



milton keynes council



2019 Air Quality Annual Status Report (ASR)

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

June 2019

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Executive Summary: Air Quality in Our Area

Overview of Air Quality in Milton Keynes

The main findings and conclusions of this report are that in 2018 air quality objectives were achieved at all monitoring locations throughout the Borough. In the Olney Air Quality Management Area (AQMA), the annual mean nitrogen dioxide objective has not been exceeded for the fourth year running; if it continues to be met during the next year the AQMA will be revoked following consultation with Defra. This is very encouraging, however much depends on continued improvements of emissions from vehicles and on meteorology throughout the calendar year, which has a strong influence on air quality. The slight overall downward trend in monitored concentrations has continued in 2018 but is becoming less pronounced.

As part of MK Council's Go Ultra Low City programme, [The Electric Vehicle Experience Centre](#) (EVEC) opened in Milton Keynes Shopping Centre in summer 2017 and has welcomed over 60,000 visitors in its first year of operation. It's the UK's first brand neutral showroom for electric vehicles (EVs) and plug-in hybrid electric vehicles (PHEVs) providing education and advice on choosing and using ultra low emission vehicles (ULEVs). There is a range of vehicles available to be booked for a 20-minute test drive and for four or seven day loan periods.

Milton Keynes has over 300 public charge points, the largest electric vehicle charging point networks in the country. To make the switch to electric easier, if it's not possible to have a Homecharge unit installed directly at your home address; MK Council will install a charge point close to your home. For businesses, there is funding available from MK Council to have charge points installed at no cost, full details can be found on the [EV Centre website](#).

Milton Keynes Coachway is now the location of the UK's largest electric vehicle charging hub, featuring eight 50 kW [POLAR](#) rapid charge points (Figure 1). More recently four [IONITY](#) 350 kW charge points providing ultra-rapid charging have been installed adjacent to the hub (Figure 2). This is in addition to the existing lower powered charge points at the Coachway.

Figure 1 MK Coachway - Electric Vehicle 8 Bay Charging Hub



Figure 2 MK - Coachway Ionity Ultra Fast 350 kW Chargers



The Council's [“Get Cycling”](#) program has a wealth of information on cycle routes and Redways, training (including adults), local groups and clubs, parking and changing facilities, and cycle hire including adapted bikes.

In addition to Santander cycle hire, Milton Keynes now has [Lime-E bikes](#) for hire. Costing £1 to unlock and 15 p per minute of usage, these bikes are electric motor-assisted, are dockless and can be left anywhere for the next person to use or for Lime engineers to locate by using GPS tracking.

Figure 3 Lime-E bikes parked outside Civic Offices



The [MK Futures 2050 Commission](#) identified sustainable mobility, tackling congestion and improving accessibility as project four of its “Six Big Projects”. The [Mobility Strategy](#) (Local Transport Plan 4 (LTP4)), covering the period 2018 to 2036, was adopted by MK Council Cabinet in March 2018. The [First and Last Mile Strategy](#) was submitted to the National Infrastructure Commission in November 2017 and forms part of a wider review of transport to support growth across the corridor between Oxford-Milton Keynes-Cambridge and address future congestion issues.

The [Mobility Strategy:Action Plan](#) was published in September 2018 and details how the Mobility Strategy will be implemented.

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 and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas^{1,2}.

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion³.

The main source of oxides of nitrogen and 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 (NO₂) and particulate matter (PM₁₀) 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 Olney. Since 2015 the annual mean objective for NO₂ 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 Anglian Region).

Actions to Improve Air Quality

Funding has been obtained from the Department for Transport (DfT) to complete the conversion of the A421 into dual carriageway from Eagle Farm roundabout to

¹ Environmental equity, air quality, socioeconomic status and respiratory health, 2010

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

³ Defra. Abatement cost guidance for valuing changes in air quality, May 2013

junction 13 of the M1 and ease congestion on this major route. Initial preparatory roadworks commenced in September 2018.

East West Rail is a scheme to re-establish a rail link between Oxford and Cambridge. The Western Section of the route (Oxford to Bedford) will be upgraded and disused sections reinstated. The scheme is being funded by the Department for Transport, with contributions from local councils. It is being delivered by Network Rail and could be operational in the early 2020s. Phase 2, Bicester to Bedford is being delivered by the East West Rail Alliance and major construction works are scheduled to start in late 2019.

Conclusions and Priorities

All air quality objectives have been achieved throughout the Borough even though the city continues to grow rapidly. 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 H6 Super Redway Route has been completed and work is in progress on the V8 route. The [Redway map](#), including other cycling routes in Milton Keynes, has been enhanced, updated and delivered to every household in the Borough.

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 How to Get Involved

The public can get involved by reducing their car usage; signing up to the [Car Share](#) scheme, changing to a car with lower emissions, walking and cycling and by using public transport.

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's [Highways and Transport Hub](#) website has links to all the services provided by the council in this area, including parking, public transport, road safety, maintenance, new roads and smarter travel.

More information on sustainable forms of travel can be found on the interactive [Get Smarter Travel MK](#) website; plan a journey, find a bus stop, track a bus, join a bike ride, discover upcoming events.

Figure 4 Smarter Travel in MK web page

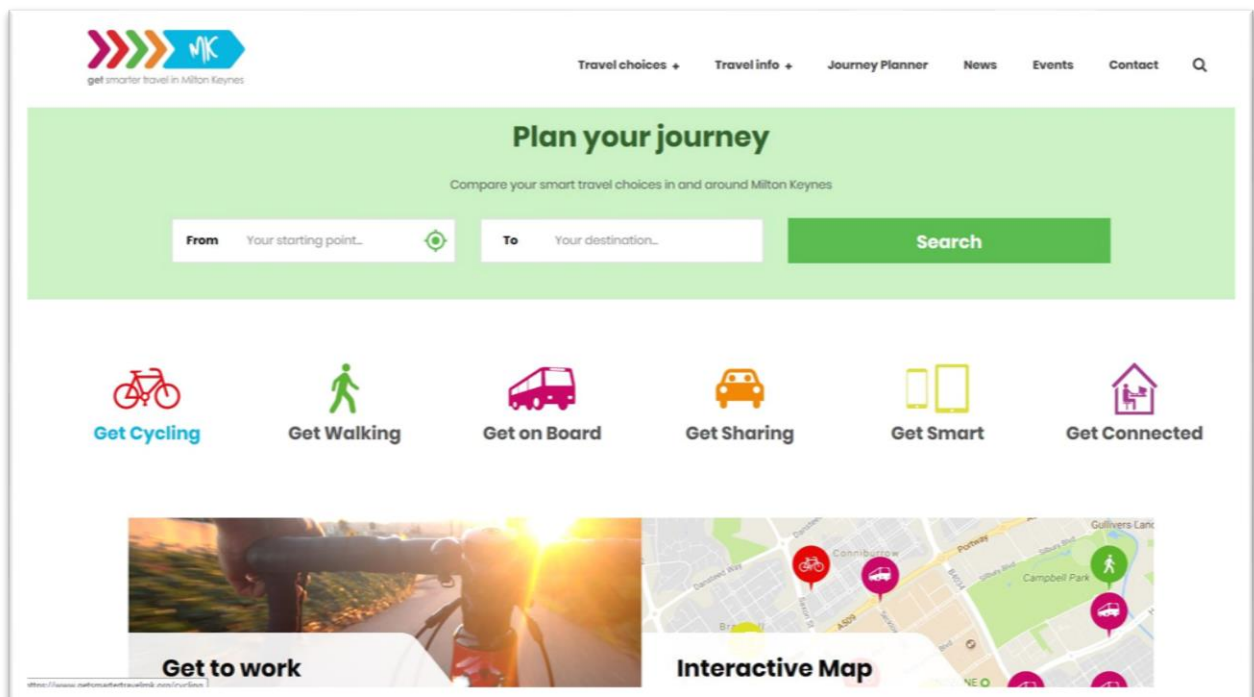


Table of Contents

Executive Summary: Air Quality in Our Area	i
Overview of Air Quality in Milton Keynes.....	i
Air Quality in Milton Keynes	iv
Actions to Improve Air Quality	iv
Conclusions and Priorities	v
Local Engagement How to Get Involved	vi
1 Local Air Quality Management	1
2 Actions to Improve Air Quality	2
2.1 Air Quality Management Areas.....	2
2.2 Progress and Impact of Measures to address Air Quality in Milton Keynes	4
2.3 PM _{2.5} – Local Authority Approach to Reducing Emissions and or Concentrations.....	11
3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance	13
3.1 Summary of Monitoring Undertaken	13
3.1.1 Automatic Monitoring Sites	13
3.1.2 Non-Automatic Monitoring Sites.....	13
3.2 Individual Pollutants	14
3.2.1 Nitrogen Dioxide (NO ₂).....	14
3.2.2 Particulate Matter (PM ₁₀).....	14
3.2.3 Particulate Matter (PM _{2.5})	15
3.2.4 Sulphur Dioxide (SO ₂).....	15
Appendix A: Monitoring Results	16
Appendix B: Full Monthly Diffusion Tube Results for 2018	30
Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC	33
Appendix D: Maps of Monitoring Locations and AQMAs	38
Appendix E: Summary of Air Quality Objectives in England	43
Glossary of Terms	44
References	45

List of Tables

Table 2.1 – Declared Air Quality Management Areas.....	3
Table 2.2 – Progress on Measures to Improve Air Quality	6
Table A.1 – Details of Automatic Monitoring Sites.....	16
Table A.2 – Details of Non-Automatic Monitoring Sites	17

Table A.3 – Annual Mean NO ₂ Monitoring Results	21
Table A.4 – 1-Hour Mean NO ₂ Monitoring Results	26
Table A.5 – Annual Mean PM ₁₀ Monitoring Results.....	27
Table A.6 – 24-Hour Mean PM ₁₀ Monitoring Results.....	29
Table B.1 – NO ₂ Monthly Diffusion Tube Results - 2018.....	30
Table C.1 – Co-location Study at Fixed Station, Civic Offices	34
Table C.2 – Co-location Study at Roadbox Station, Wolverton Road.....	34
Table C.3 – Co-location Study at Roadbox Station 2, Olney	35
Table E.1 – Air Quality Objectives in England	43

List of Figures

Figure 1 MK Coachway - Electric Vehicle 8 Bay Charging Hub.....	ii
Figure 2 MK - Coachway Ionity Ultra Fast 350 kW Chargers	ii
Figure 3 Lime-E bikes parked outside Civic Offices	iii
Figure 4 Smarter Travel in MK web page	vi
Figure A.1 – Trends in Annual Mean NO ₂ Concentrations	25
Figure A.2 – Trends in Annual Mean PM ₁₀ Concentrations	28
Figure 4 Co-location study at Marylebone Road London.....	36
Figure 5 Marylebone Road London Air Quality Monitoring Site	37
Figure 6 Fixed Air Quality Station, Civic Offices, Central Milton Keynes	38
Figure 7 Roadbox Air Quality Station, Wolverton Road, Newport Pagnell.....	39
Figure 8 Roadbox Air Quality Station, High Street South, Olney (Within Designated Air Quality Management Area).....	40
Figure 9 Automatic Air Quality Monitoring Station Photographs	41
Figure 10 Map of Non-Automatic Monitoring Sites	42

1 Local Air Quality Management

This report provides an overview of air quality in the Borough of Milton Keynes during 2018. 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 can be found in Table E.1 in Appendix E.

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 must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of the objectives.

A summary of AQMAs declared by Milton Keynes Council can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=165.

Alternatively, see Appendix D: Maps of Monitoring Locations and AQMAs which provides a map of air quality monitoring locations in relation to the AQMA.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)				Action Plan		
						At Declaration		Now		Name	Date of Publication	Link
Olney AQMA	Declared December 2008	NO ₂ Annual Mean	Olney	An area in Olney encompassing all properties fronting Bridge Street and High Street South, and also including part of Market Place.	No	43.2	µg/m ³	33.9	µg/m ³	Olney Action Plan	2012	http://www.milton-keynes.gov.uk/assets/attach/12676/Olney_Action_Plan_Oct12.pdf

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

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

Defra's appraisal of last year's ASR requested future reports show the calculations used to annualise data where there was less than 75% valid data capture for the full year in accordance with LAQM Technical Guidance 16 (TG16), however, data capture was greater than 90% at all monitoring sites in 2018 so no annualisation was necessary this year.

Within the Air Quality Action Plan (AQAP) effort has been made to include objective key performance indicators and reduction targets where possible and beneficial in tracking the effectiveness of the measure.

The appraisal supported MKC's decision to take a cautionary approach toward the revocation of the air quality management area (AQMA) in Olney. The annual mean nitrogen dioxide objective has not been exceeded for the fourth year running, which is very pleasing. New analysers have been procured and were commissioned in February 2019; data from the new analysers will be assessed with historical data to assist us in decision making with regard to revocation of the AQMA.

Four new monitoring sites were added to our monitoring network. Two of these sites are in the Eastern Expansion area Brooklands, including Mary Rose, a site close to the M1 and Fen Street, where the planners moved away from the usual 'grid road' system of the rest of Milton Keynes. The other two sites are in the older settlements of Woburn Sands and Bow Brickhill, where local development may have increased the number of vehicles. Results at all these locations are well below the annual mean objective. A map of diffusion tube locations can be found in Appendix D, labelled with the site ID references as suggested in Defra's appraisal.

Environmental Impact Assessments (EIAs) for major developments have been appraised to ensure that air quality concerns have been properly considered and will not significantly affect air quality.

Milton Keynes Council has taken forward a number of measures during the current reporting year of 2018 in pursuit of improving local air quality both within the AQMA and throughout the Borough. Details of all measures completed, in progress or planned are set out in Table 2.2.

Key completed measures are:

- New air quality monitoring analysers and communication system have been procured.
- Work commenced on dualling A421 to M1 junction 13.
- A509/A422 Willen Road to Olney road upgraded.
- Lime-E electric bike hire scheme launched.
- Vivacity sensor network completed and data purchased.
- Get on Board *zwitch campaign promoting bus use with rewards completed.

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

- Upgrading a second Redway route into a “Super Redway” (subject to funding).
- Installation of MK Coachway electric vehicle charging hub.

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

- Encouraging the continued uptake of ULEVs following the [MK Go Ultra-Low City scheme](#).
- Promoting the [Get Smarter Travel MK](#) initiative.
- Progressing the measures in the [Mobility Strategy](#) and the [First and Last Mile Strategy](#).

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations Involved and Funding source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to Implementation
1	Go Ultra Low City Scheme	Promoting Low Emission Transport	Other	MK Council	2015	2016-2020	ULEV ownership per capita	n/a	EV Centre opened in Centre:MK	2020	Trialling of driverless cars on highways and pods on shared footpaths https://www.gov.uk/government/news/40-million-to-drive-green-car-revolution-across-uk-cities
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	MK Council	Ongoing	Ongoing	Number of recharging events No of charge points	n/a	New charging hub at MK Coachway with 8 rapid and 4 ultra-rapid charge points. More than 300 public charge points installed.	Ongoing	Looking to install more in residential areas
3	Vivacity - a sensor network providing real-time transport information; volume, classification, speed, turning counts, parking availability.	Traffic Management	UTC, Congestion management, traffic reduction	MK Council/Vivacity	2016	2017/2018		n/a	Approx 400 sensors on highways and 1300 on parking areas.	2018	Some data has been purchased by MKC
4	Urban Traffic Management Control (UTMC) system	Traffic Management	UTC, Congestion management, traffic reduction	MK Council, DfT, National Productivity Infrastructure Fund	2017	By 2020			Feasibility and preliminary studies completed. Detailed design work underway.	2021	Installing an urban traffic management control system, inc bus priority measures.

Milton Keynes Council

Measure No.	Measure	EU Category	EU Classification	Organisations Involved and Funding source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to Implementation
5	UK Auto Drive programme	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	MK Council, Government, industries £19.4M	2015	2015			Trialing of driverless pods on shared footpaths ongoing. Trialing of driverless cars on public highways in MK started March 2018	2018	Research, development and integration of automated and connected vehicles http://www.ukautodrive.com/the-uk-autodrive-project/
6	Free ULEV green car parking permit. Cheaper permits for low emission vehicles	Promoting Low Emission Transport	Priority parking for LEV's	MK Council	2016	2016	Number of permits issued	n/a	Introduced July 2016	ongoing	https://www.milton-keynes.gov.uk/highways-and-transport-hub/smarter-choices/electric-vehicle-charge-points
7	Smarter travel choices	Promoting travel alternatives	Intensive active travel campaign & infrastructure	MK Council	2011	ongoing	Number of visits to website per month, currently 3500 per month	n/a	ongoing	ongoing	New website developed https://www.getsmartertravelmk.org/
8	Love to Ride - website encouraging cycling – cycle September June bike week. Prizes	Promoting Travel Alternatives	Promotion of cycling	MK Council	2017	2017	Number of new rides and miles ridden per 12 months		ongoing	ongoing	Cycle incentives website https://www.lovetoride.net/miltonkeynes
9	Super Redway Routes	Transport Planning and Infrastructure	Cycle network	MK Council	2017	2017			H6 super route completed	ongoing	Awaiting funding for further routes
10	Cycling information, events and opportunities	Public Information	Via the Internet	MK Council	2011	ongoing		n/a	ongoing	ongoing	Pedalling Culture Website developed http://www.pedallingculture.com/

Milton Keynes Council

Measure No.	Measure	EU Category	EU Classification	Organisations Involved and Funding source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to Implementation
11	Santander bike hire	Transport Planning and Infrastructure	Public cycle hire scheme	Santander /nextbike	2015	2016/17	Number of hires	n/a	300 bikes 42 docking stations	2017	Some stations closed due to vandalism
12	Lime-E Bikes	Transport Planning and Infrastructure	Public cycle hire scheme	Lime	2018	2018	Number of hires	n/a	50 bikes supplied (dockless GPS tracked)	ongoing	Bikes are unlocked using phone app
13	Public Health support for healthy schools	Promoting Travel Alternatives	Promotion of walking	MK Council	2018	2019-2024	No. of schools engaged	n/a	MoreLife UK commissioned to deliver- due to start schools element in Sept 2019	2024	Working to improve the whole school environment to reduce childhood obesity- from physical activity policies to staff training and will include active travel
14	Public Health AMKERS- Exercise on Referral	Promoting Travel Alternatives	Other	MK Council	n/a	Ongoing	Number of participants increasing their physical activity post programme	n/a	Participants can be referred to programmes across MK	ongoing	Throughout the 12 week programme participants are encouraged to increase their physical activity in all aspects of their lives including active travel
15	Public Health Weight Management programmes	Promoting Travel Alternatives	Other	MK Council	2018	2019-2024	Number of people completing programmes	n/a	Overweight individuals can access MoreLife weight management programmes across MK	ongoing	Throughout the 12 week programme participants are encouraged to increase their physical activity in all aspects of their lives including active travel
16	Modeshift STARS – national schools awards scheme	Promoting Travel Alternatives	School Travel Plans	DfT funding	2017	2017	Number of schools registered		28 schools registered to participate	ongoing	Walk to school, bike school and scooter training https://www.modeshiftstars.org/education/

Milton Keynes Council

Measure No.	Measure	EU Category	EU Classification	Organisations Involved and Funding source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to Implementation
17	First and Last Mile Strategy	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	MK Council	2017	2018-2050		n/a	Submitted to National Infrastructure Commission (NIC)	2050	https://www.nic.org.uk/wp-content/uploads/Milton-Keynes-First-Last-mile-strategy.pdf
18	Oxford to Cambridge Expressway	Transport Planning and Infrastructure	Other	Highways England / MK Council and other LAs	2016	Approx. 2025			Preferred corridor chosen. Actual route consultation 2019	2030	https://highwaysengland.co.uk/projects/oxford-to-cambridge-expressway/
19	East West Rail	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	East West Railway Company / Network Rail	2015	ongoing		n/a	Phase 1 complete. Phase 2 construction to start late 2019	2024 (estimated for western section)	https://www.eastwestrail.org.uk/
20	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	Central Beds Council/MK Council/DfT. £28.5m project.		ongoing			Initial preparatory roadworks commenced Sept 2018	Autumn/ winter 2020	http://www.centralbedfordshire.gov.uk/transport/a421/overview.aspx
21	A421 Dualling to Eagle Farm roundabout	Traffic management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	MK Council	2008 - 15	2016		n/a	completed	completed	

Milton Keynes Council

Measure No.	Measure	EU Category	EU Classification	Organisations Involved and Funding source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to Implementation
22	A509/A422 Willen Road to Olney improvements	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	MK Council DfT £3.9M funding	Summer 2017	Summer 2017			completed	Summer 2018	https://www.milton-keynes.gov.uk/pressreleases/2017/aug/council-awarded-3-9m-after-successful-bid-to-improve-highways
23	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	Highways England £373m project	2016	Jun-18		Environmental report found NO2 emissions not significant and scheme will ease congestion	Works commenced June 2018	2022	https://highwaysengland.co.uk/projects/m1-junction-13-to-junction-16-smart-motorway/
24	Real time passenger information (RTPI) – bus routes	Transport planning and infrastructure	Bus route improvements	MK Council	2012	2014 - ongoing		n/a	Most key routes now have RTPI	ongoing	https://www.milton-keynes.gov.uk/highways-and-transport-hub/bus-and-taxi/real-time-passenger-information
25	Hot Maps - mapping tools to encourage district heating schemes	Policy Guidance and Development Control	Sustainable Procurement Guidance	MK Council, EU Horizon 2020 £50K	2016	2020			contributing to creation phase	2020	Encourage more district heating schemes, expanding the heat network in CMK https://www.hotmaps-project.eu/

2.3 PM_{2.5} – 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_{2.5} (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM_{2.5} has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

The national air quality objective for PM_{2.5} is an annual mean concentration of 25 µg/m³, to be achieved by 31-Dec-2010. 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_{2.5}.

The health effects of PM_{2.5} 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.

It is estimated that UK emissions contribute about 50% of total annual average PM_{2.5}, 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_{2.5} emissions (up to 38%).

Milton Keynes Council is taking the following measures to address PM_{2.5} 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 \(2019\)](#).

Milton Keynes Council

- 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.
- Promoting the use of [Ecodesign Ready](#) domestic wood burning stoves and distributing leaflets advising how to operate and maintain stoves and the importance of using dry logs.

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

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 2018. Table A.1 in Appendix A shows the details of the sites. National monitoring results are available at <http://uk-air.defra.gov.uk/data/>

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.

A capital bid to replace the 20-year old analysers in the automatic stations was approved by Cabinet in June 2018. Air Monitors successfully bid for the contract and the new analysers were installed in February 2019. The two roadboxes each have a Serinus 40 NO_x analyser and the Civic Offices station has a Serinus 40 NO_x analyser, a Serinus 10 Ozone analyser and a Pallas Fidas 200E Particle Analyser. The Fidas analyser simultaneously records PM₁₀ and PM_{2.5} concentrations. Recorded data is automatically uploaded to the web.

3.1.2 Non-Automatic Monitoring Sites

Milton Keynes Council undertook non-automatic (passive) monitoring of nitrogen dioxide (NO₂) at 39 sites during 2018. All tubes are deployed in duplicate or triplicate. Table A.2 in Appendix A shows the details of the 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 NO₂ Network Field Inter-comparison Exercise managed by the National Physical Laboratory.

A map showing the location of the monitoring sites is provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes

including bias adjustments and any other adjustments applied (e.g. “annualisation” and/or distance correction), are included in Appendix C.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, “annualisation” and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO₂)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 5 years with the air quality objective of 40 µg/m³.

For diffusion tubes, the full 2018 dataset of monthly mean values is provided in Appendix B.

Table A.4 in Appendix A compares the ratified continuous monitored NO₂ hourly mean concentrations for the past 5 years with the air quality objective of 200 µg/m³, 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 fourth year running all diffusion tube locations within the Olney AQMA recorded annual means below the objective. The highest value was 33.9 µg/m³ recorded at the façade of 10 High Street South, Olney. The automatic analyser in Olney recorded an annual mean of 19.9 µg/m³.

Figure A.1 shows a graph of the annual mean data from the automatic air quality stations. There is a downward trend at all three monitoring stations.

3.2.2 Particulate Matter (PM₁₀)

Table A.5 in Appendix A compares the ratified and adjusted monitored PM₁₀ annual mean concentrations for the past 5 years with the air quality objective of 40 µg/m³.

Table A.6 in Appendix A compares the ratified continuous monitored PM₁₀ daily mean concentrations for the past 5 years with the air quality objective of 50 µg/m³, not to be exceeded more than 35 times per year.

Automatic monitoring results have been adjusted using the Volatile Correction Method (VCM) as developed by ERG at King's College, London for TEOM analysers.

There were no exceedences of either the annual mean or daily mean objectives. The Civic Offices station recorded an annual mean concentration of $14.7 \mu\text{g}/\text{m}^3$, 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 onwards.

3.2.3 Particulate Matter (PM_{2.5})

No specific PM_{2.5} monitoring was undertaken within the Borough of Milton Keynes in 2018, however, a Pallas Fidas 200E Particle Analyser capable of measuring both PM_{2.5} and PM₁₀ has been purchased and was installed in February 2019. Estimates of local PM_{2.5} concentrations for 2018 can be made by referring to background maps, surrogate data from AURN sites and by using local PM₁₀ data adjusted using the methodology in the technical guidance.

Based on the 2017 maps available on the Defra UK-Air website, the projected 2018 average background PM_{2.5} concentration in Milton Keynes is $10.05 \mu\text{g}/\text{m}^3$. An estimation of PM_{2.5} concentration can be made from PM₁₀ monitoring data by applying the nationally derived correction factor of 0.7, as described in Chapter 7 Section 1 paras 7.107 to 7.111 of the Technical Guidance. The estimated PM_{2.5} annual mean concentration at the Civic Offices is $10.29 \mu\text{g}/\text{m}^3$.

3.2.4 Sulphur Dioxide (SO₂)

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	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Monitoring Technique	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Inlet Height (m)
Fixed	Civic Offices, CMK	Urban Centre	485070	239131	NO ₂ ; PM ₁₀ ; O ₃	No	Chemiluminescence; Teom 1400AB; UV absorption	113 (to residential)	4.8	3.2
Roadbox 1	Wolverton Road, Newport Pagnell	Roadside	486290	243344	NO ₂	No	Chemiluminescence	25 (to residential)	3.4	1.5
Roadbox 2	High Street South, Olney	Roadside	488922	251157	NO ₂	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

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube co-located with a Continuous Analyser?	Height (m)
B1 B2	Northampton Rd, Lavendon (Horseshoe PH)	Roadside	491769	253542	NO ₂	No	0.6	3	No	2.1
C1 C2 C3	10 High St South, Olney (Cowper School House)	Roadside	488914	251173	NO ₂	Yes	0	2	No	2.3
D1 D2 D3	9 High St South, Olney (Olney Wine Bar)	Roadside	488904	251177	NO ₂	Yes	0	1.7	No	2.2
E1 E2 E3	20 High St, Olney	Roadside	488926	251455	NO ₂	No	3.3	7.6	No	2.2
F1 F2 F3	17 High St, Olney (Opp. No.20 High St)	Roadside	488905	251456	NO ₂	No	0	7.2	No	2.1
G1 G2 G3	Corner of Coneygere and Palmers Rd, Olney	Suburban	489108	251213	NO ₂	No	10.4	1.7	No	2.2
H1 H2	76 High St, Newport Pagnell	Roadside	487514	243901	NO ₂	No	2.3	2.2	No	2.4
I1 I2	63 High St, Newport Pagnell	Kerbside	487588	243912	NO ₂	No	2	0.4	No	2.4
J1 J2	57 High St, Newport Pagnell (The Plough PH)	Kerbside	487620	243922	NO ₂	No	2	0.4	No	2.4
K1 K2	16-17 Greenlands, Newport Pagnell	Suburban	486296	243208	NO ₂	No	10.1	1.6	No	2.1
L1 L2	5-7 Greenlands, Newport Pagnell	Suburban	486345	243230	NO ₂	No	5.4	1.4	No	2.5

Milton Keynes Council

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube co-located with a Continuous Analyser?	Height (m)
M1 M2	42-44 Walnut Close, Newport Pagnell	Suburban	486495	243345	NO ₂	No	7.6	1.5	No	2
N1 N2	222 Wolverton Rd, Blakelands	Suburban	486069	243148	NO ₂	No	25	1.6	No	2.2
O1 O2	64 Nicholas Mead, Great Linford	Urban Background	486039	241484	NO ₂	No	2.4	4	No	1.9
R1 R2 R3	Static Air Quality Station (Civic Offices)	Urban Centre	485070	239131	NO ₂	No	113	4.8	Yes	3.5
S1 S2 S3	Roadbox 1 (Newport Pagnell)	Roadside	486290	243344	NO ₂	No	25.8	1.8	Yes	2.4
T1 T2	Silbury Boulevard, CMK (corner of North Tenth St)	Kerbside	485298	239126	NO ₂	No	28.2	0.9	No	2.5
V1 V2	63 Windsor St, Wolverton	Suburban	481412	240860	NO ₂	No	2.3	1.1	No	2.3
W1 W2	130 Newport Rd, New Bradwell	Roadside	482965	241515	NO ₂	No	6.1	1.6	No	2.4
AA1 AA2	Brook Farm, Broughton Rd, Middleton	Suburban	489237	239016	NO ₂	No	23	1	No	2.1
BB1 BB2	14-16 Newport Rd, Wavendon	Roadside	491498	237284	NO ₂	No	9.7	7.2	No	1.9
DD1 DD2	Aylesbury St, Fenny Stratford (Bracknell House)	Roadside	488118	233814	NO ₂	No	11.1	4.5	No	2.4
EE1 EE2	6 Atherstone Court, Two Mile Ash	Suburban	481331	238825	NO ₂	No	9.5	0.4	No	1.9

Milton Keynes Council

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube co-located with a Continuous Analyser?	Height (m)
FF1 FF2 FF3	Cross Keys Office, High St South, Olney	Roadside	488898	251186	NO ₂	Yes	0.2	1.6	No	2
HH1 HH2 HH3	33 High Street South, Olney (Art Mart)	Roadside	488891	251248	NO ₂	Yes	0.6	2	No	2.1
JJ1 JJ2 JJ3	Roadbox 2 (Olney)	Roadside	488922	251157	NO ₂	Yes	10.1	2	Yes	2.1
KK1 KK2 KK3	18/20 Bridge St, Olney	Roadside	488917	251068	NO ₂	Yes	0.4	2.2	No	2.2
LL1 LL2 LL3	Courtney House, Bridge St, Olney	Roadside	488909	251077	NO ₂	Yes	0.4	1.7	No	2.1
MM1 MM2	18 Wheatcroft Close, Beanhill	Urban Background	486332	236228	NO ₂	No	10.1	0.3	No	2.2
OO1 OO2	Watling Street, Fullers Slade	Roadside	480015	239400	NO ₂	No	43	7.6	No	2.5
PP1 PP2	1 Tudor Gardens, Stony Stratford	Suburban	479459	239536	NO ₂	No	17	2.3	No	2.2
QQ1 QQ2	Silver Street, Stony Stratford	Suburban	478740	240217	NO ₂	No	3	0.9	No	2
RR1 RR2	Horsefair Green, Stony Stratford	Suburban	478882	240265	NO ₂	No	3.5	2.6	No	2
TT1 TT2	62 High Street, Newport Pagnell (Co-Op North)	Roadside	487589	243923	NO ₂	No	n/a	4.2	No	2
WER1 WER2	97 Water Eaton Road, Bletchley	Roadside	487395	233174	NO ₂	No	12	2.5	No	2.4
AAA1 AAA2	4 Mary Rose, Brooklands	Suburban	489835	240351	NO ₂	No	4.2	4.8	No	2
BBB1 BBB2	267 Fen Street, Brooklands	Roadside	490299	239695	NO ₂	No	6	0.5	No	2

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube co-located with a Continuous Analyser?	Height (m)
CCC1 CCC2	Grovesbrook, Station Road, Bow Brickhill	Roadside	490529	234611	NO ₂	No	12.2	2.9	No	2
DDD1 DDD2	Chapel Street/Station Road, Woburn Sands	Roadside	492923	235716	NO ₂	No	5.7	2.8	No	2

Notes:

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

(2) N/A if not applicable.

Table A.3 – Annual Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2014	2015	2016	2017	2018
Fixed	Urban Centre	Automatic	95.6	95.6	18.98	18.77	18.07	17.02	16.18
Roadbox 1	Roadside	Automatic	96.7	96.7	29.63	26.98	32.83	30.51	25.62
Roadbox 2	Roadside	Automatic	96.4	96.4	26.96	22.27	22.80	22.36	19.94
B1 B2	Roadside	Diffusion Tube	100	100	19.3	17	17.57	18.81	17.39
C1 C2 C3	Roadside	Diffusion Tube	100	100	40.5	32.9	36.91	33.41	33.93
D1 D2 D3	Roadside	Diffusion Tube	100	100	34.1	29.5	32.31	31.74	30.20
E1 E2 E3	Roadside	Diffusion Tube	100	100	21.9	21.6	23.53	21.43	21.33
F1 F2 F3	Roadside	Diffusion Tube	100	100	26.7	23.6	24.94	24.99	23.08
G1 G2 G3	Suburban	Diffusion Tube	100	100	12.8	10.5	11.54	11.5	10.85
H1 H2	Roadside	Diffusion Tube	100	100	26.4	22.8	25.49	26.58	23.80
I1 I2	Kerbside	Diffusion Tube	100	100	31.1	27.7	30.64	29.5	26.68
J1 J2	Kerbside	Diffusion Tube	100	100	34.2	30.1	31.43	31.05	29.98
K1 K2	Suburban	Diffusion Tube	100	100	28.4	25.6	23.4	24.76	22.16
L1 L2	Suburban	Diffusion Tube	100	100	25	22.3	21.77	24.42	20.72
M1 M2	Suburban	Diffusion Tube	100	100	19.9	18	18.13	19.18	16.87

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2014	2015	2016	2017	2018
N1 N2	Suburban	Diffusion Tube	100	100	24.7	20.1	23.19	20.96	21.46
O1 O2	Urban Background	Diffusion Tube	100	100	17.7	15.1	17.38	17.09	15.21
R1 R2 R3	Urban Centre	Diffusion Tube	100	100	19.4	17.1	18.92	18.23	18.41
S1 S2 S3	Roadside	Diffusion Tube	100	100	31.4	29.6	28.96	30.28	27.36
T1 T2	Kerbside	Diffusion Tube	100	100	23.7	21.1	23.45	23.13	21.57
V1 V2	Suburban	Diffusion Tube	100	100	15.2	14.7	15.81	14.25	15.00
W1 W2	Roadside	Diffusion Tube	100	100	20.1	17.8	19.9	19.15	17.69
AA1 AA2	Suburban	Diffusion Tube	100	100	15.8	13.3	15.91	14.94	14.36
BB1 BB2	Roadside	Diffusion Tube	100	100	23.7	19.4	21.12	19.29	18.36
DD1 DD2	Roadside	Diffusion Tube	100	100	24.2	20.1	22.55	20.69	22.75
EE1 EE2	Suburban	Diffusion Tube	91.7	91.7	12.6	10.8	11.87	11.88	12.18
FF1 FF2 FF3	Roadside	Diffusion Tube	100	100	37.3	32.9	33.99	34.48	30.59
HH1 HH2 HH3	Roadside	Diffusion Tube	100	100	32	28.5	30.45	30.89	26.64
JJ1 JJ2 JJ3	Roadside	Diffusion Tube	100	100	26.2	22.7	24.49	25.22	23.54
KK1 KK2 KK3	Roadside	Diffusion Tube	100	100	41.3	34.2	36.28	36.07	32.90
LL1 LL2 LL3	Roadside	Diffusion Tube	100	100	34.3	31.6	33.5	32.1	28.09

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2014	2015	2016	2017	2018
MM1 MM2	Urban Background	Diffusion Tube	100	100	24	22	24.11	25.69	22.58
OO1 OO2	Roadside	Diffusion Tube	100	100	18.1	17.6	20.79	18.61	19.92
PP1 PP2	Suburban	Diffusion Tube	100	100	10.6	9.2	11.12	9.85	10.64
QQ1 QQ2	Suburban	Diffusion Tube	100	100	19.8	18.6	17.95	16.91	17.73
RR1 RR2	Suburban	Diffusion Tube	100	100	22.3	20.2	22.13	21.16	21.16
TT1 TT2	Roadside	Diffusion Tube	100	100	34.2	27.6	27.12	27.53	26.81
WER1, WER2	Roadside	Diffusion Tube	100	100	–	–	–	20.89	19.99
AAA1, AAA2	Suburban	Diffusion Tube	91.7	100	–	–	–	–	19.44
BBB1, BBB2	Roadside	Diffusion Tube	91.7	100	–	–	–	–	19.75
CCC1, CCC2	Roadside	Diffusion Tube	91.7	100	–	–	–	–	14.52
DDD1, DDD2	Roadside	Diffusion Tube	91.7	100	–	–	–	–	14.91

Diffusion tube data has been bias corrected

Annualisation has been conducted where data capture is <75%

Notes:

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

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

(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%).

(3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Figure A.1 – Trends in Annual Mean NO₂ Concentrations

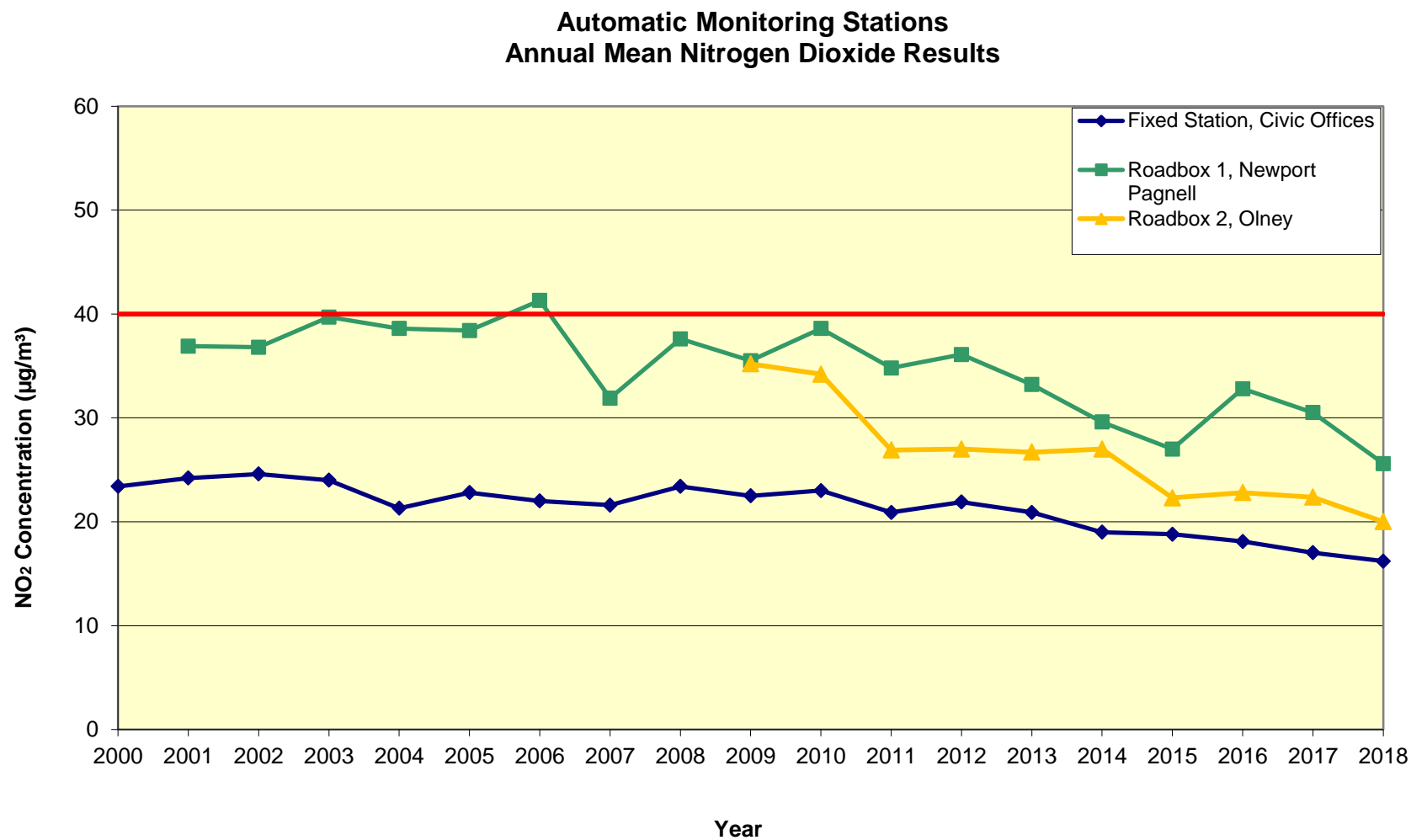


Table A.4 – 1-Hour Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ 1-Hour Means > 200µg/m ³ ⁽³⁾				
					2014	2015	2016	2017	2018
Fixed	Urban Centre	Automatic	95.6	95.6	0 (88.1)	0	0 (99.1)	0	0
Roadbox 1	Roadside	Automatic	96.7	96.7	0	0	0 (110.3)	0	0
Roadbox 2	Roadside	Automatic	96.4	96.4	0	0	0	0	0

Notes:

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

(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%).

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

Table A.5 – Annual Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	PM ₁₀ Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2014	2015	2016	2017	2018
Fixed	Urban Centre	93.9	93.9	14.7	14.8	14.2	14.5	14.7
Roadbox 1	Roadside	n/a	n/a	18	-	-	-	-
Roadbox 2	Roadside	n/a	n/a	19.1	16.7	17.4	16.5	-

Annualisation has been conducted where data capture is <75%

Notes:

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

(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%).

(3) All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Figure A.2 – Trends in Annual Mean PM₁₀ Concentrations

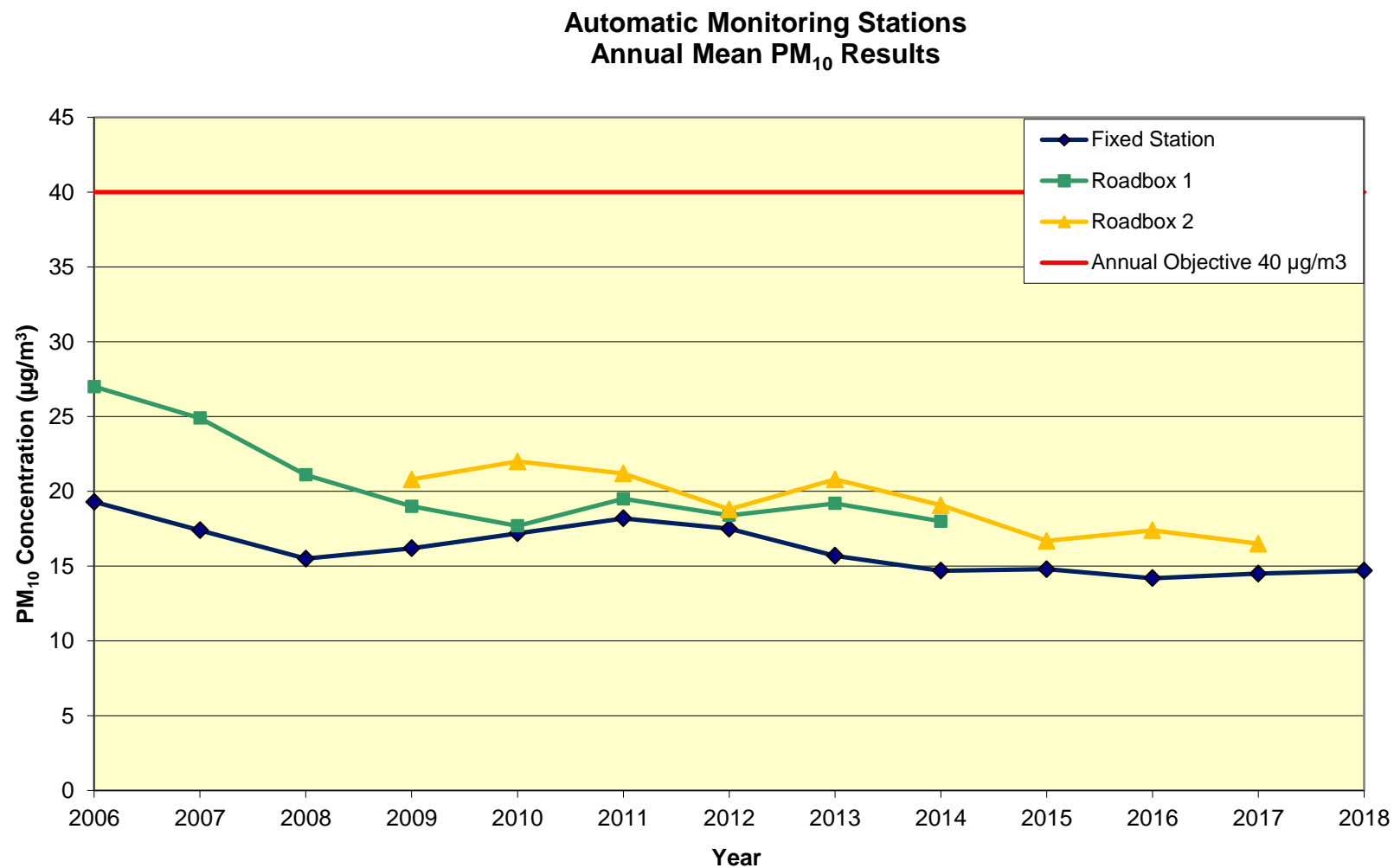


Table A.6 – 24-Hour Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	PM ₁₀ 24-Hour Means > 50µg/m ³ ⁽³⁾				
				2014	2015	2016	2017	2018
Fixed	Urban Centre	93.9	93.9	4	1	1	2	1
Roadbox 1	Roadside	n/a	n/a	4	-	-	-	-
Roadbox 2	Roadside	n/a	n/a	3	0	1	2 (29.3)	-

Notes:

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

(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%).

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

Appendix B: Full Monthly Diffusion Tube Results for 2018

Table B.1 – NO₂ Monthly Diffusion Tube Results - 2018

Site ID	NO ₂ Mean Concentrations (µg/m ³)													Annual Mean	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.78) and Annualised ⁽¹⁾	
	B1 B2	29.9	28.0	29.1	22.9	14.8	10.5	18.1	17.8	16.6	23.4	27.6			28.8
C1 C2 C3	44.1	50.3	52.8	41.9	47.6	46.0	38.4	37.0	34.0	46.8	38.8	44.3	43.5	33.9	
D1 D2 D3	41.5	45.2	44	34.8	35.7	33.2	45	35.6	30.1	41.1	37.8	40.6	38.7	30.2	
E1 E2 E3	31	34.9	33.2	26.2	24.4	23.2	24.3	19.1	20.3	30.9	32.7	28	27.4	21.3	
F1 F2 F3	33.2	35.1	33	26	22.8	19.3	29.2	30.8	28.4	33.6	28.2	35.5	29.6	23.1	
G1 G2 G3	20.7	20.2	17	13.2	8.2	7	7.9	11	10.8	15.7	17.4	17.8	13.9	10.8	
H1 H2	41.4	36.6	34	26.8	27.5	25	31.1	28.8	21.5	31.2	29.8	32.5	30.5	23.8	
I1 I2	40.8	40.6	41.2	32.5	27.7	23.6	31.2	30.6	29.9	34.4	40.8	37.1	34.2	26.7	
J1 J2	45.9	42.5	47.4	37.5	32.7	27.8	37.4	31.9	31.2	35.7	47.2	44	38.4	30.0	
K1 K2	39.1	32	37	29.2	13.6	16.7	24.7	23.6	29.3	30	33.8	31.9	28.4	22.2	
L1 L2	38.7	34.2	35	27.6	16.6	13.8	21.7	21.5	27.1	22.8	28.5	31.2	26.6	20.7	
M1 M2	32.3	28.3	27.5	21.6	10.8	9.5	17.2	19.7	18.4	22.2	24.4	27.6	21.6	16.9	
N1 N2	30.4	37.5	34.8	27.5	30.8	21.9	22.8	19.6	16.4	31.3	30.8	26.4	27.5	21.5	

Site ID	NO ₂ Mean Concentrations (µg/m ³)													Annual Mean	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.78) and Annualised ⁽¹⁾	
	O1 O2	27.4	20	26.3	20.6	14.3	11.3	11.5	16.7	16.8	20.7	24.3			24.1
R1 R2 R3	28.8	30.8	31.2	23.7	14.9	14.8	14.7	17.3	18.9	26.8	31.6	29.8	23.6	18.4	
S1 S2 S3	43.6	41.5	41.2	32.6	27.5	22.1	30.8	33.3	35.1	38.3	37.1	37.8	35.1	27.4	
T1 T2	34.8	37.4	33.1	26.1	21.8	17.2	20.7	20.2	20.6	28.8	36.6	34.6	27.7	21.6	
V1 V2	23.7	25.8	23.8	18.6	14.9	12.5	13.4	11.8	14.4	25.7	24.6	21.6	19.2	15.0	
W1 W2	29.2	30	28.8	22.7	14	9.4	18.8	16.3	20.6	25	27.9	29.5	22.7	17.7	
AA1 AA2	26	25.7	24.1	18.9	14.3	12.3	12.2	13.3	14	18.9	19.8	21.4	18.4	14.4	
BB1 BB2	28.4	30.3	27.4	21.5	22.6	18.3	17	19.1	20	24.8	26.3	26.8	23.5	18.4	
DD1 DD2	33.3	38.7	35.4	27.9	30.9	24.6	22.5	19.1	21.1	29.2	36.4	30.9	29.2	22.8	
EE1 EE2	19.4	19.3	20.5	16	missing	9.3	8.2	11.1	12.2	17.6	19.5	18.6	15.6	12.2	
FF1 FF2 FF3	44.1	45.1	45	35.6	30.4	29.6	43.4	35.2	35.1	41.3	41.5	44.3	39.2	30.6	
HH1 HH2 HH3	37.4	40.2	37.4	29.6	32.7	22.9	35.1	32.5	32.6	39.2	31.6	38.7	34.2	26.6	
JJ1 JJ2 JJ3	34.9	38.8	35.3	27.8	27.4	21.7	27.9	25.3	24.7	33.2	32.2	33	30.2	23.5	
KK1 KK2 KK3	44	48	49	38.8	41.3	34.2	44.7	38.7	35.6	40.2	42.8	48.8	42.2	32.9	
LL1 LL2 LL3	44.2	41.9	39.8	31.5	28.7	23.9	37.7	33.6	35.8	39.4	35.2	40.5	36.0	28.1	
MM1 MM2	34.9	32.6	35.5	27.9	24	19	26.5	26.9	27.8	26.3	30.6	35.4	29.0	22.6	
OO1 OO2	29	34.1	33.5	26.4	35.9	32.3	25.3	19.5	14.2	16.9	16.9	22.4	25.5	19.9	

Site ID	NO ₂ Mean Concentrations (µg/m ³)													Annual Mean	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.78) and Annualised ⁽¹⁾	
	PP1 PP2	17	18.5	19.8	15.4	8.9	9.3	8.6	9.3	9.5	14	18.8			14.6
QQ1 QQ2	27.5	29.2	30	23.6	18.8	16.4	22.2	18.3	16.6	21.9	23.6	24.7	22.7	17.7	
RR1 RR2	29.7	35	34	26.8	25.1	23.5	26.3	21.4	20.3	25.3	31	27.1	27.1	21.2	
TT1 TT2	41.1	41.3	38.5	30.3	31.7	26.7	32.8	31.2	29.1	41.7	32.1	35.9	34.4	26.8	
WER1 WER2	32.3	30.9	28.8	22.6	18.3	19.2	21.4	23.1	22.3	30.7	28.5	29.5	25.6	20.0	
AAA1 AAA2	-	35.1	29.5	23.2	23	24.3	22.7	20.8	19.2	25.9	24.5	25.9	24.9	19.4	
BBB1 BBB2	-	35.9	32.8	25.8	20	13.8	19.1	19.3	20.5	28.1	31.9	31.3	25.3	19.7	
CCC1 CCC2	-	26.3	25.2	19.7	13.3	12	13.2	13.8	14.4	20.4	23.4	23	18.6	14.5	
DDD1 DDD2	-	26.3	24.8	19.4	15.4	14.2	14.4	16.1	13.8	20.2	22.4	23.2	19.1	14.9	

Local bias adjustment factor used

Annualisation has been conducted where data capture is <75%

Where applicable, data has been distance corrected for relevant exposure (no distance correction was required)

Notes:

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

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

(1) See Appendix C for details on bias adjustment and annualisation.

(2) Distance corrected to nearest relevant public exposure.

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

Diffusion Tube Bias Adjustment Factors

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 NO₂ 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 NO₂ Network Field Intercomparison Exercise managed by the National Physical Laboratory (NPL).

Factors from Local Co-location Studies

Local co-location studies are carried out at all the automatic monitoring stations. Tubes are sited in triplicate near the air intake. Data can only be included in the bias adjustment factor calculation if there are more than 9 months data at each of the locations.

The co-location bias adjustment results for 2018 were 0.69, 0.74, and 0.67 giving a combined adjustment factor of 0.70. In addition we received a bias adjustment factor of 1.01 for the Marylebone Road, London, intercomparison tube study. The average for the four results was 0.78.

Table C.1 – Co-location Study at Fixed Station, Civic Offices

Month	Start Date	End Date	Diffusion Tube $\mu\text{g}/\text{m}^3$				Auto Average $\mu\text{g}/\text{m}^3$	
			1	2	3	Average		
Jan	03-Jan-18	31-Jan-18	26.96	29.87	29.72	28.85	20.83	
Feb	31-Jan-18	28-Feb-18	28.25	31.15	33.10	30.84	20.89	
Mar	28-Feb-18	28-Mar-18	29.93	30.75	33.04	31.24	19.43	
Apr	28-Mar-18	02-May-18	22.66	23.28	25.05	23.66	14.94	
May	02-May-18	06-Jun-18	15.41	17.65	11.70	14.92	13.19	
Jun	06-Jun-18	04-Jul-18	14.21	16.37	13.96	14.85	8.61	
Jul	04-Jul-18	01-Aug-18	15.52	16.50	12.19	14.73	11.60	
Aug	01-Aug-18	05-Sep-18	16.85	17.93	17.08	17.29	12.18	
Sep	05-Sep-18	03-Oct-18	15.53	20.26	20.98	18.92	13.07	
Oct	03-Oct-18	31-Oct-18	25.69	28.60	26.05	26.78	17.04	
Nov	31-Oct-18	05-Dec-18	30.42	30.64	33.67	31.58	22.27	
Dec	05-Dec-18	09-Jan-19	29.06	29.60	30.69	29.78	22.11	Adjustment Factor
Annual average:						23.62	16.35	

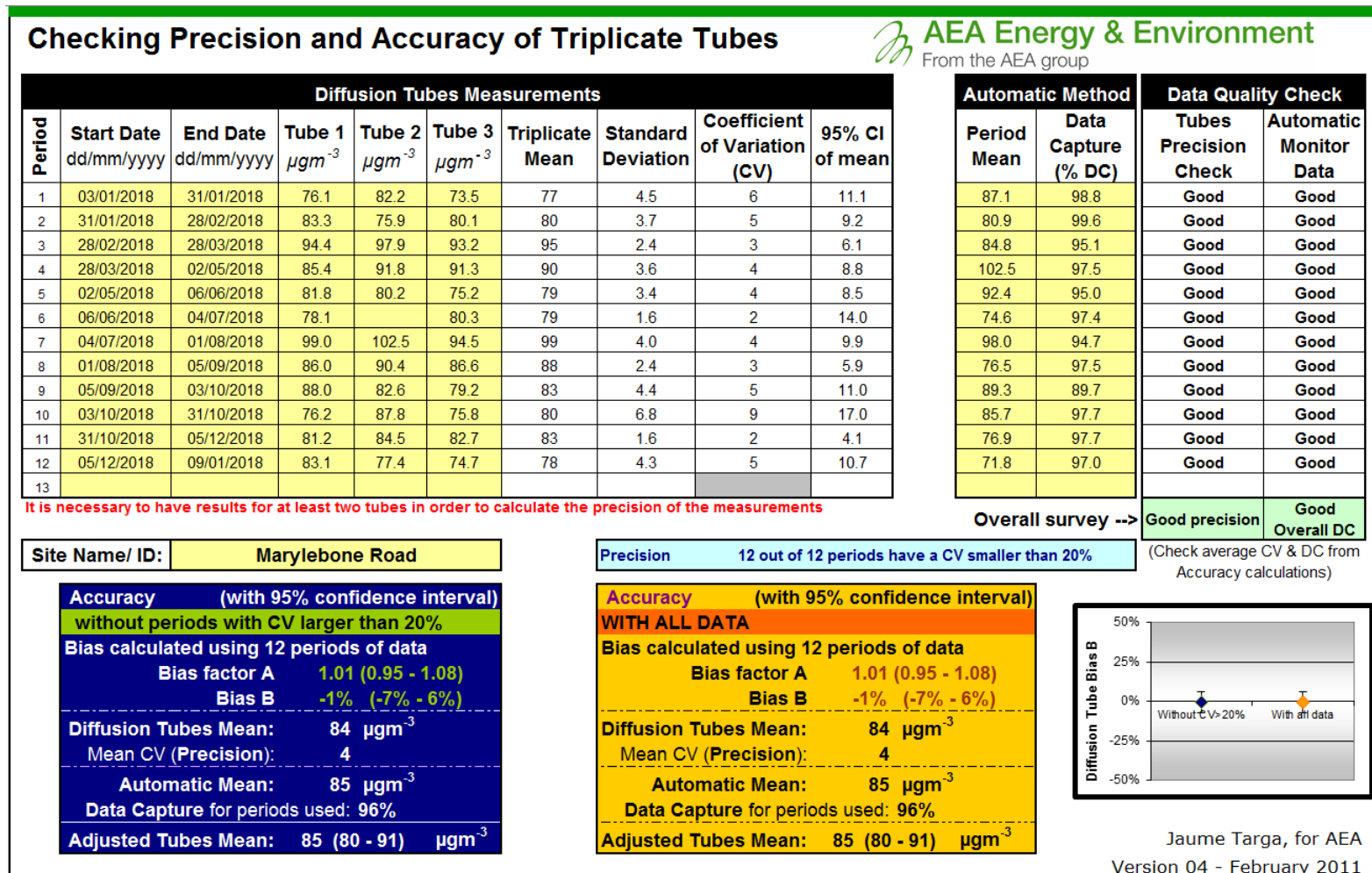
Table C.2 – Co-location Study at Roadbox Station, Wolverton Road

Month	Start Date	End Date	Diffusion Tube $\mu\text{g}/\text{m}^3$				Auto Average $\mu\text{g}/\text{m}^3$	
			1	2	3	Average		
Jan	03-Jan-18	31-Jan-18	42.33	43.09	45.40	43.61	29.11	
Feb	31-Jan-18	28-Feb-18	38.29	42.32	44.01	41.54	30.78	
Mar	28-Feb-18	28-Mar-18	39.92	41.51	42.27	41.24	30.04	
Apr	28-Mar-18	02-May-18	31.52	32.79	33.39	32.57	24.36	
May	02-May-18	06-Jun-18	24.52	26.92	31.11	27.52	18.65	
Jun	06-Jun-18	04-Jul-18	23.87	23.20	19.16	22.08	16.90	
Jul	04-Jul-18	01-Aug-18	35.49	30.21	26.64	30.78	23.87	
Aug	01-Aug-18	05-Sep-18	33.27	32.91	33.75	33.31	24.82	
Sep	05-Sep-18	03-Oct-18	34.37	36.26	34.72	35.11	26.02	
Oct	03-Oct-18	31-Oct-18	38.89	37.42	38.68	38.33	27.94	
Nov	31-Oct-18	05-Dec-18	38.17	38.93	34.30	37.13	27.20	
Dec	05-Dec-18	09-Jan-19	37.32	38.85	37.23	37.80	29.65	Adjustment Factor
Annual average:						35.09	25.78	

Table C.3 – Co-location Study at Roadbox Station 2, Olney

Month	Start Date	End Date	Diffusion Tube $\mu\text{g}/\text{m}^3$				Auto Average $\mu\text{g}/\text{m}^3$	
			1	2	3	Average		
Jan	03-Jan-18	31-Jan-18	33.01	36.55	35.23	34.93	22.59	
Feb	31-Jan-18	28-Feb-18	35.77	40.49	40.05	38.77	25.12	
Mar	28-Feb-18	28-Mar-18	35.06	37.39	33.42	35.29	24.62	
Apr	28-Mar-18	02-May-18	27.65	29.52	26.34	27.84	20.86	
May	02-May-18	06-Jun-18	28.44	28.96	24.72	27.37	18.68	
Jun	06-Jun-18	04-Jul-18	18.54	26.80	19.62	21.65	14.38	
Jul	04-Jul-18	01-Aug-18	26.61	31.62	25.45	27.89	18.68	
Aug	01-Aug-18	05-Sep-18	28.38	24.33	23.03	25.25	16.72	
Sep	05-Sep-18	03-Oct-18	21.96	26.07	26.17	24.73	15.96	
Oct	03-Oct-18	31-Oct-18	32.93	31.28	35.25	33.16	21.72	
Nov	31-Oct-18	05-Dec-18	33.02	31.67	31.91	32.20	20.54	
Dec	05-Dec-18	09-Jan-19	30.57	34.27	34.16	33.00	21.71	Adjustment Factor
Annual average:						30.17	20.13	

Figure 4 Co-location study at Marylebone Road London



If you have any enquiries about this spreadsheet please contact the LAQM Helpdesk at: LAQMHelpdesk@uk.bureauveritas.com

Figure 5 Marylebone Road London Air Quality Monitoring Site



Appendix D: Maps of Monitoring Locations and AQMAs

Automatic Monitoring Sites

Figure 6 Fixed Air Quality Station, Civic Offices, Central Milton Keynes

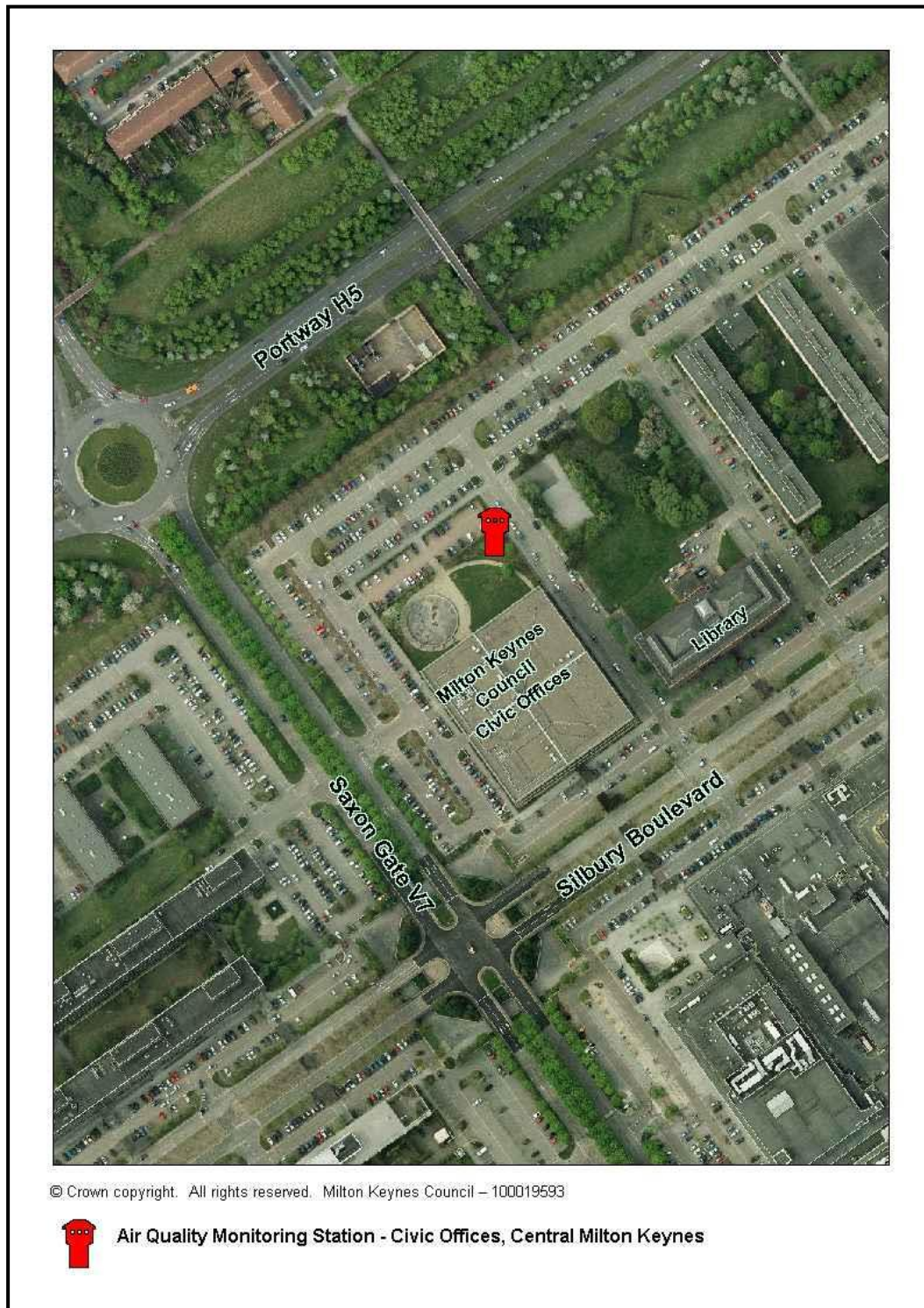


Figure 7 Roadbox Air Quality Station, Wolverton Road, Newport Pagnell

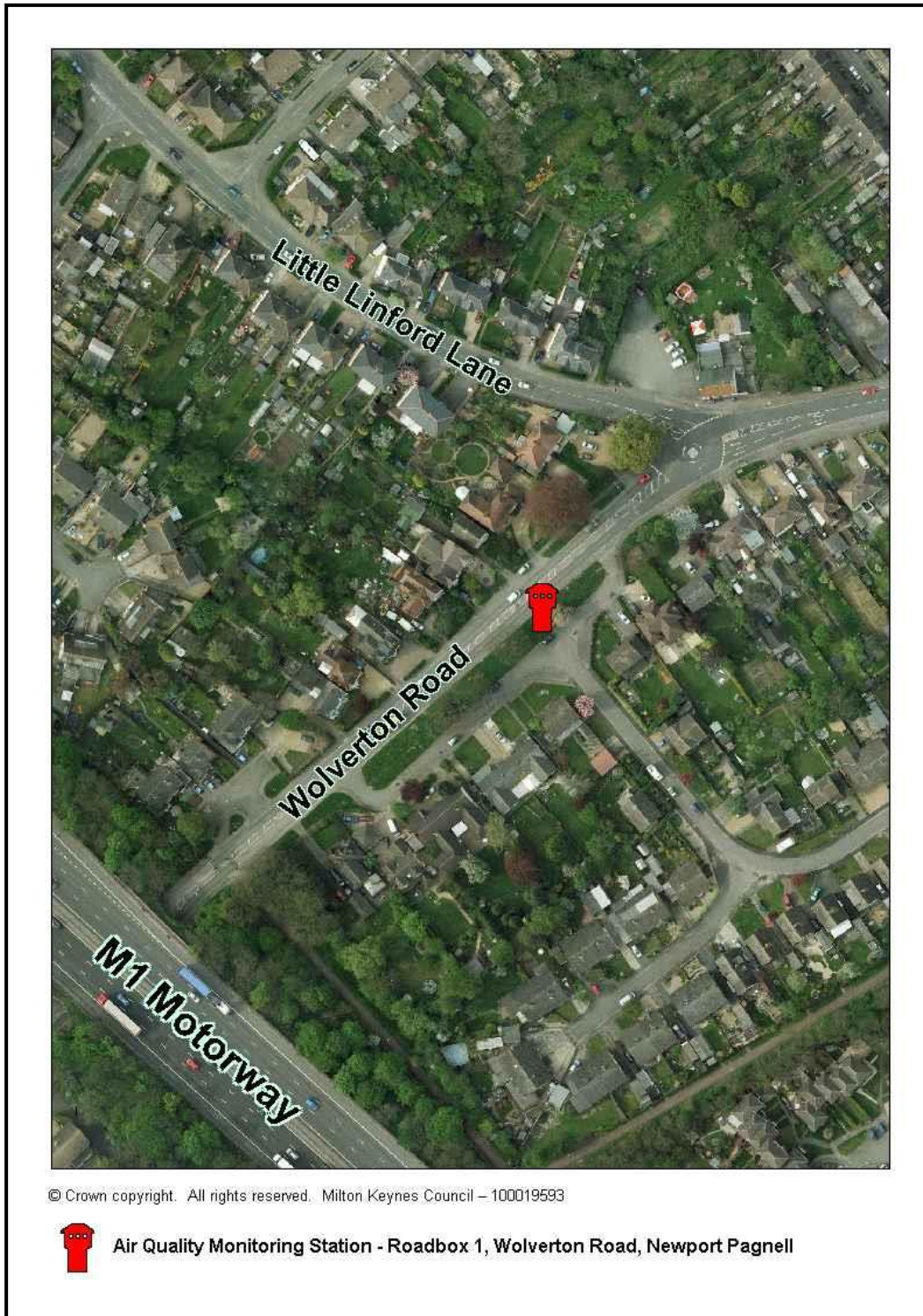


Figure 8 Roadbox Air Quality Station, High Street South, Olney (Within Designated Air Quality Management Area)

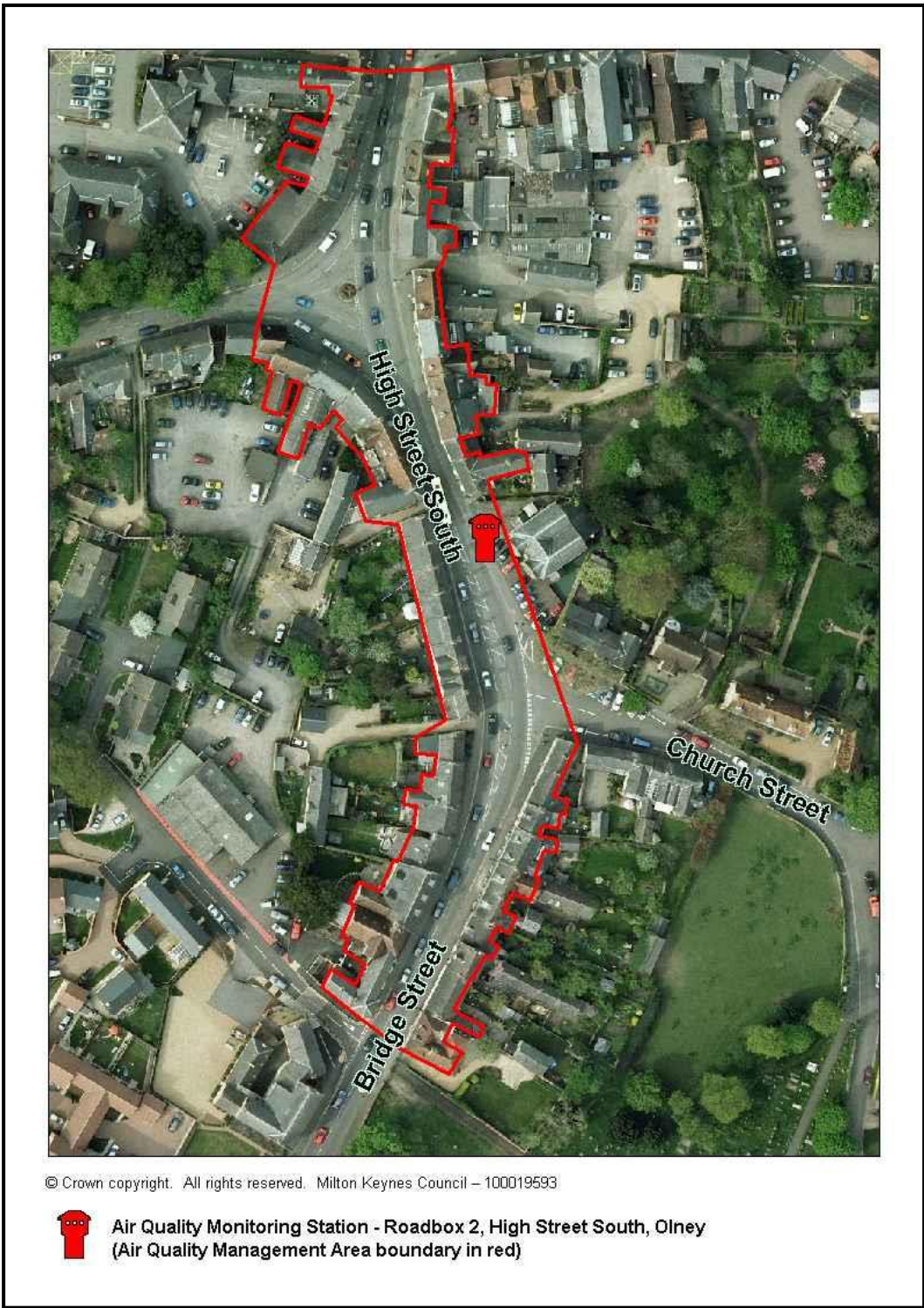


Figure 9 Automatic Air Quality Monitoring Station Photographs



Static Monitoring Station Civic Offices, CMK. (View from North Eighth Street towards Silbury Boulevard)

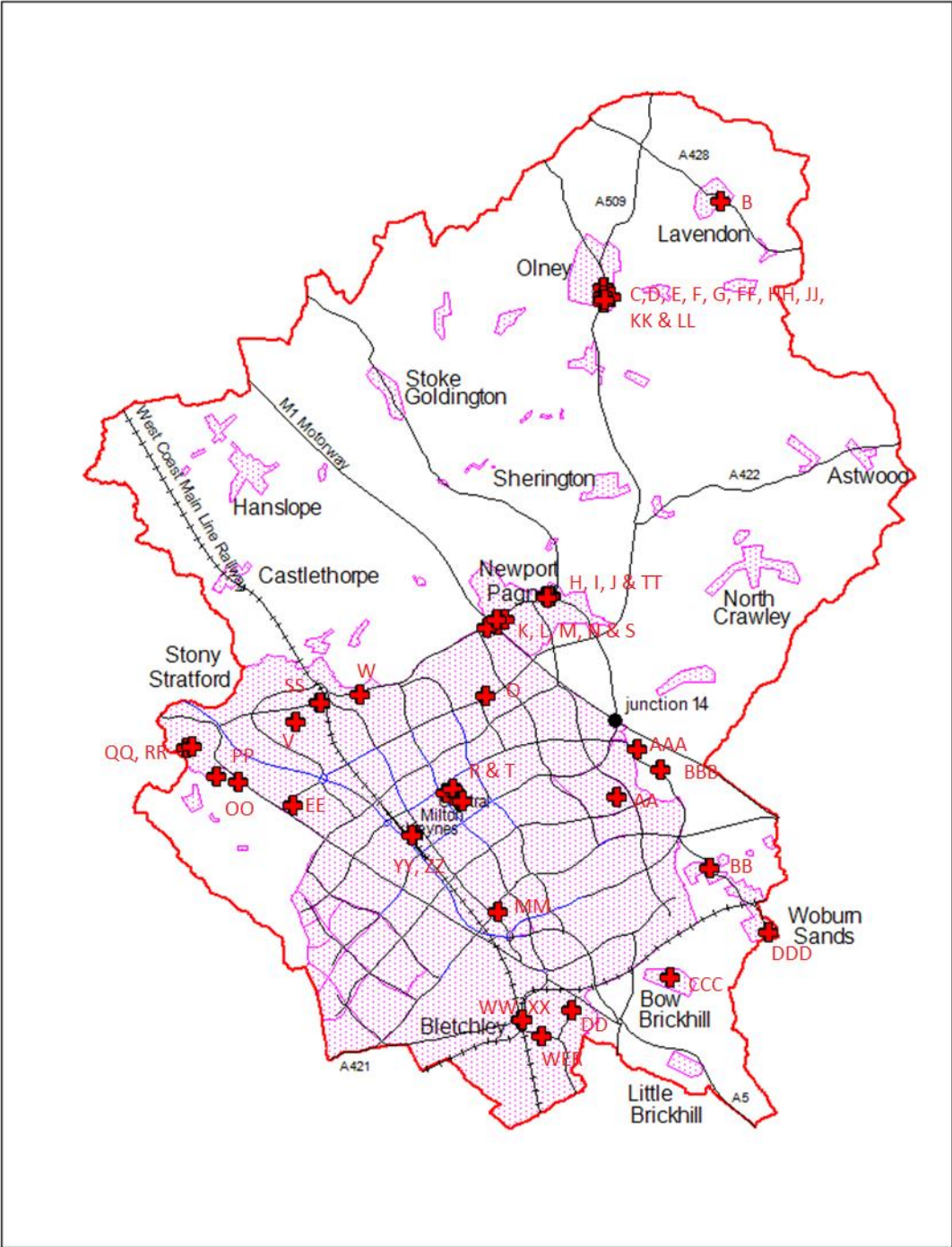


Roadbox 1 Monitoring Station Wolverton Road, Newport Pagnell (M1 bridge in background)




Roadbox 2 Monitoring Station High Street South, Olney (Within Air Quality Management Area)

Figure 10 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

Pollutant	Air Quality Objective ⁴	
	Concentration	Measured as
Nitrogen Dioxide (NO ₂)	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m ³	Annual mean
Particulate Matter (PM ₁₀)	50 µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m ³	Annual mean
Sulphur Dioxide (SO ₂)	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean

⁴ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

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	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO ₂	Sulphur Dioxide

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1. Department of the Environment, Food and Rural Affairs, The Air Quality (England) Regulations 2000, The Stationery Office.
2. Department for Environment, Food and Rural Affairs, Local Air Quality Management, Technical Guidance TG16, DEFRA Publications.
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7. Milton Keynes Council, Air Quality Action Plan, Jan 2012.
8. 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/>