NO	0.0	1.0	No	1.7
DT38	York Road School	Roadside	292469	93245	NO2	NO	3.5	2.5	No	1.7
DT39	York Road	Kerbside	292579	93146	NO2	NO	1.5	0.1	No	1.7

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT40	Union Road	Roadside	293047	93877	NO2	NO	0.0	1.0	No	1.7
DT41	Pinhoe Road inbound	Roadside	293405	93395	NO2	YES, Exeter AQMA	0.0	3.0	No	1.7
DT42	Pinhoe Road (Polsloe Road)	Kerbside	293251	93375	NO2	YES, Exeter AQMA	0.0	1.0	No	1.7
DT43	Blackboy Road (Polsloe Road)	Roadside	293227	93356	NO2	YES, Exeter AQMA	0.0	2.0	No	1.7
DT44	Beacon Heath	Kerbside	295068	94487	NO2	NO	10.0	1.0	No	1.7
DT45	Venny Bridge	Kerbside	295888	94101	NO2	NO	8.0	1.0	No	1.7
DT46	Pinhoe	Kerbside	296418	94470	NO2	NO	20.0	0.1	No	1.7
DT47	Langaton Lane	Urban Background	296984	94327	NO2	NO	12.0	0.5	No	1.7
DT48	Pinn Lane	Roadside	296494	93782	NO2	NO	9.5	1.0	No	2.0
DT49	Pinhoe Road (Fairfield Avenue)	Roadside	295413	93689	NO2	YES, Exeter AQMA	0.0	5.0	No	1.7
DT50	East John Walk	Urban Background	293091	92825	NO2	NO	1.5	N/A	No	1.7
DT51	Magdalen Road (Barrack Road)	Kerbside	293448	92419	NO2	YES, Exeter AQMA	0.0	1.0	No	1.7
DT52	Livery Dole	Roadside	293418	92497	NO2	YES, Exeter AQMA	0.0	1.5	No	1.7

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT53	Rowancroft	Kerbside	293533	92473	NO2	YES, Exeter AQMA	0.0	0.2	No	2.0
DT54	Salutary Mount	Roadside	293738	92396	NO2	YES, Exeter AQMA	4.5	1.5	No	1.7
DT55	Fore Street Heavitree outbound	Roadside	293781	92409	NO2	YES, Exeter AQMA	6.0	4.0	No	1.7
DT56	Fore Street Heavitree inbound	Roadside	294043	92359	NO2	YES, Exeter AQMA	0.0	2.0	No	1.7
DT57	East Wonford Hill	Roadside	294410	92310	NO2	YES, Exeter AQMA	0.0	2.0	No	1.7
DT58	Honiton Road	Roadside	295203	92378	NO2	YES, Exeter AQMA	20.0	1.5	No	2.0
DT59	Honiton Road façade	Roadside	295191	92395	NO2	NO	0.0	15.0	No	1.7
DT60	Sidmouth Road lamp post	Roadside	295466	92365	NO2	YES, Exeter AQMA	7.0	2.0	No	2.0
DT61	Sidmouth Road Middlemoor	Roadside	295636	92232	NO2	YES, Exeter AQMA	0.0	10.0	No	1.7
DT62	Newcourt Way	Roadside	295710	90571	NO2	NO	17.0	2.0	No	2.0
DT63	Topsham Road (Countess Wear)	Roadside	294694	90001	NO2	YES, Exeter AQMA	0.0	5.0	No	2.0
DT64	Bridge Road (Countess Wear)	Roadside	294652	89974	NO2	NO	0.0	15.0	No	1.7
DT65	High Street Topsham	Kerbside	296415	88477	NO2	NO	0.0	1.0	No	1.7

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT66	Topsham Road (Tollards Road)	Roadside	294227	90435	NO2	YES, Exeter AQMA	0.0	1.5	No	1.7
DT67	Topsham Road (Barrack Road)	Roadside	293213	91245	NO2	YES, Exeter AQMA	0.0	10.0	No	1.7
DT68	Riverside Valley Park	Urban Background	292291	91678	NO2	NO			No	2.0
DT69	Cowick Barton Playing Fields	Urban Background	291016	91304	NO2	NO			No	1.7
DT70	Exwick Playing Fields	Urban Background	291298	92593	NO2	NO			No	2.0
DT71	Heavitree Pleasure Ground	Urban Background	294387	92611	NO2	NO			No	2.0
DT72	Ladysmith School/Pretoria Road	Roadside	293617	93090	NO2	NO	1.5	1.5	No	1.7
DT73	Pennsylvania	Urban Background	293052	94185	NO2	NO	6.0	2.0	No	2.0
DT74	Northernhay Gardens	Urban Background	292056	93043	NO2	NO			No	2.0
DT75	Chudleigh Road	Roadside	291721	89727	NO2	YES, Exeter AQMA	0.0	4.0	No	2.0
DT76	Mill Lane	Urban Background	291555	90449	NO2	NO	8.5	1.0	No	2.0
DT77	Sidwell Street	Kerbside	292553	93082	NO2	YES, Exeter AQMA	6.0	1.0	No	2.0
DT78	Station Road Pinhoe	Other	296415	94165	NO2	NO	1.5	1.5	No	1.7

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT79	Tithebarn Link Road	Roadside	296827	93886	NO2	NO	2.0	2.0	No	2.0
DT80	Exeter Road	Roadside	295967	88876	NO2	NO	14.5	3.0	No	2.0
DT81	St. Leonards Road	Roadside	292637	91991	NO2	NO	0.0	2.0	No	1.7
DT82	Newtown	Urban Background	292847	92911	NO2	NO	0.0	3.5	No	2.0
DT83	New Bridge St	Roadside	291655	92258	NO2	YES, Exeter AQMA	0.0	2.0	No	2.0
DT84	Lower Coombe St	Roadside	291897	92217	NO2	NO	2.0	10.0	No	1.7

**Notes:**

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

(2) N/A if not applicable.

Table A.3 – Annual Mean NO<sub>2</sub> Monitoring Results: Automatic Monitoring (µg/m<sup>3</sup>)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2021 (%) <sup>(2)</sup>	2017	2018	2019	2020	2021
CM1	291939	92830	Kerbside		99.1	27.7	29.1	29.0	18.8	19.2

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

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

**Notes:**

The annual mean concentrations are presented as µg/m<sup>3</sup>.

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

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

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

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

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

Table A.4 – Annual Mean NO<sub>2</sub> Monitoring Results: Non-Automatic Monitoring (µg/m<sup>3</sup>)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2021 (%) <sup>(2)</sup>	2017	2018	2019	2020	2021
DT1	292199	92814	Kerbside		100.0	28.0	29.2	26.5	17.0	20.9
DT2	292315	93016	Kerbside		90.4	25.9	25.2	26.4	17.5	21.4
DT3	292185	93049	Kerbside		92.3	26.5	25.9	27.8	18.8	22.6
DT4	291779	93011	Kerbside		100.0	24.3	23.1	23.8	16.2	19.0
DT5, DT6	291944	92826	Kerbside		84.6	27.9	29.3	27.5	18.5	21.3
DT7	291984	92626	Roadside		100.0	24.4	26.0	22.6	15.7	20.4
DT8	291895	92569	Kerbside		100.0	35.7	33.9	35.7	22.6	27.9
DT9	291943	92511	Roadside		92.3	31.5	29.1	28.5	18.7	24.2
DT10	291833	92433	Kerbside		100.0	31.0	30.8	29.5	18.6	23.4
DT11	292291	92292	Kerbside		84.6	29.2	29.4	28.9	19.5	24.7
DT12	292422	92320	Kerbside		100.0	31.8	31.1	29.3	20.0	23.8
DT13	292590	92743	Roadside		100.0	20.8	21.6	19.6	13.2	16.8
DT14	292832	92731	Roadside		100.0	19.6	20.3	19.0	13.2	16.5

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2021 (%) <sup>(2)</sup>	2017	2018	2019	2020	2021
DT15	292703	92807	Kerbside		100.0	34.1	34.5	31.4	22.3	28.0
DT16	292378	92039	Kerbside		100.0	31.3	34.2	29.3	21.3	26.6
DT17	291699	92091	Roadside		90.4	22.0	22.4	21.4	15.5	18.3
DT18	291657	91973	Roadside		100.0	23.4	22.3	22.7	15.8	19.2
DT19	291669	91812	Kerbside		100.0	<b>40.8</b>	<b>47.0</b>	<b>42.0</b>	28.5	35.7
DT20	291532	91349	Roadside		100.0	33.9	33.6	31.3	22.4	27.4
DT21	291460	91390	Urban Background		100.0	13.7	15.3	12.7	9.1	11.7
DT22	291509	91151	Roadside		100.0	26.8	29.0	26.2	17.7	21.2
DT23	291518	90813	Roadside		100.0	23.4	27.3	23.4	15.3	20.6
DT24	291691	90425	Roadside		82.7	29.1	28.0	23.4	18.3	24.3
DT25	291767	90160	Kerbside		100.0	25.6	26.1	23.5	16.2	19.8
DT26	291520	90531	Roadside		100.0	32.7	31.3	30.2	20.4	25.6
DT27	290864	91725	Kerbside		100.0	37.0	39.9	38.7	26.8	31.6
DT28	291249	91874	Roadside		92.3	20.7	23.9	21.1	15.6	19.9



Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2021 (%) <sup>(2)</sup>	2017	2018	2019	2020	2021
DT29	291376	91944	Roadside		100.0	33.6	<b>43.4</b>	34.4	24.3	29.8
DT30	291500	92055	Roadside		73.1	32.0	33.2	30.1	22.1	28.2
DT31	291351	92169	Roadside		100.0	24.6	25.2	24.3	17.3	20.6
DT32	290826	93598	Roadside		92.3	27.1	25.4	25.4	17.7	21.2
DT33	291253	93299	Roadside		100.0	28.7	30.9	26.8	19.2	24.7
DT34	291242	93483	Kerbside		100.0	38.0	38.3	36.0	26.5	32.1
DT35	291272	93468	Kerbside		100.0	31.9	31.4	31.1	21.5	26.0
DT36	291054	94399	Roadside		100.0	32.3	33.8	32.5	22.9	27.5
DT37	292391	93291	Roadside		100.0	26.7	28.6	28.4	18.3	23.2
DT38	292469	93245	Roadside		100.0	28.4	29.7	27.7	18.1	23.0
DT39	292579	93146	Kerbside		92.3	37.6	38.9	36.2	23.3	31.2
DT40	293047	93877	Roadside		92.3	24.0	28.0	26.4	16.7	21.0
DT41	293405	93395	Roadside		80.8	30.2	31.2	29.8	20.9	24.0
DT42	293251	93375	Kerbside		100.0	<b>41.2</b>	37.2	35.9	25.6	30.6

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2021 (%) <sup>(2)</sup>	2017	2018	2019	2020	2021
DT43	293227	93356	Roadside		100.0	29.2	28.2	25.7	19.2	23.5
DT44	295068	94487	Kerbside		100.0	19.7	20.3	17.8	13.6	15.1
DT45	295888	94101	Kerbside		100.0	18.5	19.1	18.0	14.2	16.6
DT46	296418	94470	Kerbside		100.0	23.3	24.8	23.1	18.4	21.8
DT47	296984	94327	Urban Background		90.4	15.7	18.7	17.9	13.3	15.1
DT48	296494	93782	Roadside		100.0	17.2	19.3	17.6	12.8	15.5
DT49	295413	93689	Roadside		100.0	18.9	19.7	17.9	12.6	15.8
DT50	293091	92825	Urban Background		100.0	14.5	14.5	14.0	9.7	11.6
DT51	293448	92419	Kerbside		100.0	37.2	39.7	35.5	24.3	29.4
DT52	293418	92497	Roadside		92.3	<b>49.9</b>	<b>48.7</b>	<b>42.6</b>	31.1	34.9
DT53	293533	92473	Kerbside		100.0	<b>43.5</b>	<b>46.4</b>	38.5	27.4	32.1
DT54	293738	92396	Roadside		92.3	<b>52.7</b>	<b>53.6</b>	<b>43.4</b>	32.7	37.3
DT55	293781	92409	Roadside		100.0	30.0	31.2	26.7	19.8	23.4
DT56	294043	92359	Roadside		100.0	<b>40.9</b>	<b>43.4</b>	<b>40.3</b>	29.0	32.2

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2021 (%) <sup>(2)</sup>	2017	2018	2019	2020	2021
DT57	294410	92310	Roadside		100.0	59.0	<u>61.9</u>	53.5	38.2	42.2
DT58	295203	92378	Roadside		100.0	49.3	50.6	47.3	33.2	35.4
DT59	295191	92395	Roadside		100.0	19.7	24.5	20.4	14.8	16.0
DT60	295466	92365	Roadside		100.0	35.8	37.0	30.7	23.5	26.8
DT61	295636	92232	Roadside		100.0	23.3	24.2	21.8	15.5	19.2
DT62	295710	90571	Roadside		90.4	20.2	19.2	16.3	11.5	14.7
DT63	294694	90001	Roadside		100.0	25.0	27.0	25.4	18.1	20.7
DT64	294652	89974	Roadside		100.0	19.9	22.6	20.6	17.8	16.9
DT65	296415	88477	Kerbside		100.0	26.9	27.9	24.4	17.2	22.1
DT66	294227	90435	Roadside		100.0	35.4	39.7	36.4	25.0	30.0
DT67	293213	91245	Roadside		100.0	23.4	25.6	21.5	15.9	19.1
DT68	292291	91678	Urban Background		90.4		13.7	13.8	9.4	11.7
DT69	291016	91304	Urban Background		84.6		11.5	11.2	7.6	9.3
DT70	291298	92593	Urban Background		90.4		17.5	16.1	12.3	15.9

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2021 (%) <sup>(2)</sup>	2017	2018	2019	2020	2021
DT71	294387	92611	Urban Background		73.1		11.2	10.5	7.6	9.1
DT72	293617	93090	Roadside		100.0			14.2	10.6	12.2
DT73	293052	94185	Urban Background		92.3			10.2	7.5	8.3
DT74	292056	93043	Urban Background		65.4			11.4	8.3	10.7
DT75	291721	89727	Roadside		100.0			15.8	11.1	13.7
DT76	291555	90449	Urban Background		92.3			14.7	9.6	12.3
DT77	292553	93082	Kerbside		100.0			31.1	18.6	23.8
DT78	296415	94165	Other		100.0			15.1	10.6	13.4
DT79	296827	93886	Roadside		84.6			19.5	14.5	17.3
DT80	295967	88876	Roadside		90.4			19.8	14.3	16.4
DT81	292637	91991	Roadside		100.0			15.6	11.2	13.9
DT82	292847	92911	Urban Background		100.0				10.8	12.6
DT83	291655	92258	Roadside		82.7				19.5	24.0
DT84	291897	92217	Roadside		100.0				15.5	18.6

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

☒ Diffusion tube data has been bias adjusted.

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

**Notes:**

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

Exceedances of the  $\text{NO}_2$  annual mean objective of  $40\mu\text{g}/\text{m}^3$  are shown in **bold**.

$\text{NO}_2$  annual means exceeding  $60\mu\text{g}/\text{m}^3$ , indicating a potential exceedance of the  $\text{NO}_2$  1-hour mean objective are shown in **bold and underlined**.

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

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

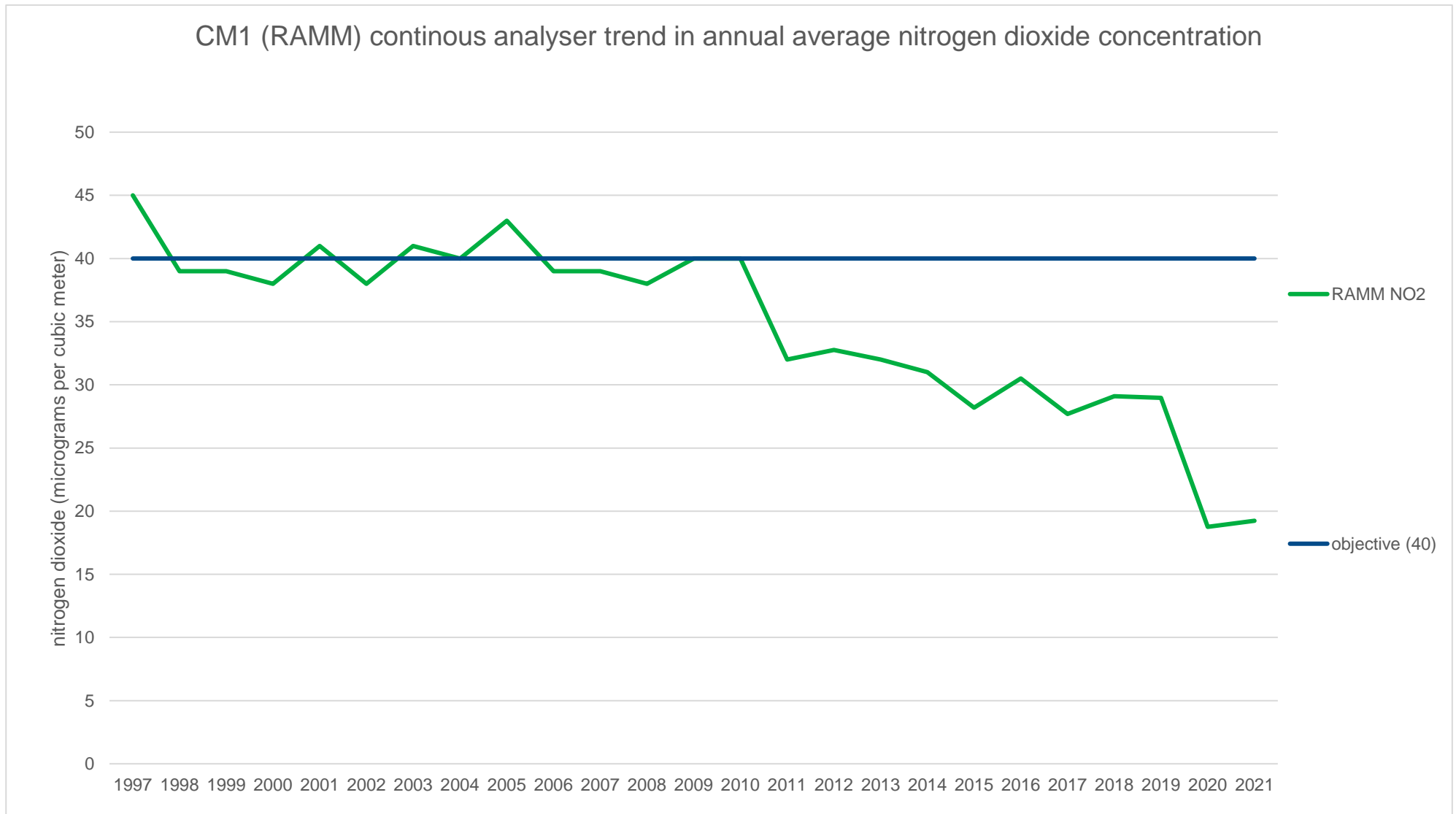
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

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

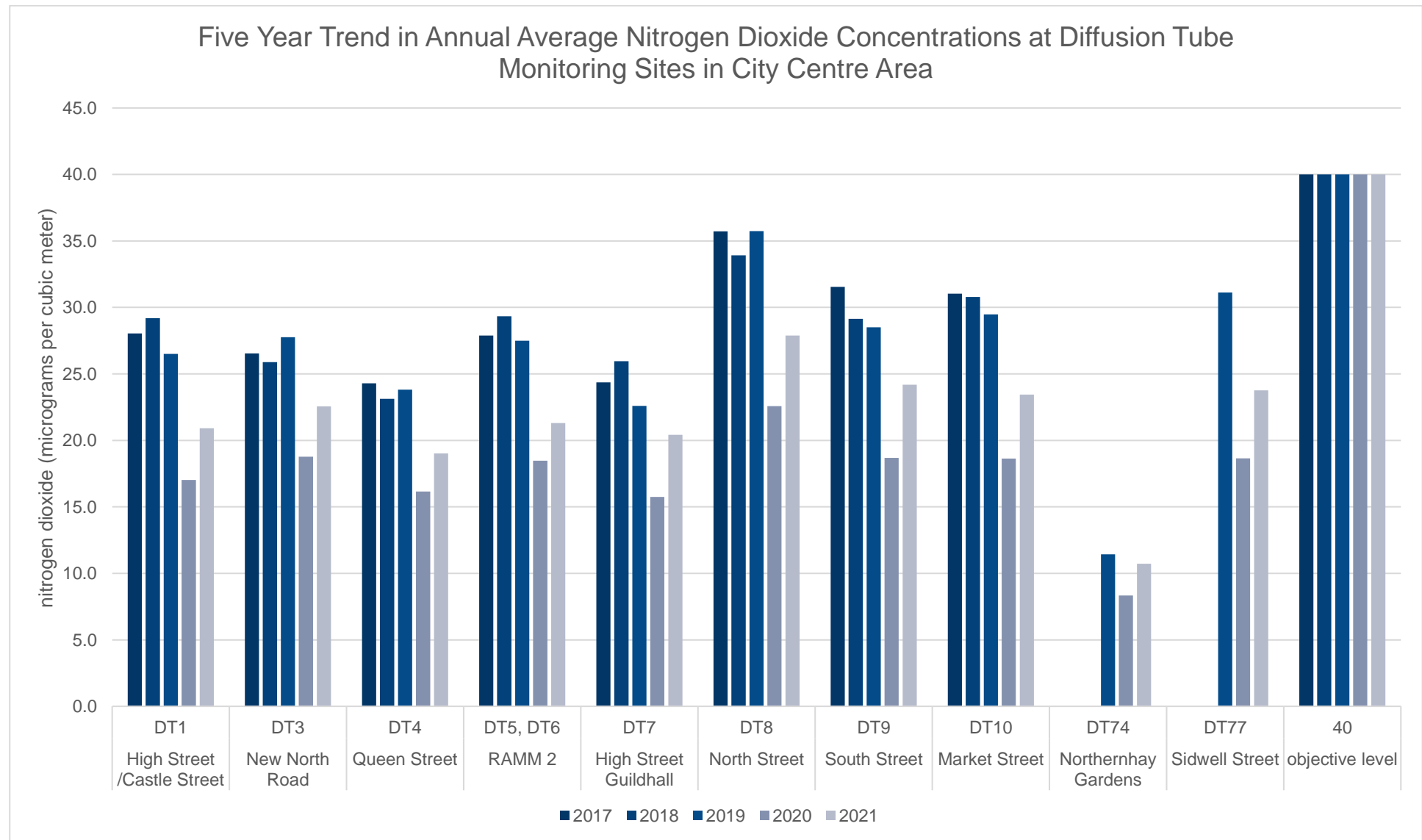
## Figure A.1 – Trends in Annual Mean NO<sub>2</sub> Concentrations

The graphs below show the five year trends in annual average nitrogen dioxide concentrations at the RAMM continuous analyser and then each of the diffusion tube monitoring sites. The diffusion tubes sites are grouped roughly by geographic location. Each graph shows the objective level of 40 micrograms per cubic meter.

The first graph shows concentrations at the RAMM continuous analyser since monitoring commenced in 1997. Levels fluctuated around the objective of 40 micrograms per cubic meter until 2009, since when they have fallen below the objective.

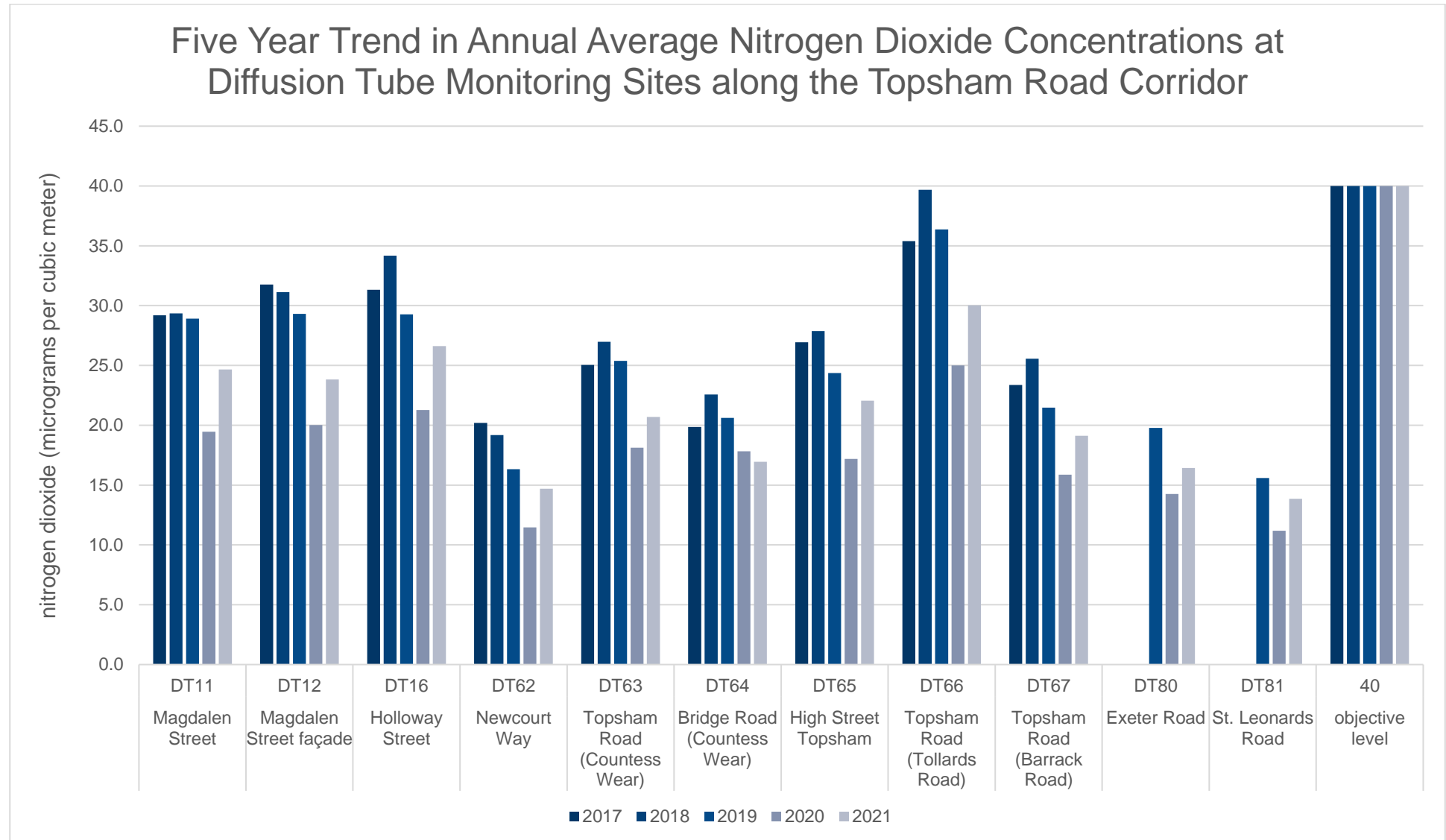


This graph shows the five year trend in concentrations at monitoring sites in the city centre. Concentrations fluctuated slightly between 2017 and 2019, with no long term trend. There was a significant fall in 2020 and then a rise in 2021 but not back to 2019 levels.

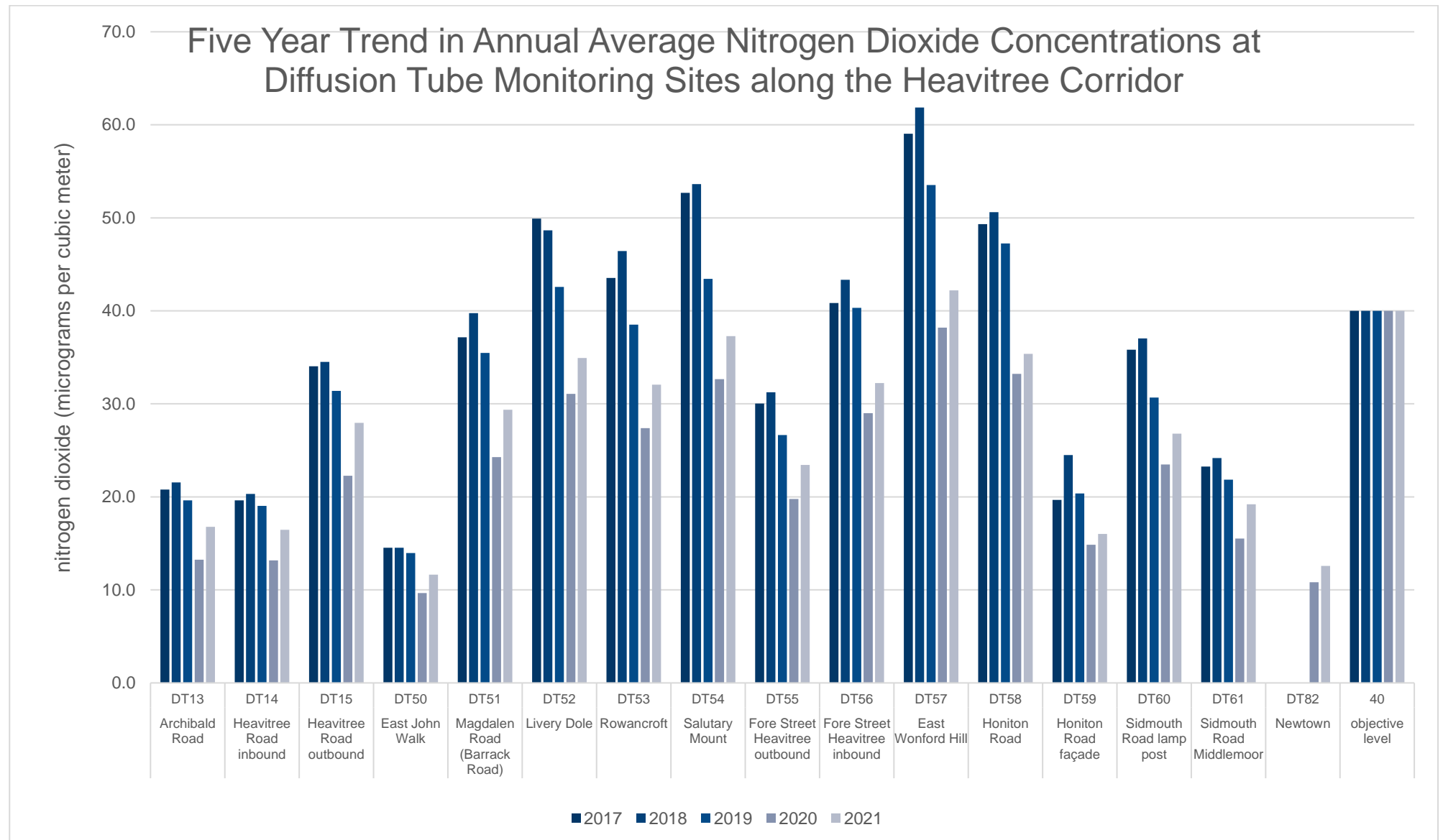




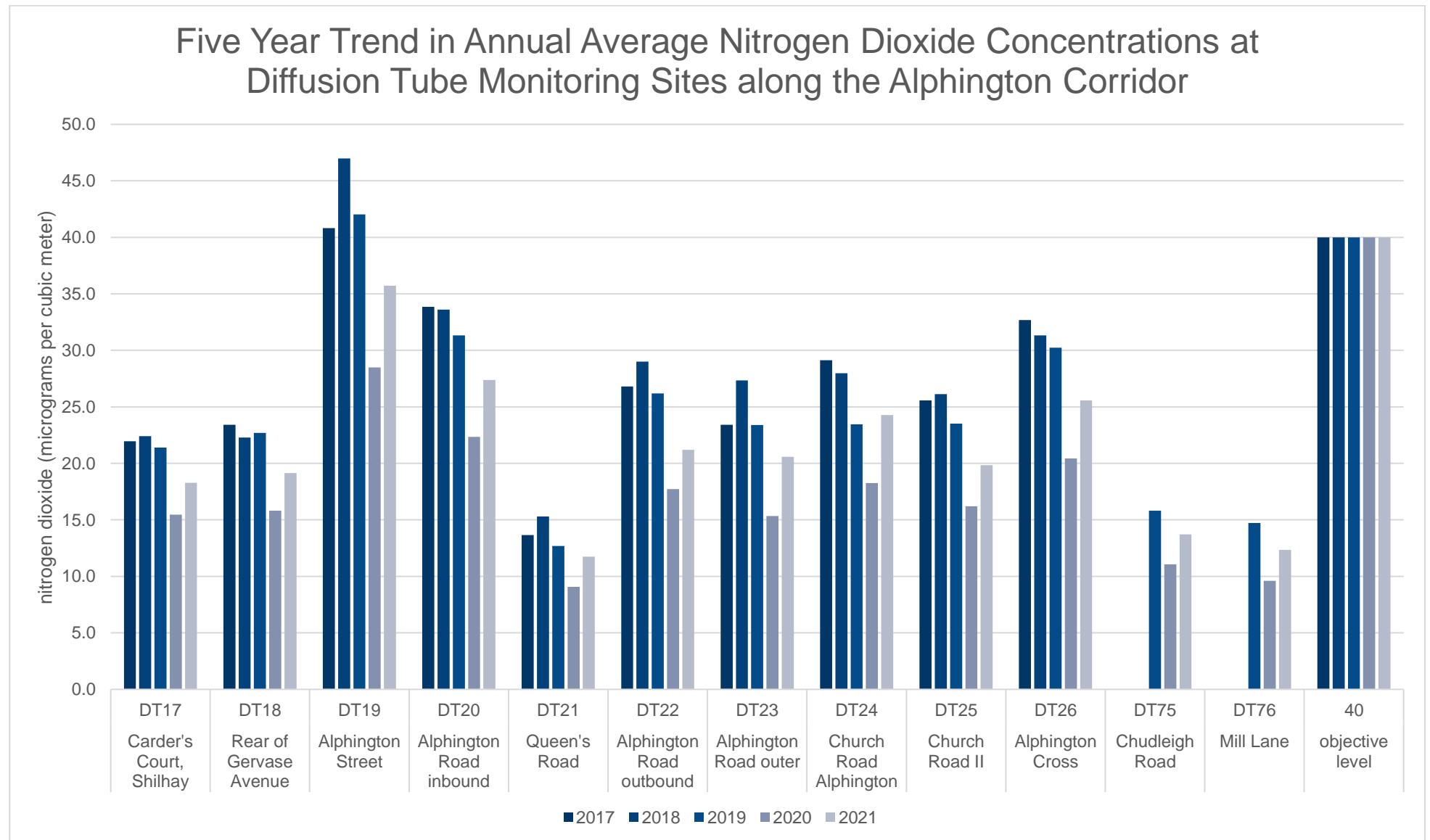
This graph shows the five year trend in concentrations at monitoring sites along the Topsham corridor. Concentrations fluctuated slightly between 2017 and 2019, with no clear long term trend. There was a significant fall in 2020 and then a rise in 2021 but not back to 2019 levels.



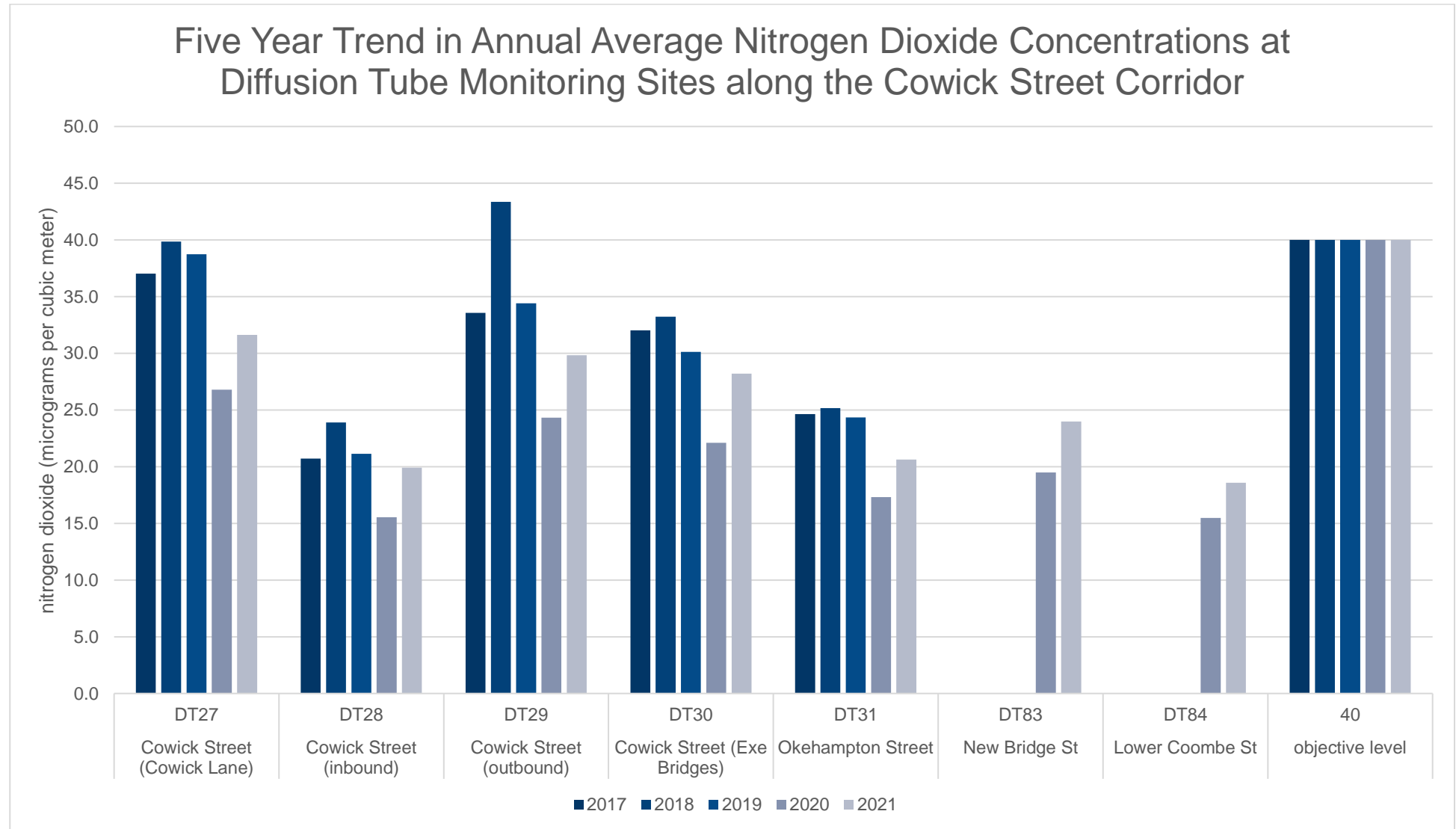
This graph shows the five year trend in concentrations at monitoring sites along the Heavitree corridor. Concentrations fluctuated slightly between 2017 and 2019, with no long term trend. There was a significant fall in 2020 and then a rise in 2021 but not back to 2019 levels.



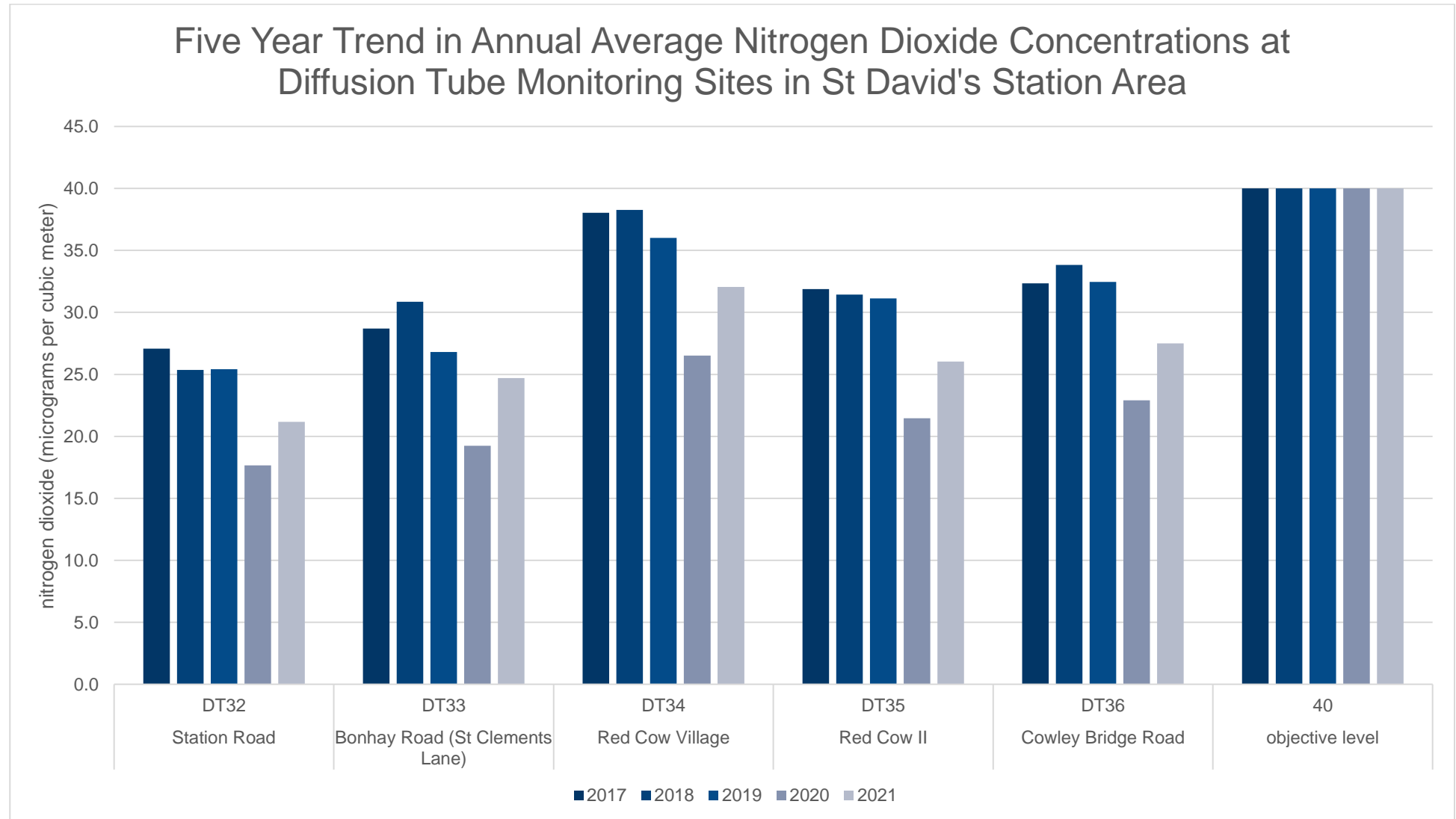
This graph shows the five year trend in concentrations at monitoring sites along the Alphington corridor. Concentrations fluctuated slightly between 2017 and 2019, with no long term trend. There was a significant fall in 2020 and then a rise in 2021 but not back to 2019 levels.



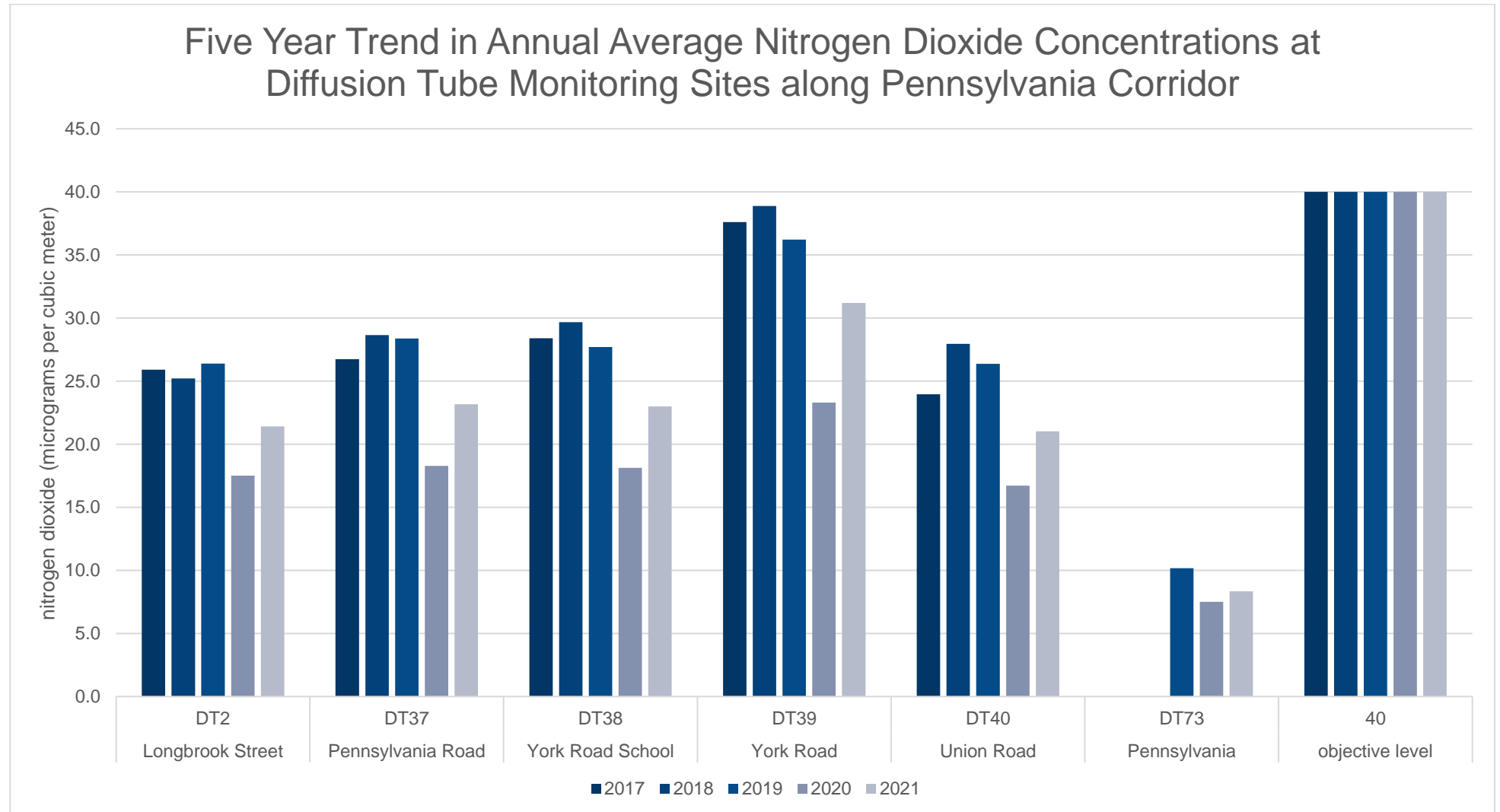
This graph shows the five year trend in concentrations at monitoring sites along the Cowick Street corridor. Concentrations fluctuated slightly between 2017 and 2019, with no long term trend. There was a significant fall in 2020 and then a rise in 2021 but not back to 2019 levels.



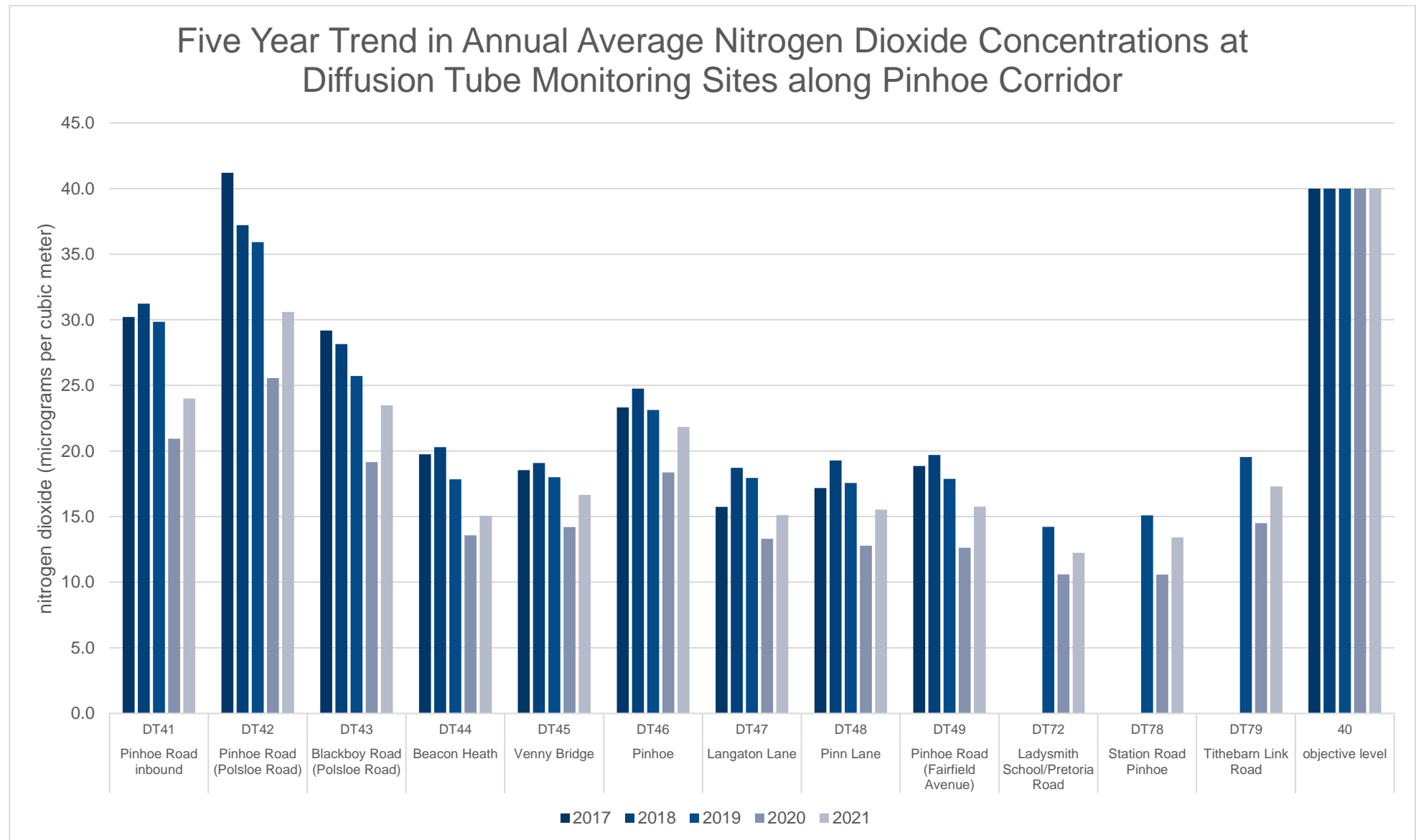
This graph shows the five year trend in concentrations at monitoring sites in the St Davids Station area. Concentrations fluctuated slightly between 2017 and 2019, with no long term trend. There was a significant fall in 2020 and then a rise in 2021 but not back to 2019 levels.



This graph shows the five year trend in concentrations at monitoring sites along the Pennsylvania corridor. Concentrations fluctuated slightly between 2017 and 2019, with no long term trend. There was a significant fall in 2020 and then a rise in 2021 but not back to 2019 levels.



This graph shows the five year trend in concentrations at monitoring sites along the Pinhoe corridor. Concentrations fluctuated slightly between 2017 and 2019, with no long term trend. There was a significant fall in 2020 and then a rise in 2021 but not back to 2019 levels.



This graph shows the five year trend in concentrations at monitoring sites in public open space. Concentrations fluctuated slightly between 2018 and 2019. There was a significant fall in 2020 and then a rise in 2021 but not back to 2019 levels.

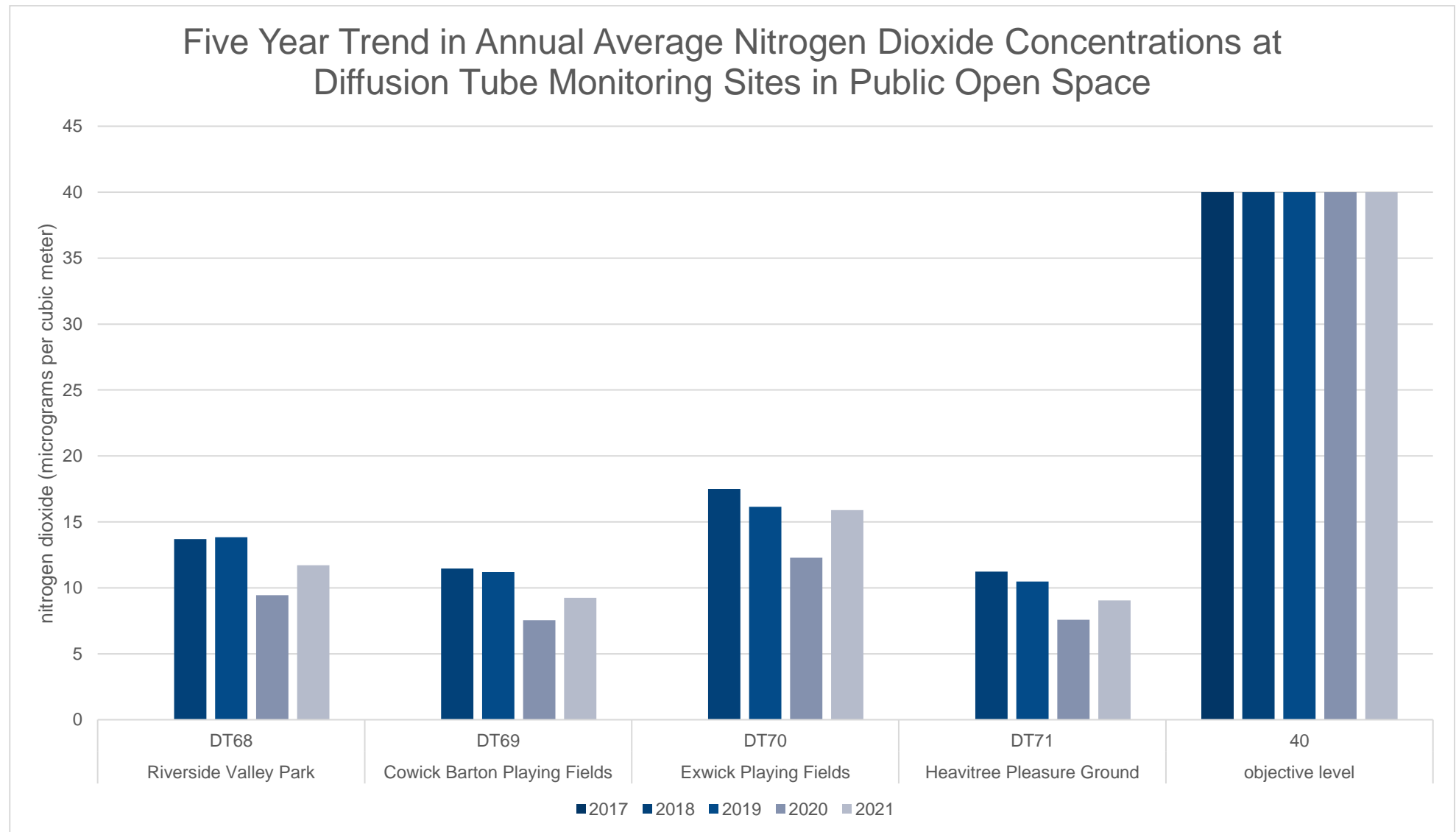




Table A.5 – 1-Hour Mean NO<sub>2</sub> Monitoring Results, Number of 1-Hour Means > 200µg/m<sup>3</sup>

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2021 (%) <sup>(2)</sup>	2017	2018	2019	2020	2021
CM1	291939	92830	Kerbside		99.1	0	0	0	0	0

**Notes:**

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

Exceedances of the NO<sub>2</sub> 1-hour mean objective (200µg/m<sup>3</sup> not to be exceeded more than 18 times/year) are shown in **bold**.

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

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

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

Table A.6 – Annual Mean PM<sub>10</sub> Monitoring Results (µg/m<sup>3</sup>)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2021 (%) <sup>(2)</sup>	2017	2018	2019	2020	2021
CM1	291939	92830	Kerbside		99.7	18	17.7	15.8	14.1	13.9
CM2	291670	91773	Roadside		86.3	19	16.7	15.1	11.5	12.0

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

**Notes:**

The annual mean concentrations are presented as µg/m<sup>3</sup>.

Exceedances of the PM<sub>10</sub> annual mean objective of 40µg/m<sup>3</sup> are shown in **bold**.

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

(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.2 – Trends in Annual Mean PM<sub>10</sub> Concentrations

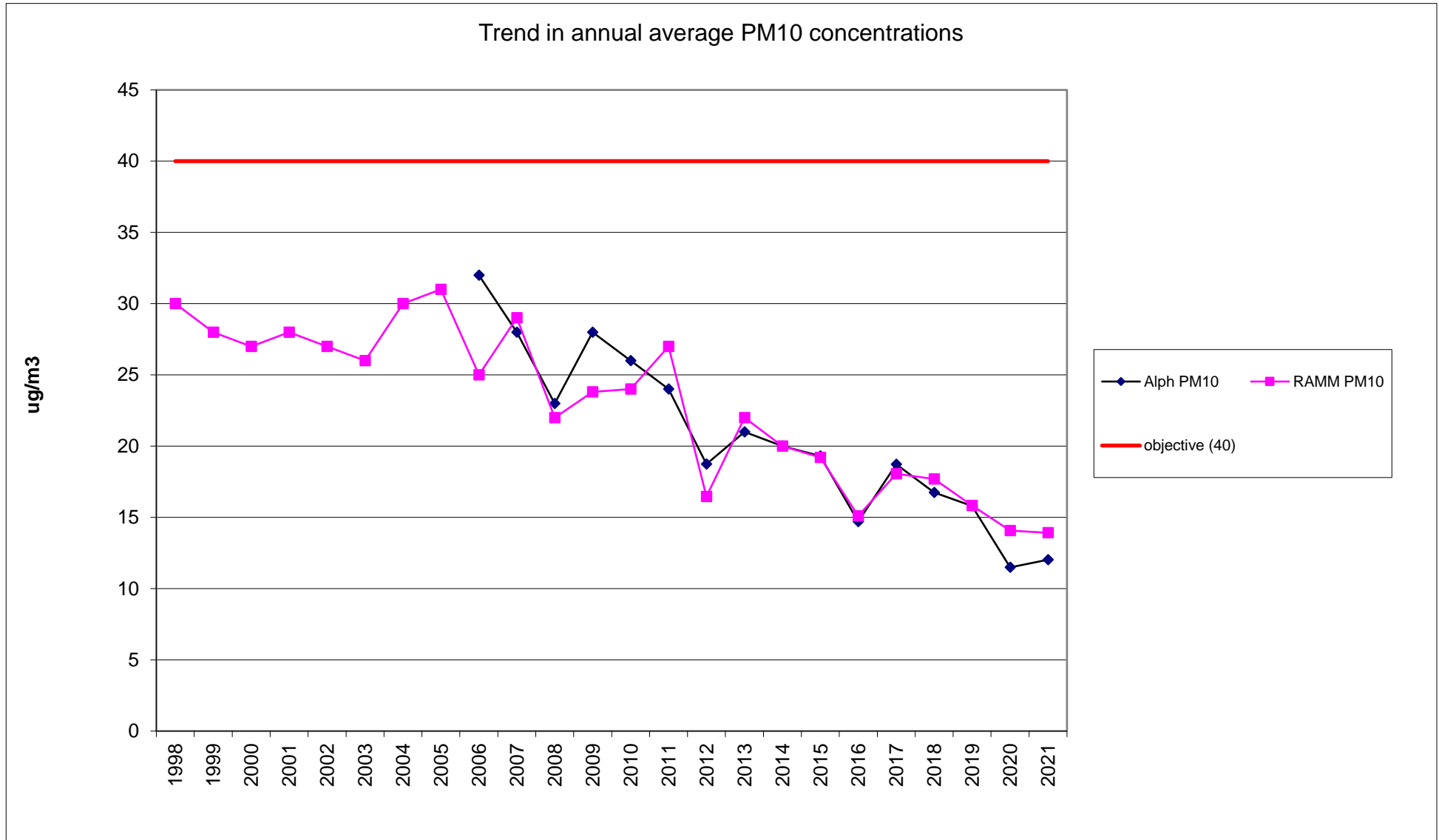


Table A.7 – 24-Hour Mean PM<sub>10</sub> Monitoring Results, Number of PM<sub>10</sub> 24-Hour Means > 50µg/m<sup>3</sup>

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2021 (%) <sup>(2)</sup>	2017	2018	2019	2020	2021
CM1	291939	92830	Kerbside		99.7	1	0 (28.8)	0 (21.2)	1	1
CM2	291670	91773	Roadside		86.3	2	1	4	0 (19.2)	0

**Notes:**

Results are presented as the number of 24-hour periods where daily mean concentrations greater than 50µg/m<sup>3</sup> have been recorded.

Exceedances of the PM<sub>10</sub> 24-hour mean objective (50µg/m<sup>3</sup> 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%).

Table A.8 – Annual Mean PM<sub>2.5</sub> Monitoring Results (µg/m<sup>3</sup>)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2021 (%) <sup>(2)</sup>	2017	2018	2019	2020	2021
CM1	291939	92830	Kerbside		99.7			10.0	8.6	8.4
CM2	291670	91773	Roadside		86.3		9.0	9.5	6.8	7.5

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

**Notes:**

The annual mean concentrations are presented as µg/m<sup>3</sup>.

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

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

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

Figure A.3 – Trends in Annual Mean PM<sub>2.5</sub> Concentrations

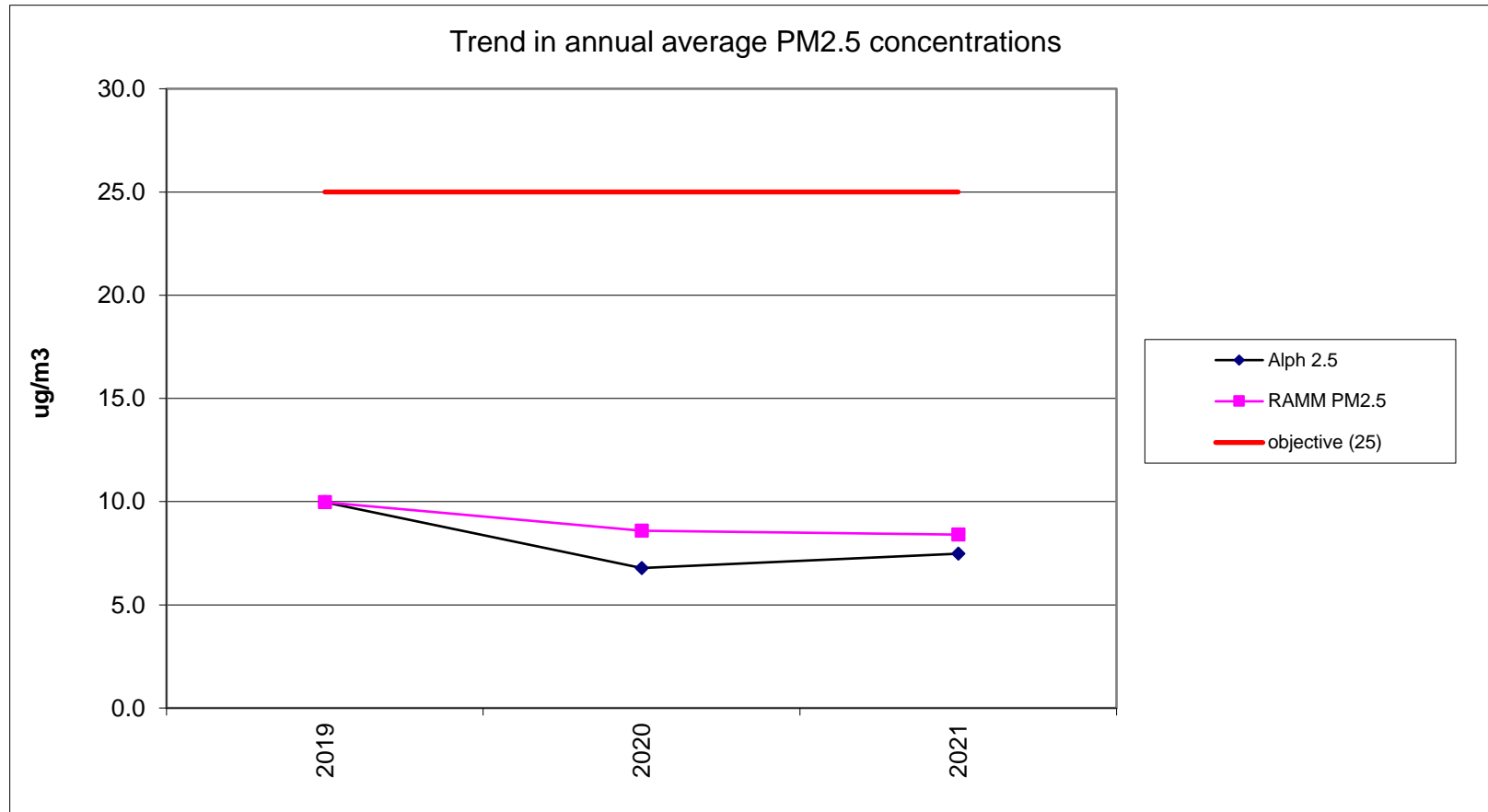


Table A.9 – O<sub>3</sub> 2021 Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2021 (%) <sup>(2)</sup>	2017 O <sub>3</sub> 8-hour mean > 100 (µg/m <sup>3</sup> )	2018 O <sub>3</sub> 8-hour mean > 100 (µg/m <sup>3</sup> )	2019 O <sub>3</sub> 8-hour mean > 100 (µg/m <sup>3</sup> )	2020 O <sub>3</sub> 8-hour mean > 100 (µg/m <sup>3</sup> )	2021 O <sub>3</sub> 8-hour mean > 100 (µg/m <sup>3</sup> )
CM1	291939	92830	Kerbside		98.5	0	12	11	87	0

**Notes:**

If the period of valid data is less than 85%, the 97<sup>th</sup> percentile of 8-hour running means is provided in brackets.

## Appendix B: Full Monthly Diffusion Tube Results for 2021

Table B.1 – NO<sub>2</sub> 2021 Diffusion Tube Results (µg/m<sup>3</sup>)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted 0.84	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT1	292199	92814	29.7	29.3	26.9	27.0	22.3	19.2	20.9	18.4	23.0	24.5	29.4	28.3	24.9	20.9	-	
DT2	292315	93016	26.5	26.4	25.3		25.2	19.7	21.3	18.3	26.6	29.1	31.8	30.2	25.5	21.4	-	
DT3	292185	93049	26.6	25.0	27.7	24.1	28.2		21.4	21.3	26.4	29.7	35.1	29.6	26.9	22.6	-	
DT4	291779	93011	26.3	24.4	21.8	24.0	22.4	17.1	18.8	17.6	21.0	25.7	27.3	25.4	22.6	19.0	-	
DT5	291944	92826	27.4		24.5	26.8	22.5		22.1	23.1	27.1	27.3	32.3	22.0	-	-	-	Duplicate Site with DT5 and DT6 - Annual data provided for DT6 only
DT6	291944	92826	27.4		24.5	26.2			22.5	19.9	27.8	24.8	33.4	23.1	25.4	21.3	-	Duplicate Site with DT5 and DT6 - Annual data provided for DT6 only
DT7	291984	92626	24.6	28.4	25.5	25.1	23.5	18.9	20.0	20.9	24.1	27.5	29.1	24.0	24.3	20.4	-	
DT8	291895	92569	31.9	27.5	33.6	33.3	31.0	28.8	30.9	25.9	37.2	38.6	48.5	31.2	33.2	27.9	-	
DT9	291943	92511		24.3	26.3	26.9	27.4	25.0	28.1	23.3	30.0	33.2	39.9	32.3	28.8	24.2	-	
DT10	291833	92433	26.9	26.9	24.6	24.6	26.2	21.1	24.5	22.3	31.9	34.0	37.1	34.7	27.9	23.4	-	
DT11	292291	92292	29.9	26.4		28.0		22.0	26.4	22.2	32.4	31.0	41.1	34.1	29.4	24.7	-	
DT12	292422	92320	21.7	26.7	28.3	29.3	25.1	22.4	23.5	23.5	31.7	32.3	41.8	33.9	28.4	23.8	-	
DT13	292590	92743	23.7	21.5	19.0	19.9	17.2	14.2	15.7	15.3	21.8	23.4	25.2	23.0	20.0	16.8	-	
DT14	292832	92731	23.2	20.0	20.5	20.4	16.6	15.4	16.5	13.9	20.6	20.9	26.3	20.9	19.6	16.5	-	
DT15	292703	92807	32.5	33.3	32.4	40.1	28.6	28.4	32.4	27.4	39.4	31.7	39.7	33.4	33.3	28.0	-	
DT16	292378	92039	33.1	33.4	31.9	31.8	28.8	28.8	26.2	24.5	35.8	27.1	45.4	33.3	31.7	26.6	-	
DT17	291699	92091	25.9	20.4	23.6	23.2	21.2	16.5	18.4	17.4	21.6		30.5	20.6	21.8	18.3	-	
DT18	291657	91973	25.8	21.2	23.3	22.2	21.3	17.3	16.0	19.5	24.6	25.7	31.7	25.0	22.8	19.2	-	



DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted 0.84	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT19	291669	91812	40.0	42.8	40.9	48.9	38.2	48.6	38.6	37.0	46.9	42.4	50.5	35.4	42.5	35.7	-	
DT20	291532	91349	35.0	30.9	32.5	33.8	29.5	29.6	30.5	26.4	33.3	34.6	42.2	32.8	32.6	27.4	-	
DT21	291460	91390	17.9	16.0	13.3	17.0	10.6	11.1	10.3	12.0	14.0	14.5	16.1	15.1	14.0	11.7	-	
DT22	291509	91151	26.2	30.4	25.1	34.1	19.8	25.3	27.4	22.2	16.6	28.2	30.5	17.1	25.2	21.2	-	
DT23	291518	90813	25.4	28.7	23.7	28.5	22.1	18.9	20.5	21.7	28.2	25.9	23.6	26.7	24.5	20.6	-	
DT24	291691	90425	31.5	27.8	29.6	28.4	30.9	25.3	26.2	24.6			34.5	30.0	28.9	24.3	-	
DT25	291767	90160	25.3	24.0	22.9	23.4	19.5	16.7	20.6	19.6	26.4	25.3	32.5	27.2	23.6	19.8	-	
DT26	291520	90531	33.1	27.9	30.8	29.4	31.6	25.8	27.7	24.9	31.5	33.3	40.4	28.8	30.4	25.6	-	
DT27	290864	91725	39.1	42.3	32.7	37.0	41.3	31.9	35.0	29.6	41.0	43.8	41.6	36.5	37.7	31.6	-	
DT28	291249	91874	25.5	23.1	23.4	27.7	18.5		19.7	20.7	23.3	25.7	28.3	24.6	23.7	19.9	-	
DT29	291376	91944	33.0	37.6	34.0	41.8	38.4	32.5	34.3	28.1	42.5	38.7	37.6	27.5	35.5	29.8	-	
DT30	291500	92055	33.9	28.6	34.2			28.4		29.0	36.3	35.0	45.4	31.5	33.6	28.2	-	
DT31	291351	92169	25.5	23.7	25.7	26.2	24.1	20.7	21.9	19.7	28.3	26.4	28.7	23.9	24.6	20.6	-	
DT32	290826	93598		26.9	22.1	24.2	27.4	22.6	23.0	13.9	29.9	29.6	31.0	26.5	25.2	21.2	-	
DT33	291253	93299	31.8	26.8	29.3	31.0	26.0	25.5	24.9	28.1	31.3	32.0	39.8	26.7	29.4	24.7	-	
DT34	291242	93483	38.7	33.5	38.8	36.1	37.7	38.1	33.0	32.7	40.7	44.7	47.4	36.6	38.2	32.1	-	
DT35	291272	93468	30.9	31.1	31.8	31.1	30.7	27.9	28.4	25.7	34.1	34.9	36.6	28.7	31.0	26.0	-	
DT36	291054	94399	34.9	36.6	31.4	27.9	33.5	27.5	27.4	23.0	37.7	40.6	39.0	33.4	32.7	27.5	-	
DT37	292391	93291	27.9	28.5	25.1	30.3	24.5	23.0	24.6	21.0	32.0	32.9	30.7	30.6	27.6	23.2	-	
DT38	292469	93245	29.9	29.3	27.3	28.5	23.6	23.6	21.9	22.5	29.7	28.6	34.1	29.4	27.4	23.0	-	
DT39	292579	93146	34.5	39.5	33.4	40.4	34.9		32.3	30.2	36.3	41.2	47.6	38.2	37.1	31.2	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted 0.84	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT40	293047	93877	22.3	26.7	23.1	25.2	24.9		21.2	18.3	27.8	29.3	30.1	26.4	25.0	21.0	-	
DT41	293405	93395	33.0	32.4	28.5	27.0	31.8	23.3	25.2	20.2	31.2		33.2		28.6	24.0	-	
DT42	293251	93375	36.6	35.6	32.0	35.1	36.5	32.5	31.2	30.2	44.3	40.5	44.8	37.5	36.4	30.6	-	
DT43	293227	93356	33.8	26.9	30.8	25.4	27.8	23.7	23.4	21.7	28.3	29.7	36.5	27.5	28.0	23.5	-	
DT44	295068	94487	21.6	18.8	18.7	16.5	16.4	13.7	15.6	12.6	19.3	19.6	22.3	19.9	17.9	15.1	-	
DT45	295888	94101	23.4	20.2	19.0	19.1	18.2	15.8	16.7	15.0	21.0	21.8	25.4	22.3	19.8	16.6	-	
DT46	296418	94470	30.8	25.0	27.5	22.3	25.3	18.0	20.6	21.3	27.0	30.4	35.3	28.5	26.0	21.8	-	
DT47	296984	94327	20.3	24.4	16.7	19.3	17.0	13.1		13.7	18.7	18.0	18.1	18.6	18.0	15.1	-	
DT48	296494	93782	21.1	19.9	17.2	17.9	15.7	13.2	14.5	15.2	20.3	21.3	24.4	21.1	18.5	15.5	-	
DT49	295413	93689	23.3	20.4	19.9	19.9	15.6	14.6	13.7	15.2	19.4	19.0	24.4	20.0	18.8	15.8	-	
DT50	293091	92825	18.9	18.3	15.0	13.8	11.3	9.7	10.2	8.8	13.1	14.1	16.5	16.5	13.9	11.6	-	
DT51	293448	92419	38.2	43.1	34.7	38.1	33.3	31.7	29.1	28.0	39.0	34.2	38.3	32.0	35.0	29.4	-	
DT52	293418	92497	46.1	41.4		39.4	44.5	31.1	35.8	35.7	46.2	47.8	50.1	39.3	41.6	34.9	-	
DT53	293533	92473	40.3	41.2	38.7	38.3	39.1	30.8	31.1	29.5	41.8	42.6	49.7	34.8	38.2	32.1	-	
DT54	293738	92396	45.6	47.8	41.6	41.9	52.2	37.8	46.0	35.1	50.2	49.6		40.5	44.4	37.3	-	
DT55	293781	92409	32.1	32.1	29.7	28.4	24.4	23.5	22.0	22.7	29.0	29.5	33.3	28.0	27.9	23.4	-	
DT56	294043	92359	41.6	42.6	36.7	36.5	45.5	29.0	33.7	29.4	42.3	42.5	39.9	40.7	38.4	32.2	-	
DT57	294410	92310	52.9	48.5	48.0	49.8	59.6	40.0	43.1	40.2	61.7	60.2	53.4	45.4	50.2	<b>42.2</b>	-	
DT58	295203	92378	47.5	45.9	43.9	43.0	45.5	33.4	31.8	26.2	49.1	48.4	53.9	36.9	42.1	35.4	-	
DT59	295191	92395	23.3	22.5	20.8	20.6	15.0	12.8	14.9	13.5	21.2	20.7	23.1	20.2	19.1	16.0	-	
DT60	295466	92365	35.9	34.2	30.9	33.3	30.7	27.0	24.4	25.8	39.0	33.4	40.6	27.8	31.9	26.8	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted 0.84	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT61	295636	92232	24.0	26.1	21.6	23.7	22.6	18.9	18.7	15.5	26.4	24.4	27.5	24.9	22.9	19.2	-	
DT62	295710	90571	19.7	17.9	17.0		15.8	14.1	14.6	13.7	20.3	18.0	23.7	17.6	17.5	14.7	-	
DT63	294694	90001	31.0	23.8	26.8	22.5	25.7	18.0	20.6	19.8	26.5	26.9	31.3	22.8	24.6	20.7	-	
DT64	294652	89974	22.6	18.3	21.6	22.3	18.6	16.9	16.4	17.6	19.9	22.0	27.2	18.6	20.2	16.9	-	
DT65	296415	88477	28.9	28.5	26.6	29.8	25.8	24.9	22.4	21.7	28.0	25.2	31.6	21.5	26.3	22.1	-	
DT66	294227	90435	36.1	37.9	35.3	34.3	37.3	33.2	33.1	29.1	42.0	41.4	41.4	27.7	35.7	30.0	-	
DT67	293213	91245	23.3	24.7	20.4	24.7	23.3	16.6	22.3	17.3	27.8	24.7	25.6	22.6	22.8	19.1	-	
DT68	292291	91678	17.1	17.4	13.8	15.4	11.9	9.5		9.0	13.2	16.0	15.2	15.0	13.9	11.7	-	
DT69	291016	91304	15.2	12.9		12.6	8.0	8.7	8.0	7.4	11.5	11.4		14.4	11.0	9.3	-	
DT70	291298	92593	21.3	17.2	18.7	21.1	16.2	14.4	14.6	21.8	19.7		24.3	18.9	18.9	15.9	-	
DT71	294387	92611	13.8	13.3	11.4			7.1		7.2	9.9	10.6	10.6	13.2	10.8	9.1	-	
DT72	293617	93090	18.9	16.4	15.9	13.6	12.8	9.4	10.8	9.0	14.2	16.9	19.7	17.2	14.6	12.2	-	
DT73	293052	94185	12.3	13.7	10.8	9.8	9.3	6.5	6.4	6.4	9.3	10.8		13.8	9.9	8.3	-	
DT74	292056	93043	16.5	14.6		12.3	11.7	7.7	9.1	8.8	12.7				11.7	10.7	-	
DT75	291721	89727	19.0	16.7	16.1	17.9	12.7	12.4	11.4	13.8	17.7	18.2	22.7	17.5	16.3	13.7	-	
DT76	291555	90449	18.3	16.3	16.2	16.0	12.8	11.8	12.1	10.9	16.0	15.2		16.1	14.7	12.3	-	
DT77	292553	93082	30.9	26.2	28.0	30.6	27.3	25.5	24.3	22.4	27.9	31.0	35.3	29.9	28.3	23.8	-	
DT78	296415	94165	18.0	17.4	16.6	16.0	13.5	12.4	13.3	11.7	18.1	16.6	20.1	18.1	16.0	13.4	-	
DT79	296827	93886			20.8	19.2	19.4	16.6	17.1	18.2	24.4	23.2	24.7	22.3	20.6	17.3	-	
DT80	295967	88876	23.8	19.2	20.8		18.9	16.4	16.6	13.2	21.1	20.4	26.2	18.5	19.6	16.4	-	
DT81	292637	91991	20.8	20.5	18.3	16.3	15.3	10.1	12.2	11.2	16.4	16.9	22.0	17.9	16.5	13.9	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted 0.84	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT82	292847	92911	19.1	17.0	16.3	14.3	14.1	8.8	11.0	10.9	11.3	17.2	20.0	19.6	15.0	12.6	-	
DT83	291655	92258	28.7	26.0	29.0	26.9	26.1	23.4		26.9	33.4	35.2		29.9	28.5	24.0	-	
DT84	291897	92217	23.4	19.0	24.0	24.6	19.4	17.0	18.9	19.7	22.0	22.6	32.6	22.4	22.1	18.6	-	

- All erroneous data has been removed from the NO<sub>2</sub> diffusion tube dataset presented in Table B.1.
- Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16.
- Local bias adjustment factor used.
- National bias adjustment factor used.
- Where applicable, data has been distance corrected for relevant exposure in the final column.
- Exeter City Council confirm that all 2021 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.

**Notes:**

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

NO<sub>2</sub> annual means exceeding 60µg/m<sup>3</sup>, indicating a potential exceedance of the NO<sub>2</sub> 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and annualisation.

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

### **New or Changed Sources Identified Within Exeter During 2021**

Exeter City Council has not identified any new sources relating to air quality within the reporting year of 2021.

### **Additional Air Quality Works Undertaken by Exeter City Council During 2021**

Exeter City Council has not completed any additional works within the reporting year of 2021.

### **QA/QC of Diffusion Tube Monitoring**

Exeter City Council uses Gradko diffusion tubes (20% TEA in water). Gradko (GRADKO International Ltd., St. Martins House, 77 Wales Street, Winchester, Hants. SO23 0RH) laboratories hold UKAS accreditation, follow the procedures set out in the Harmonisation Practical Guidance and their performance was satisfactory in the centralised AIR NO<sub>2</sub> PT scheme for quality assurance and quality control.

The tube exposure period used generally follows the Diffusion Tube Monitoring Calendar provided by the Air Quality Support Helpdesk, i.e. an exposure time of 4 or 5 weeks, with an allowed variation in exposure time of  $\pm 2$  days. During 2021, the monitoring was completed in adherence with the 2021 Diffusion Tube Monitoring Calendar.

The tubes are stored in a fridge before they are exposed. Location sites and fixings follow the recommendations in the DEFRA practical guidance on the use of diffusion tubes for NO<sub>2</sub> monitoring, published in 2008. Two tubes are collocated with the continuous analyser at the Royal Albert Memorial Museum (RAMM), Queen Street (Exeter Roadside).

Data from the tubes are ratified and suspect data rejected by Exeter City Council, following the procedure in the DEFRA practical guidance. Random checks of the data in the reporting spreadsheet are also undertaken to ensure that no mistakes were made when

inputting the data. Analysis of the data from the two tubes that are co-located with the continuous analyser shows that these have overall good precision.

### Diffusion Tube Annualisation

Data capture from the diffusion tube at Northernhay Gardens (DT74) was below 75% (67%) so this has been annualised using the LAQM Diffusion Tube Data Processing Tool. Annualisation factors were gained using data from nearby AURN sites Exeter Roadside, Honiton and Plymouth Centre. Details of the calculation method undertaken are provided in Table C.2.

### Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2021 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG16 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO<sub>x</sub>/NO<sub>2</sub> continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Exeter City Council have applied a national bias adjustment factor of 0.84 to the 2021 monitoring data. This means that the diffusion tubes over-estimate actual concentrations when compared to the reference method. The national bias adjustment factor was obtained from the spreadsheet version 03/22, for Gradko diffusion tubes (20% TEA in water) using 32 studies. This local bias adjustment factor was 0.76, derived from the two co-located diffusion tubes at the RAMM continuous analyser (CM1). Details of the calculation method undertaken are provided in Table C.3.

The national bias adjustment factor was chosen for use in this report because despite the co-located tubes at Exeter RAMM showing good overall precision, the data capture for each tube relatively low (83% and 75%). Choosing the national factor was considered to be the more conservative approach.

A summary of bias adjustment factors used by Exeter City Council over the past five years is presented in Table C.1.

Table C.1 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2021	National	03/22	0.84
2020	Local	-	0.74
2019	Local	-	0.89
2018	National	03/19	0.93
2017	Local	-	0.85

### NO<sub>2</sub> Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO<sub>2</sub> concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO<sub>2</sub> fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO<sub>2</sub> concentrations corrected for distance are presented in Table B.1.

No diffusion tube NO<sub>2</sub> monitoring locations within Exeter City Council required distance correction during 2021.

### QA/QC of Automatic Monitoring

Neither of the two PM analysers are part of the national network, however recommended QA/QC procedures from the AURN Local Site Operator's manual are followed. Horiba also service each analyser every six months.

Live PM10 and PM2.5 data is available at this [page](#).

The PM data is collected, validated and ratified by Exeter City Council. Validation involves checking the data daily for instrumentation errors etc. and then visually screening the data on a weekly basis to mark any obviously spurious or unusual measurements. The Council also undertakes data ratification on an approximately three monthly basis as well as following site services. This involves:

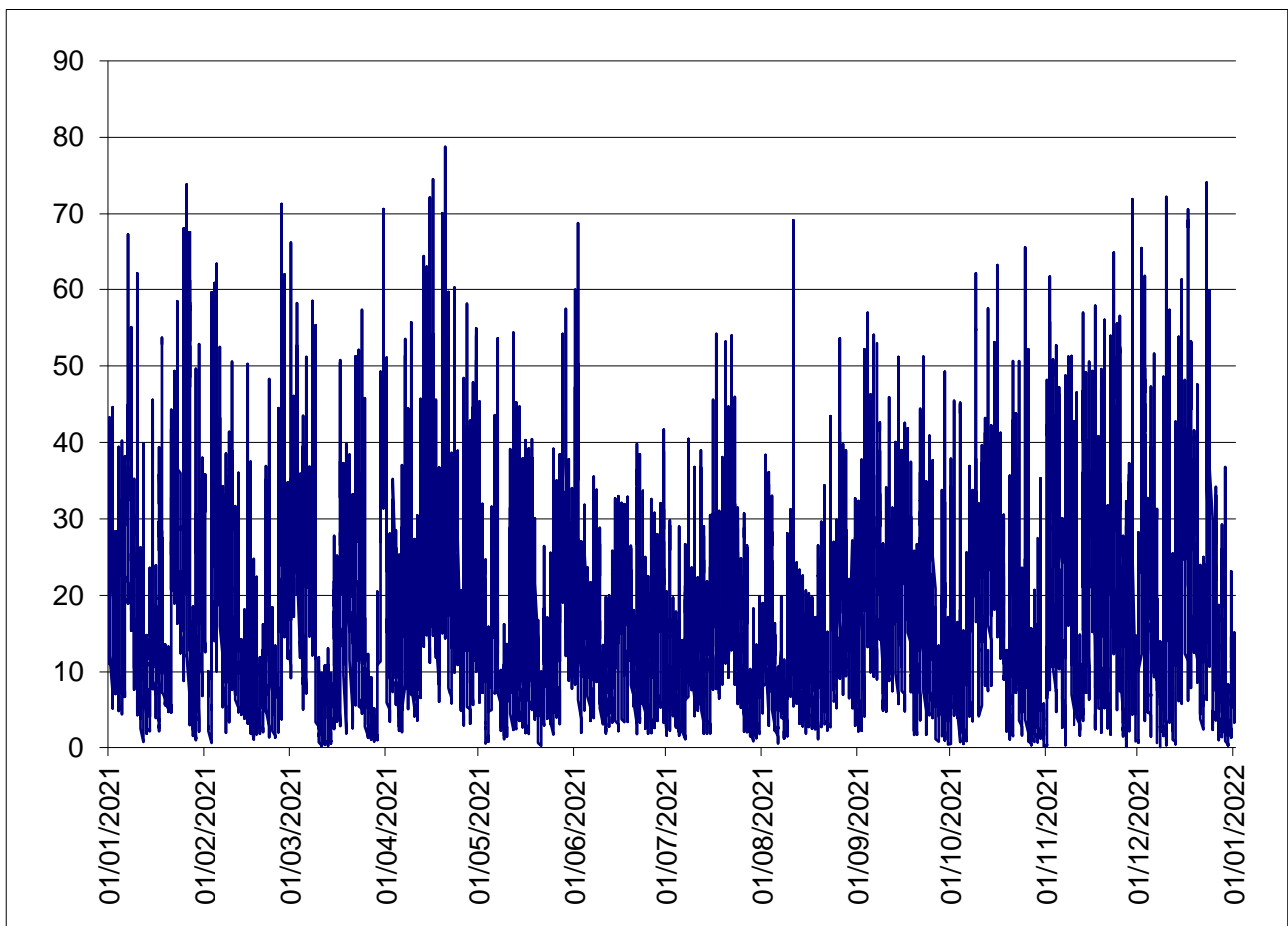
- Comparison of data with other pollutants and other appropriate AURN network sites (roadside sites and other sites in the south west),

- Final checking and deletion of data marked as possibly erroneous,
- Removal of data from unrepresentative periods of operation (e.g. road works in immediate vicinity of site etc. where data is shown or believed to have been affected),
- Adjustment for issues identified during services etc.

The NO<sub>2</sub> data from Exeter Roadside is collected and ratified by the AURN. Network data from the site can be found at [this link](#). It is ratified every 3 months by NETCEN, and is reported in the QA / QC Data Ratification Report for the Automatic Urban Network. Data capture from the NO<sub>2</sub> analyser was 99.1% in 2021.

Plots of hourly average values for nitrogen dioxide, PM<sub>10</sub> and PM<sub>2.5</sub> are shown below in figures C.1, C.2 and C.3.

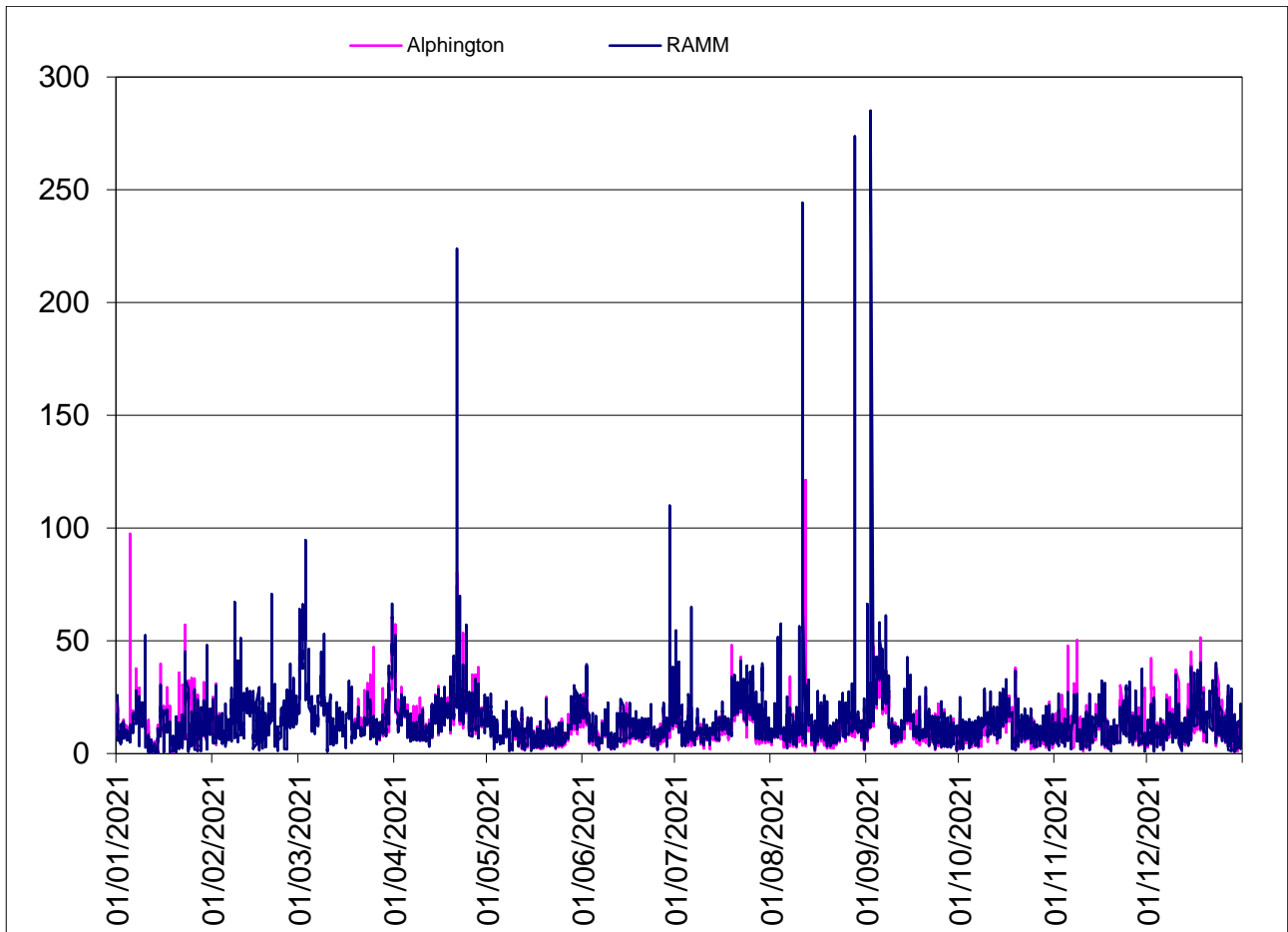
Figure C.1 Hourly NO<sub>2</sub> data from Exeter Roadside (RAMM) (µg/m<sup>3</sup>)



This graph shows the hourly NO<sub>2</sub> data from the RAMM continuous analyser.

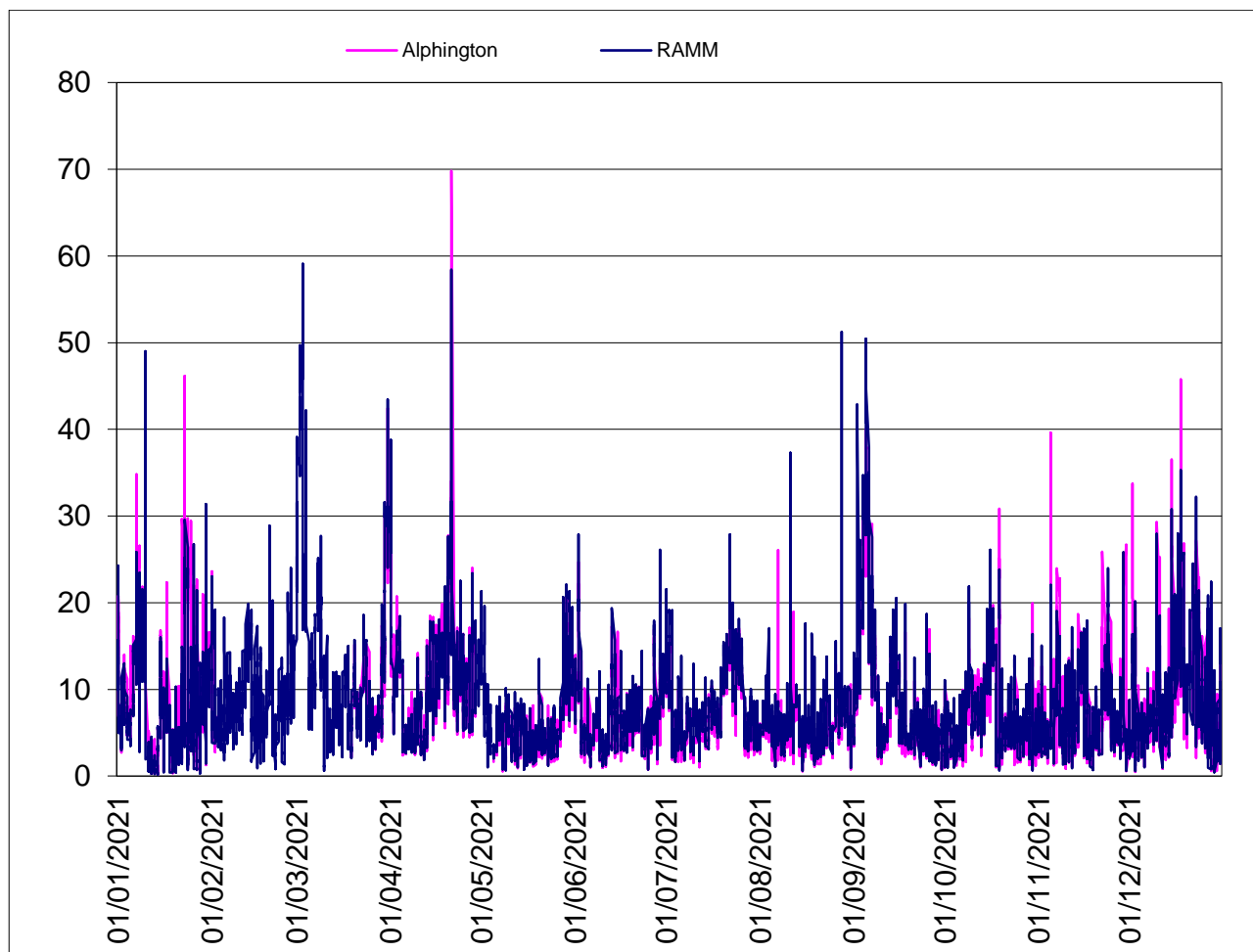


Figure C.2 Hourly PM<sub>10</sub> data from Exeter Roadside (RAMM) and Alphington Street (µg/m<sup>3</sup>)



This graph shows the hourly PM<sub>10</sub> data from the RAMM and Alphington Street continuous analysers.

Figure C.3 Hourly PM<sub>2.5</sub> data from Exeter Roadside (RAMM) and Alphington Street (µg/m<sup>3</sup>)



This graph shows the hourly PM<sub>2.5</sub> data from the RAMM and Alphington Street continuous analysers.

### PM<sub>10</sub> and PM<sub>2.5</sub> Monitoring Adjustment

The type of PM<sub>10</sub>/PM<sub>2.5</sub> monitor(s) utilised within Exeter City Council do not require the application of a correction factor.

### Automatic Monitoring Annualisation

All automatic monitoring locations within Exeter 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 annualisation.

### **NO<sub>2</sub> Fall-off with Distance from the Road**

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO<sub>2</sub> concentration at the nearest location relevant for exposure has been estimated using the NO<sub>2</sub> fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO<sub>2</sub> concentrations corrected for distance are presented in Table B.1.

No automatic NO<sub>2</sub> monitoring locations within Exeter City Council required distance correction during 2021.

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

Site ID	Annualisation Factor Exeter Roadside	Annualisation Factor Honiton	Annualisation Factor Plymouth Centre	Annualisation Factor Site 4 N/A	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
DT74	1.0329	1.0849	1.1635	-	1.0938	11.7	12.8	

Table C.3 – Local Bias Adjustment Calculation

Information	Local Bias Adjustment Input 1	Local Bias Adjustment Input 2	Local Bias Adjustment Input 3	Local Bias Adjustment Input 4	Local Bias Adjustment Input 5
<b>Periods used to calculate bias</b>	9	-	-	-	-
<b>Bias Factor A</b>	0.76 (0.71 - 0.82)	-	-	-	-
<b>Bias Factor B</b>	31% (21% - 41%)	-	-	-	-
<b>Diffusion Tube Mean (<math>\mu\text{g}/\text{m}^3</math>)</b>	25.7	-	-	-	-
<b>Mean CV (Precision)</b>	3.1%	-	-	-	-
<b>Automatic Mean (<math>\mu\text{g}/\text{m}^3</math>)</b>	19.6	-	-	-	-
<b>Data Capture</b>	99%	-	-	-	-
<b>Adjusted Tube Mean (<math>\mu\text{g}/\text{m}^3</math>)</b>	20 (18 - 21)	-	-	-	-

**Notes:**

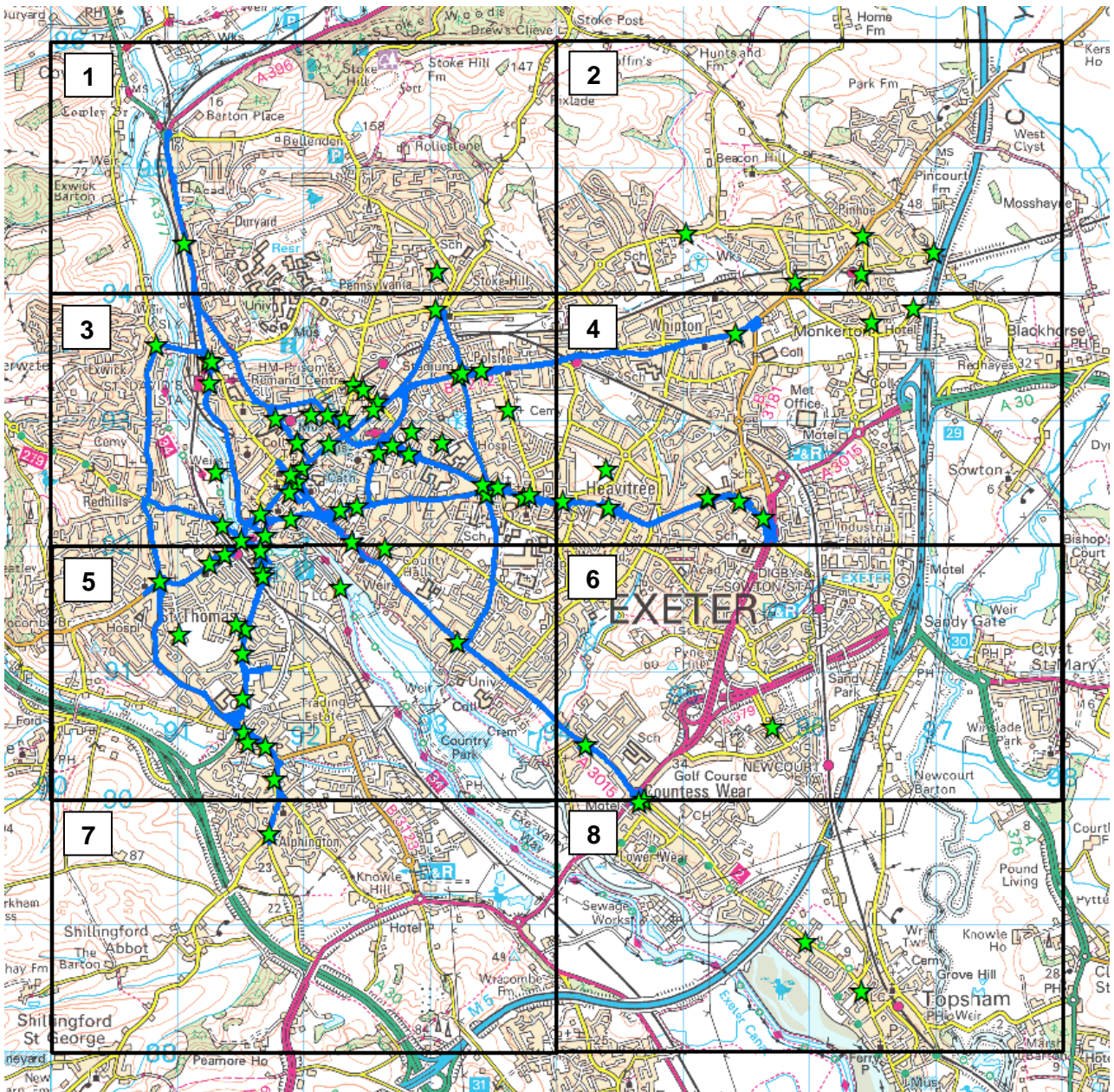
The national bias adjustment factor has been used to bias adjust the 2021 diffusion tube results.

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

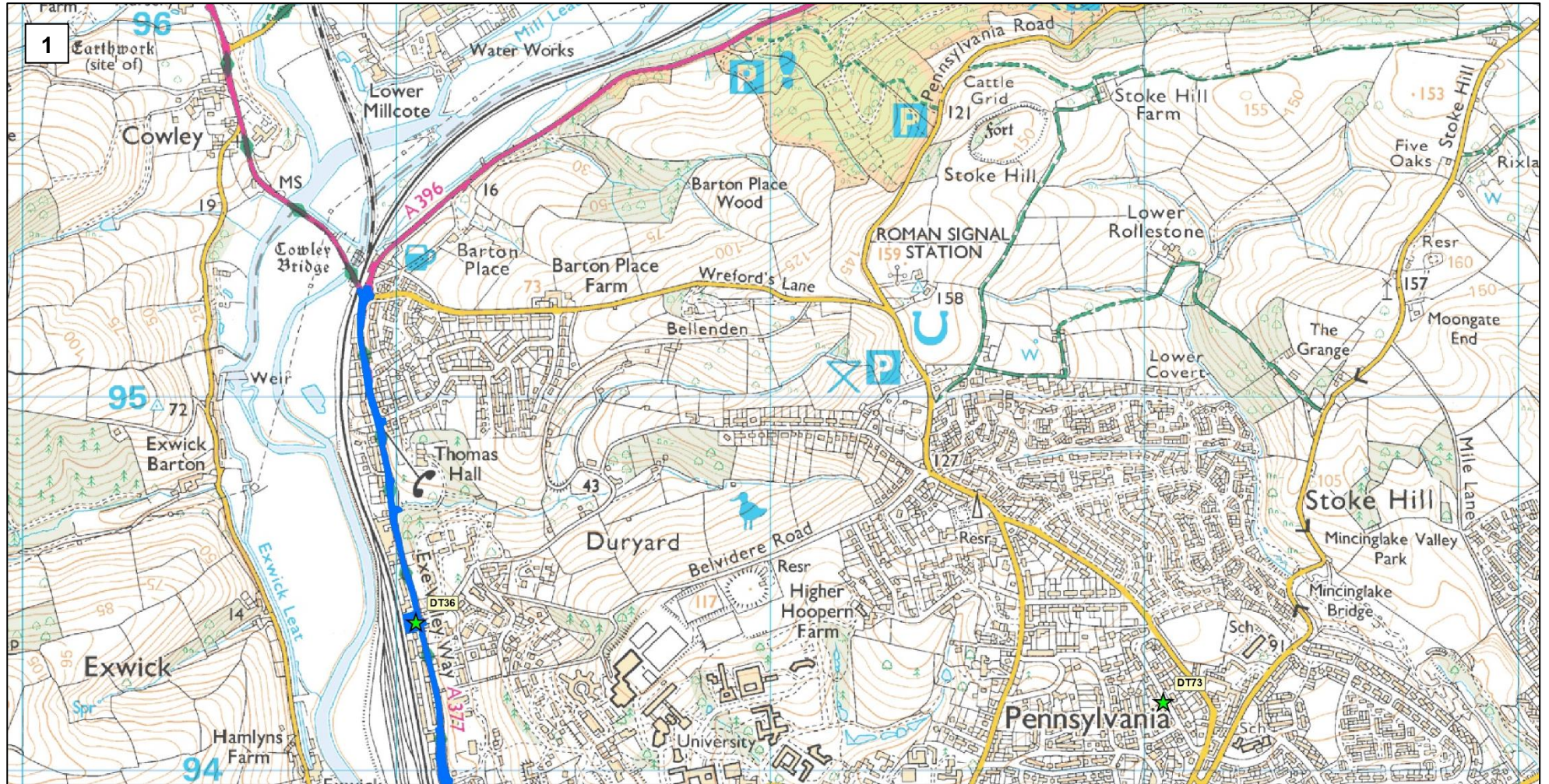
Figure D.1 – Map of Non-Automatic Monitoring Site

The monitoring locations and 2021 data can also be viewed using an online map [here](#).

Monitoring location = ★  
AQMA =



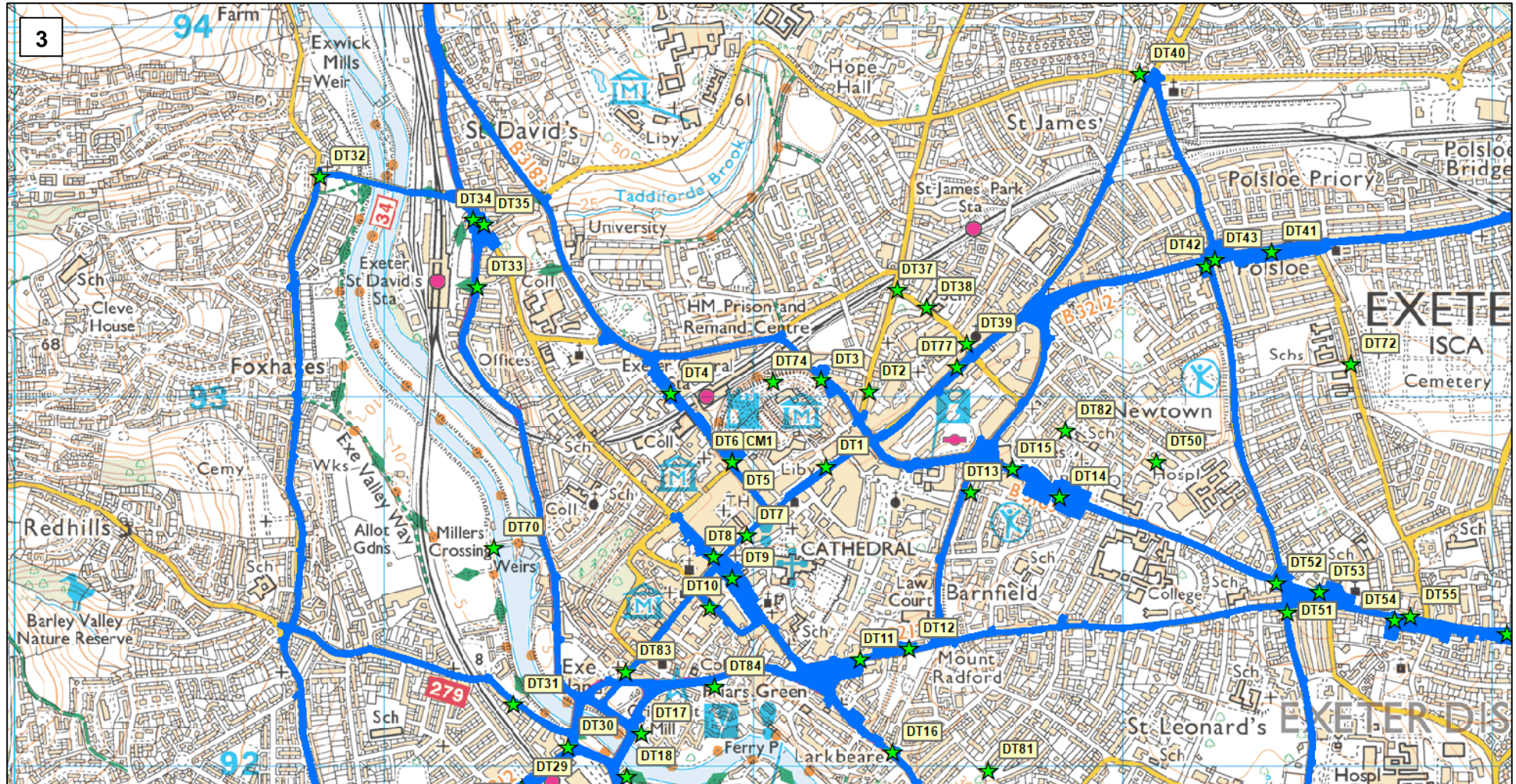
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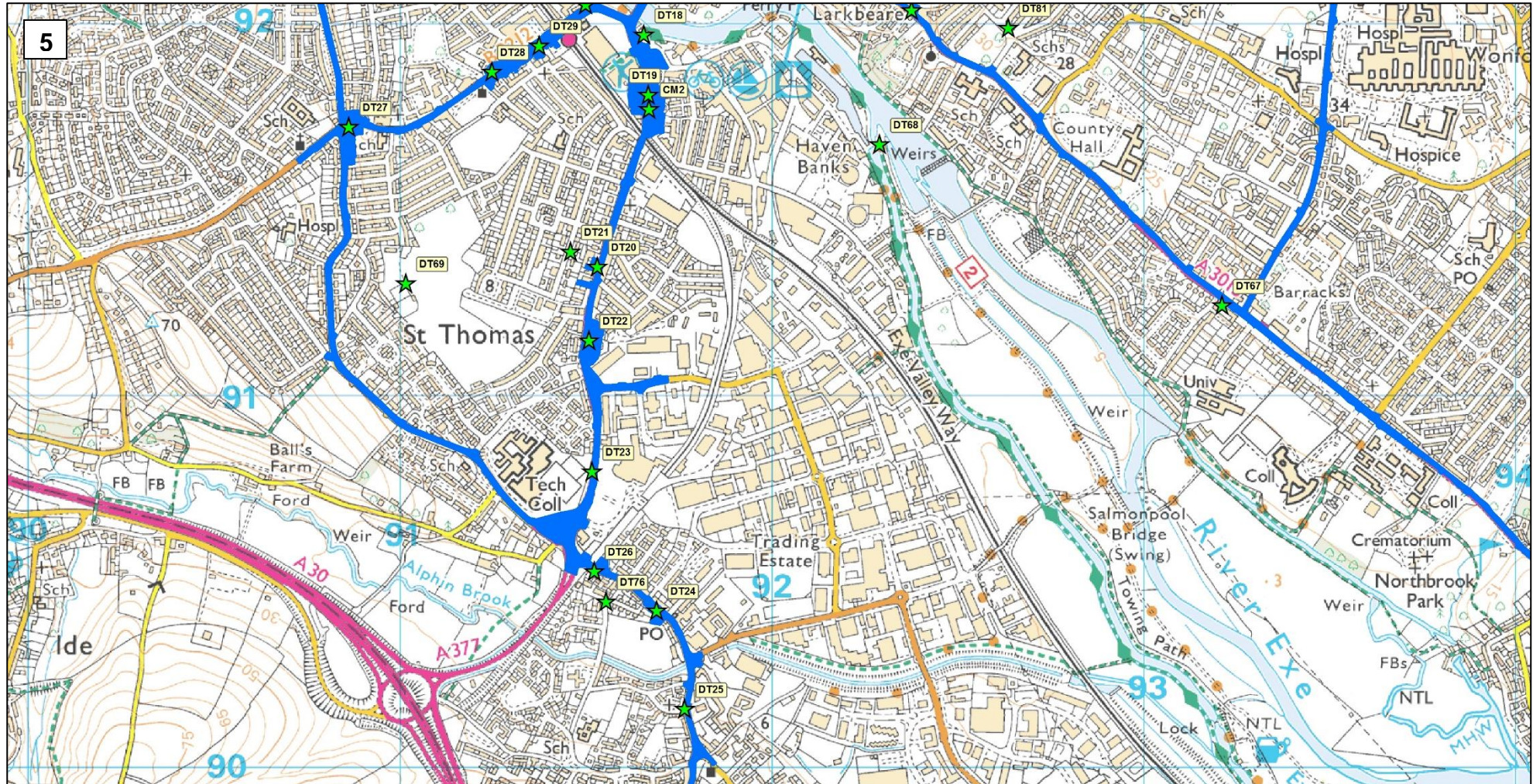


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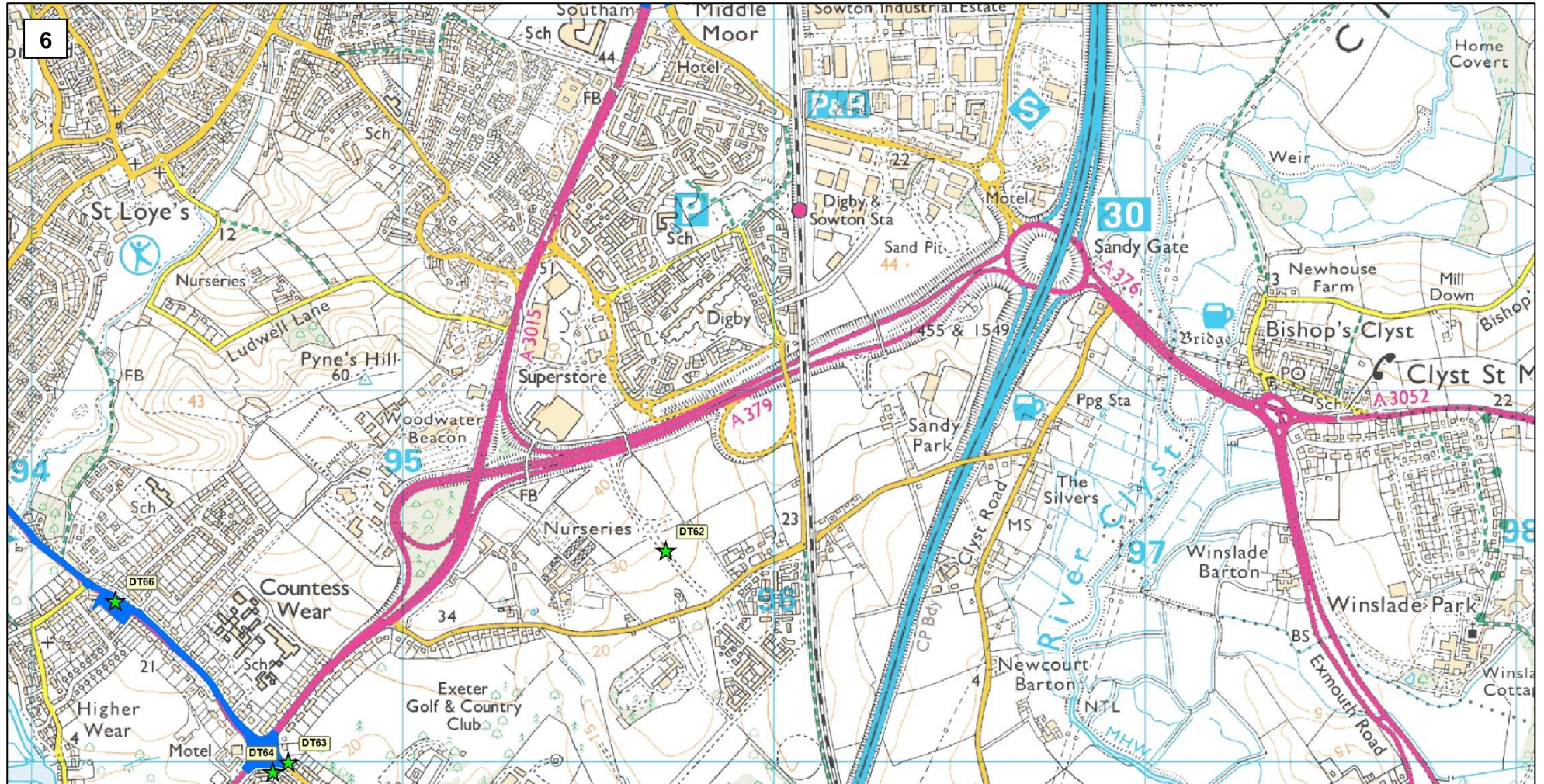




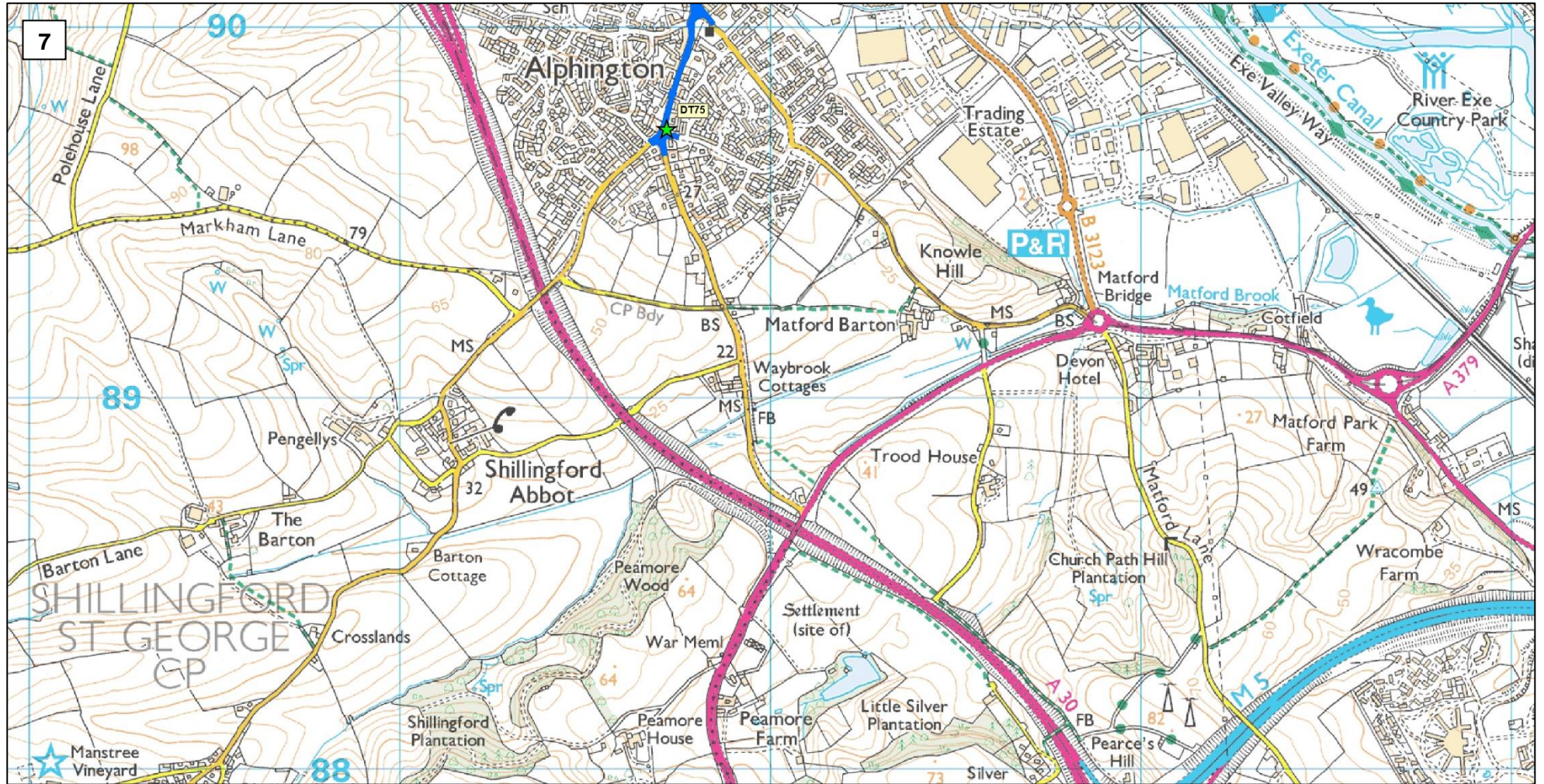
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## Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England<sup>7</sup>

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

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<sup>7</sup> The units are in microgrammes of pollutant per cubic metre of air (µg/m<sup>3</sup>).

## 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 <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Nitrogen Oxides
PM <sub>10</sub>	Airborne particulate matter with an aerodynamic diameter of 10µm or less
PM <sub>2.5</sub>	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO <sub>2</sub>	Sulphur Dioxide
O <sub>3</sub>	Ozone
DCC	Devon County Council
ECC	Exeter City Council
GESP	Greater Exeter Strategic Plan
ECF	Exeter City Futures
SELDP	Sport England Local Delivery Pilot

## References

- Local Air Quality Management Technical Guidance LAQM.TG16. April 2021. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG16. May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Exeter City Council 2019. Exeter Air Quality Action Plan 2019-2023.
- Exeter City Council 2019. Exeter Air Quality Annual Status Report.
- Diffusion Tubes for Ambient NO<sub>2</sub> Monitoring: Practical Guidance for Laboratories and Users 2008
- National bias adjustment factor spreadsheet.
- Devon Local Transport Plans.