



milton keynes 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

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# Executive Summary: Air Quality in Our Area

## Air Quality in Milton Keynes

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>.

In Milton Keynes the pollutant of most concern is nitrogen dioxide (NO<sub>2</sub>) a gas mainly produced during the combustion of fossil fuels, including petrol and diesel, along with nitric oxide (NO). Short term exposure to NO<sub>2</sub> can cause inflammation of the airways and increase susceptibility to respiratory infections and allergens. Breathing in high levels of NO<sub>2</sub> can exacerbate symptoms of pre-existing heart and lung conditions, such as chronic obstructive pulmonary disease (COPD) and asthma.

In Milton Keynes the main source of oxides of nitrogen, along with fines particles is from road traffic emissions. An Air Quality Management Area (AQMA) was declared in 2008 in High Street South and Bridge Street, Olney because the annual mean nitrogen dioxide objective was being exceeded. There is a slight downward trend in the annual mean nitrogen dioxide (NO<sub>2</sub>) and particulate matter (PM<sub>10</sub>) concentrations measured over the last 15 years at the Civic Offices automatic monitoring station. This improvement is mirrored at the two other automatic monitoring stations located in Newport Pagnell and in

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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

Olney. Since 2015 the annual mean objective for NO<sub>2</sub> has not been exceeded at any monitoring location throughout the Borough, including within the AQMA.

In Milton Keynes Council (a unitary authority) air quality is managed jointly by Environmental Health, Transport Policy, Development Control, Public Health and Sustainability Departments. The Council also works in partnership with other local authorities in Buckinghamshire as a member of the Buckinghamshire Air Quality Management Group (BAQMG) and with the Environment Agency (East of England Region).

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

### Milton Keynes Strategy for 2050

The [Milton Keynes Strategy for 2050](#) was approved at Full Council on 20<sup>th</sup> January 2021. It sets out a vision for the future of the city including 120,000 new jobs, affordable homes priced in line with local incomes, a high-tech electric road tram system, and expanded green spaces. The new long-term strategy is intended to inspire urban planners and investors to come up with more creative and well-planned ideas for MK – including innovations to help the city achieve its ambition to be carbon neutral by 2030 and carbon negative by 2050. One goal is to make it easier for everyone to travel around the city with

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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

less congestion, aided in part by a 'Mass Rapid Transit System' connecting key destinations via electric powered trams. Further details can be found in Project Four of the Strategy – [Smart, Shared and Sustainable Mobility](#)

**Figure 1 MK Strategy for 2050 Seven Big Ambitions**



## **MK Connect**

MK Connect is the biggest demand-responsive transport project of its type in the UK. It was introduced as an affordable service for people who are not served by a bus route, or for when other choices like cycling are not an option.

You can book an MK Connect vehicle when you're ready to travel, and unlike an immediate door-to-door taxi you may be sharing it with other people heading the same way. There will likely be a short wait just like at a bus stop. Most people wait around half an hour, though it can be longer.

The easiest way to book is by the MK Connect smartphone app, which you can download from your preferred app store. If you don't have a smartphone or need extra help, our customer service team can make the booking for you. If you do have the app, you can track vehicle progress in real time.

October 2021 saw the 100,000<sup>th</sup> journey on MK Connect and in November it won the UK Bus Award for Technology and Innovation 2021.

### Figure 2 MK Connect demand-responsive transport service



### Get Around MK app

A new smartphone app has been launched by MK Council to help local people and visitors make quick, clean, and green transport choices in Milton Keynes.

The first phase of the Get Around MK transport app is now live and available to download to smartphones for free on the Google Play and Apple App Store.

The launch of new Get Around MK transport app comes after the council recently published its Get Around MK website and is part of a wider £500K investment in sustainable transport following the huge uptake in cycling, walking, and scooting during the COVID-19 pandemic. The goal is to make it as easy as possible for local people to find a greener transport option that's right for them.

Both Get Around MK web and mobile platforms host a range of interactive features, including a live map of roads and Redways, nearest bus stop locator and details of bike hire locations, EV car charging points and lots more.



## **Electric vehicle community charging hubs**

2021 saw the creation of two new electric vehicle community charging hubs in Milton Keynes. These new hubs are part of the Milton Keynes Go Ultra Low City Scheme (GULCS), which is funded by the newly renamed Office for Zero Emission Vehicles (OZEV). The GULCS has already created the successful Electric Vehicle Experience Centre that provides independent help and advice to residents and businesses who are interested in electric vehicles.

The community hubs have been designed to provide facilities for electric vehicles owners / users who do not have dedicated off-street parking. Each hub will provide several 7kW charge posts where vehicles can be charged over several hours, the hubs will also include some 50kW rapid chargers for use by those who want to obtain a charge over a shorter period.

The BP Pulse charge posts at the hubs will be familiar to drivers who already charge in Milton Keynes. The posts will be available for all electric vehicle drivers and will complement the existing Milton Keynes Council scheme.

The hubs will also host a community electric vehicle car club that will be operated by Enterprise Car Club. The car club will provide electric vehicles, based at each hub, that can be rented by the hour or day, with 24/7 access 365 days of the year. Users who sign-up to become a member of the Enterprise Car Club in Milton Keynes will also have access to a further 1,400+ vehicles across the UK.

## **e-Cargo bikes made available for local businesses**

Last year MK Council introduced 21 [e-cargo bikes](#) to its vehicle fleet to help make council business travel more sustainable.

The Council's tree and highway inspectors will use the bikes as a greener way of getting around the borough for their investigations.

Highway and tree inspections clock up around 5,000 miles of council travel each year. The council intends to lead the way with sustainable transport solutions and will continue to explore alternative travel options to help meet its ambition for MK to become zero-carbon by 2030.

The Council secured funding from the Department for Transport to purchase the e-cargo bikes, which can carry up to 630 litres providing a green transport solution for first and last mile deliveries.

12 of the bikes have been made available to lease by local businesses, community groups and parish and town councils. Local business ReSync Deliveries has clocked up its 500th clean mile using one of our fully electric e-cargo bikes, reducing its carbon footprint for local deliveries.

### Figure 3 500<sup>th</sup> clean mile on Council e-cargo bike



### 'Ride it, Lock it, Love it' campaign - cycle parking for businesses

The new campaign aims to encourage more Milton Keynes residents to cycle to work by providing safer and securer bike storage for local businesses.

Milton Keynes Council is working in partnership with sustainable transport firm [PWLC](#) Projects, and bike park suppliers [Turvec](#), to offer free bicycle parking stands to businesses in the borough.



Milton Keynes Council has earmarked £45,000 from its Transport Policy budget for the project, and businesses are being urged to apply to help them reduce emissions and boost their green credentials.

As part of Milton Keynes Council's £500,000 Green Recovery Fund for Sustainable Transport Initiative, businesses could also qualify for a [grant](#) of up to £1,000 for use on measures introduced to the workplace that help encourage staff to use more sustainable modes of transport. This could allow companies to enhance their facilities by providing covered parking, public bike pumps, repair stations, or charging points for e-bikes.

### **Carbon reduction Schemes**

We launched our [Sustainability Action Plan](#) in 2019 and we've since been working on several high-impact carbon reduction schemes with the goal to become a carbon zero organisation by 2030. These have included making our council homes and other properties more energy efficient, creating electricity from MK's waste, introducing low energy streetlighting, and replacing gas boilers in schools with clean heat pumps.

This and other work have helped us reduce our carbon footprint by a third last year, and we're on track to reduce it by two thirds each year by 2024. We're already looking into further projects that will close the gap and make our organisation entirely carbon neutral by 2030 and carbon negative by 2050. This includes things like solar farms, fully carbon neutral council homes, electric buses, and a fleet of household waste collection vehicles powered by electricity produced from the very waste they collect.

Figure 4 Carbon reduction schemes happening across the Council



## Conclusions and Priorities

All air quality objectives have been achieved throughout the Borough even though the city continues to grow rapidly. Concentrations of NO<sub>2</sub> in Milton Keynes are slightly up from 2020 but continue the long-term downward trend. This long-term downward trend has also been seen in the levels of PM<sub>10</sub>. Priorities for the coming year are to continue promoting the use of ultra-low emission vehicles (ULEVs) and the initiatives in the MK Go Ultra Low City scheme. The public will also be encouraged to use public transport and to cycle and walk making full use of the extensive (325 km) Milton Keynes Redway system. The Council will be following the vision set out in the [MK Strategy for Future 2050](#) and promoting the use of the [Get Around MK](#) app and new [MK Connect](#) Service. We hope to continue the success of the [e cargo bikes](#) and [e scooters](#), and make further progress the [community electric car clubs](#) across Milton Keynes.

Actions and initiatives detailed in the governments' [Clean Air Strategy 2019](#) (published January 2019) are designed to reduce emissions and air pollution leading to improved health and quality of life.

The new Local Plan for Milton Keynes, [Plan:MK](#), covering the period up to 2031 was adopted by Milton Keynes Council on 20 March 2019. Details of the council's major developments, including a location map of sites can be found on the [Planning Hub](#).

All applications for new developments that may have an impact on air quality have been assessed against the [guidance documents](#) produced by the Institute of Air Quality Management (IAQM).

## Local Engagement and How to get Involved

The public can get involved visiting the [Get Around MK](#) website to find greener, more sustainable ways to travel and by downloading the new Get Around MK smartphone app. It is part of a wider £500K investment in sustainable transport following the huge uptake in cycling, walking and scooting during the COVID-19 pandemic. The goal is to make it as easy as possible for local people to find a greener transport option that's right for them. There is information on joining a cycling group, find a walking buddy, or discover local bus routes and schedules. Both Get Around MK web and mobile platforms host a range of interactive features, including a live map of roads and Redways, nearest bus stop locator and details of bike hire locations, EV car charging points and lots more.

There are lots of biking opportunities for all abilities and ages in Milton Keynes, including guided cycle rides, training for children and adults and the widely available [Santander](#) and [Lime-E](#) hire bikes. A new initiative funded jointly by MK Council and the Arts Council England, the [Pedalling Culture](#) project, is designed to increase cultural tourism by providing new trails and routes for walkers, runners and cyclists to ensure sustainable access to our cultural venues. Milton Keynes Council has teamed up with [Love to Ride](#) with big cycling campaigns throughout the year. [E-scooters](#) are now available for use as an alternative to vehicles for short journeys.

## Local Responsibilities and Commitment

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

Environmental Health, Transport, Planning and Sustainability teams.

If you have any comments on this ASR, please send them to Megan Harrison at:

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# 1 Local Air Quality Management

This report provides an overview of air quality in Milton Keynes 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 Milton Keynes Council to improve air quality and any progress that has been made.

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

## 2 Actions to Improve Air Quality

### 2.1 Air Quality Management Areas

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

A summary of AQMAs declared by Milton Keynes Council can be found in Table 2.1. The table presents a description of the AQMA that is currently designated within Milton Keynes Council. Appendix D: Maps of Monitoring Locations and AQMAs provides a map of AQMA and 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

We propose to revoke Olney AQMA. A report was compiled last year and attached in Appendix G of Air Quality ASR 2021. This needs to be taken forward this year.

**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
Olney AQMA	Declared December 2008	NO2 Annual Mean	An area in Olney encompassing all properties fronting Bridge Street and High Street South, and also including part of Market Place.	NO	43.2	18.49	Olney Action Plan, 2012	<a href="https://www.milton-keynes.gov.uk/environmental-health-and-trading-standards/pollution/local-air-quality-management">https://www.milton-keynes.gov.uk/environmental-health-and-trading-standards/pollution/local-air-quality-management</a>

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

Milton Keynes Council confirm that all current AQAPs have been submitted to Defra.

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

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

Defra comments	MKC comments
The report is well structured, detailed, and provides the information specified in the Guidance.	Noted
1. The report stated that automatic monitor Fixed monitors O <sub>3</sub> , monitoring results, trend and discussion are welcome.	Ozone results included in this year's report.
2. Good and accurate QA/QC procedures were applied. Calculations for bias adjustment were outlined in detail.	Noted
3. Based in the monitoring results in 2020, the Council has started compiled the report of revoking the Olney AQMA. This demonstrates the Councils proactive and dedicated approach to monitoring air quality across the area. The Council should continue and finish the process of revocation of Olney AQMA in next year.	There has been a delay in the revocation, but this will be completed this year.
4. The comments from last year's ASR have been addressed. The council has explicitly stated the comments from the previous appraisal in 2021 report.	Noted and repeated in this year's report.
5. Council have provided a clear map of the diffusion tube monitoring network; trends are displayed and discussed in the report, this is welcomed.	Noted and repeated in this year's report.

Milton Keynes 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. Twenty-seven measures are included within Table 2.2, with the type of measure and the progress Milton Keynes Council have made during the reporting year of 2021 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

More detail on these measures can be found in their respective Action Plans, links to which are in the table. Key completed measures are:

- New air quality monitoring analysers and communication system, installed in February 2019, are now running smoothly after some initial problems.
- Launch of the Get Around MK website and app
- Launch of the MK Connect Service
- E-cargo bikes up and running.
- E-scooters scheme implemented

Milton Keynes Council expects the following measures to be completed over the course of the next reporting year:

- MK electric car community clubs launched and expanded

Milton Keynes Council's priorities for the coming year are:

- Encouraging the continued uptake of ULEVs following the [MK Go Ultra-Low City scheme](#) and the expansion of the electric vehicle charging network.
- Promoting the [Get Around MK](#) website and app.
- Progressing the measures in the [Mobility Strategy](#), the [First and Last Mile Strategy](#) and the [Transport Infrastructure Delivery Plan](#).
- Progressing the measures in the [Sustainability Strategy](#).
- Progressing the measures in the [Milton Keynes Future for 2050](#) strategy.

The principal challenges and barriers to implementation that Milton Keynes Council anticipates facing are any ongoing and further impacts from Covid-19.



The measures stated above and in Table 2.2 have already achieved compliance in Olney AQMA and Milton Keynes Council anticipates that they will achieve exposure reduction across the borough.

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	Go Ultra Low City Scheme	Promoting Low Emission Transport	Other	2017		MK Council	Office for Low Emission Vehicles (OLEV)	NO	Partially Funded		Implementation	n/a	ULEV ownership per capita	EV Centre opened in July 2017 and by June 2019 had welcomed 100,000 visitors and arranged 4000 test drives.	Trialling of driverless cars on highways and pods on shared footpaths <a href="https://www.gov.uk/government/news/40-million-to-drive-green-car-revolution-across-uk-cities">https://www.gov.uk/government/news/40-million-to-drive-green-car-revolution-across-uk-cities</a>
2	Expansion of Electric Vehicle charging network	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2015		MK Council	MK Council/OL EV	NO	Partially Funded		Implementation	n/a	Number of recharging events No of charge points	New charging hub at MK Coachway with 8 rapid and 4 ultra-rapid charge points. More than 400 public charge points installed.	15 min hub sites identified to act as multi charger sites to support residential charging
3	Vivacity - a sensor network providing real-time transport information; volume, classification, speed, turning counts, parking availability.	Traffic Management	UTC, Congestion management, traffic reduction	2017	2018	MK Council/Vivacity	MK Council/Vivacity	NO	Partially Funded		Completed	n/a		Approx. 400 sensors on highways and 1300 on parking areas.	Parking data purchased by MyMK for use in parking app. Traffic junction sensors are currently turned off.
4	Urban Traffic Management Control (UTMC) system	Traffic Management	UTC, Congestion management, traffic reduction	2018	2022	MK Council/DfT	National Productivity Infrastructure Fund. Planning tariff/section 106 agreement	NO	Funded		Implementation			First tranche of CMK signals upgraded, more to follow. CCTV and more of system to be delivered in next 2 years.	Installing an urban traffic management control system, inc bus priority measures.
5	UK Auto Drive programme	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2015	2018	MK Council, Government, industries	MK Council, Government, industries £19.4M	NO	Partially Funded	£10k - 50k	Completed			Trialling of driverless pods on shared footpaths ongoing. trialling of driverless cars on public highways in MK started March 2018	Research, development and integration of automated and connected vehicles <a href="http://www.ukautodrive.com/the-uk-autodrive-project/">http://www.ukautodrive.com/the-uk-autodrive-project/</a>
6	Free ULEV green car parking permit. Cheaper permits for low emission vehicles	Promoting Low Emission Transport	Priority parking for LEV's	2016		MK Council	MK Council	NO	Not Funded		Implementation	n/a	Number of permits issued	Introduced July 2016	<a href="https://www.milton-keynes.gov.uk/highways-and-transport-hub/smarter-choices/electric-vehicle-charge-points">https://www.milton-keynes.gov.uk/highways-and-transport-hub/smarter-choices/electric-vehicle-charge-points</a>
7	Smarter travel choices	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2012		MK Council	MK Council	NO	Not Funded		Implementation	n/a	Number of visits to website per month, currently 5000 per month	ongoing	New website developed <a href="https://www.getsmartertravelmk.org/">https://www.getsmartertravelmk.org/</a>

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	Love to Ride - website encouraging cycling – cycle September June bike week. Prizes	Promoting Travel Alternatives	Promotion of cycling	2017		MK Council	MK Council	NO	Not Funded		Implementation		Number of new rides and miles ridden per 12 months	All time participation stats up to April 2019: 134 organisations, 1858 people, 434 new riders, 1,147,712 miles 95,929 trips	Cycle incentives website <a href="https://www.lovetoride.net/miltonkeynes">https://www.lovetoride.net/miltonkeynes</a>
9	Super Redway Routes	Transport Planning and Infrastructure	Cycle network	2017		MK Council	MK Council	NO	Not Funded		Implementation			H6 super route completed. Works have been undertaken on other Redway routes e.g., H8 Marlborough St.	Awaiting funding for further routes
10	Cycling information, events and opportunities	Public Information	Via the Internet	2011		MK Council	MK Council	NO	Not Funded		Implementation	n/a		ongoing	Peddalling Culture Website developed <a href="http://www.peddallingculture.com/">http://www.peddallingculture.com/</a>
11	Santander bike hire	Transport Planning and Infrastructure	Public cycle hire scheme	2017	2020	Santander/ Nextbike	Santander/ Nextbike	NO	Funded		Completed	n/a	Number of hires	300 bikes 42 docking stations	Scheme relaunched in Dec 2019 with new cycle fleet and docking stations.
12	Lime-E Bikes	Transport Planning and Infrastructure	Public cycle hire scheme	2018		Lime	Lime	NO	Funded		Implementation	n/a	Number of hires	50 bikes supplied (dock less GPS tracked)	Bikes are unlocked using phone app
13	Public Health support for healthy schools	Promoting Travel Alternatives	Promotion of walking	2019	2024	MK Council	MK Council	NO	Not Funded		Implementation	n/a	No. of schools engaged	MoreLife UK commissioned to deliver- due to start schools element in Sept 2019	Working to improve the whole school environment to reduce childhood obesity- from physical activity policies to staff training and will include active travel
14	Modeshift STARS – national schools awards scheme	Promoting Travel Alternatives	School Travel Plans	2017		MK Council/DfT	DfT	NO	Partially Funded		Implementation		Number of schools registered	40 schools registered. 19% light green modes (bus, park&stride, car sharing) 41% green modes (walking, cycling, scooting) 40% car	Walk to school, bike school and scooter training <a href="https://modeshiftstars.org/#">https://modeshiftstars.org/#</a>
15	East West Rail	Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services	2019	2024	East West Railway Company / Network Rail	EWR Consortium	NO	Funded		Implementation	n/a		Phase 1 complete. Phase 2 construction started early 2020	<a href="https://www.eastwestrail.org.uk/">https://www.eastwestrail.org.uk/</a>
16	A421 Dualling to M1 J13	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2018	2021	Central Beds Council/MK Council	DfT £28.5m project	NO	Funded	£10k - 50k	Completed			Initial preparatory roadworks commenced Sept 2018	<a href="http://www.centralbedfordshire.gov.uk/transport/a421/overview.aspx">http://www.centralbedfordshire.gov.uk/transport/a421/overview.aspx</a>

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
17	Highways England All-Lane Running (ALR) Smart Motorway	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2018	2022	Highways England	Highways England £373m project	NO	Funded	£100k - £500k	Planning	Environmental report found NO2 emissions not significant and scheme will ease congestion		Works commenced June 2018	<a href="https://highwaysengland.co.uk/projects/m1-junction-13-to-junction-16-smart-motorway/">https://highwaysengland.co.uk/projects/m1-junction-13-to-junction-16-smart-motorway/</a>
18	Real time passenger information (RTPI) – bus routes	Transport Planning and Infrastructure	Bus route improvements	2014		MK Council	MK Council	NO	Not Funded		Implementation	n/a		Most key routes now have RTPI	<a href="https://www.milton-keynes.gov.uk/highways-and-transport-hub/bus-and-taxi/real-time-passenger-information">https://www.milton-keynes.gov.uk/highways-and-transport-hub/bus-and-taxi/real-time-passenger-information</a>
19	E-cargo bikes project	Promoting Travel Alternatives	Promotion of cycling	2020	2021	MK Council	Govt grant £220K	NO	Funded	£100k - £500k	Implementation		Mileage undertaken using electric bikes	21 e-cargo bikes purchased	Level of take up for lease - will promote this for businesses
20	Milton Keynes Strategy for 2050	Other	Other	2020	2032	MK Council		NO	Not Funded		Planning			Long term strategy approved by Cabinet Dec 2020	<a href="https://www.mkfutures2050.com/">https://www.mkfutures2050.com/</a>
21	Electric Vehicle charging technologies trial	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2020	2021	MK Council CrowdCharge Flexitricity		NO	Funded		Implementation			Trial in progress	<a href="https://crowd-charge.com/">https://crowd-charge.com/</a>
22	E-scooters	Alternatives to private vehicle use	Other	2020	2021	MK Council, Lime, Spin, Ginger	DfT	NO	Funded		Implementation		Number of hires	Initial trial of 50 completed, now 300 available for public use	<a href="https://getaroundmk.org.uk/get-connected/go-electric/e-scooter-trials">https://getaroundmk.org.uk/get-connected/go-electric/e-scooter-trials</a>
23	Solar powered bus stops	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	2020	2021	MK Council	MK Council	NO	Not Funded		Implementation			Two displays installed	
24	Get Around MK website and app	Promoting Travel Alternatives	Personalised travel planning	2021	2021	MK Council	MK Council	NO	Partially Funded		Implementation			Get Around website and app launched	<a href="https://getaroundmk.org.uk/">https://getaroundmk.org.uk/</a>
25	MK Connect	Alternatives to private vehicle use	Other	2021	2021	MK Council	MK Council	NO	Partially Funded		Implementation		Number of hires	MK Connect in operation	<a href="https://ridewithvia.com/mk-connect/">https://ridewithvia.com/mk-connect/</a>
26	Electric vehicle community charging hubs	Alternatives to private vehicle use	Car Clubs	2021	2023	MK Council	MK Council	NO	Partially Funded		Planning			The 1st hub has opened at Saxon Gate, Stony Stratford will open soon. More to follow	<a href="https://getaroundmk.org.uk/news/milton-keynes-community-charging-hubs">https://getaroundmk.org.uk/news/milton-keynes-community-charging-hubs</a>
27	Bicycle parking	Alternatives to private vehicle use	Other	2021	2022	MK Council, Turvec, PWLC	MK Council, Turvec, PWLC	NO	Partially Funded		Implementation			Project launched	<a href="https://getaroundmk.org.uk/get-connected/work-smarter/cycling-parking">https://getaroundmk.org.uk/get-connected/work-smarter/cycling-parking</a>

## 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.

The national air quality objective for PM<sub>2.5</sub> is an annual mean concentration of 20 µg/m<sup>3</sup>, to be achieved by 01-Jan-2020. There is a target to reduce concentrations at urban background locations by 15%, to be achieved between 2010 and 2020.

The [Public Health Outcomes Framework](#) (PHOF) includes an indicator relating to anthropogenic particulate air pollution, measured as fine particulate matter, PM<sub>2.5</sub>. The indicator is known as D01 (previously 3.01) and the latest value for Milton Keynes is 6.1%, calculated from modelled 2020 data. This is the fraction of annual all-cause adult mortality attributable to PM<sub>2.5</sub>. As a comparison, the value for Central Beds is 5.7% and Luton 6.2%.

It is estimated that UK emissions contribute about 50% of total annual average PM<sub>2.5</sub>, the rest is mainly from European countries, the proportion varying from year to year depending on meteorology; many episodes of high concentration occur on easterly winds. Emissions from diesel engines are a major source of fine particles. In January 2019 the government published the national [Clean Air Strategy 2019](#). This identifies domestic wood and solid fuel burning as a major source of locally derived PM<sub>2.5</sub> emissions (up to 38%).

The health effects of PM<sub>2.5</sub> are recognised in Milton Keynes and the [Joint Strategic Needs Assessment](#) (JSNA) contains a section on this pollutant and its effect on the local population.

Milton Keynes Council is taking the following measures to address PM<sub>2.5</sub> primarily by reducing emissions from transport and by promoting a more active lifestyle:

- Partnership working to address pollution and health concerns takes place between Environmental Health, Transport Policy, Public Health and Sustainability Departments within the Council. Public health evidence will be implemented to prevent and minimise impacts of air pollution, including [NICE Guideline NG70: Air pollution: outdoor air quality and health \(2017\)](#) and the Public Health England: [Review of interventions to improve outdoor air quality and public health \(2019\)](#).

- By promoting active travel plans - the “Get Smarter Travel in MK” campaign encourages more sustainable forms of travel such as walking and cycling, moving away from single occupancy vehicles.
- Raising awareness of the effect of air pollution on public health and of the health benefits of more active travel.
- Promoting the use of electric and other low emission vehicles and providing charge points throughout the Borough.
- Improving bus services and providing real time bus passenger information to encourage the use of public transport; Get on Board is a promotional initiative funded by the Department of Transport’s Better Bus Area (BBA) fund.
- Procuring electric buses for major routes through the city.
- By adopting a [low carbon](#), more sustainable approach to living in Milton Keynes. By implementing the [Sustainability Strategy 2019-2050](#)
- Promoting the use of [Eco-design Ready](#) domestic wood burning stoves and distributing leaflets advising how to operate and maintain stoves and the importance of using dry logs.
- Promoting the [Ready to Burn](#) fuel certification scheme for Manufactured Solid Fuels (MSF) and wood fuel, to comply with Air Quality (Domestic Solid Fuels Standards) (England) Regulations 2020.



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

This section sets out the monitoring undertaken within 2021 by Milton Keynes 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 monitoring trends to be identified and discussed.

### 3.1 Summary of Monitoring Undertaken

This section sets out what monitoring has taken place and how it compares with objectives.

#### 3.1.1 Automatic Monitoring Sites

Milton Keynes Council undertook automatic (continuous) monitoring at 3 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.

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

Milton Keynes Council undertook non- automatic (i.e., passive) monitoring of nitrogen dioxide at 40 sites during 2021. All tubes are deployed in duplicate or triplicate. Table A.2 in Appendix A presents the details of the non-automatic sites.

Diffusion tubes are prepared 'in-house' using 20% triethanolamine (TEA) in water and are analysed following the procedures set out in the AEA Practical Guidance document. MKC participates in the proficiency testing scheme, AIR PT, provided by LGC Standards for quality assurance of diffusion tube analysis. MKC also participates in the monthly NO<sub>2</sub> Network Field Inter-Comparison Exercise managed by the National Physical Laboratory (NPL).

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

There were no exceedences of either the annual or hourly objectives at any monitored location throughout the Borough. For the seventh year running all diffusion tube locations within the Olney AQMA recorded annual means below the objective. The highest value was 35.2 µg/m<sup>3</sup> recorded at 9 High Street South, Olney. The automatic analyser in Olney recorded an annual mean of 18.5 µg/m<sup>3</sup>.

Figure A.1 shows a graph of the annual mean data from the automatic air quality stations. The slightly downward trend at all three monitoring stations since 2000 took an upward turn in 2019, which is most pronounced at the Civic Offices monitoring station. This may have been due to initial problems with the new analysers; diffusion tube raw data didn't show the

same upward turn that year. Monitoring data from 2020 showed the NO<sub>2</sub> levels to be back on the slight downward trend. 2021 data is slightly higher than the previous year but this could be because 2020 was an unusually low year for nitrogen dioxide due to so few vehicles on the roads during the national lockdown during the Covid-19 pandemic.

### 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 exceedances of either the annual mean objective and one exceedance of the daily mean objective. The Civic Offices station recorded an annual mean concentration of 11.6 µg/m<sup>3</sup>, well within the objective. Figure A.2 shows there is a slight downward trend at the stations over the last 10 years that flattens out from 2014 rising again in 2019, with 10 exceedances of the 24-hour mean. As with NO<sub>2</sub> data, the 2020 and 2021 datasets have reversed this apparent shift.

### 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.

The PM<sub>2.5</sub> annual mean concentration at the Civic Offices in 2020 was 7.88 µg/m<sup>3</sup>.

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

Ozone is monitored at the automatic air quality station at the Civic Offices. Although it is included in the National Air Quality Strategy it is not included in the local air quality management regime due to its trans-boundary nature and its origin as a 'secondary pollutant'.

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

The O<sub>3</sub> annual mean concentration at the Civic Offices in 2021 was 46.2 µg/m<sup>3</sup> and the average daily maximum of the running 8-hour mean was 60.4 µg/m<sup>3</sup>, well below the objective level.

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

Automatic monitoring was undertaken between 1999 and 2012. Sulphur dioxide is no longer monitored in Milton Keynes because levels are very low and there are no risks of exceeding air quality objectives.

## 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)
Fixed	Civic Offices, CMK	Urban Centre	485070	239131	NO <sub>2</sub> ; PM <sub>10</sub> ; PM <sub>2.5</sub> ; O <sub>3</sub>	NO	Chemiluminescence; Fidas 200E; UV absorption	113 (to residential)	4.8	3.2
Roadbox 1	Wolverton Road, Newport Pagnell	Roadside	486290	243344	NO <sub>2</sub>	NO	Chemiluminescence	25 (to residential)	3.4	1.5
Roadbox 2	High Street South, Olney	Roadside	488922	251157	NO <sub>2</sub>	YES	Chemiluminescence	11 (to residential)	2	1.5

**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)
B1, B2	Northampton Rd, Lavendon (Horseshoe PH)	Roadside	491769	253542	NO2	No	0.6	3.0	No	2.1
C1, C2, C3	10 High St South, Olney (Cowper School House)	Roadside	488914	251173	NO2	Yes - Olney AQMA	0.0	2.0	No	2.3
D1, D2, D3	9 High St South, Olney (Olney Wine Bar)	Roadside	488904	251177	NO2	Yes - Olney AQMA	0.0	1.7	No	2.2
E1, E2, E3	20 High St, Olney	Roadside	488926	251455	NO2	No	3.3	7.6	No	2.2
F1, F2, F3	17 High St, Olney (Opp No.20 High St)	Roadside	488905	251456	NO2	No	0.0	7.2	No	2.1
G1, G2	Corner of Coneygere and Palmers Rd, Olney	Suburban	489108	251213	NO2	No	10.4	1.7	No	2.2
H1, H2	76 High St, Newport Pagnell	Roadside	487514	243901	NO2	No	2.3	2.2	No	2.4
I1, I2	63 High St, Newport Pagnell	Kerbside	487588	243912	NO2	No	2.0	0.4	No	2.4
J1, J2	High St, Newport Pagnell (HSBC Bank)	Kerbside	487620	243922	NO2	No	2.0	0.4	No	2.4
K1, K2	16-17 Greenlands, Newport Pagnell	Suburban	486296	243208	NO2	No	10.1	1.6	No	2.1

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)
L1, L2	5-7 Greenlands, Newport Pagnell	Suburban	486345	243230	NO2	No	5.4	1.4	No	2.5
M1, M2	42-44 Walnut Close, Newport Pagnell	Suburban	486495	243345	NO2	No	7.6	1.5	No	2.0
N1, N2	222 Wolverton Rd, Blakelands	Suburban	486069	243148	NO2	No	25.0	1.6	No	2.2
O1, O2	64 Nicholas Mead, Great Linford	Urban Background	486039	241484	NO2	No	2.4	4.0	No	1.9
R1, R2, R3	Static Air Quality Station (Civic Offices)	Urban Centre	485070	239131	NO2	No	113.0	4.8	Yes	3.5
S1, S2, S3	Roadbox (Newport Pagnell)	Roadside	486290	243344	NO2	No	25.8	1.8	Yes	2.4
T1, T2	Silbury Boulevard, CMK (corner of North Tenth St)	Kerbside	485298	239126	NO2	No	28.2	0.9	No	2.5
V1, V2	63 Windsor St, Wolverton	Suburban	481412	240860	NO2	No	2.3	1.1	No	2.3
W1, W2	130 Newport Rd, New Bradwell	Roadside	482965	241515	NO2	No	6.1	1.6	No	2.4
AA1, AA2	Brook Farm, Broughton Rd, Middleton	Suburban	489237	239016	NO2	No	23.0	1.0	No	2.1
BB1, BB2	14-16 Newport Rd, Wavendon	Roadside	491498	237284	NO2	No	9.7	7.2	No	1.9

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DD1, DD2	Aylesbury St, Fenny Stratford (Bracknell House)	Roadside	488118	233814	NO2	No	11.1	4.5	No	2.4
EE1, EE2	6 Atherstone Court, Two Mile Ash	Suburban	481331	238825	NO2	No	9.5	0.4	No	1.9
FF1, FF2, FF3	Cross Keys Office, High St South, Olney	Roadside	488898	251186	NO2	Yes - Olney AQMA	0.2	1.6	No	2.0
HH1, HH2, HH3	Art Mart, 33 High Street South, Olney	Roadside	488891	251248	NO2	Yes - Olney AQMA	0.6	2.0	No	2.1
JJ1, JJ2, JJ3	New Roadbox location (Olney)	Roadside	488922	251157	NO2	Yes - Olney AQMA	10.1	2.0	Yes	2.1
KK1, KK2, KK3	18/20 Bridge St, Olney	Roadside	488917	251068	NO2	Yes - Olney AQMA	0.4	2.2	No	2.2
LL1, LL2, LL3	Courtney House, Bridge St, Olney	Roadside	488909	251077	NO2	Yes - Olney AQMA	0.4	1.7	No	2.1
MM1, MM2	18 Wheatcroft Close, Beanhill	Urban Background	486332	236228	NO2	No	10.1	0.3	No	2.2
OO1, OO2	Watling Street, Fullers Slade	Roadside	480015	239400	NO2	No	43.0	7.6	No	2.5
PP1, PP2	1 Tudor Gardens, Stony Stratford	Suburban	479459	239536	NO2	No	17.0	2.3	No	2.2
QQ1, QQ2	Silver Street, Stony Stratford	Suburban	478740	240217	NO2	No	3.0	0.9	No	2.0
RR1, RR2	Horsefair Green, Stony Stratford	Suburban	478882	240265	NO2	No	3.5	2.6	No	2.0



Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
TT1, TT2	Co-Op traffic sign, High St, NP (north side)	Roadside	487589	243923	NO2	No	n/a	4.2	No	2.0
WER1, WER2	97 Water Eaton Road, Bletchley	Roadside	487395	233174	NO2	No	12.0	2.5	No	2.4
AAA1, AAA2	4 Mary Rose, Brooklands	Suburban	489835	240351	NO2	No	4.2	4.8	No	2.0
BBB1, BBB2	267 Fen Street, Brooklands	Roadside	490299	239695	NO2	No	6.0	0.5	No	2.0
CCC1, CCC2	Grovesbrook, Station Road, Bow Brickhill	Roadside	490529	234611	NO2	No	12.2	2.9	No	2.0
DDD1, DDD2	Chapel St/Station Rd, Woburn Sands	Roadside	492923	235716	NO2	No	5.7	2.8	No	2.0
EEE1, EEE2	Miles Close, Blakelands	Suburban	486164	243168	NO2	No	17.3	1.6	No	2.0

**Notes:**

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

(2) N/A if not applicable.

**Table A.3 – Annual Mean 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
Fixed	485070	239131	Urban Centre	99.6	99.6	17.0	16.2	23.5	16.36	16.56
Roadbox 1	486290	243344	Roadside	94.5	94.5	30.5	25.6	27.1	24.22	29.67
Roadbox 2	488922	251157	Roadside	93.9	93.9	22.4	19.9	23.9	17.77	18.49

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
B1, B2	491769	253542	Roadside	100	100.0	18.8	17.4	18.8	14.8	15.3
C1, C2, C3	488914	251173	Roadside	100	100.0	33.4	33.9	36.4	28.5	33.4
D1, D2, D3	488904	251177	Roadside	100	100.0	31.7	30.2	30.9	24.7	35.2
E1, E2, E3	488926	251455	Roadside	100	100.0	21.4	21.3	19.8	17.4	19.3
F1, F2, F3	488905	251456	Roadside	100	100.0	25.0	23.1	25.1	19.6	21.9
G1, G2	489108	251213	Suburban	100	100.0	11.5	10.8	11.1	8.8	9.9
H1, H2	487514	243901	Roadside	100	73.1	26.6	23.8	21.8	20.2	21.5
I1, I2	487588	243912	Kerbside	82.7	82.7	29.5	26.7	24.6	23.6	24.9
J1, J2	487620	243922	Kerbside	100	73.1	31.1	30.0	25.8	22.2	24.9
K1, K2	486296	243208	Suburban	100	100.0	24.8	22.2	20.5	19.3	19.5
L1, L2	486345	243230	Suburban	100	100.0	24.4	20.7	20.7	17.8	18.6
M1, M2	486495	243345	Suburban	100	100.0	19.2	16.9	14.7	13.9	14.2
N1, N2	486069	243148	Suburban	100	100.0	21.0	21.5	14.8	16.5	19.3

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
O1, O2	486039	241484	Urban Background	100	100.0	17.1	15.2	16.3	13.4	15.5
R1, R2, R3	485070	239131	Urban Centre	100	100.0	18.2	18.4	17.1	13.6	15.4
S1, S2, S3	486290	243344	Roadside	100	100.0	30.3	27.4	21.4	22.2	25.1
T1, T2	485298	239126	Kerbside	92.3	92.3	23.1	21.6	18.3	17.7	22.6
V1, V2	481412	240860	Suburban	100	100.0	14.3	15.0	15.0	11.8	13.6
W1, W2	482965	241515	Roadside	100	100.0	19.2	17.7	17.9	16.5	19.0
AA1, AA2	489237	239016	Suburban	100	100.0	14.9	14.4	13.7	12.7	13.6
BB1, BB2	491498	237284	Roadside	100	100.0	19.3	18.4	16.5	13.8	15.9
DD1, DD2	488118	233814	Roadside	100	100.0	20.7	22.8	19.8	20.1	23.7
EE1, EE2	481331	238825	Suburban	100	100.0	11.9	12.2	10.6	8.6	10.4
FF1, FF2, FF3	488898	251186	Roadside	90.4	90.4	34.5	30.6	34.0	27.5	29.3
HH1, HH2, HH3	488891	251248	Roadside	100	100.0	30.9	26.6	27.9	23.1	26.7
JJ1, JJ2, JJ3	488922	251157	Roadside	100	100.0	25.2	23.5	18.4	19.9	22.7
KK1, KK2, KK3	488917	251068	Roadside	100	100.0	36.1	32.9	34.7	28.7	33.1

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2021 (%) <sup>(2)</sup>	2017	2018	2019	2020	2021
LL1, LL2, LL3	488909	251077	Roadside	100	100.0	32.1	28.1	29.6	25.1	28.2
MM1, MM2	486332	236228	Urban Background	100	100.0	25.7	22.6	19.0	20.3	23.0
OO1, OO2	480015	239400	Roadside	100	32.7	18.6	19.9	12.1	11.7	13.1
PP1, PP2	479459	239536	Suburban	92.3	92.3	9.9	10.6	10.3	7.8	8.9
QQ1, QQ2	478740	240217	Suburban	100	100.0	16.9	17.7	14.9	13.3	14.5
RR1, RR2	478882	240265	Suburban	100	100.0	21.2	21.2	19.2	16.9	18.4
TT1, TT2	487589	243923	Roadside	90.4	90.4	27.5	26.8	25.3	22.9	27.1
WER1, WER2	487395	233174	Roadside	100	100.0	20.9	20.0	17.9	18.8	20.6
AAA1, AAA2	489835	240351	Suburban	100	100.0		19.4	17.8	15.9	17.2
BBB1, BBB2	490299	239695	Roadside	100	100.0		19.7	19.1	17.6	20.2
CCC1, CCC2	490529	234611	Roadside	100	100.0		14.5	13.4	12.7	13.4
DDD1, DDD2	492923	235716	Roadside	100	100.0		14.9	15.1	12.0	12.7
EEE1, EEE2	486164	243168	Suburban	100	100.0			14.8	17.5	18.8

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**.

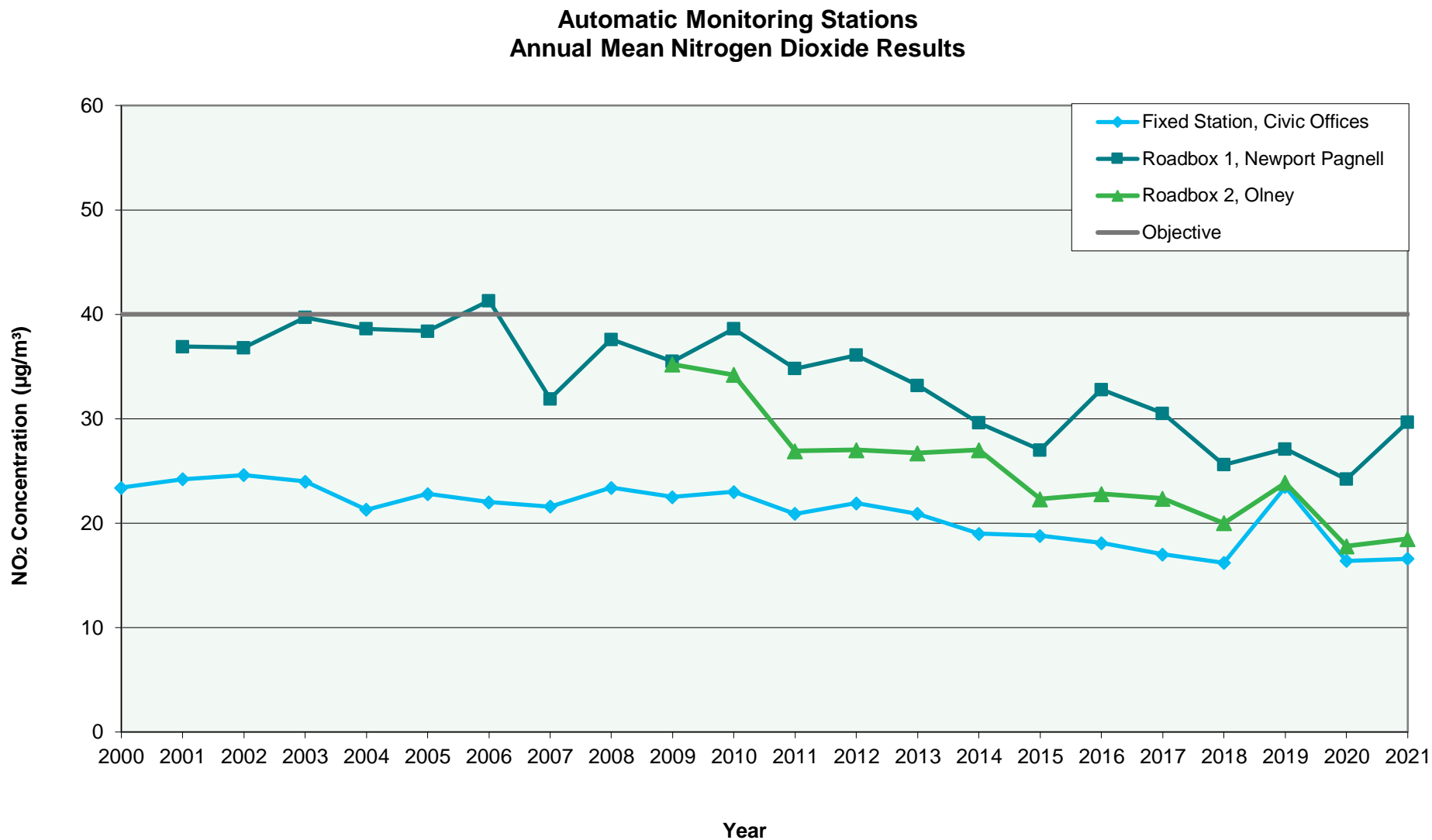
Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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



**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
Fixed	485070	239131	Urban Centre	99.6	99.6	0	0	0	0	0
Roadbox 1	486290	243344	Roadside	94.5	94.5	0	0	0	0	0
Roadbox 2	488922	251157	Roadside	93.9	93.9	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
Fixed	485070	239131	Urban Centre	92.2	92.2	14.5	14.7	16.06	11.7	11.6

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**.

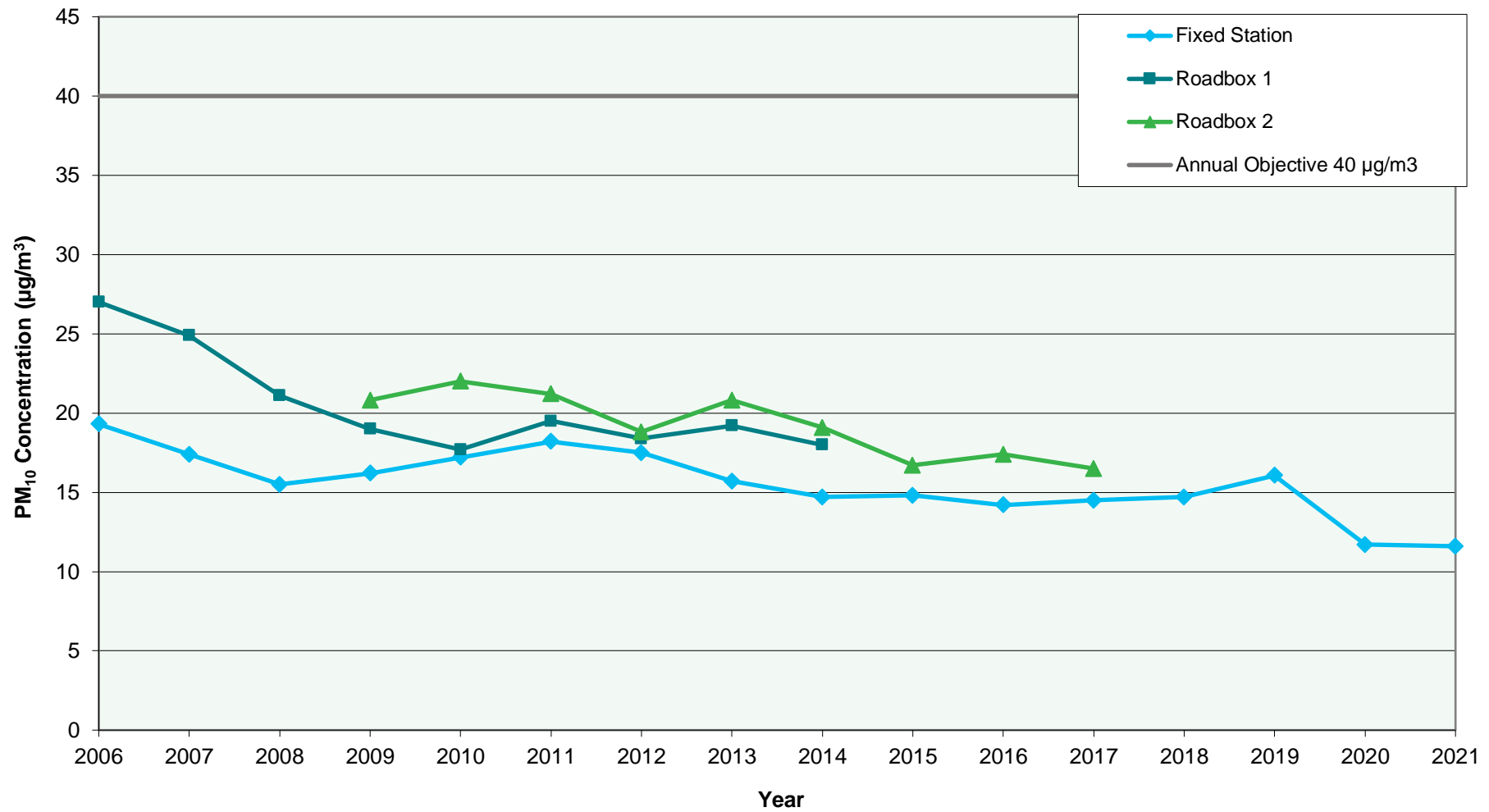
All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(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

Automatic Monitoring Stations  
Annual Mean PM<sub>10</sub> Results



**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
Fixed	485070	239131	Urban Centre	92.2	92.2	2	1	10	0	1

**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
Fixed	485070	239131	Urban Centre	92.2	92.2			11.2	7.56	7.88

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

**Notes:**

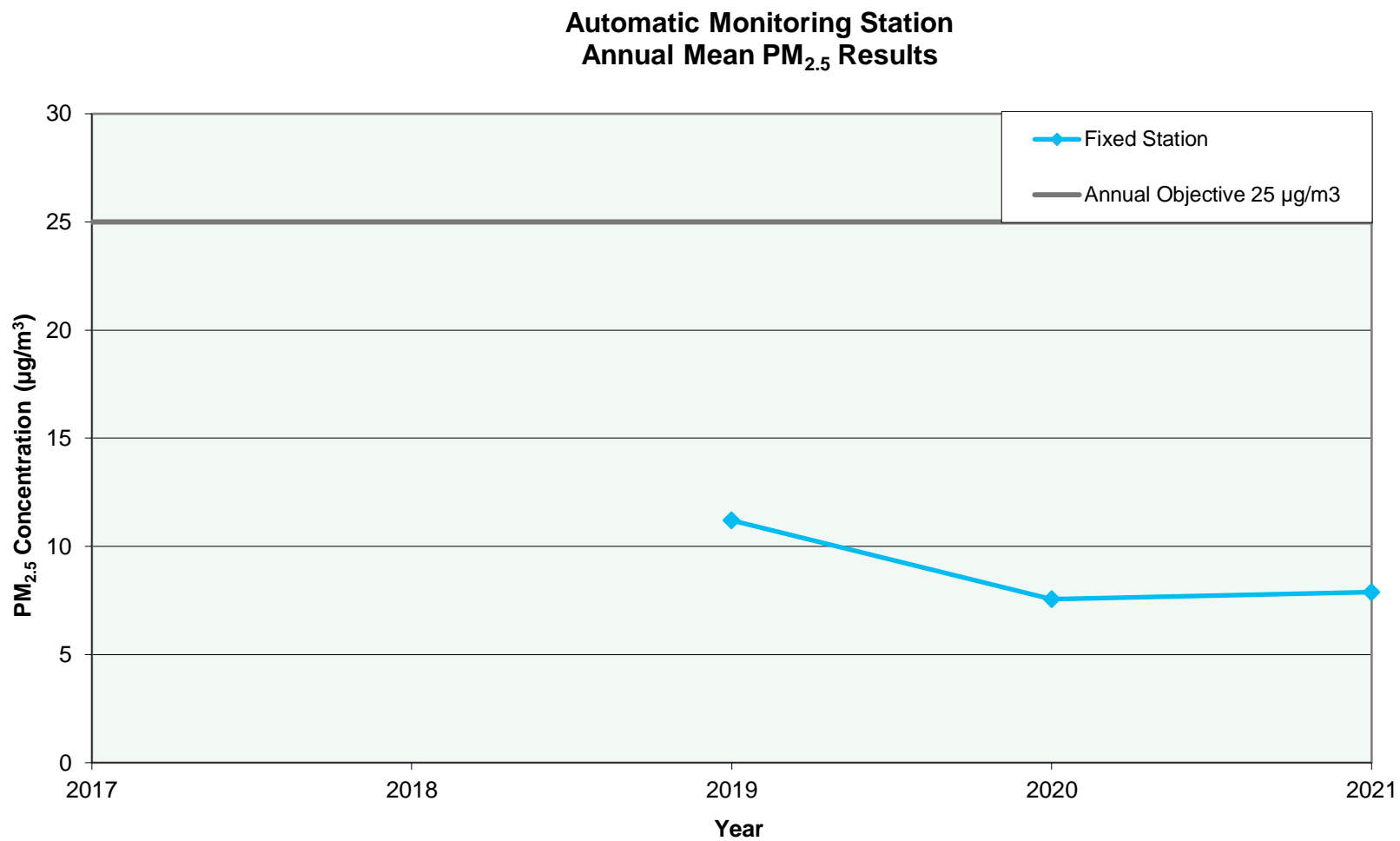
The annual mean concentrations are presented as µg/m<sup>3</sup>.

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



Note: monitoring only began in 2019

**Table A.9 – Annual Mean Daily Max of 8 hour Running Mean O<sub>3</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
Fixed	485070	239131	Urban Centre	92.2	92.2	71.73	68.25	59.43	61.58	60.44

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.4 – Trends in daily max running 8 hour mean O<sub>3</sub> concentrations

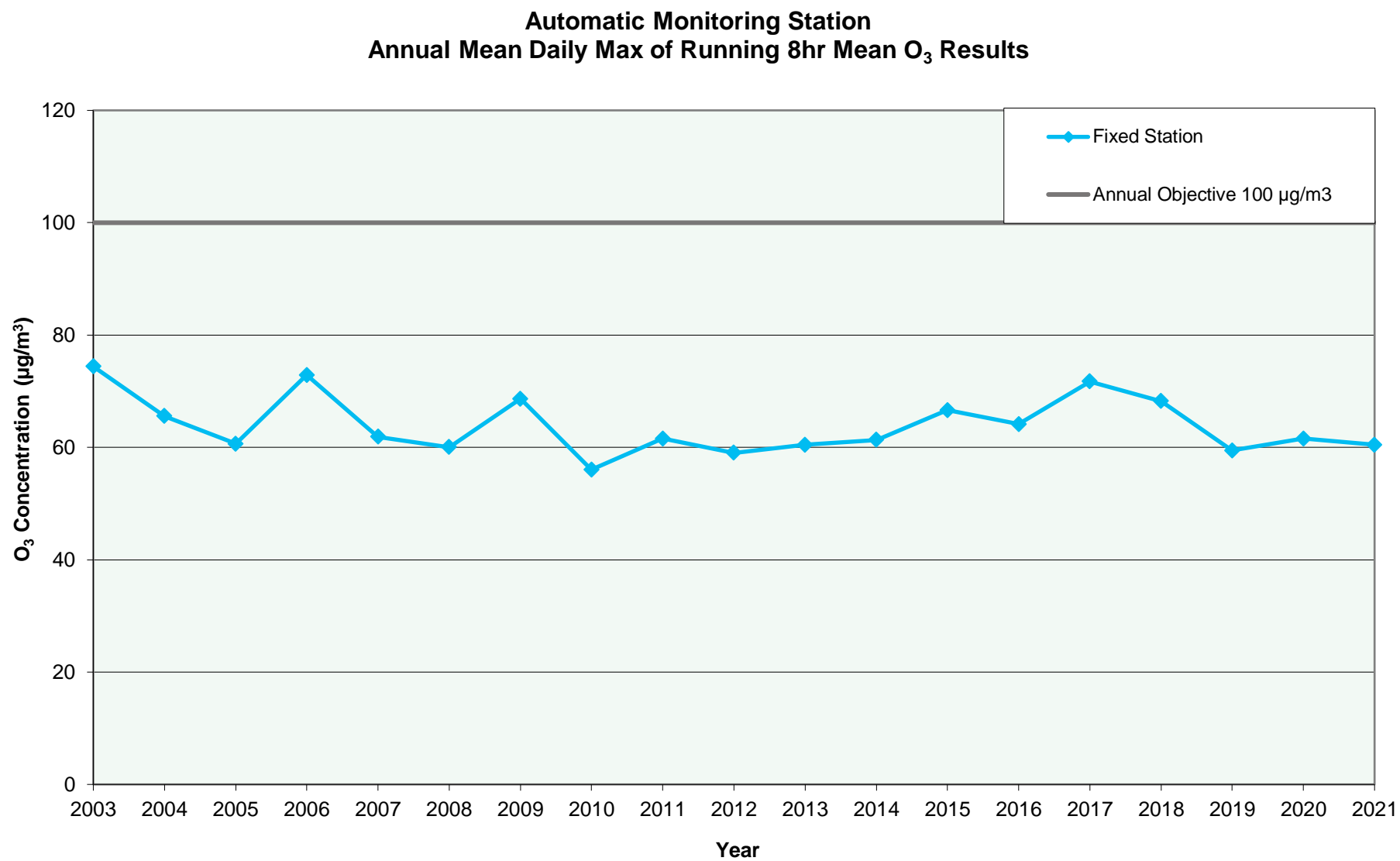


Table A.10 – Daily Max 8hr Running Mean O<sub>3</sub> Monitoring Results, Number of Means > 100µg/m<sup>3</sup>

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
Fixed	485070	239131	Urban Centre	92.2	92.2	37	37	13	18	8



## 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 (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.94)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
B1	491769	253542	21.7	21.4	18.5	13.7	15.1	11.0	14.7	9.2	17.9	18.4	13.1	18.1	-	-	-	Duplicate Site with B1 and B2 - Annual data provided for B2 only
B2	491769	253542	21.3	23.1	19.9	13.6		11.5	12.5	11.0	19.9	16.7	14.9		16.3	15.3	-	Duplicate Site with B1 and B2 - Annual data provided for B2 only
C1	488914	251173	42.7	37.5	35.5	41.1	36.7	36.1	40.1	32.6	38.9	30.0	22.2	30.9	-	-	-	Triplicate Site with C1, C2 and C3 - Annual data provided for C3 only
C2	488914	251173	40.5	36.9	32.1	37.3	38.0	35.3	37.3	33.7	41.6	30.6	23.0	33.5	-	-	-	Triplicate Site with C1, C2 and C3 - Annual data provided for C3 only
C3	488914	251173	35.5	39.9	35.3	38.7	39.8	38.6	33.1	28.3	46.2	30.0	35.4	33.9	35.5	33.4	-	Triplicate Site with C1, C2 and C3 - Annual data provided for C3 only
D1	488904	251177	34.9	34.8	37.7	35.8	42.6	37.3	38.7	31.6	44.8	37.7	39.3	38.7	-	-	-	Triplicate Site with D1, D2 and D3 - Annual data provided for D3 only
D2	488904	251177	33.7	32.4	39.2	33.8	43.6	34.3	31.6	35.9	46.6	34.7	39.7	34.9	-	-	-	Triplicate Site with D1, D2 and D3 - Annual data provided for D3 only
D3	488904	251177	38.2	33.3	38.5	34.1	36.6	36.1	38.0	35.6	45.9	36.9	41.9	38.2	37.4	35.2	-	Triplicate Site with D1, D2 and D3 - Annual data provided for D3 only
E1	488926	251455	22.4	25.4	18.8	19.1	21.0	19.2	17.4	16.8	23.2	16.9	22.4	19.7	-	-	-	Triplicate Site with E1, E2 and E3 - Annual data provided for E3 only
E2	488926	251455	23.2	26.0	20.5	19.5	22.2	18.7	18.1	14.5	21.6	16.8	18.2	19.8	-	-	-	Triplicate Site with E1, E2 and E3 - Annual data provided for E3 only
E3	488926	251455	29.4	28.5	21.6	18.6	21.7	17.0	19.6	16.9	23.0	20.1	20.8	21.8	20.6	19.3	-	Triplicate Site with E1, E2 and E3 - Annual data provided for E3 only
F1	488905	251456	28.1	20.3	26.9	15.6	24.8	20.1	15.7	19.4	25.9	24.3	26.3	22.9	-	-	-	Triplicate Site with F1, F2 and F3 - Annual data provided for F3 only
F2	488905	251456	26.9	21.2	24.8	26.3	23.7	18.7	20.3	22.9	26.6	24.9	24.6	22.8	-	-	-	Triplicate Site with F1, F2 and F3 - Annual data provided for F3 only
F3	488905	251456	29.5	20.1	23.0	24.1	24.9	21.4	17.8	21.4	24.9	23.1	27.9	24.4	23.2	21.9	-	Triplicate Site with F1, F2 and F3 - Annual data provided for F3 only
G1	489108	251213	16.0	12.9	9.4	11.6	11.3	8.0	6.0	3.9	10.4	9.8	15.5	12.9	-	-	-	Duplicate Site with G1 and G2 - Annual data provided for G2 only
G2	489108	251213	19.6	14.6	4.6	10.2	9.7	5.4	7.7	6.9	9.7	12.4	12.8	12.1	10.6	9.9	-	Duplicate Site with G1 and G2 - Annual data provided for G2 only
H1	487514	243901	31.3	26.0	23.6	21.8	23.0	21.9	17.5	16.4	28.0				-	-	-	Duplicate Site with H1 and H2 - Annual data provided for H2 only
H2	487514	243901	29.9	27.9	25.5	18.5	21.0	19.1	18.4	16.1	26.4				22.9	21.5	-	Duplicate Site with H1 and H2 - Annual data provided for H2 only

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.94)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
I1	487588	243912	37.2	31.2	27.4	22.8	22.6	20.9	22.7	20.6	31.1			27.9	-	-	-	Duplicate Site with I1 and I2 - Annual data provided for I2 only
I2	487588	243912	32.2	31.6	26.5	21.2	26.6	23.9	24.3	18.1	31.3			30.1	26.5	24.9	-	Duplicate Site with I1 and I2 - Annual data provided for I2 only
J1	487620	243922	33.7	28.1	22.5	19.0	28.6	24.6	25.5	19.7	33.4				-	-	-	Duplicate Site with J1 and J2 - Annual data provided for J2 only
J2	487620	243922	31.3	29.7	28.0	24.7	28.0	22.0	23.8	19.3	34.0				26.4	24.9	-	Duplicate Site with J1 and J2 - Annual data provided for J2 only
K1	486296	243208	27.2	25.3	25.3	17.1	14.0	15.0	17.0	14.9	22.5	22.5	27.1	26.5	-	-	-	Duplicate Site with K1 and K2 - Annual data provided for K2 only
K2	486296	243208	28.6	22.2	21.9	14.9	13.6	14.6	10.7	16.9	22.3	24.1	28.1	25.6	20.7	19.5	-	Duplicate Site with K1 and K2 - Annual data provided for K2 only
L1	486345	243230	26.3	21.3	20.9	11.1	18.1	15.1	13.9	13.7	20.9	23.4	26.5	23.4	-	-	-	Duplicate Site with L1 and L2 - Annual data provided for L2 only
L2	486345	243230	25.6	25.3	22.5	10.4	20.5	15.7	14.6	11.1	22.2	22.5	26.0	23.5	19.8	18.6	-	Duplicate Site with L1 and L2 - Annual data provided for L2 only
M1	486495	243345	20.4	15.7	16.6	9.4	15.6	8.7	7.1	10.1	18.9	18.4	18.9	19.0	-	-	-	Duplicate Site with M1 and M2 - Annual data provided for M2 only
M2	486495	243345	25.8	17.2	19.1	6.7	10.2	5.2	12.0	11.6	17.6	17.2	20.2	21.1	15.1	14.2	-	Duplicate Site with M1 and M2 - Annual data provided for M2 only
N1	486069	243148	26.3	25.4	19.6	25.3	16.6	17.2	17.0	16.2	23.6	17.5	23.0	21.6	-	-	-	Duplicate Site with N1 and N2 - Annual data provided for N2 only
N2	486069	243148	24.0	23.7	21.4	21.0	21.0	19.8	19.5	11.7	24.0	14.0	23.0	21.4	20.6	19.3	-	Duplicate Site with N1 and N2 - Annual data provided for N2 only
O1	486039	241484	20.3	20.2	19.0	13.8	11.5	11.8	14.2	7.9	18.1	18.0	20.3	20.1	-	-	-	Duplicate Site with O1 and O2 - Annual data provided for O2 only
O2	486039	241484	20.4	20.0	15.8	15.4	15.0	10.3	13.2	9.3	19.0	19.0	22.4	20.8	16.5	15.5	-	Duplicate Site with O1 and O2 - Annual data provided for O2 only
R1	485070	239131	22.6	18.6	17.2	13.5	14.3	10.1	10.7	11.4	19.3	16.5	22.0	20.9	-	-	-	Triplicate Site with R1, R2 and R3 - Annual data provided for R3 only
R2	485070	239131	21.6	21.1	15.4	14.4	13.1	9.3	12.5	10.6	19.0	18.9	24.2	19.1	-	-	-	Triplicate Site with R1, R2 and R3 - Annual data provided for R3 only
R3	485070	239131	23.7	19.7	14.2	11.2	16.0	11.1	12.7	8.9	19.6	17.4	20.3	19.8	16.4	15.4	-	Triplicate Site with R1, R2 and R3 - Annual data provided for R3 only
S1	486290	243344	36.4	27.1	30.5	25.0	25.7	22.6	20.2	20.4	31.5	26.2	30.7	26.4	-	-	-	Triplicate Site with S1, S2 and S3 - Annual data provided for S3 only
S2	486290	243344	38.8	33.6	24.7	25.2	24.5	22.3	18.4	18.9	32.4	30.3	33.3	26.4	-	-	-	Triplicate Site with S1, S2 and S3 - Annual data provided for S3 only
S3	486290	243344	33.0	23.5	30.4	21.2	18.5	22.8	17.5	22.6	30.6	27.5	33.7	28.5	26.7	25.1	-	Triplicate Site with S1, S2 and S3 - Annual data provided for S3 only
T1	485298	239126	26.7	23.3	20.3	20.7	20.9		22.1	17.0	27.9	26.5	27.8	28.0	-	-	-	Duplicate Site with T1 and T2 - Annual data provided for T2 only

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.94)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
T2	485298	239126	28.4	26.7	19.0	20.6	22.9		27.6	15.4	26.4	23.1	27.4	28.9	24.0	22.6	-	Duplicate Site with T1 and T2 - Annual data provided for T2 only
V1	481412	240860	21.9	18.2	14.5	15.6	13.5	11.2	12.9	4.9	17.7	12.5	17.2	16.5	-	-	-	Duplicate Site with V1 and V2 - Annual data provided for V2 only
V2	481412	240860	20.8	17.2	15.8	16.7	14.4	8.7	5.3	7.7	17.6	14.7	15.9	15.0	14.4	13.6	-	Duplicate Site with V1 and V2 - Annual data provided for V2 only
W1	482965	241515	25.0	22.6	23.3	13.9	19.9	14.8	9.7	15.3	25.7	21.1	23.1	23.4	-	-	-	Duplicate Site with W1 and W2 - Annual data provided for W2 only
W2	482965	241515	25.4	22.9	21.9	17.7	20.2	16.8	17.6	14.5	21.8	19.9	24.6	24.4	20.2	19.0	-	Duplicate Site with W1 and W2 - Annual data provided for W2 only
AA1	489237	239016	20.9	18.2	14.2	13.3	15.2	9.0	11.9	4.8	17.0	13.8	20.0	17.6	-	-	-	Duplicate Site with AA1 and AA2 - Annual data provided for AA2 only
AA2	489237	239016	22.6	16.5	15.6	13.0	11.6	12.0	13.1	6.7	15.2	13.7	20.3	12.1	14.5	13.6	-	Duplicate Site with AA1 and AA2 - Annual data provided for AA2 only
BB1	491498	237284	22.5	16.4	18.2	17.3	13.4	14.0	15.3	10.4	17.5	13.9	22.2	18.6	-	-	-	Duplicate Site with BB1 and BB2 - Annual data provided for BB2 only
BB2	491498	237284	22.2	18.9	20.7	15.9	18.2	13.4	13.7	12.4	16.1	12.6	21.9	19.6	16.9	15.9	-	Duplicate Site with BB1 and BB2 - Annual data provided for BB2 only
DD1	488118	233814	32.5	30.7	30.0	25.2	13.6	24.2	18.3	15.8	26.7	22.1	28.7	23.4	-	-	-	Duplicate Site with DD1 and DD2 - Annual data provided for DD2 only
DD2	488118	233814	33.9	31.1	25.5	18.0	19.4	22.2	30.8	18.6	32.8	21.8	28.7	29.1	25.2	23.7	-	Duplicate Site with DD1 and DD2 - Annual data provided for DD2 only
EE1	481331	238825	18.1	16.2	11.9	10.0	12.4	8.3	10.3	5.0	9.8	9.8	14.9	12.7	-	-	-	Duplicate Site with EE1 and EE2 - Annual data provided for EE2 only
EE2	481331	238825	14.2	15.3	11.6	11.9	9.6	6.1	3.1	5.4	10.6	10.0	17.3	12.0	11.1	10.4	-	Duplicate Site with EE1 and EE2 - Annual data provided for EE2 only
FF1	488898	251186	34.4	32.4	38.4	25.1	32.7	19.1		32.7	37.2	36.1	34.9	32.9	-	-	-	Triplicate Site with FF1, FF2 and FF3 - Annual data provided for FF3 only
FF2	488898	251186	37.8	32.4	37.2	24.1	32.7	5.0		20.6	38.8	37.8	37.2	33.5	-	-	-	Triplicate Site with FF1, FF2 and FF3 - Annual data provided for FF3 only
FF3	488898	251186	33.7	30.3	31.9	20.7	32.0	9.9		29.7	40.4		38.8	31.1	31.2	29.3	-	Triplicate Site with FF1, FF2 and FF3 - Annual data provided for FF3 only
HH1	488891	251248	29.9	29.4	28.9	23.1	33.7	28.5	26.2	23.1	32.8	27.0	34.9	27.5	-	-	-	Triplicate Site with HH1, HH2 and HH3 - Annual data provided for HH3 only
HH2	488891	251248	32.3	26.9	28.7	24.0	31.3	25.7	28.7	25.8	31.5	27.8	32.5	27.8	-	-	-	Triplicate Site with HH1, HH2 and HH3 - Annual data provided for HH3 only
HH3	488891	251248	28.0	29.2	32.6	20.6	29.3	25.8	24.7	25.5	29.3	26.7	35.8	26.5	28.4	26.7	-	Triplicate Site with HH1, HH2 and HH3 - Annual data provided for HH3 only
JJ1	488922	251157	27.8	22.8	27.1	16.8	23.6	21.7	23.5	22.8	27.9	23.9	24.6	25.4	-	-	-	Triplicate Site with JJ1, JJ2 and JJ3 - Annual data provided for JJ3 only
JJ2	488922	251157	31.4	24.8	23.5	22.8	26.8	20.7	14.4	19.8	25.6	24.1	30.2	24.6	-	-	-	Triplicate Site with JJ1, JJ2 and JJ3 - Annual data provided for JJ3 only

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.94)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
JJ3	488922	251157	28.2	26.0	24.4	22.5	25.7	21.4	24.7	20.5	30.5	20.1	24.2	25.4	24.2	22.7	-	Triplicate Site with JJ1, JJ2 and JJ3 - Annual data provided for JJ3 only
KK1	488917	251068	36.9	36.8	36.5	33.5	36.3	30.5	38.0	30.8	42.6	33.4	31.8	35.3	-	-	-	Triplicate Site with KK1, KK2 and KK3 - Annual data provided for KK3 only
KK2	488917	251068	41.7	39.7	36.4	25.2	41.6	32.1	38.0	31.7	37.5	30.5	33.4	34.9	-	-	-	Triplicate Site with KK1, KK2 and KK3 - Annual data provided for KK3 only
KK3	488917	251068	39.6	37.9	35.2	32.0	36.7	36.0	26.8	32.8	41.7	32.5	33.4	36.4	35.2	33.1	-	Triplicate Site with KK1, KK2 and KK3 - Annual data provided for KK3 only
LL1	488909	251077	32.8	27.9	34.3	25.7	32.0	26.3	25.6	30.2	31.4	29.1	34.8	33.3	-	-	-	Triplicate Site with LL1, LL2 and LL3 - Annual data provided for LL3 only
LL2	488909	251077	35.8	28.7	33.7	21.3	31.0	29.2	31.7	20.4	33.2	31.6	35.3	31.4	-	-	-	Triplicate Site with LL1, LL2 and LL3 - Annual data provided for LL3 only
LL3	488909	251077	32.9	25.1	31.2		32.6	26.8	27.9	28.4	31.8	27.1	34.2	29.7	29.9	28.2	-	Triplicate Site with LL1, LL2 and LL3 - Annual data provided for LL3 only
MM1	486332	236228	29.3	23.1	29.8	19.7	21.9	22.8	19.6	17.6	24.8	23.1	30.9	25.3	-	-	-	Duplicate Site with MM1 and MM2 - Annual data provided for MM2 only
MM2	486332	236228	31.0	23.6	29.6	21.2	20.9	24.3	20.9	19.4	27.5	23.4	30.5	25.7	24.4	23.0	-	Duplicate Site with MM1 and MM2 - Annual data provided for MM2 only
OO1	480015	239400	19.3	17.2	14.5	12.1									-	-	-	Duplicate Site with OO1 and OO2 - Annual data provided for OO2 only
OO2	480015	239400	17.5	21.0	14.6	9.4									15.7	13.1	-	Duplicate Site with OO1 and OO2 - Annual data provided for OO2 only
PP1	479459	239536	10.8	12.9	8.2	11.6	7.3	5.8	8.8		8.7	7.8	12.4	10.1	-	-	-	Duplicate Site with PP1 and PP2 - Annual data provided for PP2 only
PP2	479459	239536	14.2	13.0	10.7	8.8	7.2	6.1	7.6		8.4	6.4	10.8	11.6	9.5	8.9	-	Duplicate Site with PP1 and PP2 - Annual data provided for PP2 only
QQ1	478740	240217	18.9	18.1	17.6		14.8	12.9	14.9	7.7	15.5	14.0	17.9	16.7	-	-	-	Duplicate Site with QQ1 and QQ2 - Annual data provided for QQ2 only
QQ2	478740	240217	17.5	18.2	14.2	16.3	17.7	12.9	15.5	8.7	18.0	11.3	18.9	15.0	15.4	14.5	-	Duplicate Site with QQ1 and QQ2 - Annual data provided for QQ2 only
RR1	478882	240265	20.2	21.4	18.9	19.6	21.9	13.9	20.2	14.7	23.3	17.5	20.1	21.6	-	-	-	Duplicate Site with RR1 and RR2 - Annual data provided for RR2 only
RR2	478882	240265	24.1	23.9	17.7	20.9	18.6	14.8	22.5	12.2	21.5	17.1	22.2	20.7	19.6	18.4	-	Duplicate Site with RR1 and RR2 - Annual data provided for RR2 only
TT1	487589	243923	33.6	28.8	33.9	22.9	24.4	25.7	25.2	22.0	31.4	25.8	37.7		-	-	-	Duplicate Site with TT1 and TT2 - Annual data provided for TT2 only
TT2	487589	243923	31.5	26.4	36.4	30.3	27.8	27.4	28.9	22.4	31.0	28.0	33.0		28.8	27.1	-	Duplicate Site with TT1 and TT2 - Annual data provided for TT2 only
WER <sub>1</sub>	487395	233174	33.7	22.6	25.6	18.0	21.5	18.2	18.9	13.3	22.6	20.9	28.6	23.8	-	-	-	Duplicate Site with WER1 and WER2 - Annual data provided for WER2 only
WER <sub>2</sub>	487395	233174	30.3	23.1	22.5	18.4	19.4	15.4	15.8	14.1	22.1	19.3	32.0	26.3	21.9	20.6	-	Duplicate Site with WER1 and WER2 - Annual data provided for WER2 only

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.94)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
AAA1	489835	240351	22.2	21.7	17.7	20.3	17.3	11.3	16.7	10.5	22.2	17.1	22.4	19.9	-	-	-	Duplicate Site with AAA1 and AAA2 - Annual data provided for AAA2 only
AAA2	489835	240351	23.4	21.5	20.3	18.7	16.2	11.5	14.6	11.7	18.6	16.0	26.0	20.3	18.3	17.2	-	Duplicate Site with AAA1 and AAA2 - Annual data provided for AAA2 only
BBB1	490299	239695	30.0	26.7	25.0	19.4	14.5	13.7	18.4	11.6	24.7	22.9	29.5	24.5	-	-	-	Duplicate Site with BBB1 and BBB2 - Annual data provided for BBB2 only
BBB2	490299	239695	24.3	20.0	23.0	18.7	20.3	15.2	20.3	13.7	24.1	21.2	29.4	24.9	21.5	20.2	-	Duplicate Site with BBB1 and BBB2 - Annual data provided for BBB2 only
CCC1	490529	234611	20.1	17.4	16.4	11.3	13.7	9.0	7.2	10.2	14.8	12.4	19.4	15.7	-	-	-	Duplicate Site with CCC1 and CCC2 - Annual data provided for CCC2 only
CCC2	490529	234611	22.6	16.6	14.4	15.5	12.5	8.8	11.1	6.3	16.5	12.0	22.5	14.6	14.2	13.4	-	Duplicate Site with CCC1 and CCC2 - Annual data provided for CCC2 only
DDD1	492923	235716	16.9	14.8	14.2	11.9	10.9	9.3	10.8	9.2	15.9	13.1	15.5	15.3	-	-	-	Duplicate Site with DDD1 and DDD2 - Annual data provided for DDD2 only
DDD2	492923	235716	18.5	15.2	14.6	12.5	10.5	12.0	10.7	6.5	15.7	14.0	19.5	15.4	13.5	12.7	-	Duplicate Site with DDD1 and DDD2 - Annual data provided for DDD2 only
EEE1	486164	243168	22.2	26.5	20.7	25.8	10.3	21.0	17.3	16.4	25.4	14.1	19.2	22.3	-	-	-	Duplicate Site with EEE1 and EEE2 - Annual data provided for EEE2 only
EEE2	486164	243168	23.9	23.5	20.5	24.7		17.4	21.6	18.0	24.5	14.2	19.4	20.9	20.0	18.8	-	Duplicate Site with EEE1 and EEE2 - Annual data provided for EEE2 only

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.

Milton Keynes 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 Milton Keynes During 2021**

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

### **Additional Air Quality Works Undertaken by Milton Keynes Council During 2021**

Milton Keynes Council has not completed any additional works within the reporting year of 2021.

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

Nitrogen dioxide diffusion tubes are prepared 'in-house' by Milton Keynes Council using 20% triethanolamine (TEA) in water and are analysed following the procedures set out in the AEA Practical Guidance document produced by the Defra Working Group on Harmonisation of NO<sub>2</sub> Diffusion Tubes that was released early in 2008. The Council participates in the proficiency testing scheme, AIR PT, provided by LGC Standards for quality assurance of diffusion tube analysis and the monthly NO<sub>2</sub> Network Field Intercomparison Exercise managed by the National Physical Laboratory (NPL). The monitoring has been completed in adherence with the 2021 Diffusion Tube Monitoring Calendar.

### **Diffusion Tube Annualisation**

Almost all diffusion tube monitoring locations within Milton Keynes Council recorded data capture of greater than 75% therefore it was not required to annualise this monitoring data. The only site which recorded less was site OO1, OO2 (Watling Street, Fullers Slade). This site was only operational for 4 months before the site was removed due to works to create

a new road layout. The Diffusion Tube Data Processing Tool was used to complete the annualisation. Data from the three automatic stations was used. Details of the calculation method undertaken are provided in Table C.2.

### Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2022 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.

Milton Keynes Council have applied a local bias adjustment factor of 0.94 to the 2021 monitoring data using co-location studies at the three automatic monitoring stations input into the Diffusion Tube Data Processing Tool. A summary of bias adjustment factors used by Milton Keynes 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	Local	-	0.94
2020	National	06/21	0.83
2019	National	06/20	0.84
2018	Local	-	0.78
2017	Local	-	0.77

### 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 Milton Keynes required distance correction during 2021.

## QA/QC of Automatic Monitoring

The three automatic monitoring stations are under a service contract with ACOEM who provide twice yearly services of the stations.

## 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 utilised within Milton Keynes Council do not require the application of a correction factor.

## Automatic Monitoring Annualisation

All automatic monitoring locations within Milton Keynes 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 passive or automatic NO<sub>2</sub> monitoring locations within Milton Keynes Council required distance correction during 2021.



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

Site ID	Annualisation Factor Fixed Station	Annualisation Factor Roadbox 1	Annualisation Factor Roadbox 2	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
OO1, OO2	1.1006	0.6941	0.8619	0.8855	15.7	13.9	Duplicate Site with OO1 and OO2

**Table C.3 – Local Bias Adjustment Calculation**

	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>	12	10	10		
<b>Bias Factor A</b>	1.01 (0.9 - 1.14)	1.12 (0.93 - 1.43)	0.76 (0.68 - 0.88)		
<b>Bias Factor B</b>	-1% (-12% - 11%)	-11% (-30% - 8%)	31% (14% - 48%)		
<b>Diffusion Tube Mean (<math>\mu\text{g}/\text{m}^3</math>)</b>	16.4	27.4	24.8		
<b>Mean CV (Precision)</b>	8.0%	8.7%	7.9%		
<b>Automatic Mean (<math>\mu\text{g}/\text{m}^3</math>)</b>	16.5	30.8	19.0		
<b>Data Capture</b>	100%	99%	97%		
<b>Adjusted Tube Mean (<math>\mu\text{g}/\text{m}^3</math>)</b>	17 (15 - 19)	31 (25 - 39)	19 (17 - 22)		

**Notes:**

A combined local bias adjustment factor of 0.94 has been used to bias adjust the 2021 diffusion tube results.

## Appendix D: Maps of Monitoring Locations and AQMAs

### Automatic Monitoring Sites

Figure D.1 – Fixed Air Quality Station, Civic Offices, Central Milton Keynes

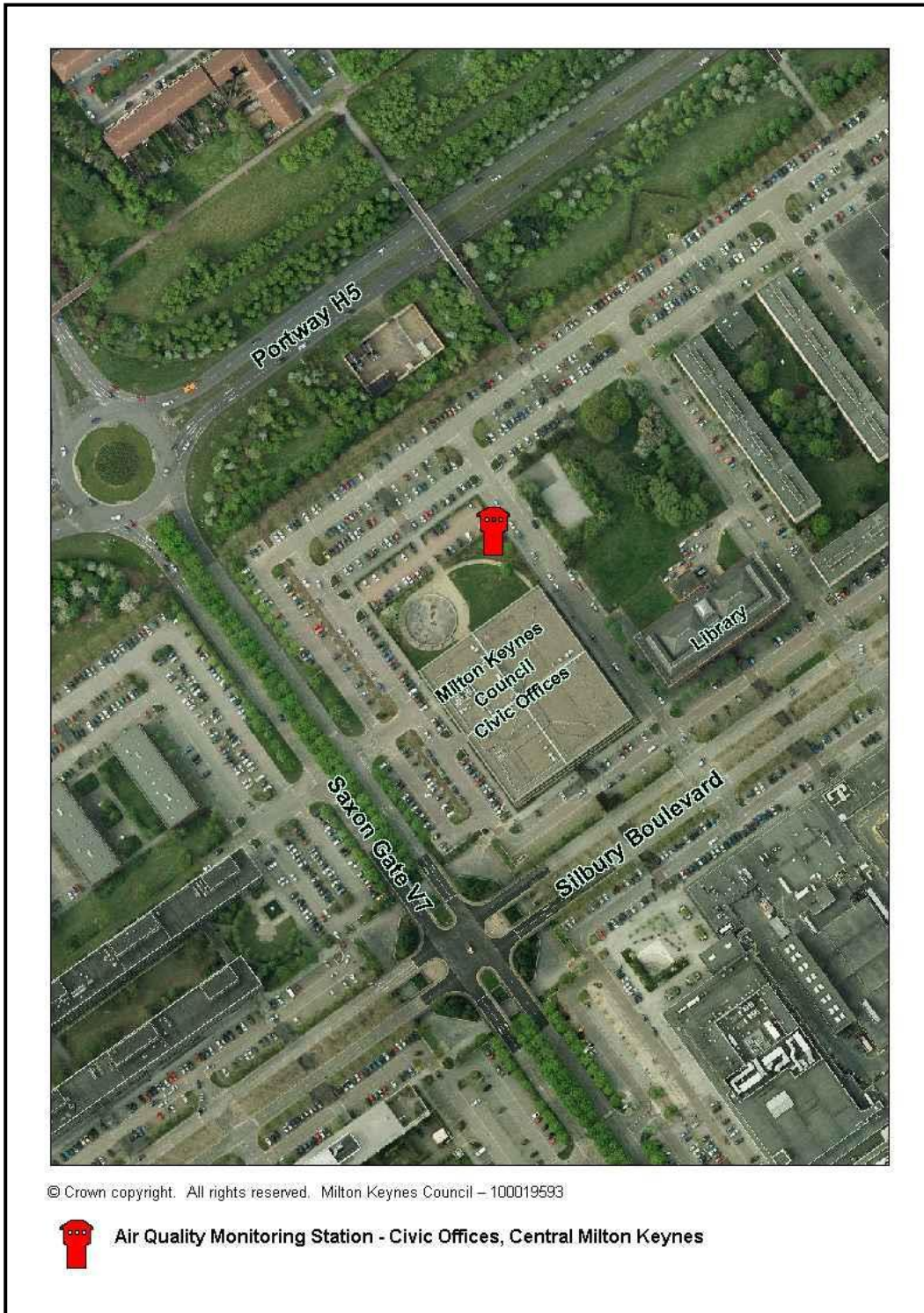
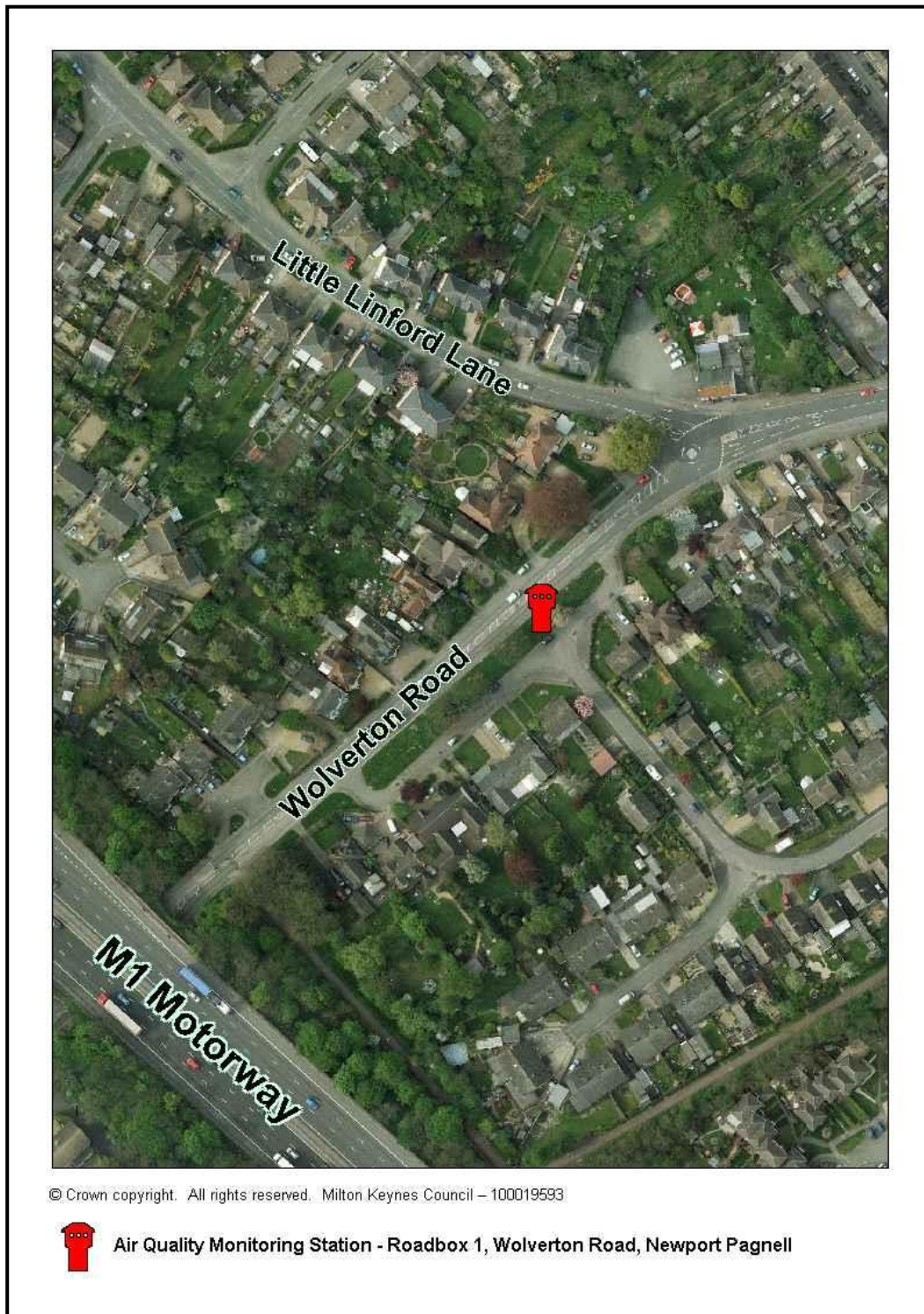


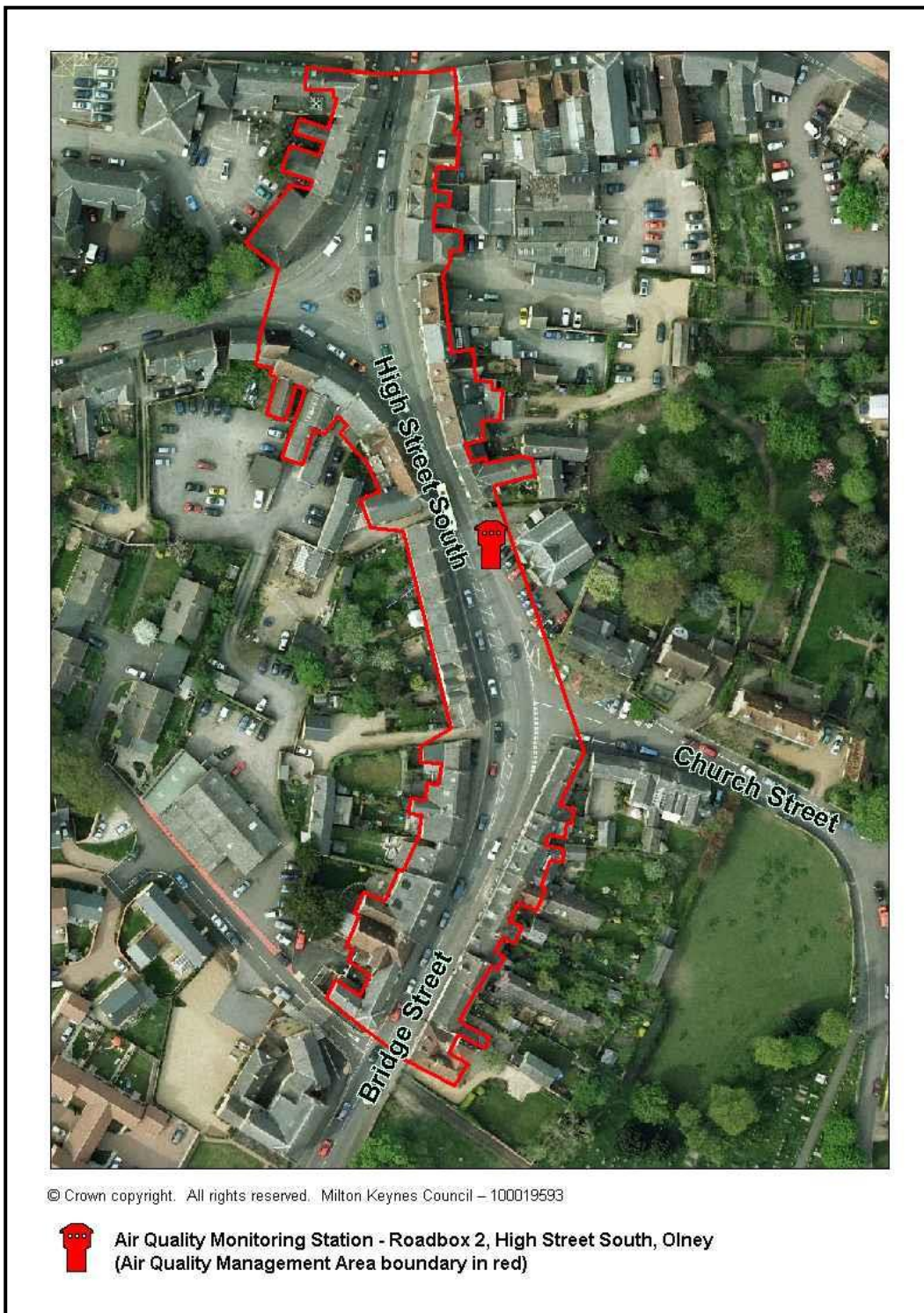


Figure D.2 – Roadbox 1 Air Quality Station, Wolverton Road, Newport Pagnell





**Figure D.3 – Roadbox 2 Air Quality Station, High Street South, Olney (Within Designated Air Quality Management Area)**



**Figure D4 Automatic Air Quality Monitoring Station Photographs**



Fixed Monitoring Station, Civic, MKC



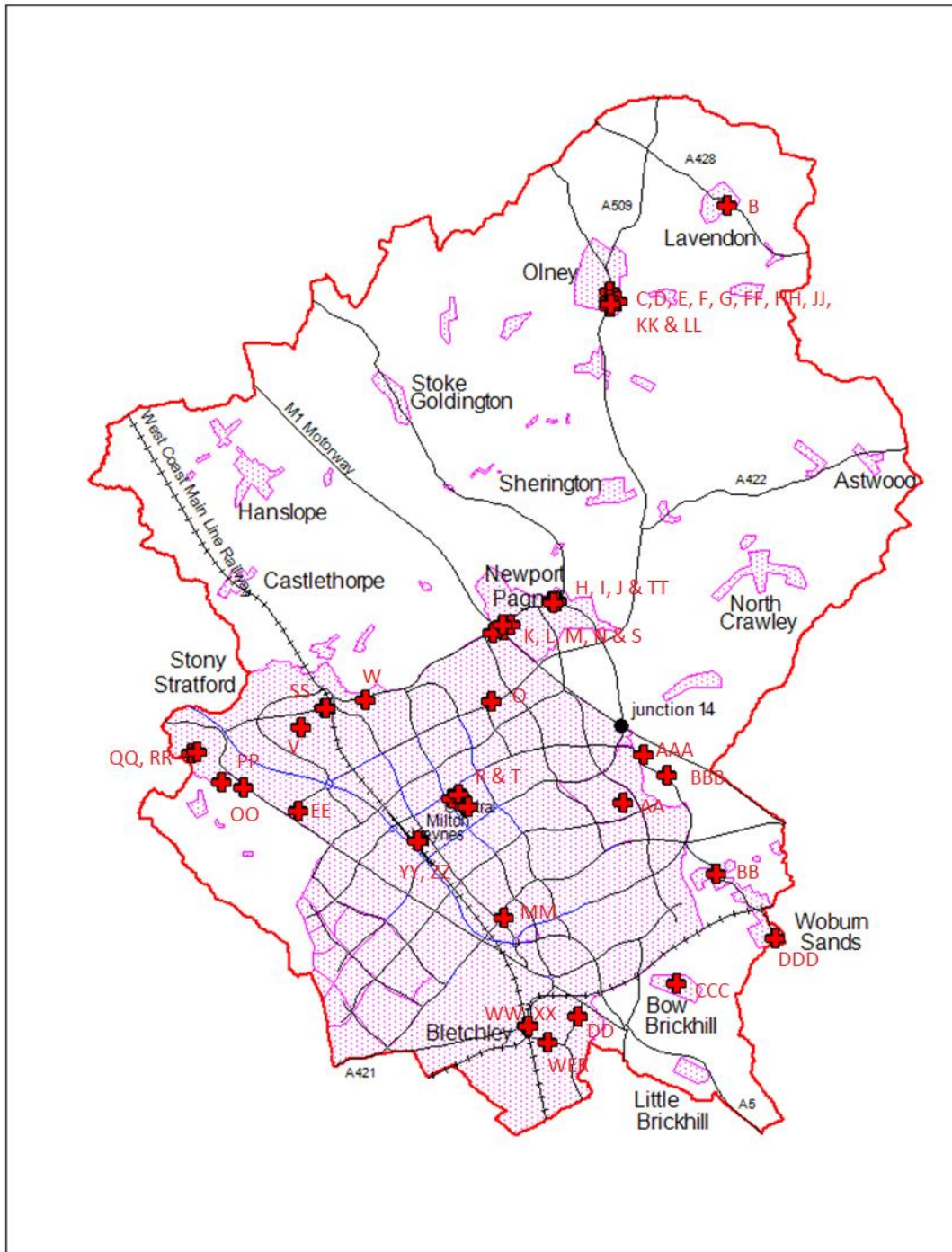
Roadbox 1 Monitoring Station Wolverton Road, Newport Pagnell (M1 bridge in background)




Roadbox 2 Monitoring Station High Street South, Olney



Figure D5 – Map of Non-Automatic Monitoring Sites



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 Nitrogen Dioxide diffusion tube location

## 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

<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

## 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.
- Milton Keynes Council, Annual Status Reports 2020.
- Milton Keynes Council, Air Quality Action Plan, Jan 2012.
- Local Air Quality Management Tools, NETCEN, on behalf of Department of the Environment, Food and Rural Affairs, available from web site: <http://uk-air.defra.gov.uk/>