2022 Air Quality Annual Status Report (ASR) for Broxtowe Borough Council

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

June, 2022

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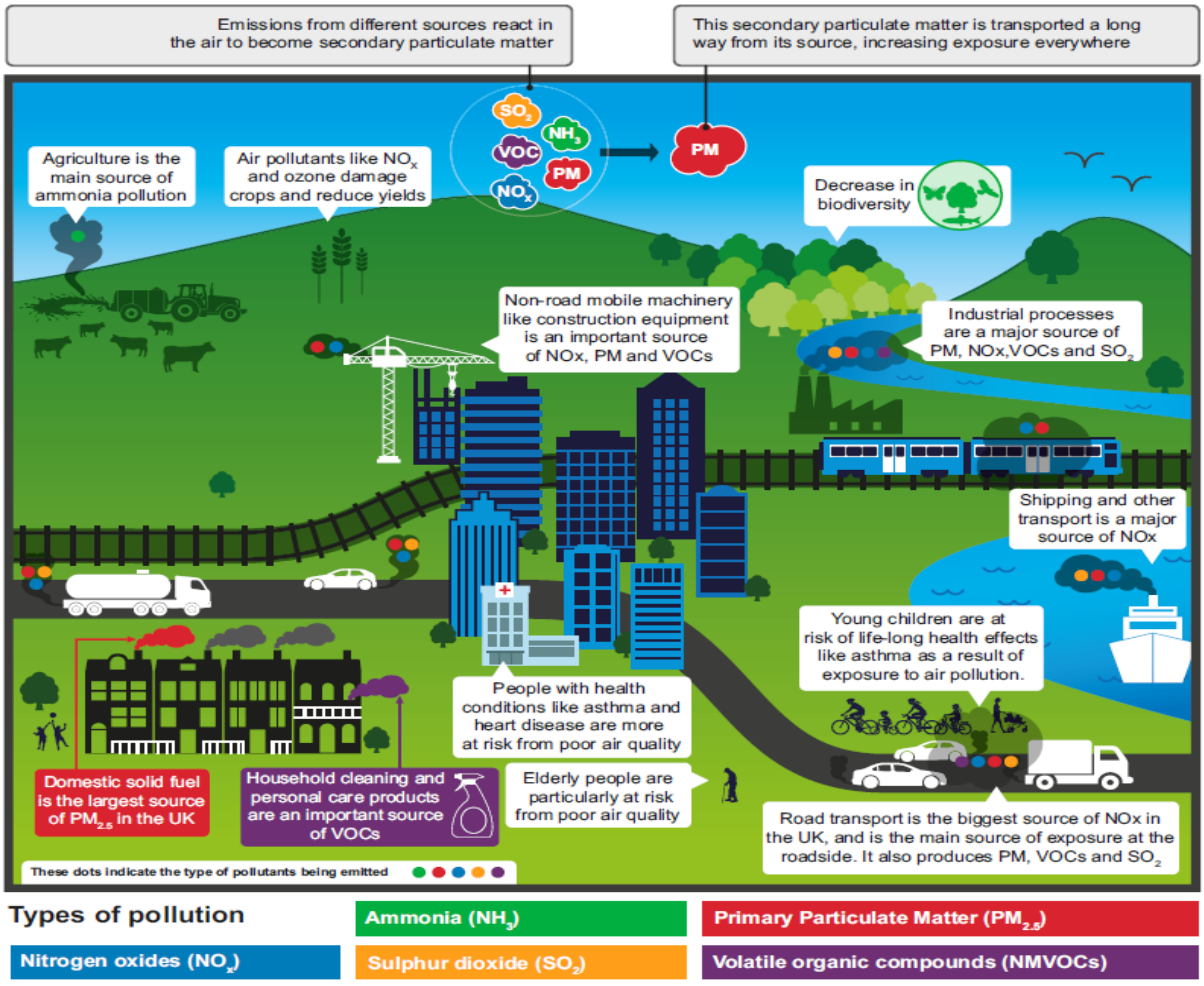
Executive Summary: Air Quality in Our Area

What is Air Pollution and where does it come from?

Air pollution is generally defined as any type of particulate (dust) or gaseous substance (e.g. Oxides of Nitrogen) that is emitted into the atmosphere due to the combustion of fuels such as coal, oil, gas, petrol, diesel and the burning of wood or natural gas from domestic central heating boilers or power stations. When these fuels are combusted, they are emitted into the atmosphere and they affect the air quality within the United Kingdom (UK).



Source – Clean Air Strategy 2019, DEFRA Clean Air Strategy

Poor air quality can affect people's health on a daily basis and can result in premature death. Therefore, it is imperative that poor air quality is recognised as a public health issue

and that continual measures are taken to improve the air quality even if the air quality objectives in the UK are being met.

The two main types of air pollution within the United Kingdom are Nitrogen Dioxide (NO_2) and Particulate Matter (PM_{10} and $PM_{2.5}$), therefore this report will explain the effects of these pollutants on health, the concentration levels within the Borough of Broxtowe and measures that have been, are being and will be taken to improve the air quality within the Borough.

What is Nitrogen Dioxide?

Nitrogen Dioxide is a reddish brown gas with the chemical formula NO_2. Nitrogen Monoxide is a colourless gas with the chemical formula NO. Collectively NO_2 and NO are known as Oxides of Nitrogen and the chemical formula is NOx.

As mentioned previously NOx is emitted into the atmosphere due to the combustion of fuels such as coal, oil, gas, petrol, diesel and the burning of wood or as natural gas from domestic central heating boilers or power stations.

Some sources of NOx release NOx in the form of NO_2 into the atmosphere, these are known as primary sources of NO_2, which are mainly emitted from vehicle exhausts. It was previously believed that it was petrol vehicles that were the main source of NO_2 however the use of diesel particulate filters within the exhaust systems of diesel vehicles have resulted in high concentrations of NO_2 being emitted into the atmosphere.

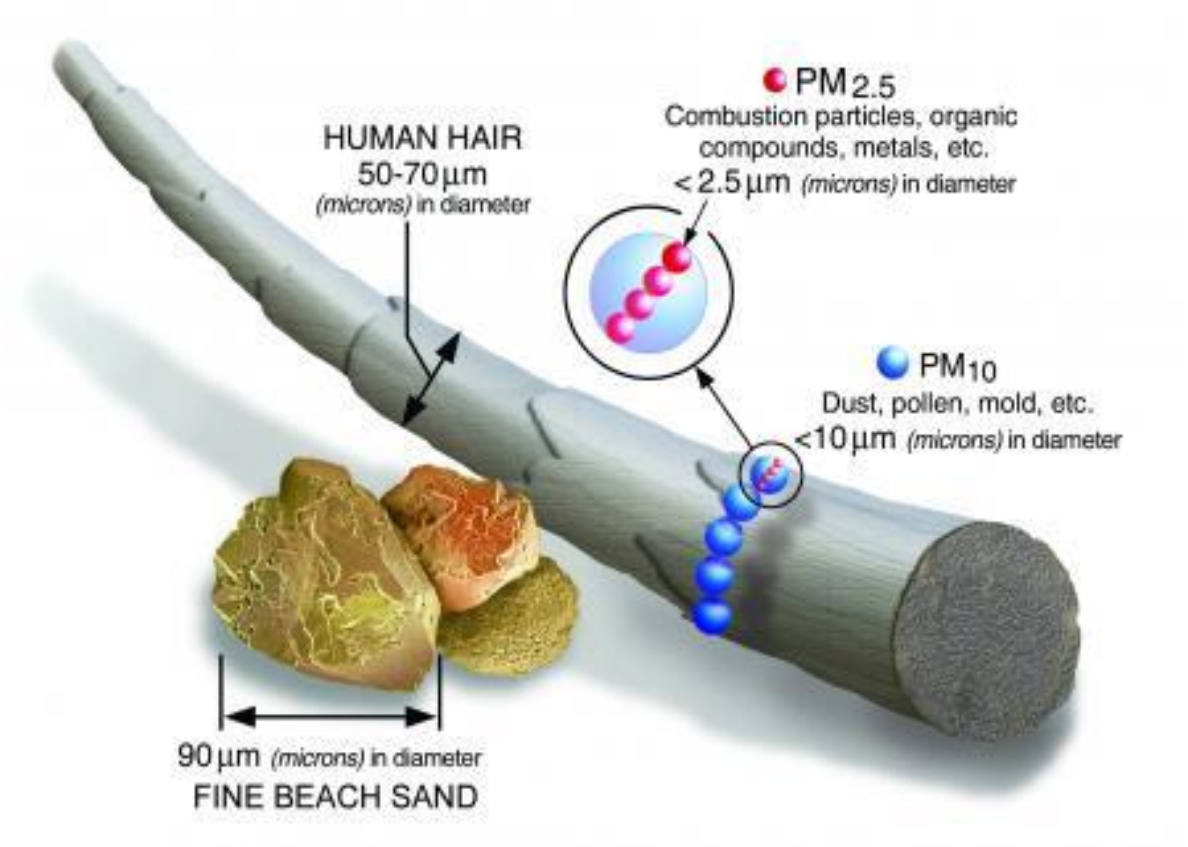
Another source of NO_2 in the atmosphere is due to a chemical reaction in the atmosphere between NO and Ozone (O_3). This is classed as a secondary source of NO_2. However, if concentrations of O_3 are low near to the source of NO then NO_2 will not be formed.

What is Particulate Matter?

Particulate matter is the term used for a mixture of solid particles and/or liquid droplets within the air. Particulate matter varies in size with some particles being easily visible to humans e.g. dust, soot, smoke and vapour from domestic boiler flues. However, some

particles are so small that they cannot be seen with the naked eye and it is these particles that are easily absorbed deep into the lungs and cannot be expelled when they are breathed in.

Size of Particulate Matter



Source: USEPA - Size of Particulate Matter

Research has shown that there is significant harm to health at concentrations of Particulate Matter well below the current EU and UK limit values. (See Appendix H for the Air Quality Objectives for the UK).

There are many sources of particulate matter in the United Kingdom, examples of these are:

- Vehicle exhausts
- The wearing of brake pads, tyres and asphalt
- Rust from vehicles
- Poor fuel combustion

- Dust from demolition and building sites
- Bonfires and inefficient burning of solid fuel e.g. wood.

Within the United Kingdom the main particulate matter that causes concern is particulates that are classed as 'fine particles' ($PM_{2.5}$) or 'inhalable coarse particles' (PM_{10}). The particles are measured in size and referred to as microns (µm). PM_{10} are particles that are 10 microns to 2.5 microns in size, and $PM_{2.5}$ are particles that are 2.5 microns or less.

What are the Health Effects of Poor Air Quality?

Air pollution is associated with a number of adverse health impacts both short term and long term. 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].

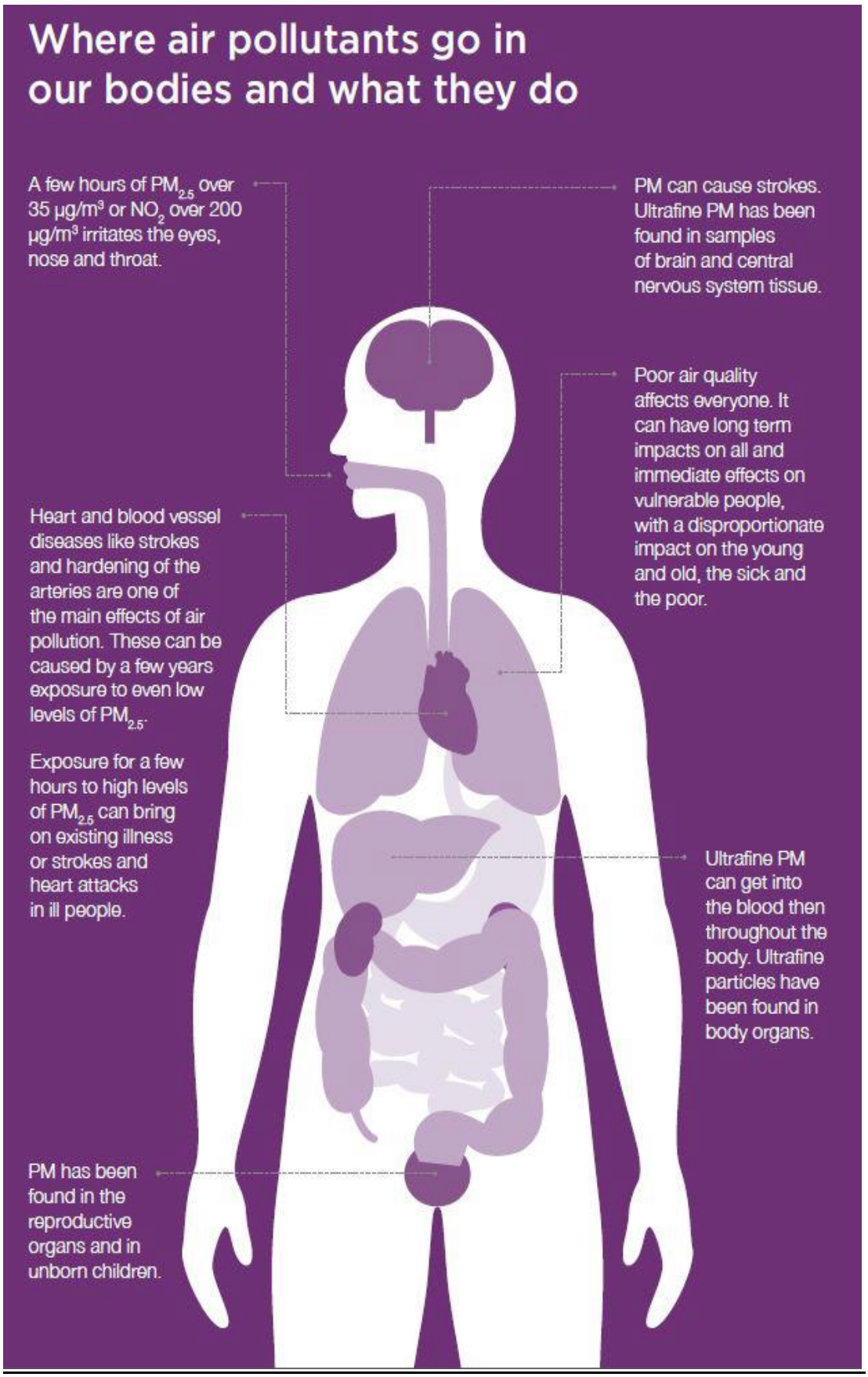
The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion[3].

To be able to understand the full effects of poor air quality on humans an understanding of how the pollutants enter the body, where they go once they are within the body and the effects that they have are shown in the diagram below.

[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

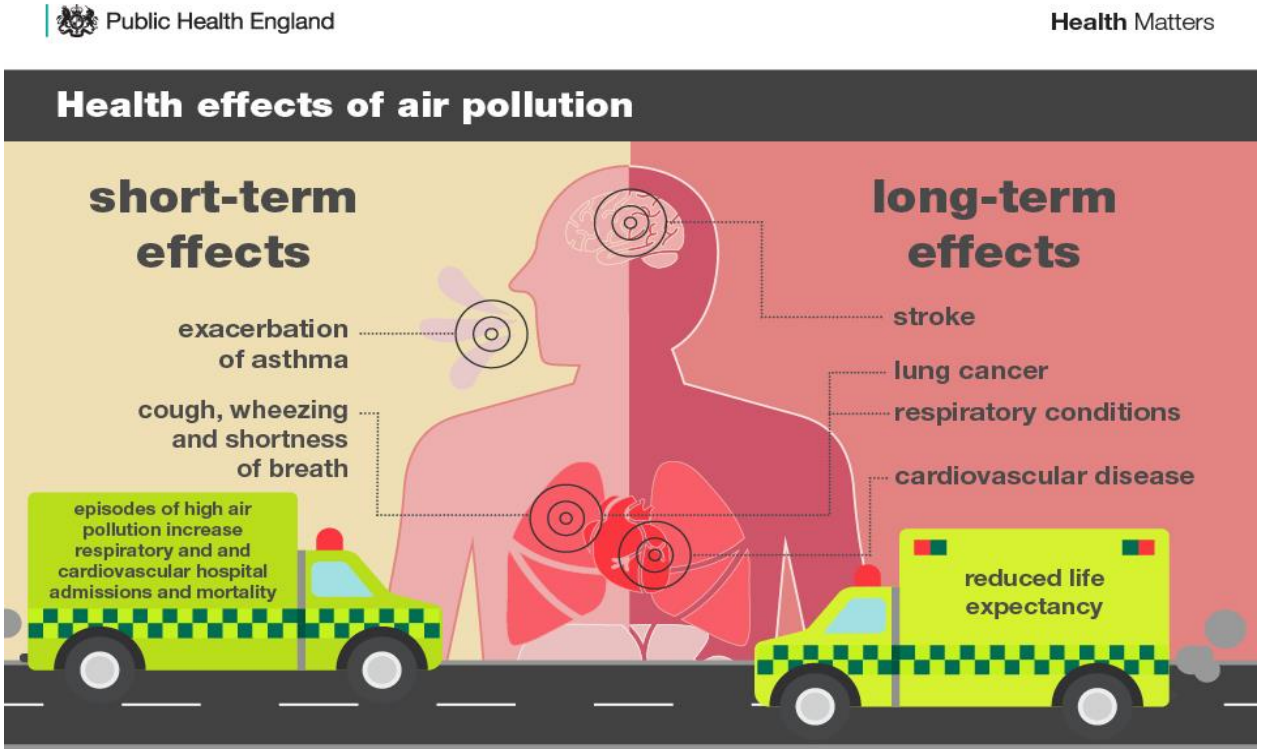
[3] Defra. Abatement cost guidance for valuing changes in air quality, May 2013



Source - Air Quality: A Briefing for Directors of Public Health, March 2017 Air Quality: A Briefing for Directors for Public Health

When people are within an area of poor air quality the length of time they are there is called the ‘exposure’ time’. There are two types of exposure, short-term and long term. Short-term is when the person is subjected to poor air quality for a short time e.g. a couple of hours and the effects are called ‘Short-term effects’. Long term exposure is when people are consistently living or working with in an area where there is poor air quality. The short- term and long-term effects on the body are shown in the diagram below.

The short and long-term effects of air pollution



Source – Health Matters 2018, Public Health England

Health Effects of Nitrogen Dioxide

The main health effect of breathing in raised levels of Nitrogen Dioxide is the increased likelihood of respiratory problems, as Nitrogen Dioxide inflames the lining of the lungs, and it can reduce immunity to lung infections. This can cause problems such as wheezing, coughing, colds, flu and bronchitis and can exasperate pre-existing conditions like asthma and Chronic Obstructive Pulmonary Disease.

The Committee on the Medical Effects of Air Pollution (COMEAP) has produced estimates of the attributable deaths of people aged 25+ due to NO_2 and Particulate Matter based on 36,000 for all local authorities in the United Kingdom. The estimates are based on the researched evidence of mortality risk combined with modelled levels of background air pollution to which populations are exposed to at each local authority. Table i provides the results for the East Midlands, Nottingham City and all the District and Borough Councils within Nottinghamshire.

Table i – Estimated Attributable Deaths in 2020 due to NO_2 and Particulate Matter based on 36,000.

Area	Attributable deaths Age 25+ due to NO_2 and PM based on 36,000	Associated Life-years Lost based on 36,000 (COMEAP Aug 18)
East Midlands	3,445	30,878
Nottingham City	197	2,004
Ashfield	93	851
Newark and Sherwood	85	805
Bassetlaw	85	797
Broxtowe Borough Council	90	787
Mansfield	86	764
Gedling	98	807
Rushcliffe	74	679

Source: COMEAP, Associations of long-term average concentrations of Nitrogen Dioxide with mortality, 2018.

Table i shows that in the Borough of Broxtowe out of 787 life years lost, 90 of these are attributable to NO_2 and Particulate Matter. However, the data also identifies that Broxtowe does not have the highest number of deaths that are attributable to air quality in comparison to other District and Borough authorities in Nottinghamshire.

Health Effects of Particulate Matter

The health effects associated with short term and long-term exposure to particulate matter are; exacerbation of asthma, effects on lung function, increases in hospital admissions for respiratory and cardiovascular conditions, and also increases in mortality[4]. Public Health England (PHE) has produced estimates of the risk of mortality from particulates for all local authorities in the United Kingdom. The estimates are based on the researched evidence of mortality risk combined with modelled levels of background air pollution to which populations are exposed to at each local authority. See Section 2.3 of this report for further information on the estimated effects of annual mortality in 2020 of human made $PM_{2.5}$ air pollution.

Air Quality in the Borough of Broxtowe

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 health inequalities issues because areas with poor air quality are also often less affluent areas[5,6].

[4]Gowers, A.M. et al Estimating Local Mortality burdens associated with Particulate Air Pollution, Public Health England, 2017.

[5] Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

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

The mortality burden of air pollution within the UK is equivalent to 28,000 to 36,000 deaths at typical ages[7], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[8].

The main air quality issue within the Borough is due to the M1 and the A52, which is the main road that connects Nottingham to Derby and is used heavily by commuters. Residential properties are situated alongside the M1 and the A52.

The main pollutants of concern within the Borough is Nitrogen Dioxide and Particulate Matter, which is emitted from vehicles exhausts and is prevalent in areas where there are congested roads e.g. the M1 and the A52. However, it must also be noted that ambient background levels are affected by emissions from domestic heating e.g. Oxides of nitrogen from boilers and particulate matter from solid fuel burners.

Broxtowe Borough Council participates in the United Kingdom Nitrogen Dioxide diffusion tube network and has 45 diffusion tubes sites throughout the Borough. The sites are primarily monitoring the M1 corridor and the A52. Some of the diffusion tubes are sited within and near to the existing Air Quality Management Area (AQMA), which is situated in Trowell. Monitoring is still being undertaken in the three revoked AQMAs to ensure that the concentrations remain below the air quality objective. Further information on the AQMA is discussed in Section 2.1 of this report.

The 2021 nitrogen dioxide results show that the air quality levels are below the objective of 40µg/m^3 for all of the monitoring locations throughout the Borough. The results and trends are discussed in greater detail in Section 3.2.1 of this report.

In respect of particulates, the modelled background level provided by Defra for the Borough of Broxtowe indicated levels between 7.5µg/m^3 and 9.5µg/m^3 for 2021, with the

[7] Defra. Air quality appraisal: damage cost guidance, July 2020

[8] Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

annual mean for 2021 being 8.4µg/m^3. The World Health Organisation (WHO) guideline level for $PM_{2.5}$ is 10µg/m^3.

Broxtowe Borough Council has a close working relationship with National Highways and Nottinghamshire County Council's Place Department who have responsibility for highways. National Highways manages the M1 Motorway and the A52, which run through the Borough. Nottinghamshire County Council Place Department manage the remaining roads that run through the Borough; this includes the A610/B600 Nuthall Roundabout.

The Council works with National Highways and Nottinghamshire County Council by continuing to monitor air quality levels throughout the Borough, to inform them of any changes to the air quality levels, to provide maps of the air quality management areas and to provide yearly air quality reports. By working together actions are implemented where possible to ease congestion by maintaining a steady flow of traffic throughout the Borough and to also promote sustainable travel.

The Environmental Health team at Broxtowe Borough Council also works closely with the Environment Agency who attend the Nottinghamshire Environmental Protection Working Group meetings along with some of the local authority planners. This ensures that air quality issues are raised and considered throughout the planning process.

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[9] sets out the case for action, with goals even more ambitious than EU requirements to reduce exposure to harmful pollutants. The Road to Zero[10] sets out the approach to reduce exhaust emissions from road transport through a number of

[9] Defra. Clean Air Strategy, 2019

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

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.

Below is a brief summary of the core actions to target sources of pollution in the Borough of Broxtowe over the past year.

- **Low Emission Fleet Vehicles** – Broxtowe Borough Council has purchased eight more Euro 6 vehicles in 2021 to replace two older more polluting vehicles.
- **Electric Fleet Vans** – Two electric fleet vehicles were purchased in 2021 due to satisfactory trials of two electric fleet vans in 2020.
- **To replace Broxtowe Borough Council older combination boilers and system boilers to Seasonal Efficiency of a Domestic Boiler in the UK (SEDBUK) A rated condensing boilers** – In 2021, BBC have replaced a total of 103 domestic boilers. Of these, 17 were of low efficiency, the others being lifecycle
- **Broxtowe Borough Council Cycle to Work Scheme** – Seven employees purchased bikes through this scheme in 2021. Since the scheme started, 177 employees have purchased bikes through the scheme.
- **Marketing and promotion of sustainable transport alternatives** – both the County Council and Broxtowe Borough Council continue to develop and deliver programmes to encourage more sustainable travel. These include infrastructure improvements such as the County Council's integrated transport programme delivering improvements for pedestrians, cyclists and bus users; cycle training, as well as marketing materials and campaigns developed in partnership with stakeholders such as passenger transport operators.
- **Car Club partnership** – Work has been undertaken to investigate the feasibility of a partnership with a Car Club operator in the County, for both residents and internal use (i.e. staff travel), which will feed into a wider review of fleet and staff business travel.
- **Electric Vehicle Cable Channels** – The County Council continues to work on developing the EV charging infrastructure network within the county. A report on 'On-street Electric Vehicle Charging Infrastructure' was considered at the February 2022 Transport & Environment Committee, and approval was granted for the introduction of an Electric Vehicle Cable Channel pilot scheme. Work is currently underway to finalise the details of the pilot scheme.

- **Bus Service Improvement Plans (BSIP)** – NCC have developed two Bus Service Improvement Plans (BSIP) for Nottinghamshire; the BSIP for the Greater Nottinghamshire (Robin Hood) area which was developed in partnership with Nottingham City Council, and the BSIP for Nottinghamshire. The plans, which were approved at the Transport & Environment Committee in November 2021, outline the Council's ambitions for improving bus services within the county.
- **Traffic management improvements** – general traffic management schemes have been introduced in the borough, including signal improvements/upgrades to help improve capacity/traffic flows on the A6005 Queens Road/Station Road, Beeston and A608 Derby Road/Mansfield Road/Nottingham Road, Eastwood.
- **Effective Network Management** – the County Council continues to work with stakeholders to effectively manage its highway network. This includes the co-ordination of works, contingency planning, and effective event and incident planning.
- **Cycle network improvements** – the County Council, working in partnership with Nottingham City Council, has secured funding through the City Council's Transforming Cities for potential upgrades to routes along the A6005 corridor. Initial feasibility work has been undertaken and public consultation on the project is due to end in May 2022. The County Council's Tranche 2 of the Active Travel Fund (ATF) include cycling improvements in Beeston, including the potential installation of additional secure cycling hubs at the rail station, subject to feasibility/ consultation/ approval.
- **Workplace Travel Plans** – Broxtowe Borough Council and Nottinghamshire County Council have completed a Council Travel Plan to help promote sustainable travel amongst staff as part of both their journeys to work and whilst undertaking Council business. Travel Plans are also developed with businesses through the development control process.
- **School Travel Toolkit** – Following a successful trial with four pilot schools in 2019/20, the Nottinghamshire School Travel Planning Toolkit was rolled out to all County schools during the 2020/21 academic year. The toolkit provides schools, parents/carers and children with information and advice on improving travel to and from schools, including the sustainable travel options available.

Further information on these core actions and progress on grant funded projects are discussed in greater detail in Table 2.2 of this document.

Conclusions and Priorities

The 2021 Nitrogen Dioxide results show that the air quality levels are below the objective of 40µg/m^3 for all of the monitoring locations throughout the Borough including the AQMA. Although the objectives are being met it is very important to continue to improve air quality within the UK as poor air quality is a public health concern.

Therefore, to continue to improve the air quality in the Borough the priorities for Broxtowe Borough Council in addressing air quality for the coming year are to:

- Review the NO_2 diffusion tubes network annually, discontinue sites where the annual air quality levels are comfortably below the objective, and relocate them to new sites within the Borough. Extensive monitoring will allow Broxtowe Borough Council to identify and focus on 'problem' areas.
- Continue to reduce the levels of NO_2 in the Borough by working with National Highways and Nottinghamshire County Council.
- Continue to be a member of the East Midlands Air Quality Network (EMAQN), to liaise with colleagues in Public Health and other local authorities.
- Continue to promote the final version of the "EMAQN Air Quality and Emissions Mitigation: guidance for developers" document.
- Continue to be a member of the Nottinghamshire Environmental Protection Working Group, and to liaise with colleagues in Public Health and the Health and Wellbeing Boards (Nottingham City and Nottinghamshire County) to ensure that Air Quality continues to be included in the Joint Strategic Needs Assessment for the County and any future work that involves air quality issues.
- Engage with the public about air quality and raise awareness of the health effects of air quality.
- Continue to provide the public, companies and businesses within the Borough with methods that they can use to improve air quality for themselves and also the health of their employees.

- Continue to provide information on green travel e.g. walking, cycling by providing leaflets.
- Continue to support bus companies and taxis that operate within the Borough to reduce emissions.
- Continue to review suitable research methods for reducing air quality levels for both NO_2 and particulate matter.
- Broxtowe Borough Council to continue as an active member in the Air Quality Strategy Task Group.
- Ensure that the new Nottinghamshire Air Quality Strategy is promoted and used once more as a valuable working document.
- Review the measures in Broxtowe Borough Council's Air Quality Action Plan and to continue to report on them in the next ASR as well as all the measures that are being implemented in the Borough to reduce air pollution levels.

One of the challenges associated with addressing the air quality in the Borough is that the main source of the air quality problem is the M1 Motorway, which is managed by National Highways and is not under the control of Broxtowe Borough Council. Although Broxtowe Borough Council have a close working relationship with National Highways it is unable to impose or make any changes to the M1 to improve the air quality within the neighbouring residential areas. However, National Highways has undertaken projects at great expense in the past to improve the air quality within the Borough e.g. widening scheme and Smart Motorway scheme.

Apart from the M1 and the A52 all of the roads within the Borough are managed by Nottinghamshire County Council who manage the traffic flows, repairs, diversions etc. There are several challenges associated with this. The first challenge is that Broxtowe Borough Council is unable to impose or make any changes to the structure or flow of the roads. The second challenge is the limited funding currently available to County Councils for significant integrated transport improvements (£3.9m per year for all safety, capacity, active travel, parking, bus and traffic management infrastructure improvements). This limits the funding available for transport schemes that will deliver air quality improvements.

Although no real time monitoring was carried out in 2021 for PM_{10} and $PM_{2.5}$, 'modelled' figures are obtained from Defra and are discussed in greater detail in Section 2.3 of this report.

The monitoring of PM_{10} and $PM_{2.5}$ is expensive to undertake due to the installation, running costs and the maintenance of the equipment. However, there has been a variety of new real time monitors to the market that are not as expensive as the Gravimetric or other reference monitors and one of these is called the 'Zephyr', which is a fraction of the cost to purchase. Therefore, in late 2021 BBC purchased a Zephyr real time monitor to monitor $PM_{2.5}$, PM_{10} and NO_2 in the Trowell AQMA. This data will be reported in the 2023 ASR.

Local Engagement

Since the 2021 Annual Status Report (ASR) Broxtowe Borough Council has continued to be in the East Midlands Air Quality Network (EMAQN), which reviews current air quality issues for the area. EMAQN is run by Public Health England. EMAQN has collectively produced a report to assist local authorities and developers when determining whether an air quality assessment is needed during the planning application process. The aim of EMAQN is to engage decision makers from different disciplines to assist in reducing AQ levels as a whole in the East Midlands. This also enables neighbouring counties to communicate more openly, which is vital for Broxtowe Borough Council due to it being next to Derbyshire because the A52 is a major source of air pollution, which runs through Derbyshire and Nottinghamshire.

Defra have identified Derby and Nottingham as exceeding the air quality objective therefore, they are mandated to implement a Clean Air Zone (CAZ). However, Nottingham City Council subsequently undertook air quality modelling of several potential CAZ options (charging and non-charging) alongside planned actions (e.g. measures to provide and promote sustainable transport infrastructure) to determine if they would deliver the required air quality objectives. This modelling has identified that air quality objectives are anticipated to be met without the introduction of a charging CAZ.

Broxtowe Borough Council was selected in 2018 to be in the Air Quality Task and Finish Group, which was set up to update the Nottinghamshire Air Quality Strategy (NAQS). The

draft NAQS was approved at the Nottinghamshire County and City Health & Wellbeing Boards in 2019 and the finished format of the NAQS has been endorsed by the portfolio holders and is now published online. Improving Air Quality is now a priority of the 2022-2026 Nottinghamshire Joint Health and Wellbeing Strategy as part of the Ambition to develop Healthy and Sustainable Places.

How to get Involved

Residents and businesses living or working in Nottinghamshire can improve the air quality in the area by taking simple measures. One of the main changes that can be made is to use sustainable travel more and reduce dependency on the car when possible. Below are some of the actions that people can take, and particularly for short journeys.

- Travel Choice – Nottinghamshire County Council's Travel Choice webpages provide information and advice on the different ways to travel around Nottinghamshire, whether that's walking, cycling, public transport or car sharing. Residents, jobseekers, businesses and employees can find travel information and advice for the county (including bus and cycle maps, leisure 'Routes and Rides' and a journey planner) at Travel Choice

- School Travel Toolkit – Aimed at school leaders, teachers, parents/carers, children, and those living near to our schools, the Nottinghamshire School Travel Planning Toolkit provides information and advice on improving travel to and from Nottinghamshire's schools, including the sustainable and active travel modes available. The toolkit can be found at School Travel Toolkit

- Public transport – To use all means of public transport whenever possible e.g. trams, buses and trains. In addition to printed materials, an integrated public transport planning tool detailing local bus, rail and tram networks, as well as for trips further afield can be found at Travel Choice Journey Planner and Traveline Details on travelling on school buses to Nottinghamshire schools and assistance available to do so, can be found at Travel to Schools. The tram timetable is available at Tram Timetable The Big Wheel promotes sustainable travel within the

Nottingham urban area (including parts of Broxtowe); it assists people and businesses with journey planning and advice. Further information can be found at The Big Wheel

- Car share – The Nottinghamshire car share scheme, *'nottinghamshare'*, is available to anyone Car Share Scheme but all businesses can produce their own.

- Park and Ride – There are a variety of Park and Ride sites within Nottinghamshire, which serve the Nottingham Tram and buses. Information for these Park and Ride sites which includes maps of their locations are found at Park and Ride

- Walking and Cycling – The health benefits of physical activity e.g. walking or cycling outweigh the risks from air pollution. You can easily avoid the worst pollution by travelling along quieter streets. Even walking on the side of the pavement furthest from the road can help.

Walking -

- Walk short distances rather than drive; this also has the benefit of improving your health as well.
- Information on walking networks in Nottinghamshire can be found at Walking Networks and Rights of way when walking in Nottinghamshire and a planning tool for deciding your route when walking can be found on the Travel Choice website
- Walking and cycling to school – School travel plans promote group cycling and walking for pupils to safely get to school. Information on the travel to school options can be found at Travel to Schools Options.

Cycling –

Use the extensive cycle routes that are available throughout Nottinghamshire. Maps and cycling journey planners that cover Nottinghamshire, including Broxtowe are available on the Travel Choice

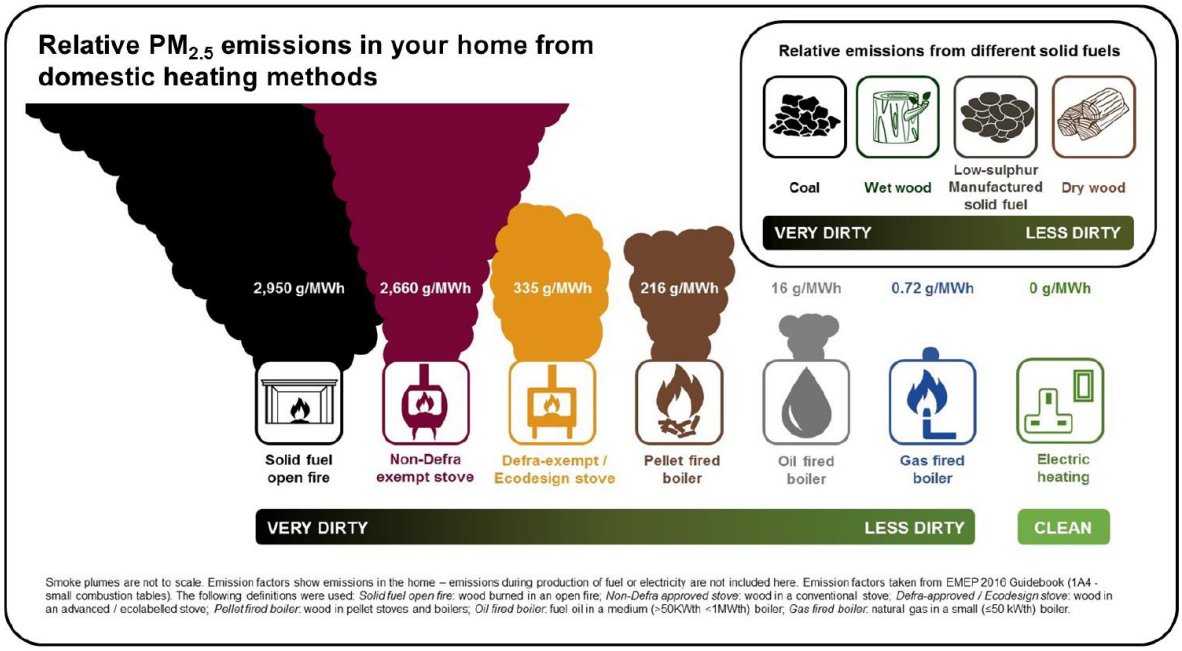
website and at Cycling Rights of Way in Nottinghamshire. Maps of just the city cycle routes for Nottingham are available at Cycle Maps for Nottingham. Sustrans is a charity that promotes sustainable travel and further information can be found at Sustrans
RideWise, a local cycling charity, also provide advice, training, bike rides, free bike loans and information about routes and journey planning. Further information about RideWise can be found at RideWise

- Driving- When you have to drive you can still help to improve air quality by;
    - Make sure that your car is at its most efficient and think about how you drive, this will also save you money. Tips on how to save money on fuel and reduce your emissions are available at Driving Advice from Energy Saving Trust.
    - If you are thinking about changing your car consider buying a low-emission vehicle, you can get more information on these vehicles and the support available at Electric vehicle charging in and around Nottinghamshire or at Go Ultra Low in Nottingham

- Bonfires – To not have bonfires at all and to compost all garden waste and recycle rubbish rather than burn it.

- Heating your home –
    - Smoke Control Area – Large parts of Nottinghamshire are smoke control areas, therefore you cannot emit smoke from a chimney unless you are burning an authorised fuel or using an exempt appliance e.g. some burners or stoves. Further information on suitable fuels and exempt appliances can be found at Smoke Control Information from Defra All appliances must be kept in good working order to ensure that they are working efficiently and it is advised that you contact your Local Council to determine whether you are in a smoke control area or not.

- House Boilers – Ensure that boilers are serviced regularly and kept in good working order. If a boiler needs replacing then purchase one that has a low NOx emission rating



Source – Clean Air Strategy 2019, DEFRA Clean Air Strategy, Defra 2019

Local Responsibilities and Commitment

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

- Suzanne Hickey, Chief Environmental Health Officer - BBC Public Protection Department.
- Steven Mills, Environmental Health Technical Officer - BBC Public Protection Department.
- Dave Lawson, Planning Policy Team Leader - BBC Planning Policy Department.
- Derek Musto, Parking Manager - BBC Parking Services Department.
- John Miley, Licensing Manager - BBC Licensing Team.
- Steve Dixon, Capital Works Manager – BBC Capital Works Department.
- Paul Wolverson, Head of Environmental Services – BBC Executive Director Department (Environment Division)
- Roger Wakefield, Transport and Stores Manager - BBC Transport and Stores Department.

- Nick Hawkes, Asset Manager – BBC Asset Management and Development Department.
- Sean Parks, Team Manager – Nottinghamshire County Council Local Transport Plans & Programme Development Place Department.
- Ellie Jaycock, Local Transport Plan Officer - Nottinghamshire County Council Local Transport Plans & Programme Development Place Department.
- John Wilcox, Senior Public Health & Commissioning Manager, Public Health, Nottinghamshire County Council.
- Councillor Helen E Skinner, Chair of the Environment and Climate Change Committee, Broxtowe Borough Council.

This ASR has been approved and signed off by:

Councillor Helen E Skinner, Chair of the Environment and Climate Change Committee, Broxtowe Borough Council.	John Wilcox, Senior Public Health & Commissioning Manager, Public Health, Nottinghamshire County Council
	

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Figures

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1 Local Air Quality Management

This report provides an overview of air quality in Broxtowe Borough Council 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 Broxtowe Borough 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 I.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 the AQMA declared by Broxtowe Borough Council can be found in Table 2.1. The table presents a description of the AQMA that is currently designated within Broxtowe Borough Council. The AQMA was designated as the levels at the time of designation were above the NO_2 annual mean of 40µg/m^3. Appendix D: Map of all Monitoring Locations and Appendix E: Map of AQMA in Trowell provides maps of the AQMA and also the air quality monitoring locations in relation to the AQMA and throughout the Borough.

Further information about the one remaining AQMA declared by Broxtowe Borough 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 Broxtowe Borough Councils Air Quality Webpage

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
AQMA 1 Trowell	Declared 1st February 2006.	NO_2 Annual Mean	AQMA 1 encompasses twenty properties on parts of Iona Drive and Tiree Close next to the M1 motorway in Trowell	YES	45µg/m^3	22.2µg/m^3 *	AQAP for Broxtowe Borough Council 2008	Visit the AQAP for AQMA 1 Trowell Action Plan 2008.

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

☒ **Broxtowe Borough Council confirm that all current AQAPs have been submitted to Defra**

***** The average of the Annual Mean from all of the four monitoring sites located with the AQMA.

2.2 Progress and Impact of Measures to address Air Quality in Broxtowe Borough Council

Defra's appraisal of last year's ASR concluded that;

- *The executive summary includes additional information explaining what air pollutants are, in addition to listing several ways to get involved. This provides a good source of information for the general public. This is welcomed.* **– BBC will continue to report in this manner.**

- *The Council have produced a good Section 2.3 regarding $PM_{2.5}$. Despite not having capacity to monitor $PM_{2.5}$, the Council have reported nearby monitoring and modelled results. There is a link to the Public Health Outcomes Framework and a reference to the relevant indicator. There is a good range of measures to tackle $PM_{2.5}$ emissions and concentrations. This demonstrates the Councils commitment to improving air quality and is encouraged to continue.* **– BBC will continue to report in this manner.**

- *It is promising to see that the Council are continuing to review their monitoring locations and discontinue sites where the annual air quality levels are below the objective. The Council have stated that rather than decommission sites they will relocate tubes to new areas within the borough to identify potential 'hotspot' or 'problem' areas. This is encouraging to see as it demonstrates the Council's active engagement in monitoring air quality within the borough.* **– BBC will continue to do this.**

- *The report has a summary of historical and existing AQMAs and has outlined their decisions on reviewing AQMAs. The Authority are not revoking their AQMA on the ground that 2020 concentrations are likely to be an anomaly. This is supported.* **– BBC will continue to monitor and report on the AQMA in this ASR and future ASR's.**

- *The Council have discussed monitoring trends at length. Segregating the discussion by AQMA, former AQMAs and problem areas is beneficial for readers unfamiliar to the Borough to identify local spatial and temporal trends. However, the Council may consider restructuring the order of sections to allow for a better flow when reading. For example, starting with across the Borough, and then going into local detail (or vice versa). The monitoring locations within trend graphs may also be grouped according to the same sections.* **– BBC has done this.**

- *The Council have produced a detailed report with all the required information and continues to be an example of good practice.* **– BBC will continue to be an example of good practice.**

Broxtowe Borough 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. Eighty-seven measures are included within Table 2.2, with the type of measure and the progress Broxtowe Borough 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 BBC Air Quality Action Plan, BBC Improving the Air We Breathe Action Plan, BBC Local Plan 2018 – 2028, The Nottinghamshire Local Transport Plan 2011 -2026 (and its Implementation Plans), Nottinghamshire County Council's Environment Strategy and Action Plan 2020 and National Highways Reports (post opening project evaluation reports for the M1 Junction 25 to 28 widening and the A52 West of Nottingham Corridor Improvements).

Key completed measures are:

- Low Emission Fleet Vehicles – Broxtowe Borough Council has purchased eight more Euro 6 vehicles in 2021 to replace two older more polluting vehicles.
- Electric Fleet Vans – Two electric fleet vehicles were purchased in 2021 due to satisfactory trials of two electric fleet vans in 2020.

- Electric Vehicle Fleet Procurement for small vans below 2 tonnes - All 6 vehicles have now been replaced with Electric Vehicles.
- To Replace Broxtowe Borough Council older combination boilers and system boilers to Seasonal Efficiency of a Domestic Boiler in the UK (SEDBUK) A rated condensing boilers - In 2021, BBC have replaced a total of 103 domestic boilers. Of these, 17 were of low efficiency, the others being lifecycle.
- Trial of New Heating Technology- A trial was undertaken for fitting air source heat pumps in 7 new builds in 2021. The success of this will be reported on.
- Increased the number of Electric Vehicle Charging Points in the Borough Car Parks - 2 x rapid fast charges were installed at Victoria Street car park Stapleford in 2021, BBC has dedicated 4 spaces for Electric Vehicle use.
- Promoting on the Council Webpage the Council's Electric Vehicle Charging Points Network within the Borough - 2 new 50KW charges were added and promoted in 2021.
- To raise awareness of anti-idling legislation with local bus companies – All local bus companies that operate within the borough were notified of anti-idling legislation and the associated health affects in 2021.
- Broxtowe Borough Council Cycle to Work Scheme – Seven employees purchased bikes through this scheme in 2021.Since the scheme started 177 employees have purchased bikes through the scheme.
- The inclusion of Air Quality as a priority in the Nottinghamshire Joint Health and Wellbeing Strategy and the Nottinghamshire ICS Green Plan [led by the NHS].
- Marketing and promotion of sustainable transport alternatives – both the County Council and Broxtowe Borough Council continue to develop and deliver programmes to encourage more sustainable travel. These include infrastructure improvements such as the County Council's integrated transport programme delivering improvements for pedestrians, cyclists and bus users; cycle training, as well as marketing materials and campaigns developed in partnership with stakeholders such as passenger transport operators.
- Retrofitting of buses – In February 2018 it was announced that the County Council (and Nottingham City Council) had successfully secured funding from the Green Technology Fund to retrofit some of the most polluting buses in the county –

including a number of buses that travel in the Borough. The County Council has invested £0.94m from the Clean Bus Technology Fund to retrofit older buses. This is in addition to operator investment in new Euro VI standard buses on some routes. Trentbarton also invested in Euro VI vehicles in 2020, for their Indigo and Rainbow 1 services.

- ❖ Effective Network Management – the County Council continues to work with stakeholders to effectively manage its highway network. Along with the co-ordination of works, contingency planning, and effective event and incident planning, the County Council purchased a third camera enforcement car during 2019/20 to effectively enforce parking violations.
- ❖ Workplace Travel Plans – Broxtowe Borough Council and Nottinghamshire County Council have completed a council Travel Plan to help promote sustainable travel amongst staff as part of both their journeys to work and whilst undertaking Council business. Travel Plans are also developed with businesses through the development control process.
- ❖ Local Cycling and Walking Infrastructure Plan (LCWIP) – the County Council (in partnership with Derby City, Derbyshire County, and Nottingham City Councils) have developed an LCWIP.
- ❖ Off-Street Parking Order –BBC has consolidated all of their Off-Street Parking Orders into one Order which was made legal in 2021.
- ❖ Review of on-street car parking in and around the AQMA - Introduction of junction protection and targeted roadside parking restrictions (including bus stop clearways) along feeder corridors into the AQMA to help traffic flows/journey times.

Broxtowe Borough Council expects the following measures to be completed over the course of the next reporting year:

- ★ <u>To investigate providing Supplementary Planning Guidance or a Supplementary Planning Document</u> relating to 'Air Quality and Emissions Mitigation Guidance for Developers' This measure will be taken to Broxtowe Borough Councils Committee in 2022.
- ★ <u>To raise awareness of anti-idling legislation</u>- All taxis that operate within the borough will be notified of anti-idling legislation and the associated health affects in 2022.

- ★ Investigation into whether it is feasible for free parking in the borough car parks for Electric and Hybrid vehicles - To be taken to BBC's Committee in 2022/2023 for consideration.
- ★ To develop a plan for future infrastructures to support growth in BBC's Electric Fleet and the domestic use of Electric Vehicles - A review is currently being undertaken to determine the necessary infrastructure to accommodate the move to a carbon neutral fleet. A 1000kv substation will be required and a charging relay system installed in the parking areas. This will all be costed with a proposal submitted to BBC Committee in 2022/2023.
- ★ To communicate with all allotment providers in the borough to discourage the use of bonfires to dispose of garden waste - A questionnaire was sent to all allotment holders at one allotment site re waste. All remaining sites will be contacted in 2022.

Broxtowe Borough Council's priorities for the coming year are predominantly through measures to make the best use of the transport networks and through smarter travel measures that will encourage people to travel more sustainably.

Measures will include:

- On-going effective land use planning and securing of appropriate levels of developer contributions for mitigation (including travel planning) and sustainable transport improvements
- Traffic control and information provision to minimise disruption and delay on County Council managed roads (including the A610) such as contingency planning, the effective co-ordination of works and the provision of real-time travel information
- On-going parking enforcement on County Council managed roads to ensure that the traffic keeps moving
- Measures to reduce the need to travel at peak times such as the provision and encouragement of flexible working arrangements
- The facilitation of smarter travel behaviour such as the provision of a car sharing scheme and integrated and concessionary ticketing schemes

- The encouragement of smarter travel behaviour such as the marketing and promotion of passenger transport, walking and cycling, provision of cycling and walking route maps, cycle training programmes, and web-based journey planners
- The encouragement of the uptake of low-emission vehicles, including the continued identification and implementation of the Nottinghamshire public electric vehicle charging network as well as grants for businesses to install on-site charging infrastructure
- Enhancements to the local cycling and walking networks
- Travel planning such as the development of new travel plans at businesses across the county through planning conditions
- Undertaking feasibility work on significant projects such as cycling improvements along the A6005.

The principal challenges and barriers to implementation that Broxtowe Borough Council and Nottinghamshire County Council anticipates facing are:

- Availability of funding for the above measures to continue their delivery
- Ensuring sufficient mitigation is secured through the development control process to address the potential impacts on the highway network of not only individual developments but also the cumulative impacts of development.

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

- The County Council were due to undertake a review of all the bus services in the County (including commercial, supported and specialist services). The aim of this work was to review and design cost effective services that meet local needs. During COVID-19 the Transport Review was put on hold, however it is due to recommence in 2022/23.
- Cycling Networks – cycling improvements are developed and delivered as part of the annual integrated transport programme but due to the high cost of delivering such scheme, they are dependent on securing external funding.
- Public Cycle Hire Scheme – The scheme is dependent upon commercial cycle hire scheme providers committing to and delivering a scheme.

Whilst the measures stated above and in Table 2.2 will help to contribute towards improving the air quality, Broxtowe Borough Council anticipates that further additional measures not yet prescribed will be required in subsequent years to improve the air quality in the borough and enable the revocation of AQMA 1 Trowell.

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	**Light rail tram infra-structure**	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	2015	-	NCiC/NCC	DfT/WPL funding	No	Funded	>£10 Million	Complete On-going Currently Unknown	Reduction in N02 and PM	Increased passenger transport patronage	• NET Phase 2 (with route through Broxtowe) opened 2015 • 202-2021, there were 2.9 Million passengers using the tram, which was a reduction of 15.1 million in comparison to the previous year. • The extension of the existing tram to the HS2 Hub in Toton was included in Midlands Connect's 'Access to the HS2 EM Hub study', although feasibility work has not been completed and no funding has been secured for its delivery as yet. This will also be reviewed due to changes of the proposed location of facilities in the county.	• The reduction is believed to be due to the National/regional lockdowns and people working from home • Extension of the existing tram route would be subject to feasibility, consultation and County Council approvals
2	**Car sharing scheme**	Alternatives to private vehicle use	Car & lift sharing schemes	Early 2000s	Ongoing	NCC	Local Authority	No	Funded	<£10k annually	Implemented	Between 01/01/21 - 31/12/21: 333.49 tonnes CO2 reductions 1.51 tonnes NOx reductions.	Between 01/01/21 - 31/12/21: 1,512,434 miles saved £378,865 money saved 333.49 tonnes CO2 reductions 1.51 tonnes NOx reductions	• 3,522 members currently registered. Implementation ongoing	Annual costs are shown in the Estimated Cost of Measure
3	**Introduction of car club**	Alternatives to private vehicle use	Car Clubs	TBD	Ongoing	NCC/NCiC	Local Authority	No	TBD	-	Ongoing	Reduction in N02 and PM.	Restrain average journey times in the morning peak to a 1% increase per year A reduction in staff business emissions and cost, through both a car club and a wider review of staff travel habits.	• Nottm city scheme introduced in 2014 • Provider reviewed in 2018. Expansion of scheme into county dependent on its success which is still unclear • Work has been undertaken to look at the feasibility of a partnership with a Car Club operator in the county, for both residents and internal use (i.e. staff travel). This will feed	Dependent on the determination of business case and commercial operator coming forward Barriers include financial risk, organisational culture (i.e. using personal cars less) and specific service needs

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
														into a wider fleet review and review of staff business travel, with a few more aspects to be expanded upon. • Funding for implementation to be determined, Scheme is dependent on the determination of business case and commercial operator coming forward	
4	**Nottingham Go-Ultra Low programme - introduction of area wide EV charging network**	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2016	2020	NCiC/NCC/BBC	OLEV funding	No	Funded	£1 Million-£10Million	Implemented	Reduction in $N0_2$ and PM due to increased use of low emission vehicles.	On-going take-up of cleaner vehicles	• £6.1m funding secured for 2016-2020 through the Go Ultra Low programme • 123 locations in the county have been investigated for the potential provision of EV charge points as part of GUL project - 24 in Broxtowe; of which five were currently feasible; providing one rapid and 20 fast charge points within car parks in four towns within the borough (Beeston, Eastwood, Kimberley and Stapleford). • A total of 67 chargers across 22 sites in Nottinghamshire were installed during 2019-20 as part of the GUL programme. This include 21 chargers in Broxtowe.	**Complete**
5	**Nottingham Go-Ultra Low programme - promoting uptake of LEVs**	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2016	2020	NCiC/NCC	OLEV funding	No	Funded	£1 Million-£10Million	Implemented	Reduction in pollutants and emissions due to increased use of low emission vehicles.	On-going take-up of cleaner vehicles	• £6.1m funding secured for 2016-2020 through the Go Ultra Low programme. • Promotion events held for public, businesses and fleet operators including loans of LEVs for trial use in 2018 and 2019 • Funding ended in 2021	**Complete**
6	**Nottinghamshire on-street EV charging pilot scheme - electric vehicle**	Promoting Low Emission Transport	On-street EV charging infrastructure	2022	2023	NCC	Privately funded by resident	No	Privately funded by resident	Costs to be determined	Pending	Reduction in pollutants and emissions due to	Number of EVCC installed and back-office	• County Council approved the trialling of on-street EV charging cable channels at	The County Council is still finalising the details of the pilot scheme

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	cable channels (EVCC)											increased use of low emission vehicles.	data from EV charge point	Transport & Environment Committee in February 2022. • All delivery processes, design specifications, and internal approvals being finalised • Nottinghamshire County Council intend to submit a bid for OZEV's Local Electric Vehicle Infrastructure (LEVI) pilot funding in June 2022. If successful, the LEVI funding will help extend the pilot.	
7	**Nottinghamshire EV charging infrastructure (potentially on and off street)**	Promoting Low Emission Transport	Potential residential EV charging infrastructure (on and off street)	2023/24	2024/25	NCC / districts	OZEV funding (LEVI)	No	Unsecured - the full LEVI fund is currently not available for local authorities to bid for	Costs to be determined	Pending	Reduction in pollutants and emissions due to increased use of low emission vehicles.	Number of EV charging installed	• The County Council is working to determine the Council's long term on-street EV strategy • NCC is looking to develop a bid for the main LEVI funding for 2023/24.	Measure is reliant on a successful LEVI bid
8	**Joint Strategic Needs Assessment**	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2017	2020	NCC/NCiC/Borough and District councils	LA	No	Funded	N/A	Complete	Reduced Emissions from raising awareness	Raising awareness and reduced emissions	• Air Quality is now a chapter in the Joint Strategic Needs Assessment and part of the Health and wellbeing Board considerations. • Reviewed and updated in 2020.	**Complete**
9	**To contribute to Nottinghamshire Air Quality Strategy (NAQS)**	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2018	2020	NCC/NCiC/ Borough and District councils	N/A	No	Not Funded	N/A	Complete	Reduced Emissions from raising awareness	Improving Air Quality, reduced Emissions and Raising awareness	•Strategy reviewed and rewritten; and the draft was approved at the Nottinghamshire County and City Health & Wellbeing Board in 2019. • The NAQS has been endorsed by portfolio holders and its published online	**Complete** **Complete**
10	**To promote the Nottinghamshire Air Quality Strategy**	Public Information	Via the Internet	2020	On-going	BBC Public Protection – Environmental Health Technical Officer	N/A	No	Not Funded	N/A	On-going	Reduced Emissions from raising awareness	Improving Air Quality, reduced Emissions and Raising awareness	•The NAQS was endorsed by portfolio holders in 2020 and it is promoted on BBCs website.	**Complete**
11	**To have Air Quality as a priority in the Nottinghamshire Joint Health**	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2021	2021	NCC and NHS	N/A	No	Funded	N/A	Complete	Reduced Emissions from raising awareness	Raising awareness and reduced emissions	Air Quality is now a priority in the 2022 - 2026 Nottinghamshire Joint Health and Wellbeing Strategy	**Complete**

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
	and Wellbeing Strategy and the Nottinghamshire ICS Green Plan [led by the NHS].													and the Nottinghamshire ICS Green Plan [led by the NHS].	
12	**To investigate providing Supplementary Planning Guidance or a Supplementary Planning Document relating to 'Air Quality and Emissions Mitigation Guidance for Developers'**	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2021	2023	BBC Planning Policy Department – Planning Policy Team Leader	LA-BBC	No	Funded	Within existing resources	Planning	Reduced Emissions of N02 and PM	Reduced emissions	Possible measures could involve: • Supplementing Part 1 of Policy 20 of the Local Plan to provide further guidance on what reasonable steps are required in order to encourage the use of public transport. • Supplementing Part 2 of Policy 20 of the Local Plan to say what would constitute a "significant deterioration" in air quality. • Supplementing Part 3 Policy 20 of the Local Plan to set a ratio of Electric Vehicle Charging Points to new dwellings. • Promoting Travel Choices – Encouraging developers to provide occupants with 'travel packs' regarding public transport, walking and cycling to all new built homes.	This measure is likely to be taken to BBC committee/cabinet in 2022 and the findings will be reported on in the 2023 ASR.
13	**Planning and Policy Guidance**	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2019	2019	BBC Planning Policy Department – Planning Policy Team Leader	N/A	No	Not Funded	N/A	Complete	Reduction in N02 and PM	Reduced Emissions	Broxtowe Part 2 of the Local Plan (2018-2028), which includes Policy 20 on Air Quality, was adopted in 2019. This policy ensures that air quality remains an important consideration when granting planning permission and to encourage developers to include sustainable travel measures as part of the planning application.	**Complete**
14	**Developer requirements to provide of EV charging**	Policy Guidance and	Air Quality Planning and Policy Guidance	2019	2020	BBC Planning Policy Department – Planning Policy Team Leader	N/A	No	Not Funded	N/A	**Complete**	Reduction in N02 and PM	Reduced Emissions	Review of the Broxtowe Local plan includes Policy 26 that would require a Travel	**Complete**

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	points at new development	Development Control												Plan to be submitted with any planning application for 10 or more dwellings or 1,000 square metres or more floorspace. This policy was adopted in September 2019.	
15	**Inspection of Permitted Processes**	Environmental Permits	Other Measures through permit systems and economic instruments	On-going	On-going	BBC Public Protection – Environmental Health Technical Officer	N/A	No	Not Funded	N/A	On-going	Reduced Emissions	Reduction in air bourne pollutants from the various processes throughout the Borough.	Due to the on-going Covid -19 pandemic a hybrid approach was utilised for inspections in 2021. Some processes were deemed to require a face to face inspection whilst others were contacted via alternative means to ensure that contact was maintained and that the processes remained unchanged and that the risk rating for these businesses remained unchanged	On-going
16	**To ensure that all Permitted Processes (where feasible) continue to be rated as 'low environmental risk'**	Environmental Permits	Measures to reduce pollution through IPPC Permits going beyond BAT	On-going	On-going	BBC Public Protection – Environmental Health Technical Officer	N/A	No	Not Funded	N/A	On-going	Reduced Emissions	Reduction in air bourne pollutants from the various processes throughout the Borough.	The risk rating did not change in 2021, and all permitted processes were fully compliant..	On-going
17	**To Inspect Crushers that are used within the Borough on demolition sites when notifications are received to ensure compliance with the process permit and ensure good housekeeping is being maintained**	Environmental Permits	Other measure through permit systems and economic instruments	On-going	On-going	BBC Public Protection – Environmental Health Technical Officer	N/A	No	Not Funded	N/A	On-going	Reduction in air bourne particulates from the crushers used throughout the Borough.	% of crushers inspected.	All notified crushers on demolition sites were inspected in 2021	On-going
18	**To ensure that all Dust Management Plans are reviewed and approved during the**	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	On-going	On-going	BBC Public Protection – Environmental Protection Officers	N/A	No	Not Funded	N/A	On-going	Reduction in air bourne particulates from new developments throughout the Borough.	% of dust management plans that are reviewed and approved during the planning stage	All dust management plans were reviewed and approved during the planning stage in 2021.	On-going

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	planning application stage														
19	**Encouragement of low-emission public transport fleets**	Vehicle Fleet Efficiency	Vehicle Retrofitting programmes	2018	On-going	NCC/Operators	NCC/OLEV - Clean Bus Technology Fund	No	Partially Funded	£500k-£1Million	Implemented	Reduction in N02 and PM due to increased use of low emission vehicles.	Reduced Emissions and On-going take-up of cleaner vehicles	• NCC has invested £0.94m from the Clean Bus Technology Fund in Feb 2018 to retrofit older buses. This is in addition to operator investment in new Euro VI standard buses on some routes • Trentbarton invested in Euro VI vehicles for indigo and Rainbow 1 in 2020	Costs of measured is funding secured to date
20	**Encouragement of low-emission public transport fleets**	Vehicle Fleet Efficiency	Promoting low emission public transport	2017	2017	NCC	NCC/OLEV - Low Emission Bus Scheme	No	Funded	£500k-£100k	Implemented	Reduction in N02 and PM due to increased use of low emission vehicles.	Reduced Emissions and On-going take-up of cleaner vehicles	• NCC secured £527,000 OLEV funding and match funded the scheme with £410,000 from its transport budget. • Introduction of two electric buses (and their associated infrastructure) on route 510, serving communities in Beeston and Stapleford.	
21	**Encouragement of low-emission public transport fleets**	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	-	On-going	NCC/NCiC/PT operators	NCT (operator) funding	No	-	-	On-going	Reduction in N02 and PM due to increased use of low emission vehicles.	Reduced Emissions	• The Statutory Quality Partnership Schemes (SQPSs), which includes fleet standards is in place affecting all buses travelling through AQMA.	Funding details not known as dependent on private commercial operators
22	**Traffic control and information**	Traffic Management	UTC, Congestion management, traffic reduction	On-going	On-going	Nottinghamshire County Council (NCC)/Via EM Ltd/Nottingham City Council (NCiC)	NCC and NCiC revenue funding	No	Funded	£100k - £500k	On-going	Reduced emissions by reducing congestion on the roads	Restrain average journey times in the morning peak to a 1% increase per year	• Traffic control centre that monitors traffic movement on the local highway network (not the trunk road/motorways) and provides real time traffic control over many traffic signal installations, including on A610 at Nuthall	Lack of future revenue funding The UTCC is a shared facility between Nottinghamshire County Council and the City Council. Estimated cost shown is the County Council's annual contribution
23	**Co-ordination of street works**	Traffic Management	UTC, Congestion management, traffic reduction	On-going	On-going	NCC/Via EM/NCiC	NCC and NCiC revenue funding	No	Funded	Funded within existing resources	On-going	Reduced emissions by reducing congestion on the roads	Restrain average journey times in the morning peak to a 1% increase per year	• Systems for notice management and coordination have been upgraded to enhance noticing handling, monitoring of works proposals, coordination of	Costs are dependent on number street works undertaken

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														works and directing timing of works. • The County Council introduced a streetworks permit scheme on 1 April 2020 to help plan/coordinate roadworks on its managed highway network. • Street designations/network hierarchy review is on-going to improve data quality for works promoters and network managers and to prioritise works management. • Regular coordination meetings held between all works promoters and regional partners in additional to regular meetings between National Highways and regional partners to create a framework programme of planned works affecting strategic and local routes. • Detailed journey time monitoring undertaken annually since 2005/06.	
24	**Contingency planning, and effective event and incident management**	Traffic Management	UTC, Congestion management, traffic reduction	Ongoing	Ongoing	NCC/Via EM/NCiC/ National Highways (NH)	NCC, NCiC, National Highways revenue funding	No	Funded	-	Implemented and on-going	Reduced emissions by reducing congestion on the roads	Restrain average journey times in the morning peak to a 1% increase per year	• The local operating agreement between NCC and NH has been comprehensively reviewed to identify the relevant parts of the network which have interaction on each authority and to put in place appropriate communication channels for management of incidents and dissemination of information • Key locations on the local network have been identified and associated diversion routes investigated in line	Cost dependent on the number of incidents

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
														with the developing network hierarchy • Incidents dealt with through agreed procedures and regular partnership meetings held. Working in close collaboration with the City and NH, tactical diversion routes have been developed for the emergency diversion of traffic from any part of the strategic road network, to reduce the delay in rerouting traffic to ease congestion at the time of incidents • Detailed journey time monitoring undertaken annually since 2005/06.	
25	**Traffic management control patrols on arterial route through the Borough at peak period travel times to identify hot spots where parking affects the traffic flow**	Traffic Management	UTC, Congestion management, traffic reduction	2019	On-going	NCC and BBC Parking services – Parking Manager	Notts CC	No	Funded	Not known	On-going	Reduced emissions by reducing congestion on the roads.	Number of visits to the locations and number of observations during the visits.	•All main routes into, out of and through the Borough are patrolled regularly and enforcement action where necessary is taken. If particular areas suffer as a result of road works patrols are increased to ensure the smooth flow of traffic. **Update** - On-street parking patrol activities now comes directly under Nottinghamshire County Council; Broxtowe Borough Council will make every effort/endeavour to work closely with Nottinghamshire County Council to achieve local air quality targets. Particularly where arterial route traffic congestion exists	On-street parking patrol activities now comes directly under Nottinghamshire County Council
26	**Increase the number of Electric Vehicle Charging Points in the Borough Car Parks.**	Transport Planning and Infrastructure	Other	2020	2021	BBC Parking services – Parking Manager	BP charge master	No	Funded	70K for 14 x 7kw units and £90K for 2 x 50kw units	On-going	Reduction in NO_2 and PM due to increased use of electric vehicles.	% Usage of EVCP	•This is undertaken in association with BP chargemaster, who fund the capital and revenue for number of years BBC lose income by dedicating spaces solely for Electric Vehicle use.	**Complete**

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														. • 2 x rapid fast charges were installed at Victoria Street car park Stapleford in 2021, BBC has dedicated 4 spaces for Electric Vehicle use.	
27	**Promoting on the Council Webpage the Council's Electric Vehicle Charging Points Network within the Borough**	Public Information	Via the Internet	2020	On-going 2021	BBC Parking services – Parking Manager	LA - BBC	No	Not Funded	Within existing resources	On-going	Reduction in NO_2 and PM due to raising awareness of where people can use the charge points for their **electric** vehicles	30 EVCP are currently promoted on BBC's website.	•The Council currently has 30 electric vehicle charging points in Beeston, Stapleford, Kimberley and Eastwood these are displayed with the postcodes for easy identification on the Council website and this is updated when necessary. • 2 new 50KW charges were added and promoted in 2021.	On-going **Complete**
28	**To continue investigating the installation of Electric Vehicle Charging Points for staff and visitors to the Council to use**	Promoting Low Emission Transport	Other	2020	2020 On-going	BBC Parking services – Parking Manager	LA - BBC	No	Not Funded	Within existing resources	On-going	Reduction in NO_2 and PM by encouraging Electric Vehicle use	Number of EVCP installed for employees and visitors to the Council to use.	• Investigation into this has been undertaken and the infrastructure and power supply has already been installed within Devonshire Avenue car park. • Funding opportunities for further charging points need to be explored.	Infrastructure and power supply complete On-going
29	**Investigation into whether it is feasible for free parking in the borough car parks for Electric and Hybrid vehicles**	Traffic Management	Emission based parking or permit charges	2020	2021 2023	BBC Parking services – Parking Manager	LA - BBC	No	Funded	Currently unknown	Planning	Reduction in NO_2 and PM by encouraging ULEV to utilise free parking	% Usage of spaces for Electric and Hybrid vehicles if this measure is introduced	•There are currently 28 x 7KW Electric Vehicle spaces, an x 2 rapid Electric Vehicle charging spaces, totalling 30 spaces. • To be discussed in Committee in 2022/2023, as It is currently not free to park and this would need consideration by members Any free provision would have to be managed by limiting time, otherwise it would reduce the availability of spaces for Electric Vehicles.	To be taken to BBC's Committee in 2022/2023 for consideration.
30	Review of off-street car parking charging	Traffic Management	Emission based parking or permit charges	2020	2021	BBC Parking services – Parking Manager	LA - BBC	No	Funded	<10K	Completed	Reduction in NO_2 and PM	Reduced Emissions	•BBC has consolidating all of their Off-Street Parking Orders into	**Complete**

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					2023									one Order which was made legal in 2021. •Charges will also be reviewed on an adhoc basis with the next review being due in 2022/2023. This review will also include the use of electric vehicle charging points.	On-going annually. The policy document is updated only when there is significant legislation or council policy changes.
31	**Real time travel information**	Public Information	Other	-	Ongoing	NCC/Via EM Ltd	NCC revenue funding	No	Funded	-	Implemented and on-going	Reduced Emissions	Restrain average journey times in the morning peak to a 1% increase per year	• Information conveyed by all forms of media (press, radio, website, social media etc.). • The Travelwise centre remains in operation 24hrs a day, every day.	
32	**Bus service improvements**	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	-	Ongoing	NCC/NCiC/PT operators	PT operators	No	Funded	-	On hold	Reduction in N02 and PM as increased bus patronage	Increased passenger transport patronage	• NCC have developed two Bus Service Improvement Plans (BSIP) for Nottinghamshire; the BSIP for the Greater Nottinghamshire (Robin Hood) area which was developed in partnership with Nottingham City Council, and the BSIP for Nottinghamshire. The plans, which were approved at the Transport and Environment Committee in November 2021, outline the Council's ambitions for improving bus services within the county. • Review of all of the bus services in the county, including commercial, supported and specialist services. • The aim of this work is to review and design cost effective services that meet	• Transport Review put on hold during Covid and to recommence in 22/23. NCC successful in Rural Mobility Fund Bid will help inform Transport Review. • Costs are not known because services are delivered by private commercial operators

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33	**Bus infra-structure**	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	-	Ongoing	BBC and NCC	Integrated transport block funding	No	Funded	-	Implemented and on-going	Reduced emissions due to increased bus patronage.	Increased bus patronage	• An annual programme of updates and maintenance of all stops including updating network maps to ensure all information is current and accurate is on-going. • BBC provides 50% of the funds for the installation of new bus shelters and real time bus information at bus stops.	Costs vary year on year dependent on priorities identified for investment
34	**To raise awareness of anti-idling legislation with local bus companies and Taxi's that operate within the borough**	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	2020	2021 2022	BBC Public Protection – Environmental Health Technical Officer	N/A	No	Not Funded	N/A	Planning	Reduced Emissions from raising awareness	Improving Air Quality, reduced Emissions and Raising awareness	All local bus companies that operate within the borough were notified of anti-idling legislation and the associated health affects in 2021. All taxis that operate within the borough will be notified of anti-idling legislation and the associated health affects in 2022	**Complete** 2022
35	**Marketing and promotion of passenger transport**	Promoting Travel Alternatives	Other	-	On-going	NCC/NCiC/PT operators	LA-NCC LA-NCiC	No	Funded	Within existing Resources	On-going	Reduction in N02 and PM as increased bus patronage	Increased passenger transport patronage	• NCC undertakes various marketing campaigns in partnership with operators and NCiC • Co-ordinated through the Greater Nottingham Bus Quality Partnership. • Network maps produced to coincide with route/timetable changes • NCC's Travel Choice webpages include information on public transport across the county (for residents and businesses)	
36	**Sustainable Travel information for the Public**	Public Information	Via the internet	2010	On-going	BBC Public Protection and Human Resources Manager	LA-BBC	No	Not Funded	Within existing resources	On-going	Reduced Emissions of $N0_2$ and PM	Increased use of public transport	• The Travel Choice website provides information and advice to residents, jobseekers and businesses, on sustainable travel options within the county • School travel Toolkit (see measure No.73)	On-going

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														BBC have leaflets on safe cycling on the tram lines, bus routes, Broxtowe cycling map, Broxtowe Country and Erewash Valley routes and walking leaflets. These are all available in the Council reception. •Sustainable Travel methods are also available on the main council website.	
37	**Concessionary fare schemes**	Transport Planning and Infrastructure	Other	On-going	On-going	NCC/PT operators	LA-NCC	No	Funded	> £10 million	On-going	Reduced emissions due to increased bus patronage.	Increased passenger transport patronage	• Countywide off-peak concessionary public transport fare scheme available for the over 60s and disabled.	Annual costs are shown in the Estimated Cost of Measure
38	**Nottingham city workplace parking levy (WPL)**	Traffic Management	Workplace Parking Levy, Parking Enforcement on highway	2012	On-going	NCiC	-	No	Funded	-	On-going	Reduced emissions	Restrain average journey times in the morning peak to a 1% increase per year	• NCiC introduced WPL within the city in 2012 and have used funding to make passenger transport improvements in the city	
39	**Review of on-street car parking in and around the AQMA**	Traffic Management	Workplace Parking Levy, Parking Enforcement on highway	-	On-going	NCC	LA-NCC	No	Funded	-	Implemented	Restrain average journey times in the morning peak to a 1% increase per year	Reduced emissions by reducing congestion on the roads in and around the AQMA	• Introduction of junction protection and targeted roadside parking restrictions (including bus stop clearways) along feeder corridors into the AQMA to help traffic flows/journey times. • Parking restrictions already in place, no additional side-road/off-line locations currently identified as requiring restrictions to aid traffic flow; but annual programmes of such schemes are developed should any be required in the future	**Complete** On-going
40	**Taxi Licensing Conditions**	Promoting Low Emission Transport	Taxi Licensing conditions	2018	On-going	BBC Licensing Team - Licensing Manager	N/A	No	Not Funded	N/A	On-going	Reduction in NO_2 and PM as cleaner vehicles	Recued Emissions	No cars normally older than 8 years will be licensed as a taxi within the borough.	On-going
41	**To Increase the number of low**	Promoting Low	Taxi Licensing conditions	2020	On-going	BBC Licensing Team - Licensing Manager	N/A	No	Not Funded	N/A	On-going	Reduction in NO_2 and PM	Number of LEV and Electric	Broxtowe Borough Council currently license 1 Electric	On-going

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	emission and electric vehicles licensed as Taxis by Broxtowe Borough Council.	Emission Transport										as cleaner vehicles	Vehicles licensed within the borough as Taxis	vehicle and 27 Hybrid vehicles out of the 114 Vehicles that are licensed to operate as Taxis. Note: all other vehicles are Euro 6 compliant	
42	**To Investigate the feasibility of incentives for Taxi Drivers to purchase low emission or electric vehicles**	Promoting Low Emission Transport	Taxi emission incentives	2020	2023	BBC Licensing Team - Licensing Manager	N/A	No	Not Funded	N/A	Planning	Reduction in NO_2 and PM as cleaner vehicles	% uptake of the incentive if implemented.	• New Measure devised in late 2020. There has been no progress in 2021 as the Implementation of National Standards has delayed investigation. • Progress will be updated in 2023 ASR.	2023
43	**To consult with Taxi Trade about Increasing the number of Low Emission and Electric vehicles licensed**	Promoting Low Emission Transport	Other	2020	2023	BBC Licensing Team - Licensing Manager	N/A	No	Not Funded	N/A	Planning	Reduction in NO_2 and PM as cleaner vehicles	Increase in the number of LEV and Electric Vehicles licensed within the borough as Taxis	• New Measure devised in late 2020. There has been no progress in 2021 as the Implementation of National Standards has delayed the consultation. • Progress will be updated in 2023 ASR	2023
44	**To amend the Taxi Policy as required following consultation on Increasing the number of low emission and electric vehicles licensed**	Policy Guidance and Development Control	Other policy	2020	2023	BBC Licensing Team - Licensing Manager	N/A	No	Not Funded	N/A	Planning	Reduction in NO_2 and PM as cleaner vehicles	Number of LEV and Electric Vehicles licensed within the borough as Taxis	• New Measure devised in late 2020. There has been no progress in 2021 as the Implementation of National Standards has delayed the amendment. • Progress will be updated in 2023 ASR.	2023
45	**To Replace older combination boilers and system boilers to Seasonal Efficiency of a Domestic Boiler in the UK (SEDBUK) A rated condensing boilers**	Other	Other	2020	2022 On-going	BBC Capital Works Manager	LA-BBC	No	Funded	£10k - £50k	Implementation	Reduced emissions due to more efficient boilers	Number of boilers replaced	•The replacement of the remaining less efficient units (less than 1%) is planned over the next 18 months -22 replaced during 2020. •The typical life cycle of a unit is 15 years. Therefore, the current stock needs to be replaced as it becomes beyond its serviceable life. This is a 15 year Rolling program. • **UPDATE** – In 2021, we have replaced a total of 103 domestic	On -going

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														boilers. Of these, 17 were of low efficiency, the others being lifecycle changes	
46	**To investigate and consider new heating technologies that are more efficient, effective and produce lower emissions**	Other	Other	2020	2021 and ongoing 2023	BBC Capital Works Manager	Better Care fund	No	Funded	£50k - £100k	Implementation	Reduced emissions due to more efficient boilers	Success of the trials for cleaner heating technology	•Currently reviewing the development of hydrogen technology for boilers. Studies show that the emissions are reduced greatly. Subject to existing networks and Government. •A trial was undertaken for fitting air source heat pumps in 7 new builds in 2021. The success of this will be reported on.	On-going
47	**To investigate and consider suitable alternative replacements for the remaining electrically heated Council properties**	Other	Other	2020	2024 On-going consideration	BBC Capital Works Manager	N/A	No	N/A	N/A	Success of the trials for cleaner heating technology	Reduced emissions due to more efficient and cleaner technologies to heat the council properties	Efficiency rating of new heating replacements.	• High heat retention units were being fitted as replacements in 2021 and this will be continuing in future years •Air source heat pumps will also be considered at suitable properties where a retro fit solution is possible.	On-going
48	**Public sector LEV procurement**	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	2015	2024 and On-going	NCC/BBC	LA-BBC LA-NCC	No	Funded	-	On-going	Reduction in NO_2 and PM due to increased use of low emission vehicles.	Reduction in vehicle emissions due t less polluting vehicles replacing older more polluting vehicles	•NCC upgraded its pool vehicles to lower emission diesel vehicles. •All new fleet vehicles at BBC are Euro6 emissions complaint. There are 90+ fleet vehicles and they are on a 10 year replacing rolling programme •Procurement strategies for such measures are being reviewed as part of NCC's Environmental Strategy •Dependant on whether funding from Central Government continues	2024
49	**Low Emission Vehicle Procurement**	Promoting Low	Company vehicle Procurement - prioritising uptake	2017, 2019 and 2020	2024	BBC Transport and Stores Manager	LA-BBC	No	Funded	£10k - £50k	On-going	Reduced Emissions of N02 and PM	Reduction in NO_2 and PM due to cleaner	•All new fleet vehicles at BBC are Euro6 emissions complaint.	2024

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		emission transport	of low emission vehicles										vehicle technology	There are 90+ fleet vehicles and they are on a 10 year replacing rolling programme. •BBC has purchased three new Euro 6 vehicles in 2017/2018 replacing three older vehicles. •Two new Euro 6 vehicles purchased in 2019 / 2020 •BBC have procured two electric vans in 2019 •Subject to satisfactory trials another two Electric vehicles were purchased in 2021 at a cost of £45k. •BBC have purchased 8 new Euro 6 Vehicles in 2021.	**Complete** **Complete** **Complete** **Complete** **Complete**
50	**To develop a plan for future infrastructures to support growth in BBC's Electric Fleet and the domestic use of Electric Vehicles**	Vehicle Fleet Efficiency	Other	2020	2022-2023	BBC Transport and Stores Manager	LA-BBC and External grant – Grant provider not currently known	No	-	£500k - £1 Million	Planning	Reduction in $N0_2$ and PM due to increased use of low emission vehicles.	Reduction in $N0_2$ and PM due to cleaner vehicle technology	A review is currently being undertaken to determine the necessary infrastructure to accommodate the move to a carbon neutral fleet. A 1000kv substation will be required and a charging relay system installed in the parking areas. This will all be costed with a proposal submitted to BBC Committee in 2022/2023	2022/2023
51	**Electric Vehicle Fleet Procurement for small vans below 2 tonnes**	Vehicle Fleet Efficiency	Other	2019	2021-2024	BBC Transport and Stores Manager	LA-BBC	No	Funded	£10k - £50k	On-going	Reduced Emissions of N02 and PM	Reduction in $N0_2$ and PM due to cleaner vehicle technology and the procurement of two electric fleet vehicles.	•The Council currently has a fleet of 8 small vans (below 2 Tonnes). Two of these vehicles have been replaced with electric vehicles at a cost of £45k. •From 2021 to 2024 the remaining 6 vehicles where practical and economic (As they reach a life of 12 years) will be replaced with electric vehicles •**Update** - All 6 vehicles have now been replaced with Electric Vehicles.	**Complete**

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52	**To use the on board Vehicle Monitoring IT System data for fleet vehicles (e.g. it records harsh braking, excessive speeding etc. On the basis of this data a programme of driver training will be created to address safety, fuel economy, extended vehicle life and reduced emissions**	Vehicle Fleet Efficiency	Driver training and ECO driving aids	2020	2022-2023	BBC Transport and Stores Manager	LA-BBC	No	Funded	Within existing resources	On-going	Reduction in NO_2 and PM due to improved driving efficiency .	Number of employees that have undergone driver training.	The data obtained over the next few months will allow a driver training program to be established in 2022/2023 to address the common themes within driving performance. Where it is evident that there are also drivers who are not driving as environmentally and economically as they could these will also be addressed on an individual basis. This will ensure the continuation of safe economical driving as well reducing the of whole life vehicle cost and improving the Councils green performance.	2022/2023
53	**Capital Fleet Vehicle Replacement for HGV's**	Vehicle Fleet Efficiency	Other	2020	2021-2024	BBC Transport and Stores Manager	LA-BBC	No	Funded	£500k - £1 Million	On-going	Reduction in NO_2 and PM due to replacement of older HGV's.	Number of replacement HGV's	• The Capital Vehicle Fleet replacement programme for HGV's (Refuse Freighters 26 Tonnes) identified for replacement will be replaced with Euro standard engines (Euro 6 onwards). • £750k per annum • Before purchasing, consideration will be given based on practicality and economics of the adoption of new technologies that have come to market. This includes Electric and Hydrogen Propulsion methods.	On-going
54	**Vehicle Emissions Testing**	Vehicle Fleet Efficiency	Testing Vehicle Emissions	On-going	On-going	BBC Transport and Stores Manager	LA - BBC	No	Not Funded	Within existing resources	On-going	Reduction in NO_2 and PM as regular serviced and maintained vehicles to ensure they are operating efficiently.	Reduced emissions	• All BBC Fleet vehicles (98 road vehicles including 20 LGV's) are annually emission tested in house prior to MOT Emission testing. • BBC also undertakes additional emissions tests on all fleet vehicles if any new fuel or engine components have been changed. This is to ensure vehicle emission compliance.	On-going On-going

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55	**Investigate ways to decarbonise BBC's fleet through alternative fuels**	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	2021	2023	BBC Environment – Head of Environment	LA-BBC	No	Not Funded	£10k - £50k	Planning	Reduction in N02 and PM	Reduced emissions	• Report to be submitted to Cabinet in 2022 for Members to consider the use of Biofuel instead of Diesel Engine Road Vehicle (DERV) for vehicles which are for compatible	New measure devised in late 2021
56	**To Investigate providing all allotments within the borough with green waste recycling collections**	Other	Other	2020	On-going	BBC Environment – Head of Environment	LA-BBC	No	Not Funded	Within existing resources	Planning	Reduction in Particulates due to reduction of bonfires on site	Reduction in bonfires from allotments within the borough.	• Multi team meeting taken place to discuss the feasibility of this. Several factors need resolving to determine whether this is a viable option. • One allotment holders group has been written too, in order to ascertain the extent of the waste produced. • Update: The investigation determined that providing all allotments with a garden waste collection was not feasible.	**Complete**
57	**To communicate with all allotment providers in the borough to discourage the use of bonfires to dispose of garden waste**	Public Information	Other	2020	2022	BBC Public Protection - Chief Environmental Health Officer	LA-BBC	No	Not Funded	N/A	Planning	Reduction in Particulates due to reduction of bonfires on site	Reduction in bonfires from allotments within the borough.	A questionnaire was sent to all allotment holders at one allotment site re waste. All remaining sites will be contacted in 2022.	2022
58	**Marketing of cycling**	Promoting Travel Alternatives	Promotion of cycling	2010 and 2017	On-going	BBC	LA - BBC	No	Not Funded	Within existing resources	On-going	Reduced Emissions of NO_2 and PM	In Broxtowe district there has been a 30% increase in cycling between 2010 and 2014	• Prior Covid-19 (2019) cycling levels had increased in Nottinghamshire by 4%; and in Broxtowe by 5%. Cycling levels, particularly on urban/commuter route, across the county have been impacted by the Covid-19 pandemic and have not yet fully recovered • New cycle stands were installed at Beeston Train station and in Eastwood and Beeston Town Centres. Improved	On-going **Complete**

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														more stands Kimberley Leisure Centre and Council Offices.	
59	**To investigate the feasibility of increased provision for cycle parking in the Borough**	Alternatives to private vehicle use	Other	2022	2023	BBC Head of Asset Management	LA - BBC	No	Not yet identified	Not yet calculated	Planning	Reduced Emissions of NO_2 and PM	No of cycle parking spaces in the borough	An investigation will be undertaken to determine the feasibility of increasing the provision for cycle parking within the borough.	Progress on this new measure will be in the 2023 ASR.
60	**Cycling networks - development of Local Cycling and Walking Infrastructure Plan (LCWIP)**	Transport Planning and Infrastructure	Cycle network	2019	2020	NCC/NCiC/DCC/DCiC/borough and district councils/Sustrans/other stakeholders	DfT funding	No	Funded	Within existing resources	Planning	Reduced Emissions of N02 and PM	Increased levels of cycling	• Funding secured to develop D2N2 wide LCWIP. Data collected; three stakeholder events held to date • Further public engagement on the D2N2 LCWIP is due to be undertaken in the summer of 2022. • Future countywide priorities will be identified through technical analysis undertaken as part of the LCWIP development and will be subject to feasibility, consultation, and County Council Cabinet approval	The D2N2 LCWIP public engagement will be focus on cycle corridors only, and not specific schemes. Any future cycle improvement schemes will be subject to funding availability, feasibility consultation, and approvals
61	**Cycling networks**	Transport Planning and Infrastructure	Cycle network	2018/19	On-going	NCC/Via EM/NCiC	LGF, s106 funding	No	Not Funded	>£10 million	Complete	Reduced Emissions of N02 and PM	Increased cycling trips	• Construction of improved cycle links between Beeston, Enterprise Zone and the City are completed. • NCC, working in partnership with NCiC, has secured funding through NCiC's Transforming Cities Fund to potentially upgrade routes along A6005 • Other small-scale cycling improvements are developed and delivered as part of the annual integrated transport programme and through developer funded improvements	• Future schemes will be determined by members following finalisation of LCWIP • Any future cycle improvement schemes will be subject to funding availability, feasibility consultation, and approvals.

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62	**Cycling networks as part of Active Travel Funding (ATF)**	Transport Planning and Infrastructure	Cycle network	2020/21	On-going	NCC / Via EM	LGF	No	Funded	>£10 million	Planning	Reduced Emissions of N02 and PM	Increased cycling trips	• One of the proposed schemes included within NCC's Active Travel Fund (ATF) Tranche 2 bid is cycling improvements in Beeston, including the potential installation of additional secure cycling hubs at the rail station. This scheme is subject to feasibility/ consultation/ approval. (See measure 61)	• The ATF and Town Fund funded proposals are still subject to feasibility, consultation, and County Council Cabinet approval
63	**Cycling networks as part of Towns Fund**	Transport Planning and Infrastructure	Cycle network	TBD	TBD	NCC / Via EM	LGF	No	Funded	>£4 million	Planning	Reduced Emissions of N02 and PM	Increased cycling trips	• BBC's Town Fund bid includes proposals for cycle infrastructure improvements in Stapleford (funding amount to be determined by Board and scheme proposals subject to feasibility, consultation, and County Council Cabinet approval. • BBC's Town Fund includes potential cycle infrastructure, including a Cycle Superhighway, comprising of 3 connecting cycle links in Stapleford (funding amount to be determined by Board and scheme proposals subject to feasibility, consultation, and County Council Cabinet approval.	• The Towns Fund funded proposals are still subject to feasibility, consultation, and County Council Cabinet approval
64	**Cycle hire scheme**	Transport Planning and Infrastructure	Public cycle hire scheme	TBD	Not known - dependent on commercial cycle hire scheme providers	NCiC/NCC	Funding source to be determined	No	TBC	-	Planning	Reduced Emissions of N02 and PM	Increased cycling trips	• Hire schemes at the nearby University of Nottingham in place • Feasibility study undertaken on a city based hire scheme which potentially could include parts of the county such as Beeston • Scheme dependent on commercial cycle hire scheme providers committing to, and delivering a scheme	Scheme dependent on commercial cycle hire scheme providers committing to, and delivering a scheme

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65	**Cycle training**	Promoting Travel Alternatives	Promotion	Circa 1970s	Ongoing	NCC	DfT funding/PH funding	No	Funded	Various	Implemented	Reduced Emissions of N02 and PM	Increased cycling trips	• Across the county, 4,000 people received cycle training during 2020/21 and 6,020 in 2021/22 and in Broxtowe specifically, the numbers were 636 and 649 respectively	The number of people receiving cycle training during 2020/21 and 2021/22 was much less than in 2019/20 due to the Covid-19 pandemic which saw school closures and the introduction of 'bubbles' and consequently restricted the number of schools who participated/were able to receive cycle training.
66	**Cycle parking facilities**	Transport Planning and Infrastructure	Cycle network	2015	On-going	NCC/BBC	Integrated transport block/developer contributions	No	Funded	£10k - £50k	Implemented and on-going	Reduced Emissions of N02 and PM	Increased cycling trips	• Cycle hub installed in 2015 to integrate with bus/rail services • Ad-hoc parking provided where required • BBC's Town Fund bid includes proposals for cycle hub in Stapleford Town Centre.	• Potential barrier: Lack of future revenue funding • One of the proposed schemes included within NCC's Active Travel Fund (ATF) bid is cycling improvements in Beeston, including the potential installation of additional secure cycling hubs at the rail station. Broxtowe BC, the owner of the carpark where the hub was intended to be installed, withdrew support for the hub at the railway station as existing facilities now meet demand due to changes in commuting habits post Covid-19. The County Council is therefore working with

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															BBC to try and identify a suitable alternative location in the town centre.
67	**Marketing of cycling**	Promoting Travel Alternatives	Promotion of cycling	2010 and 2017	On-going	BBC	LA - BBC	No	Not Funded	Within existing resources	On-going	Reduced Emissions of NO_2 and PM	In Broxtowe district there has been a 30% increase in cycling between 2010 and 2014	• Prior Covid-19 (2019) cycling levels had increased in Nottinghamshire by 4%; and in Broxtowe by 5%. Cycling levels, particularly on urban/commuter route, across the county have been impacted by the Covid-19 pandemic and have not yet fully recovered • New cycle stands were installed at Beeston Train station and in Eastwood and Beeston Town Centres. Improved more stands Kimberley Leisure Centre and Council Offices.	On-going **Complete**
68	**Marketing of cycling**	Promoting Travel Alternatives	Promotion of cycling	2010 and 2017	On-going	NCC	LA- NCC	No	Funded	within existing resources	Implemented and on-going	Reduced Emissions of N02 and PM due to increased cycling uptake	Increased cycling trips	• Prior Covid-19 (2019) cycling levels had increased in Nottinghamshire by 4%; and in Broxtowe by 5%. Cycling levels, particularly on urban/commuter route, across the county have been impacted by the Covid-19 pandemic and have not yet fully recovered. • Marketing of cycling is undertaken in a variety of formats for both commute and leisure trips. Various NCC campaigns have been undertaken including 'cycling week', 'Notts Routes & Rides' • NCC's Travel Choice webpages include information on cycling across the county (for residents and businesses)	

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69	**Cycle maps**	Promoting Travel Alternatives	Promotion of cycling	2018 and 2019	On-going	NCC	LA-NCC	No	Funded	-	Implemented and on-going	Reduced Emissions due to increased cycling uptake	Increased cycling trips	• Greater Nottingham cycling maps reviewed during 2018, updated and available as a leaflet and online • Cycling maps reviewed as/when the network is enhanced	
70	**Marketing of walking**	Promoting Travel Alternatives	Promotion of walking	-	On-going	NCC	LA-NCC	No	Funded	Within existing resources	Implemented and on-going	Reduced Emissions of N02 and PM due to more people walking	Increased walking trips	• Marketing of walking is undertaken in a variety of formats for both commute and leisure trips. Various NCC campaigns have been undertaken including 'walk week', 'Notts Routes & Rides'. • NCC's Travel Choice webpages include information on walking across the county (for residents and businesses)	
71	**Pedestrian infrastructure improvements**	Transport Planning and Infrastructure	Other	On-going	On-going	NCC/BBC	NCC/External	No	Funded	Schemes included in 2021/22 programme worth £100k - £200k	On-going	Reduction in N02 and PM emissions as more people are walking	Increased walking trips	• Pedestrian improvements developed and delivered as part of the annual integrated transport programme. Funding also secured to deliver improvements through the planning process. • Schemes including footpath improvements, dropped kerbs and pedestrian crossings were included within the 2021/22 Integrated Transport programme	• Potential barrier: Lack of future funding.
72	**Encouraging the use of emissions standards when procuring school bus contracts and supported bus services**	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	-	Ongoing	NCC/PT operators	PT operators	No	Funded	-	On-going	Reduced Emissions of N02 and PM	Reduced Emissions and on-going take-up of cleaner vehicles	• On-going take-up of LEVs	Funding details not known as its funded commercial private operators

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73	**School travel plans**	Promoting Travel Alternatives	School Travel	2000	On-going	NCC	LA-NCC	No	Funded	£10k - £50k	Implemented	Reduced Emissions of N02 and PM if alternative methods of sustainable travel are used	Restrain average journey times in the morning peak to a 1% increase per year	• Following the trial with four pilot schools in 2019/20, the online school travel toolkit was rolled out to all County schools during the 2020/21 academic year. • The Nottinghamshire School Travel Toolkit provides information and advice on improving travel to and from Nottinghamshire's schools.	Costs detailed are for the School Travel Toolkit only. There currently is not any funding available for delivering travel planning to individual schools
74	**Web based journey planners**	Public Information	Via the Internet	Early 2000s	On-going	NCC	LA-NCC	No	Funded	within existing resources	Implemented	Reduction in N02 and PM due to increase in sustainable travel	Increased walking/cycling/ passenger transport trips	• Nottinghamshire is part of the national, multi-modal Traveline journey planner • Web links to the Traveline site are publicised and available from the County Council's website.	
75	**Personalised travel planning**	Promoting Travel Alternatives	Personalised Travel Planning	2016/17	2017	NCC/AECOM	DfT	No	Funded	£50k - £100k	Implemented	Reduction in N02 and PM due to increase in sustainable travel	Restrain average journey times in the morning peak to a 1% increase per year	• Personalised Travel Planning undertaken in Beeston during 2016/17 There may also potentially be further opportunities to offer travel planning through future rounds of the Capability Fund, although this is yet to be confirmed.	Cost detailed are associated with personalised travel planning undertaken in Beeston in 2016/17, not for any opportunities which may be identified in the future
76	**Encouraging the use of Hybrid or Electric vehicles for BBC staff**	Promoting Low Emission Transport	Other	2020	On-going	BBC Human Resources Manager	LA-BBC	No	Funded	Within existing resources	Not yet started	Reduction in N02 and PM	Number of staff using hybrid or electric vehicles	•To encourage employees of BBC to purchase hybrid vehicles and electric vehicles for their personal and business use. •Three employees used a personal Electric vehicle and one used a ULEV in 2021.	On –going
77	**Cycle to work Scheme**	Promoting Travel Alternatives	Promotion of cycling	2009	On-going	BBC Human Resources Manager	N/A	No	Not Funded	Within existing resources	System in place	Reduction in N02 and PM	No of bikes purchased through scheme	•Cycle to work Scheme – to assist and give tax relief on bike purchases for employees of BBC. •Seven employees purchased a bike through this scheme in	On-going

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
														2021.Since the scheme started 177 employees have purchased bikes through the scheme.	
78	**Investigate the feasibility of a Council staff car sharing**	Alternatives to Private Vehicle Use	Car Clubs	2020	2023	BBC Chief Environmental Health Officer and Human Resources Manager	N/A	No	Not Funded	N/A	Not yet started	Reduction in N02 and PM	No of staff car sharing	Due to Covid-19 being prevalent and it is transmissible in confined spaces, this measure has been put on hold temporarily. However, staff in the future will be encouraged to travel together. An update will be provided in the next ASR.	
79	**Flexible working arrangements**	Promoting Travel Alternatives	Encourage/Facilitate Home Working	2012	On-going	NCC/BBC	N/A	No	Not Funded	N/A	On-going	Reduction in $N0_2$ and PM due to employees not commuting	Restrain average journey times in the morning peak to a 1% increase per year	•NCC operates flexible working arrangements for all its staff. •BBC New Ways of Working was introduced in 2019, which allows and encourages employees to work from home when practical to do so. •Due to Covid-19 restrictions This will be continued, to some extent, going forward.	On-going On-going On-going
80	**Workplace travel plans**	Promoting Travel Alternatives	Workplace Travel Planning	On-going	On-going	BBC Planning Policy Department – Planning Policy Team Leader and NCC	LA – BBC and NCC	No	Not Funded	N/A	**Complete**	0.2µg/m^3	Restrain average journey times in the morning peak to a 1% increase per year	•Broxtowe Part 2 of the Local Plan (2018-2028) which includes Policy 26 on Travel Plans, was adopted in 2019. It is expected in this policy that all planning applications for large development sites (10 or more dwellings or 1,000 square metres or more gross floor space) must include a travel plan. •BBC and NCC have a travel plan •BBC has undertaken a review of the Councils travel plan by reviewing Lease cars, car allowances and work place parking. Produced a transport map specifying the modes of transport the organisation considers acceptable if other modes or transport	**Complete** **Complete** **Complete**

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														are not suitable. Feasibility study of having bus card/ Tickets for employee use.	
81	**NCC car pool vehicles**	Alternatives to private vehicle use	Car Clubs	2016/17	On-going	NCC	N/A	No	Not Funded	-	Complete	0.2µg/m3	Restrain average journey times in the morning peak to a 1% increase per year	• NCC upgraded its pool vehicles to lower emission diesel vehicles • Pool vehicles will be reviewed in line with new County Council Environment Strategy	To be determined in line with review to be undertaken in line with the Environmental Strategy
82	**To reschedule the dry recycling waste rounds to reduce fuel consumption and improve efficiency**	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	2020	2023	BBC Environment – Head of Environment	N/A	No	Not Funded	N/A	Planning	Reduction in NO_2 and PM due to efficient routes.	Reduced emissions	Improved vehicle utilisation has been undertaken to improve service delivery. Further investigation for rescheduling is planned in 2022/23 to take account of new builds and increased tonnages	2022/2023
83	**To reschedule the green waste rounds to reduce fuel consumption and improve efficiency**	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	2020	On-going	BBC Environment – Head of Environment	N/A	No	Not Funded	N/A	Planning	Reduction in NO_2 and PM due to efficient routes	Reduced emissions	Improved vehicle utilisation has been undertaken to improve service delivery. The garden waste rounds are dictated by the number of subscribers to the service this is reviewed on an annual basis	On-going
84	**Eco-driver training sessions**	Vehicle Fleet Efficiency	Driver training and ECO driving aids	2012	2018	NCC	LA –NCC	No	Not Funded	Within existing resources	Complete	Reduction in N02 and PM due to improved driving efficiency.	Reduced emissions	• Eco-driving training sessions held for NCC staff	**Complete**
85	**Fleet vehicle tracking system**	Vehicle Fleet Efficiency	Driver Training and ECO driving aids	2015-2017	2017	BBC Transport and Stores Manager and NCC	LA – BBC and NCC	No	Not Funded	Within existing resources	**Complete**	Reduction in NO_2 and PM due to improved driving efficiency and efficient routes.	Reduced emissions	•All BBC and NCC fleet vehicles are fitted with a vehicle tracking system, which records vehicle speed and idling time. •A review of the journeys undertaken will ensure that if necessary measures can be implemented e.g. staff training, to improve fleet efficiency.	**Complete** **Complete**
86	**Zoning of refuse collections**	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	2016-2017	2017	BBC Transport and Stores Manager	LA - BBC	No	Not Funded	Within existing resources	**Complete**	Reduction in NO_2 and Particulate Matter as there is one	Reduced emissions	•A review of the refuse collection areas at BBC to enable the areas to be zoned to ensure that the	**Complete** The Refuse round restructure is now complete

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
												less fleet vehicle used.		collection rounds are within the designated zone, which reduces the amount of non-productive travelling time.	and we have reduced the fleet size by one vehicle.
87	**Integrated ticketing**	Transport Planning and Infrastructure	Other	2014/15	On-going	NCC/NCiC/PT operators	PT operators	No	Funded	-	Implemented	Reduction in N02 and PM due to increased passenger transport patronage	Increased passenger transport patronage	• Integrated ticketing strategy developed in 2014/15. • New smartcard platform introduced in 2014. Robin Hood card scheme introduced in 2015 • Further smartcard/contactless improvements being developed • The major bus operators have now all introduced contactless payments for their own ticketing products alongside the Robinhood card and this was completed in around March 2020 • The first multi-operator contactless ticketing system in the UK outside London was launched in the Nottingham area in May 2022. • Public transport users can now pay a single daily capped fare across the majority of the city's buses and trams using their chosen contactless payment method • The Nottinghamshire Enhanced Partnership is seeking to use indicative BSIP funding to deliver a multi operator ticket (MOT) in Newark & Mansfield, alongside development of an add-on for passengers travelling into the Robinhood network in Greater Nottingham.	

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
														- MOT strategy completed: December 2022 • Robinhood add-on to launch: March 2024	

KEY: **BBC** =Broxtowe Borough Council, **DCC**= Derbyshire County Council; **DCiC**= Derby City Council; **NCC**= Nottinghamshire County Council, **NH** = National Highways, **NCiC**= Nottingham City Council, **DfT** = Department for Transport.

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.

As BBC does not monitor $PM_{2.5}$ the only methods that can be used to try and determine what the potential levels of $PM_{2.5}$ in the Borough are is to review the nearest relevant Automatic Urban and Rural Network (AURN) site which monitors $PM_{2.5}$ and to identify the modelled background levels for the Borough from Defra's webpages.

The nearest AURN site is in Nottingham City and for 2021 the annual mean concentration is 8.4µg/m^3 for the City Centre site. The modelled background level provided by Defra for the Borough of Broxtowe are modelled to be between 7.5µg/m^3 and 9.5µg/m^3 for 2021, with the annual mean for 2021 being 8.4µg/m^3. The modelled background concentrations are shown to be in the higher range along the M1 Motorway. The background maps are shown in Appendix H.

The Air Quality Objective (AQO) for $PM_{2.5}$ is an annual mean of 25µg/m^3. However, the World Health Organisation guideline value are more stringent for $PM_{2.5}$, as it is currently 10µg/m^3 therefore the modelling results show that the Borough are also meeting WHO guideline.

As well as reviewing the modelled background and the nearest AURN to identify $PM_{2.5}$, it is also important to review the Public Health Outcomes Framework (PHOF), which is published by Public Health England (PHE) and reviewed every three years. PHOF enables local authorities to identify the local indicator for $PM_{2.5}$ in their district, to compare the 'Fraction of mortality attributable to particulate air pollution indicator' value and to compare this to nearby local authorities.

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Table 2.3 below provides the estimated effects of annual mortality in 2020 of human-made $PM_{2.5}$ air pollution for Nottingham City, Broxtowe Borough Council and other neighbouring local authorities. The figures show that within the Borough of Broxtowe there are modelled to be 70 deaths attributable to human-made air pollution.

Table 2.3 – Estimated Effects of Annual Mortality in 2020 of human-made $PM_{2.5}$ Air Pollution.

Council/Area	Attributable fraction	Attributable deaths aged 30+* (2020 deaths ONS)	Associated Life-years Lost due to PM based on 29,000 nationally (COMEAP 2010)
Nottingham City	5.7	153	1559
Ashfield District	5.1	73	662
Newark and Sherwood District	4.8	66	626
Bassetlaw District	4.6	66	620
Gedling Borough	5.5	75	628
Broxtowe Borough	5.5	70	612
Rushcliffe Borough	5.1	57	528
Mansfield District	5.1	67	594

Source: Estimating Local Mortality Burdens associated with particulate air pollution, PHE, 2019.

*Air pollution is likely to contribute a small amount to the deaths of a larger number of exposed individuals rather than being solely responsible for the number of deaths equivalent to the calculated figure of attributable deaths.

Research has shown that there is significant harm to health at concentrations of Particulate Matter well below the current EU and UK limit values. Therefore, BBC are working towards reducing the $PM_{2.5}$ levels by taking the following measures:

- Ensuring that dust management plans are requested during the planning application stage for all sites that involve large scale demolition and building works.
- To ensure that best practicable means of dust control measures are being used regardless of how large the development is. These measures can include the use of bowsers, road sweepers and dust suppression to prevent 'trackout'. Also minimise dust generating activities on dry windy days and if there are stockpiles ensure they are covered to prevent wind-whipping.
- Ensuring that developers are carrying out dust suppression monitoring on site at large development sites.
- Ensuring that water suppressants are in use when Nibblers and mobile crushers are on site.
- Educating the public in matters that contribute to air quality e.g. not having bonfires.
- Educate and advise the public about using exempt appliances with the correct fuel for that appliance in BBCs smoke control areas.
- Enforcing the Clean Air Act 1993 and the Environmental Protection Act 1990 where necessary to minimise the risk of particulates becoming air borne.
- To continue to manage, advice and enforce the Pollution Prevention and Control Regulations 1999 and the Environmental Permitting (England and Wales) Regulations 2010 on permitted processes when necessary.
- To encourage, support and promote sustainable travel within the Borough by working with a variety of organisations and neighbouring local authorities.
- To continue to promote green travel e.g. walking, cycling, low emissions/ electric vehicles and the tram network.
- To continue to support bus companies and taxis that operate within the Borough to reduce emissions.
- To continue to review suitable research methods for reducing air quality levels for particulate matter e.g. the use of vegetation.

- Promote and encourage the use of the final version of the “EMAQN Air Quality and Emissions Mitigation: guidance for developers” document.
- To inspect Crushers that are used within the Borough on demolition sites when notifications are received to ensure compliance with the process permit and good housekeeping so that dust levels are reduced.
- To communicate with all allotment providers in the Borough to discourage the use of bonfires to dispose of green waste.
- To investigate the feasibility of providing all allotments within the Borough with green waste recycling collections to prevent bonfires on site.
- To educate the public that electric motor vehicles whilst being positive for reducing NO_2 and CO_2, will still emit Particulate Matter and therefore active travel is still recommended as an alternative.

In late 2021 BBC purchased a Zephyr real time monitor to monitor PM_{10}, $PM_{2.5}$ and NO_2 in the Trowell AQMA. Therefore, the 2022 data will be reported in the 2023 ASR.

2.4 Update on the 2008 Air Quality Action Plan

2.4.1 The history of Broxtowe Borough Council's Air Quality Acton Plan.

Part IV of the Environment Act 1995 requires all local authorities to review and assess the current and future air quality in their area against objectives set out for eight key pollutants, under the provisions of the Air Quality Regulations 2000 and the Air Quality (Amendment) Regulations 2002.

Where an exceedence of the objectives is likely, the local authority is under a duty to declare an Air Quality Management Area (AQMA) to improve air quality.

Following detailed work reviewing and assessing the air quality in Broxtowe in 2006, it was predicted that the annual mean nitrogen dioxide (NO_2) concentrations in certain locations would not achieve the air quality objective of 40$\mu g/m^3$ or less by the end of 2005. Broxtowe Borough Council (BBC) declared four Air Quality Management Areas (AQMAs) within the borough along the M1 corridor. A NO_2 reduction of around 6$\mu g/m^3$ was required in order to achieve the objective.

In line with its statutory duty, Broxtowe Borough Council produced an Air Quality Action Plan (AQAP) in 2008 to manage the air quality throughout the borough to try to ensure the air quality standards and objectives were met.

2.4.2 Limitations to the Air Quality Action Plan

The primary source of NO_2 within the AQMAs is from vehicle emissions from the M1 Motorway. Unfortunately, the motorway's control is outside the Council's management as the responsibility lies with National Highways. However, BBC considered various motorway strategies, taking into account factors such as whether the Council has the ability to implement the options identified, cost, feasibility and non-air quality benefits.

The conclusion of the AQAP was that whilst the primary source of NO_2 within the AQMAs is outside the Council's management, BBC had identified other measures that would have an effect on the contributing levels of NO_2 to improve the air quality both in the AQMAs, as well as the rest of the borough, whilst also continuing to work alongside National Highways.

2.4.3 Update on the four AQMAs.

Broxtowe Borough Council used to have four AQMAs, however three of these have now been revoked and the one remaining AQMA is situated in Trowell. Table 2.4 below shows the four AQMAs, their locations, the date they were declared and the dates that the three were revoked.

Although AQMAs 2, 3 and 4 have been revoked, a decision was made to continue to monitor the air quality at these locations to ensure that the air quality objectives are still being met, which they are. All of the AQMAs are due to the M1 Motorway, which is managed and maintained by National Highways.

Table 2.4 – The four AQMAs in the Borough.

AQMA Name	Location	Date Declared	Date Revoked
AQMA 1	Trowell – Iona Drive & Tiree Close	2006	-
AQMA 2	Trowell – Derbyshire Avenue	2006	2010
AQMA 3	Trowell – Nottingham Road	2006	2010
AQMA 4	Nuthall - Nottingham Road	2006	2017

2.4.4 The NO_2 Annual Mean Concentrations for the remaining AQMA.

When AQMA 1 in Trowell (which will now be referred to as "the AQMA" was declared in 2006, it was an area that had been identifying as exceeding the AQO of 40μg/m3. The

data showed that within this area in 2006 the annual mean was 45μg/m3 and therefore exceeding the AQO by 5μg/m3.

Since 2012, there has been a general decreasing trend with the concentrations being below the air quality objective since 2016. Table 2.4.1 shows the annual mean concentrations for nitrogen dioxide from 2012 to 2021. This data is also shown as a trend chart in Figure A.2 in the Appendices.

In January 2016 a second monitoring location was added (site ID 18), which is situated in Tiree Close. In addition to Site 18 and Site 19, Defra and the LAQM Helpdesk recommended that more monitoring locations were added to provide a more detailed assessment of the air quality within this AQMA and to part fulfil Defra's requirements to not update the AQAP. Therefore, in March 2020 two new monitoring locations were added in Tiree Close Site ID 44 and 45. The locations are situated between Junctions 25 and 26 of the M1 and are monitoring NO_2 levels from the M1 Motorway (see Appendix E for a map of the AQMA and the locations). The tubes are sited on the façade of properties that are the closest to the M1.

Table 2.4.1 – Results for AQMA in Trowell 2012 – 2021.

Site ID	NO_2 Annual Mean Concentration (μg/m^3)									
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
18	-	-	-	-	34.3	32.9	28.2	28.4	17.9	22.3
19	**42.2**	38.7	38.1	**42.3**	37.6	37.2	31.9	30.9	22.9	23.8
44	-	-	-	-	-	-	-	-	24.8	27.6
45	-	-	-	-	-	-	-	-	20.1	20.8

Although the data in Table 2.4.1 shows a downward trend (not including the 2020 data as it is an anomaly due to National Lockdowns to stop the spread of Covid-19), there has been a steady decrease year on year. However, the 2015 data did show an increase in NO_2 at Site19. This may have been as a result of the SMART Motorway scheme on the

M1 between junctions 28 and 31 (Junctions 25 to 28 were completed in 2010), which had just been opened in June 2016. Therefore, it was considered that this may have caused congestion further south, which could have had an effect on increasing the air quality levels in 2015. The SMART Motorway scheme will be discussed in greater detail in Section 2.4.5.

However, the results do show that there is a decreasing trend (if the 2015 data is seen as an anomaly due to the SMART Motorway Scheme and the 2020 data is discredited), as the NO_2 levels have reduced by 12.0 µg/m^3 from 2016 to 2021 for Site 18 and 13.8µg/m^3 from 2016 to 2021 for Site 19. Site 18 in 2021 is 17.7µg/m^3 below the AQO, Site 19 in 2021 is 16.2µg/m^3 below the AQO, Site 44 in 2021 is 12.4µg/m^3 below the AQO and Site 45 in 2021 is 19.2µg/m^3 below the AQO.

The results in Table 2.4.1 show that for six consecutive years the AQO has been met within the remaining AQMA and for four years the data has been below 36µg/m^3 which is a 10% reduction of the 40µg/m^3 AQO.

2.4.5 SMART Motorway Scheme

The SMART Motorways is a scheme that was introduced by National Highways with the aim of relieving congestion by making the hard shoulder available for use by traffic. On some SMART motorways, the hard shoulder is opened at busy times. On others it is permanently converted into a traffic lane (known as all-lane running). Regularly spaced refuge areas are used for emergencies.

SMART motorways use technology to:

- monitor traffic levels
- change the speed limit to smooth traffic flow, reduce frustrating stop-start driving and improve journey times
- activate warning signs to alert you to traffic jams and hazards up ahead
- close lanes – for example to allow emergency vehicles through

National Highways has been implementing this scheme on the M1 within the boundary of the borough of Broxtowe and the stretch of the M1 to the north and south of the borough. Table 2.4.2 shows the junctions in which this scheme has been introduced and the period in which it was completed. This identifies where there is likely to be congestion issues as the number of lanes of the M1 were reduced to allow the work to be undertaken safely. This will have had an effect upon the air quality within the area. This information may explain why there was an increase in 2015 within the AQMA.

Table 2.4.2 – SMART Motorway Scheme on the M1 between Junctions 23a – 35a.

Junctions of the M1 Motorway	Start Date	Completion Date
23a to 25	Feb 2017	Feb 2019
25 to 28	Jan 2007	Dec 2010
28 to 31	Oct 2014	Dec 2015
32 to 35a	Jan 2015	Mar 2017

Further information about the Smart Motorway scheme can be found on the National Highways website: SMART Motorway Scheme, National Highways

2.4.6 Defra's recommendations for Broxtowe Borough Council.

Every year the Council analyses the results, and discuss their findings and observed trends in the ASR. This includes the results for the monitoring sites located within the remaining AQMA. The annual ASR has also included all of the actions that BBC are implementing to reduce the background air quality within the borough and also any measures that Nottinghamshire County Council are also implementing. These measures are displayed in Table 2.2 and discussed throughout the report. The ASR once completed is then submitted to Defra for approval.

Defra as well as approving the ASR also provide recommendations for the Council to implement and to be discussed in the next ASR.

The recommendations that BBC have received from Defra are:

- The borough has made some good progress towards developing their AQAP and implementing AQAP measures in the last year, which is commended.
- The borough has stated that they will continue to monitor and keep the AQMA under review whilst the effects of the SMART motorway scheme are being determined, and until a significant decreasing trend can be demonstrated. This is supported, and it is suggested that the AQMA could be considered for revocation after demonstrating compliant NO_2 concentrations below 36 µg/m^3 for three consecutive years.
- There have been no exceedances of national air quality objectives in 2018 and concentrations in the Trowell AQMA continue to fall. The Council have stated that they plan to implement measures to ensure NO_2 concentrations are below the AQOs and when long-term compliance is achieved they will revoke the AQMA. If current NO_2 trends continue and concentrations decline, then the revocation of the AQMA is strongly supported.

Although for the past six consecutive years, the data has been below the AQO the data has only been below 36 µg/m^3 for four consecutive years. Therefore, BBC will not revoke the AQMA until it is consistently below 36 µg/m^3 for four or more consecutive years (not including 2020 Data due to Covid-19 restrictions).

2.4.7 Agreed Methodology for not producing a new AQAP.

As the measures in the 2008 Air Quality Action Plan (AQAP) are to reduce the background NO_2 concentrations and the results are below the AQO within the remaining AQMA, and Defra has also recommended revoking the AQMA. BBC contacted the LAQM helpdesk to discuss the need for revising the Air Quality Acton Plan in 2019.

BBC proposed that instead of producing a new AQAP, that the measures that BBC are implementing to improve the air quality are continued to be discussed annually in the ASR instead and are shown in Table 2.2 until the AQMA is revoked within the next couple of years.

The LAQM Helpdesk discussed the proposal with BBC in 2019 and it was agreed that if BBC would follow and action these measures, then there would not be a need to produce

a new AQAP. Defra having reviewed these measures in the 2020 ASR have agreed that they are adequate.

The measures are;

1. To undertake a detailed monitoring study, by increasing the number of diffusion tubes within the AQMA to identify whether the AQMA designation is required. – ***Since March 2020, two additional monitoring locations have been added within the AQMA.***
2. To send the LAQM helpdesk the latest results on a regular basis rather than providing an annual figure – ***BBC are sending updated data to LAQM.***
3. To identify any factors that would contribute to the anomaly in 2015 when there was an increase in NO2 levels. ***BBC identified that it was likely to have been the SMART motorway scheme.***

BBC will continue to monitor NO_2 levels in this area and work alongside National Highways to improve air quality levels, the Council will continue to review and implement measures stated within Table 2.2 of this and future ASR's .

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

This section sets out the monitoring undertaken within 2021 by Broxtowe Borough 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

3.1.1 Automatic Monitoring Sites

BBC does not currently utilise any automatic air quality monitoring within the Borough. However, in late 2021 BBC purchased a Zephyr real time monitor to monitor PM_{10}, $PM_{2.5}$ and NO_2 in the Trowell AQMA. Therefore, the 2022 data will be reported in the 2023 ASR.

3.1.2 Non-Automatic Monitoring Sites

Broxtowe Borough Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 45 sites during 2021. Table A. in Appendix A presents the details of the non-automatic sites.

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

3.2 Individual Pollutants

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

3.2.1 Nitrogen Dioxide (NO_2)

Table A.2 in Appendix A compare the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. Note that

the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 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.

Although there are no exceedances of the NO_2 objective there is still one AQMA within the Borough, which is situated in Trowell. The monitoring results from the diffusion tubes sited in the AQMA will be discussed in greater detail below.

As well as discussing the results from the recently revoked AQMA in Nuthall and the current AQMA. The following chapter will discuss areas of concern within the Borough where the air quality levels are higher than average, but still within the Air Quality Objective. This is to determine whether any trends are developing, which will allow suitable measures if necessary, to be put in place to reduce the likelihood of an exceedance in the future.

Revoked AQMA in Nuthall

There are three diffusion tube sites located on Nottingham Road in Nuthall that are located within the recently revoked AQMA in Nuthall. The results below show that since 2012 the levels of NO_2 are consistently below the objective of 40µg/m^3 for all three sites. Site 33 and 34 are a duplicate site and the annual data is provided for 34 only.

Table 3.1 – Results for the Revoked AQMA in Nuthall 2012 – 2021.

Site ID	NO_2 Annual Mean Concentration (µg/m^3)									
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
33 & 34	30.8	32.3	30.5	28.1	29.1	27.7	25.5	25.9	18.7	20.7
35	35.0	33.5	33.7	34.1	32.2	33.6	30.0	29.7	22.6	23.4

Monitoring will continue to be undertaken at these three sites and the results will be reported in the 2023 Air Quality Annual Status Report.

AQMA in Trowell

Since 2011 there was only one monitoring site situated on the façade of a property on Iona Drive (Site ID 19). However, in January 2016 a second monitoring location was added (Site ID 18) in Tiree Close and since March 2020, two new monitoring locations were added in Tiree Close (Site ID 44 and 45), as Defra and the LAQM Helpdesk recommended that more monitoring locations were added to provide a more detailed assessment of the air quality within this AQMA and to part fulfil Defra's requirements to not update the AQAP. All locations are situated between Junctions 25 and 26 of the M1 and are monitoring NO_2 levels from the M1 Motorway (see Appendix E for a map of the AQMA and the locations). The tubes are sited on the façade of properties that are the closest to the M1.

The diffusion tube monitoring results from 2012 to 2021 are shown below. Please see Figure A.2 in the appendices for a trend chart showing the data below.

Table 3.2 – Results for AQMA in Trowell 2012 – 2021.

Site ID	NO_2 Annual Mean Concentration (µg/m^3)									
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
18	-	-	-	-	34.3	32.9	28.2	28.4	17.9	22.3
19	**42.2**	38.7	38.1	**42.3**	37.6	37.2	31.9	30.9	22.9	23.8
44	-	-	-	-	-	-	-	-	24.8	27.6
45	-	-	-	-	-	-	-	-	20.1	20.8

The data in Table 3.2 (excluding Site 44 and Site 45), shows that there has been a steady decrease year on year. However, the 2015 data did show an increase in NO_2 at Site 19. This may have been as a result of the SMART Motorway scheme on the M1 between junctions 28 and 31 (Junctions 25 to 28 were completed in 2010), which had just been

opened in June 2016. Therefore, it was considered that this may have caused congestion further south, which could have had an effect on increasing the air quality levels in 2015.

However, the results do show that there is a decreasing trend (if the 2015 data is seen as an anomaly due to the SMART Motorway Scheme), as the NO_2 levels have reduced by 12µg/m^3 from 2016 to 2021 for site 18 and 13.8µg/m^3 from 2016 to 2021 for site 19. Site 18 in 2021 is 17.7µg/m^3 below the AQO, Site 19 in 2021 is 16.2µg/m^3 below the AQO, Site 44 in 2021 is 12.4µg/m^3 below the AQO and Site 45 in 2020 is 19.2µg/m^3 below the AQO.

As mentioned previously in this section, in March 2020 two new monitoring locations were added to the diffusion tube network (site 44 and site 45). The first year of data showed an annual mean of 24.8µg/m^3 for site 44 and 20.1µg/m^3 for site 45. During 2020 there were national and regional lockdowns due to Covid-19, which resulted in a reduction in traffic. The data for 2021 shows an increase of 2.8µg/m^3 for site 44 and an increase of 0.7µg/m^3 for site 45 in comparison to the 2020 data.

The results in Table 3.2 show that for six consecutive years the AQO has been met within the remaining AQMA and for four years the data has been below 36µg/m^3 which is a 10% reduction of the 40µg/m^3 AQO. However, due to national and regional lockdowns and an increase in working from home, the amount of vehicles on the road has reduced. Therefore, the 2020 data should be regarded as an anomaly.

BBC will continue to monitor NO_2 levels in this area and work alongside National Highways to improve air quality levels. Please view Section 2.4 of this report on an Update on the Air Quality Action Plan for this AQMA.

A610/B600 Nuthall Island

Since 2016 there have been two new sites for monitoring the air quality levels on the Nuthall Island (Site's 36 and 37). The reason for changing the original site (BX 22) was due to the diffusion tube being located less than 1m from Nottingham Road which was very near to the A610/B600 Nuthall Island but not near the residential properties. Therefore, the site was not a true representation of the levels that receptors are receiving

at their properties so the site was relocated to the façade of a residential property in January 2016 (See Appendix F for the Map of the roundabout and the current monitoring locations).

In January 2016 a second site was also chosen to determine what the NO_2 levels are on a residential property that is situated on the opposite side of the roundabout to Site 36 where the traffic is leaving Nottingham City and travelling into the Borough of Broxtowe. The results from 2012 to 2015 are shown for the 'old' site and the 2016 to 2021 results for the 'new' sites are shown below.

Table 3.3 – Results for Nuthall Island 2012 – 2021.

Site ID	NO_2 Annual Mean Concentration (µg/m^3)									
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
BX 22	**41.7**	**41.1**	39.2	**41.1**	-	-	-	-	-	-
36	-	-	-	-	35.2	35.2	32.8	31.7	24.9	26.0
37	-	-	-	-	32.2	29.5	28.9	26.4	19.3	23.5

The results above show that that the original site did not provide a true representation of NO_2 levels at the façade of the properties. However, the two 'new' sites are showing that the levels are below the air quality objective by 14µg/m^3 for site 36 and 16.5µg/m^3 for site 37 in 2021 and are showing an overall decreasing trend since 2016 (the 2020 data is considered an anomaly due to national and regional lockdowns). Therefore, BBC will continue to monitor NO_2 levels at these sites and provide an update in the 2023 ASR. BBC will also continue to work alongside Nottinghamshire County Council to improve air quality levels.

Bramcote Island, Derby Road, Bramcote

Since January 2016, increased monitoring has been undertaken at this location due to the original site showing exceedances of the air quality objective of 40µg/m^3. The original site

(BX04) was discontinued and relocated in January 2016 to a neighbouring property at a more suitable height and nearer to Bramcote Island (Site 41). An additional site was also chosen to determine whether the concentration reduces further away from the roundabout (Site 40). Both sites are on the façade of properties on Derby Road. (See Appendix G for the Map of the roundabout and the monitoring locations).

As discussed in the 2016 ASR, the diffusion tube results were believed to be over the objective level for several years as there were a number of parallel traffic schemes which were being undertaken in the Borough and also within Nottingham City. Therefore, as suspected, the traffic schemes affected the results when comparing the past results to the results since 2016.

Table 3.4 – Results for Bramcote Island 2012 – 2021.

Site ID	NO_2 Annual Mean Concentration ($\mu g/m^3$)									
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
BX 04	**42.2**	37.8	**41.8**	**40.7**	-	-	-	-	-	-
40	-	-	-	-	37.5	32.7	34.0	32.0	23.6	27.4
41	-	-	-	-	37.4	35.6	34.1	30.9	23.5	26.0

Table 3.4 shows that in 2021 the NO_2 concentrations for Site 40 is 27.4$\mu g/m^3$ and Site 41 is 26$\mu g/m^3$, this is an increase of 3.8$\mu g/m^3$ for site 40 and 2.5$\mu g/m^3$ for site 41 in comparison to the 2020 data. However, the 2020 data is considered an anomaly due to national and regional lockdowns.

Although this is an overall downward trend for both sites from 2016 and they are below the objective level. There is a slight increase by 1.3$\mu g/m^3$ at Site 40 in 2018. This could have been due to localised roadworks that were taking place on the A52, which has resulted in an increase in stationary traffic near to this site. However, since 2018 this site has shown a decrease in the levels, which further indicates that the slight increase was due to

localised roadworks which were completed in 2018. Site 41 has continued to show a decreasing trend since 2016.

BBC will continue to monitor and report on the NO_2 levels in this area, to note any works that are being undertaken and to continue to work alongside National Highways to improve the air quality levels in this area.

Town Street, Bramcote.

In December 2016 a review was undertaken of the monitoring network and as Town Street is often used as a 'rat run' in rush hour to avoid the A52 a decision was made to monitor at this location. Therefore, in January 2017 a site location was picked where the street is narrowed due to residents parking outside their properties, which tends to cause a 'bottle neck' situation in rush hour. The siting of the tube was chosen so that it is parallel with the façade of a nearby residential property, as there were no suitable downpipes to attach it to the façade of the property.

Due to the result obtained in 2017 (see Table 3.5 below), a decision was made to start monitoring at a second location on Town Street (Site 56) in 2018 (the tube is sited on the façade of a house that is near to the Bramcote Island end of Town Street). The additional site in 2018 was to determine whether there is a potential issue along all of Town Street, or just at the site where there is a bottle neck.

Table 3.5 – Results for Town Street 2017 – 2021.

Site ID	NO2 Annual Mean Concentration (µg/m3)				
	2017	2018	2019	2020	2021
48	37.5	35.7	30.4	25.4	27.8
56	-	25.1	23.4	18.7	19.6

Table 3.5 shows that in 2021 the NO_2 concentrations for Site 48 is 27.8µg/m^3 and Site 56 is 19.6µg/m^3. This is an increase of 2.4µg/m^3 for site 48 and 0.9µg/m^3 for site 56 in

comparison to the 2020 data. Since 2017, the results for both sites are showing a downward trend apart from the increase in 2021, but the 2020 data was lower due to national and regional lockdowns and therefore the 2021 data is higher in comparison.

Table 3.5 also shows that the data for site 48 in comparison to site 56 does enforce the theory that the results are higher on site 48 due to the 'Bottle neck' situation. Therefore, BBC will continue to monitor NO_2 levels at these sites and provide an update in the 2023 ASR. BBC will continue to work alongside Nottinghamshire County Council to improve air quality levels.

The Results and Trends for all Monitoring Sites in 2021.

Defra requested that trend charts were provided for all monitoring sites to identify any trends in the annual mean concentrations. The trend charts are displayed in Figure A.1 in the Appendices for all of the sites in use since 2017 to 2021.

Before evaluating the trend charts, it must be noted the effect that Covid-19 has had on the 2020 data and therefore the trends in the data discussed below, are for what the trends have shown since 2017 – 2021 excluding the 2020 data, as the 2020 data has shown a decreasing trend at all sites, but this is to be expected due to the national and regional lockdowns.

Out of the 45 sites that are identified in the trend charts in Figure A.1 in the Appendices, 35 have been in use since 2017, in 2018 seven additional sites were added and in 2020 there were a further three additional sites. In 2020 site 10 was discontinued due to the consistently low readings and the tube was moved to site 57.

The trend charts have identified that out of the 45 sites, twenty-one are showing a consistent downward trend year on year. Fifteen sites are showing an overall downward trend. One site has shown an increase in the 2021 data in comparison to the 2019 data and four sites have shown a slight increase since monitoring at the sites and then a downward trend in recent years. Four of the sites will not have the data discussed as out of the four, three of the sites were started in 2020 (Sites 57, 58 and 59) so a trend cannot

be identified yet. However, with continuous yearly data being collected it is hoped that a clear trend can be identified in future years. The remaining site out of the four (site 10) was discontinued in 2020. Therefore, the remaining 41 sites and their trends will be discussed in greater detail below.

Twenty-one of the 41 sites are showing a consistent downward trend year on year (site 2, site 4, site 5, site 8, site 12, site 13, site 16, site 17, site 18, site 19, site 30, site 35, site 36, site 37, site 38, site 41, site 43, site 48, site 54, site 55 and site 56).

Fifteen of the 41 sites are showing an overall downward trend of the data these sites are; site 1, site 7, site 9, site 11, site 20, site 22, site 27, site 31, site 33&34, site 39, site 40, site 44, site 45, site 50 and site 53.

One of the 41 sites showed an increase in the 2021 data in comparison to the 2019 data (2020 excluded as an anomaly), this was site 51 and it was an increase of 0.6µg/m^3. As this is only a slight increase of 0.6µg/m^3 this could be due to many factors such as meteorology, traffic disruption due to road works etc. However, Site 51 will be closely monitored and will be reported on in the 2023 ASR.

The remaining four sites (Sites 3, 15, 32 and 52) have shown a slight increase since monitoring at the sites started and then a downward trend in recent years. Therefore, these sites are discussed in greater detail below.

Site 3 - Queens Road East, Beeston.

Table 3.6 below shows the results for 8 Queens Road East in Beeston for 2016 to 2020, the data shows that the highest concentration was in 2016 at 26µg/m^3. In 2017 it had decreased greatly by 4µg/m^3. In 2018 it increased by 0.5µg/m^3 and an additional 0.6µg/m^3 in 2019. The 2020 data is seen as an anomaly, but the 2021 data shows a decrease of 4µg/m^3 in comparison to 2019 data. The reason for the slight increase in 2018 and 2019 is unknown.

Table 3.6 – Results for 8 Queens Road East, Beeston 2016 – 2021.

Site ID	NO_2 Annual Mean Concentration (µg/m^3)					
	2016	2017	2018	2019	2020	2021
3	26.0	22.0	22.5	23.1	17.7	19.1

This site is located on the façade of the property and is situated near the junction of the A6005 Queens Road East as it becomes the A6005 University Boulevard that links Beeston with Nottingham. This is a route which is used by commuters going in and coming out of Nottingham City. There was also a residential development being built in 2019, which may have resulted in an increase in vehicles to the area. Although the data is below the air quality objective of 40µg/m^3, this site will be closely monitored and an update will be provided in the 2023 ASR.

Site 15 - George Spencer Academy, Stapleford

Table 3.7 below shows the results for George Spencer Academy in Stapleford for 2016 to 2021, the data shows that the highest concentration was in 2016 at 35.6µg/m^3. In 2017 it had decreased greatly by 9.9µg/m^3. In 2018 it increased by 2.5µg/m^3 and an additional 0.4µg/m^3 in 2019. The 2020 data is seen as an anomaly, but the 2021 data shows a decrease of 3.4µg/m^3 in comparison to 2019 data. The reason for the slight increase in 2018 and 2019 is unknown.

Table 3.7 – Results for George Spencer Academy, Stapleford 2016 – 2021.

Site ID	NO_2 Annual Mean Concentration (µg/m^3)					
	2016	2017	2018	2019	2020	2021
15	35.6	25.7	28.2	28.6	24.4	25.2

The location of this site is closer to the A52 than the main academy buildings, this is to ensure that the monitoring data is consistently collected, as previously diffusion tubes have been removed. This location also allows BBC to determine the worst case scenario

for the academy. Although the data is below the air quality objective of 40µg/m^3, this site will be closely monitored and an update will be provided in the 2023 ASR.

Site 32 - 59b Main Street, Kimberley.

Table 3.8 below shows the results for 59b Main Street in Kimberley for 2016 to 2020, the data shows that the highest concentration was in 2016 at 30µg/m^3. In 2017 it had decreased by 1.4µg/m^3. In 2018 it increased by 0.3µg/m^3 and stayed the same in 2019. The 2020 data is seen as an anomaly, but the 2021 data shows a decrease of 6µg/m^3 in comparison to 2019 data. The reason for the slight increase in 2018 and 2019 is unknown.

Table 3.8 – Results for 59b Main Street, Kimberley 2016 – 2021.

Site ID	NO_2 Annual Mean Concentration (µg/m^3)					
	2016	2017	2018	2019	2020	2021
32	30.0	28.6	28.9	28.9	21.3	22.9

This site is located on the façade of a business premises parallel with neighbouring residential dwellings on Main Street in Kimberley near to a busy mini roundabout that serves a variety of retail and food businesses. This is the main route to either Giltbrook or Watnall when avoiding the A610. Although, the data is below the air quality objective of 40µg/m^3, this site will be closely monitored and an update will be provided in the 2023 ASR.

Site 52- 228 Station Road, Beeston.

Table 3.9 below shows the results for 228 Station Road in Beeston for 2018 to 2021. The data shows that the highest concentration was in 2019 at 24.5µg/m^3. The 2020 data is seen as an anomaly, but the 2021 data shows a decrease of 5.5µg/m^3 in comparison to 2019 data.

Table 3.9 – Results for Station Road, Beeston 2018 – 2021.

Site ID	NO2 Annual Mean Concentration (µg/m3)			
	2018	2019	2020	2021
52	22.9	24.5	18.0	19.0

This site is located on the façade of a residential dwelling that is situated on Station Road and monitoring at this location started in January 2018. The data was the highest in 2019, which may have been due to construction works on a nearby housing development and improvement works being undertaken on the A6005. Although, the data is below the air quality objective of 40µg/m3, this site will be closely monitored and an update will be provided in the 2023 ASR.

3.2.2 Particulate Matter (PM_{10})

BBC does not currently monitor PM_{10} within the Borough. However, in late 2021 BBC purchased a Zephyr real time monitor to monitor PM_{10}, $PM_{2.5}$ and NO_2 in the Trowell AQMA. Therefore, the 2022 data will be reported in the 2023 ASR.

3.2.3 Particulate Matter ($PM_{2.5}$)

BBC does not currently monitor $PM_{2.5}$ within the Borough. However, in late 2021 BBC purchased a Zephyr real time monitor to monitor PM_{10}, $PM_{2.5}$ and NO_2 in the Trowell AQMA. Therefore, the 2022 data will be reported in the 2023 ASR.

3.2.4 Sulphur Dioxide (SO_2)

Previous air quality reports have shown there are no relevant sources of Sulphur Dioxide within the Borough. Subsequently, the Council does not monitor for this pollutant.

Appendix A: Monitoring Results

Table A.1 – Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
1	113 Wollaton Road, Beeston	Roadside	452527	337313	NO_2	No	0	2	N	1.9
50	309 Wollaton Road, Beeston	Roadside	452114	338018	NO_2	No	0	14	N	1.7
2	166 Derby Road, Beeston	Roadside	452091	338122	NO_2	No	0	9	N	1.8
3	8 Queens Road East, Beeston	Roadside	453659	337412	NO_2	No	0	13	N	1.8

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
4	226 Queens Road, Beeston	Roadside	453361	336627	NO_2	No	0	5	N	1.8
51	36 Meadow Road, Beeston	Roadside	453537	336100	NO_2	No	0	7	N	1.7
52	228 Station Road Beeston	Roadside	453287	336349	NO_2	No	0	5	N	1.7
5	Chilwell Olympia School, Beeston	Urban Background	451782	335320	NO_2	No	0	104	N	1.9
6	127 Attenborough Lane, Chilwell	Roadside	451482	334936	NO_2	No	0	13	N	1.7
7	31 Hickton Drive, Chilwell	Roadside	450756	334328	NO_2	No	0	6	N	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) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
53	1 Calverton Close, Chilwell	Roadside	450360	334982	NO_2	No	0	5	N	1.7
8	The Manor Pub, 350 Nottingham Road, Toton	Roadside	450422	334243	NO_2	No	0	5	N	1.8
9	Toton branch Surgery, 2 Banks Road, Toton	Roadside	449876	334804	NO_2	No	0	9	N	1.8
10	1 Katherine Drive, Toton	Roadside	449748	335472	NO_2	No	0	16	N	1.7
11	269 Stapleford Lane, Toton	Roadside	449694	335501	NO_2	No	0	10	N	1.8

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
12	Lamppost, Stapleford Lane, Toton	Roadside	449615	335664	NO_2	No	0	1	N	1.9
45	209 Toton Lane, Stapleford	Roadside	449467	336220	NO_2	No	0	15	N	1.8
15	George Spencer Academy, Stapleford	Roadside	449406	336135	NO_2	No	0	4	N	1.9
13	George Spencer Lower School, Toton	Roadside	449266	336075	NO_2	No	0	15	N	1.8

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
16	24 Brampton Drive, Stapleford	Roadside	449516	336216	NO_2	No	0	7	N	1.7
54	195 Derby Road, Stapleford	Roadside	448467	336591	NO_2	No	0	4	N	1.8
17	Lamppost Church Street, Stapleford	Roadside	448890	337190	NO_2	No	0	3	N	1.8
55	12 Ilkeston Road, Stapleford	Roadside	449814	338471	NO_2	No	0	9	N	1.8
18	20 Tiree Close, Trowell	Roadside	448560	338889	NO_2	Yes AQMA 1	0	9*	N	1.7

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
19	15 Iona Drive, Trowell	Roadside	448586	339023	NO_2	Yes AQMA 1	0	18*	N	1.9
20	30 Derbyshire Avenue, Trowell	Roadside	448652	339652	NO_2	No	0	12*	N	1.9
22	81 Nottingham Road, Trowell	Roadside	448832	340098	NO_2	No	0	18*	N	1.8
23	Church Lane, Cossall	Roadside	448195	342287	NO_2	No	0	2	N	1.8
24	Gin Close Way, Awsworth	Roadside	448230	344446	NO_2	No	0	2	N	1.8

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
44	32 Mansfield Road, Eastwood	Roadside	446509	347091	NO_2	No	0	2	N	1.8
27	Sun Inn Pub, 6 Derby Road, Eastwood	Roadside	446465	346985	NO_2	No	0	8	N	1.8
28	9 Derby Road, Eastwood	Roadside	446401	346920	NO_2	No	0	3	N	1.7
30	560 Nottingham Road, Giltbrook	Roadside	448544	345241	NO_2	No	0	4	N	1.9
31	15 Hayley Close, Kimberley	Roadside	448826	344883	NO_2	No	0	7	N	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) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
32	59b Main Street, Kimberley	Roadside	450122	344658	NO_2	No	0	5	N	1.8
33 and 34	19a Nottingham Road, Nuthall^	Roadside	451631	344526	NO_2	No	0	11*	N	1.7
35	20 Nottingham Road, Nuthall	Roadside	451728	344440	NO_2	No	0	20*	N	1.9
36	113 Nottingham Road, Nuthall	Roadside	452232	344033	NO_2	No	0	20	N	1.7
37	114 Nottingham Road, Nuthall	Roadside	452331	343910	NO_2	No	0	27	N	1.7

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
57	22-27 Spring Gardens, Strelley	Roadside	451413	341424	NO_2	No	0	23	N	1.9
38	Opp Sherwin Arms, Derby Road, Bramcote	Roadside	450389	337866	NO_2	No	2	2	N	1.8
39	9 Bembridge Court, Bramcote	Roadside	450434	337781	NO_2	No	0	14	N	1.6
56	10 Town Street, Bramcote	Roadside	450570	337851	NO_2	No	0	9	N	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) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
40	153 Derby Road, Bramcote	Roadside	450632	337929	NO_2	No	0	13	N	1.7
41	169 Derby Road, Bramcote	Roadside	450555	337909	NO_2	No	0	10	N	1.8
43	Broxtowe Borough Council Offices	Urban Background	452733	336962	NO_2	No	0	8	N	1.8
46	Middle Street, Beeston	Roadside	452914	336650	NO_2	No	0	4	N	1.9
47	6 Broughton Street, Beeston	Roadside	452593	337186	NO_2	No	0	3	N	1.8

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
48	Near 73 Town Street, Bramcote	Roadside	450817	337592	NO_2	No	0	2	N	1.8
49	4 Commercial Avenue, Beeston	Roadside	452804	336940	NO_2	No	0	4	N	1.8
58	10 Tiree Close, Trowell	Roadside	448588	338940	NO_2	Yes AQMA 1	0	11*	N	1.7
59	4 Tiree Close, Trowell	Roadside	448602	338965	NO_2	Yes AQMA 1	0	9*	N	1.7

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.

(*) All distance to kerb of nearest road but sites near to the M1 Motorway.

(^) Duplicate Diffusion Tubes

Table A.2 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	2017	2018	2019	2020	2021
1	452527	337313	Roadside	99.7	99.7	27.8	25.6	26.8	19.0	21.0
50	452114	338018	Roadside	99.7	99.7	-	28.2	29.2	18.9	16.3
2	452091	338122	Roadside	99.7	99.7	28.5	26.6	26.5	18.9	20.8
3	453659	337412	Roadside	99.7	99.7	22.0	22.5	23.1	17.7	19.1
4	453361	336627	Roadside	99.7	99.7	28.4	26.0	25.8	19.1	20.2
51	453537	336100	Roadside	99.7	99.7	-	18.3	15.9	15.0	16.5
52	453287	336349	Roadside	99.7	99.7	-	22.9	24.5	18.0	19.0
5	451782	335320	Urban Background	99.7	99.7	18.8	16.7	15.7	13.2	13.5
6	451482	334936	Roadside	-	-	24.7	-	-	-	-
7	450756	334328	Roadside	99.7	99.7	26.4	23.0	23.4	16.2	18.0
53	450360	334982	Roadside	99.7	99.7	-	19.3	19.9	13.9	14.7

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2021 (%) [2]	2017	2018	2019	2020	2021
8	450422	334243	Roadside	90.1	90.1	28.7	27.1	24.3	20.8	22.4
9	449876	334804	Roadside	90.1	90.1	20.9	21.9	21.5	16.2	18.0
10	449748	335472	Roadside	-	-	25.6	20.8	21.6	-	-
11	449694	335501	Roadside	99.7	99.7	29.4	26.1	27.6	20.8	23.0
12	449615	335664	Roadside	99.7	99.7	25.3	23.6	20.5	17.3	19.1
45	449467	336220	Roadside	99.7	99.7	29.2	25.9	26.7	20.1	20.8
15	449406	336135	Roadside	99.7	99.7	25.7	28.2	28.6	24.4	25.2
13	449266	336075	Roadside	90.1	90.1	33.8	26.0	24.9	18.1	20.4
16	449516	336216	Roadside	99.7	99.7	26.3	25.9	25.4	18.4	20.0
54	448467	336591	Roadside	92.0	92.0	-	29.8	29.9	21.9	23.6
17	448890	337190	Roadside	99.7	99.7	34.8	33.0	32.7	25.1	26.7
55	449814	338471	Roadside	99.7	99.7	-	24.6	23.8	17.9	19.0

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2021 (%) [2]	2017	2018	2019	2020	2021
18	448560	338889	Roadside	99.7	99.7	32.9	28.2	28.4	21.5	22.3
19	448586	339023	Roadside	99.7	99.7	37.2	31.9	30.9	22.9	23.8
20	448652	339652	Roadside	99.7	99.7	23.6	24.1	23.3	17.3	19.7
22	448832	340098	Roadside	99.7	99.7	24.0	24.2	24.2	18.7	19.7
23	448195	342287	Roadside	-	-	22.4	-	-	-	-
24	448230	344446	Roadside	-	-	24.1	-	-	-	-
44	446509	347091	Roadside	99.7	99.7	33.2	33.7	31.7	24.8	27.6
27	446465	346985	Roadside	99.7	99.7	23.7	24.1	20.4	17.8	18.9
28	44601	346920	Roadside	-	-	20.7	-	-	-	-
30	448544	345241	Roadside	99.7	99.7	27.9	23.1	21.9	18.3	20.3
31	448826	344883	Roadside	92.0	92.0	31.9	25.7	28.8	21.2	22.8
32	450122	344658	Roadside	90.1	90.1	28.6	28.9	28.9	21.3	22.9

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2021 (%) [2]	2017	2018	2019	2020	2021
33 and 34	451631	344526	Roadside	99.7	99.7	27.7	25.5	25.9	18.7	20.7
35	451728	344440	Roadside	99.7	99.7	33.6	30.0	29.7	22.6	23.4
36	452232	344033	Roadside	99.7	99.7	35.2	32.8	31.7	24.9	26.0
37	452331	343910	Roadside	99.7	99.7	29.5	28.9	26.4	19.3	23.5
57	451413	341424	Roadside	99.7	99.7	-	-	-	15.2	16.0
38	450389	337866	Roadside	99.7	99.7	30.5	29.8	26.7	20.5	24.1
39	450434	337781	Roadside	99.7	99.7	25.6	26.7	25.5	18.6	21.1
56	450570	337851	Roadside	99.7	99.7	-	25.1	23.4	18.7	19.6
40	450632	337929	Roadside	82.4	82.4	32.7	34.0	32.0	23.6	27.4
41	450555	337909	Roadside	99.7	99.7	35.6	34.1	30.9	23.5	26.0
43	452733	336962	Urban Background	99.7	99.7	18.5	18.6	18.3	13.8	14.9

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	2017	2018	2019	2020	2021
46	452914	336650	Roadside	-	-	23.8	-	-	-	-
47	452593	337186	Roadside	-	-	24.6	-	-	-	-
48	450817	337592	Roadside	99.7	99.7	37.5	35.7	30.4	25.4	27.8
49	452804	336940	Roadside	-	-	24.3	-	-	-	-
58	448588	338940	Roadside	99.7	99.7	-	-	-	19.4	21.8
59	448602	338965	Roadside	99.7	99.7	-	-	-	19.1	21.0

☐ **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 µg/m^3.

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

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

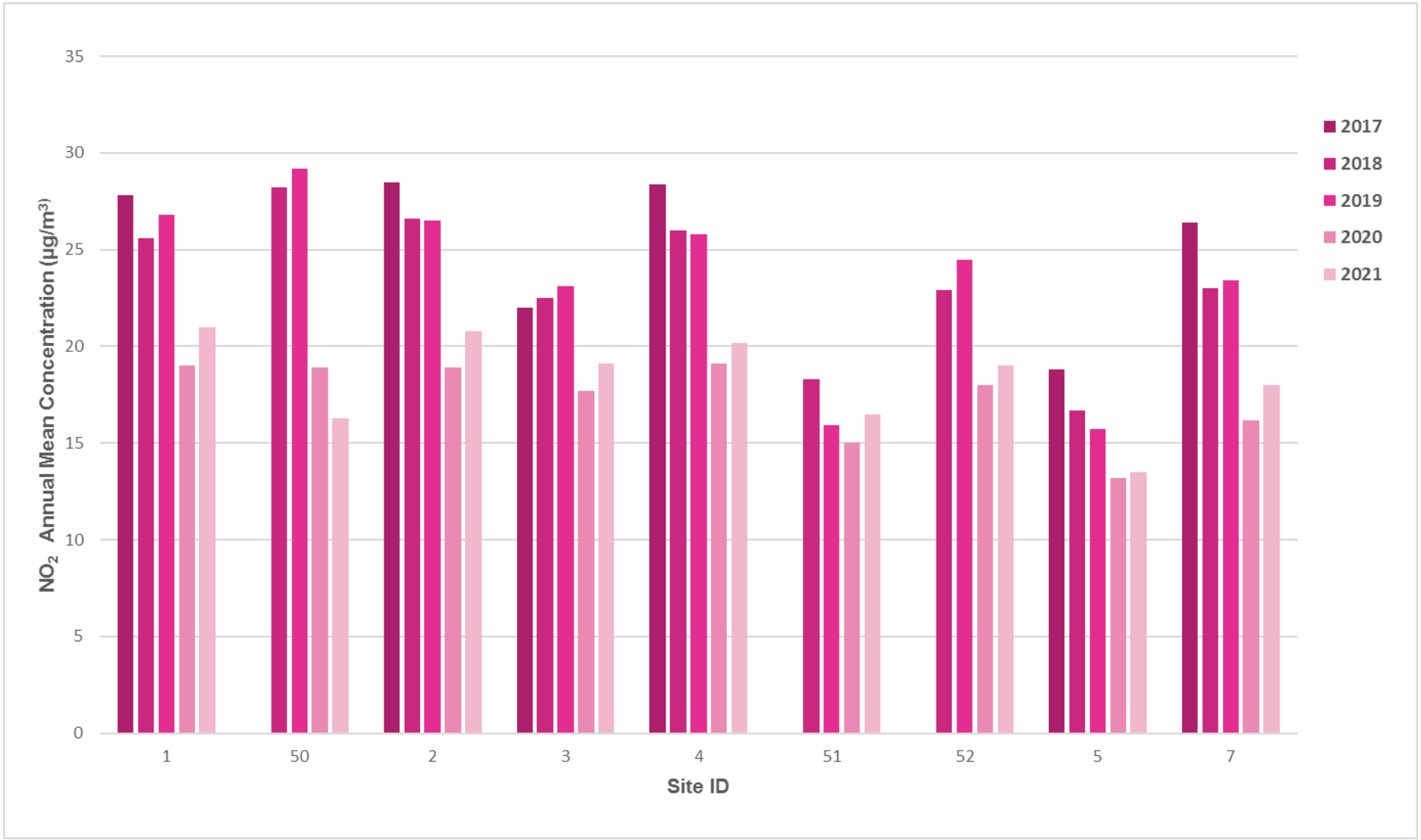
Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

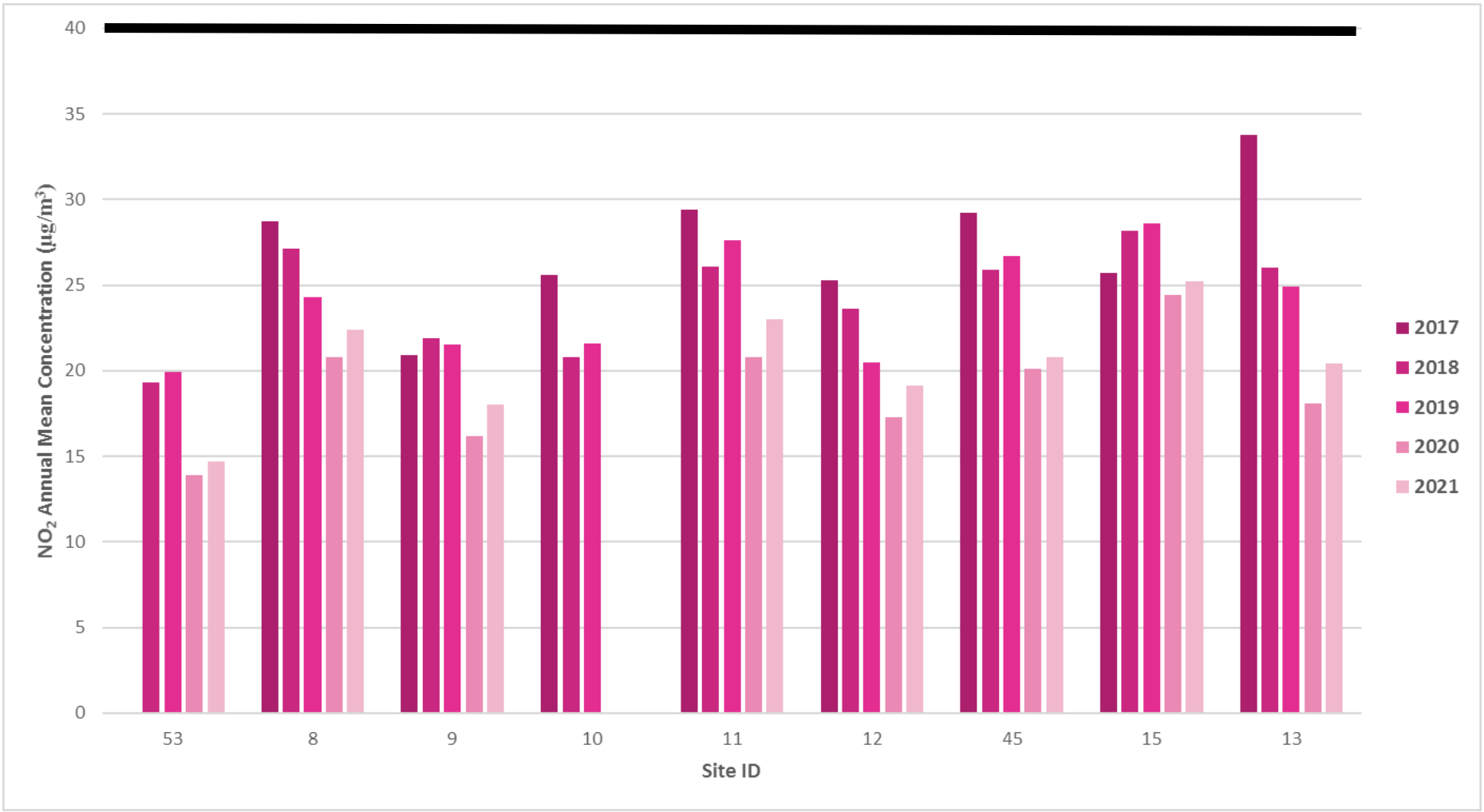
Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

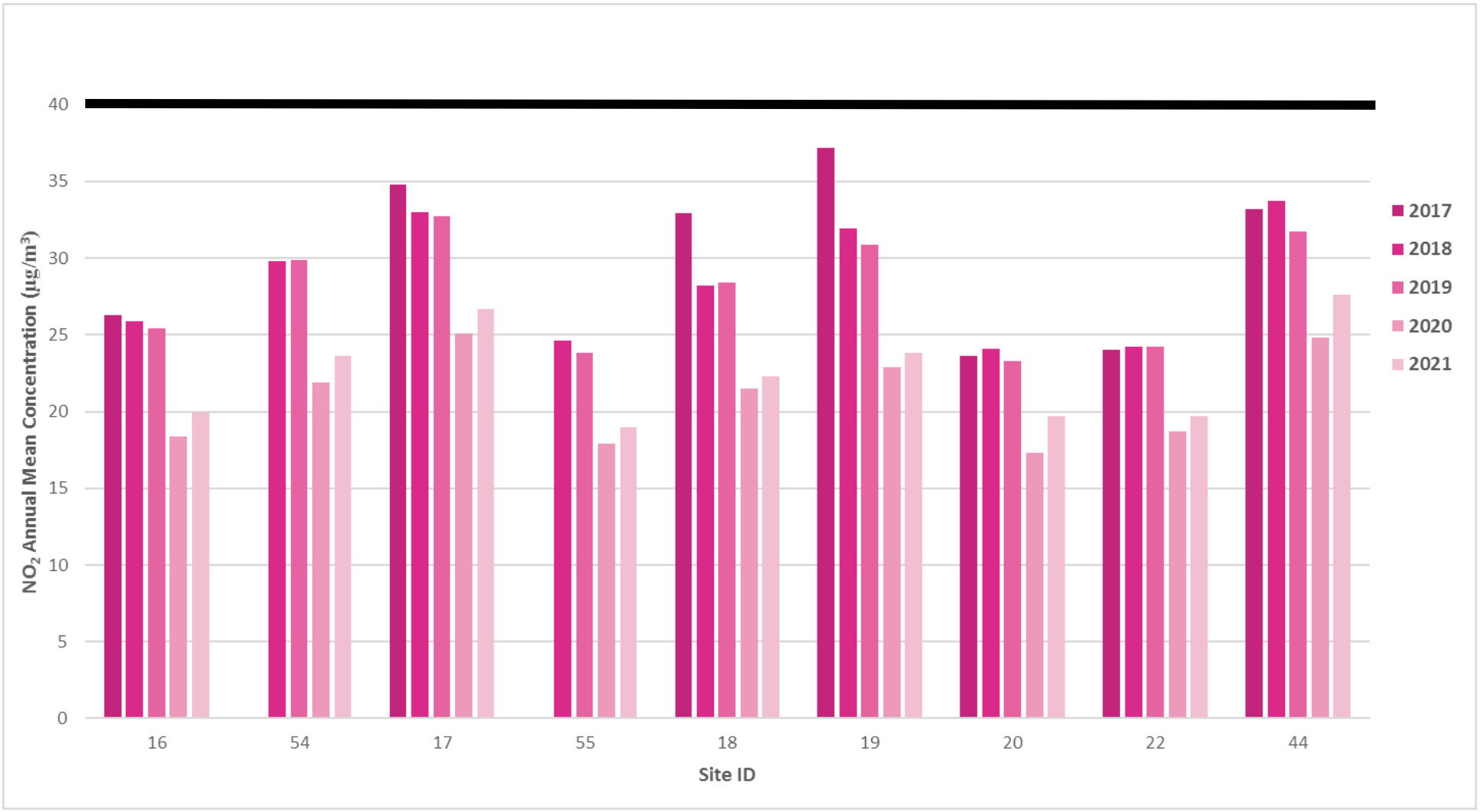
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

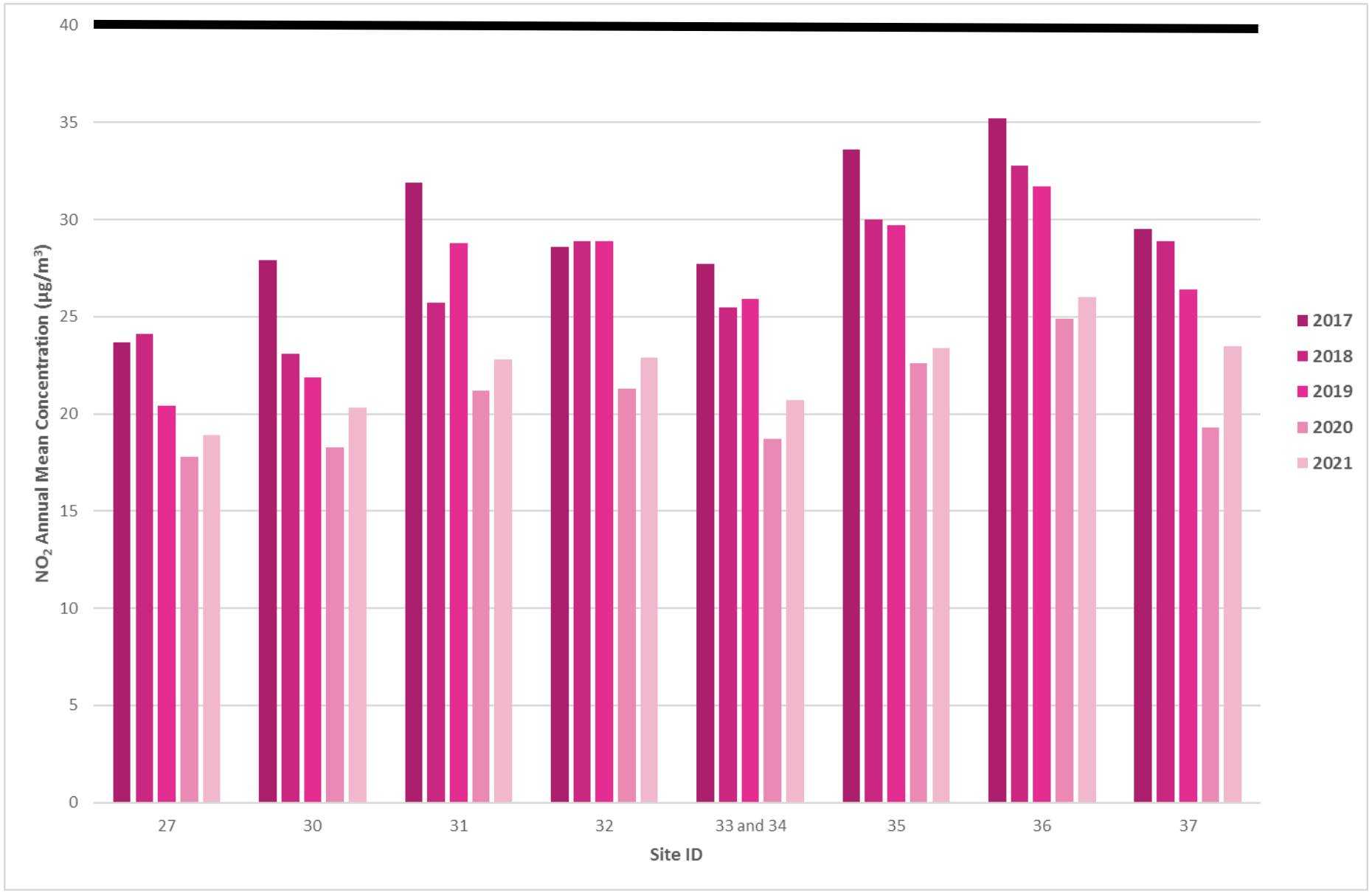
(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Figure A.1 – Trends in Annual Mean NO_2 Concentrations for all sites since 2017 to 2021.




40
35
30
25
20
15
10
5
0
NO2 Annual Mean Concentration (µg/m3)
53
8
9
10
11
12
45
15
13
Site ID
2017
2018
2019
2020
2021


40
35
30
25
20
15
10
5
0
NO2 Annual Mean Concentration (µg/m3)
16
54
17
55
18
19
20
22
44
Site ID
2017
2018
2019
2020
2021


40
35
30
25
20
15
10
5
0
NO2 Annual Mean Concentration (µg/m3)
27
30
31
32
33 and 34
35
36
37
Site ID
2017
2018
2019
2020
2021

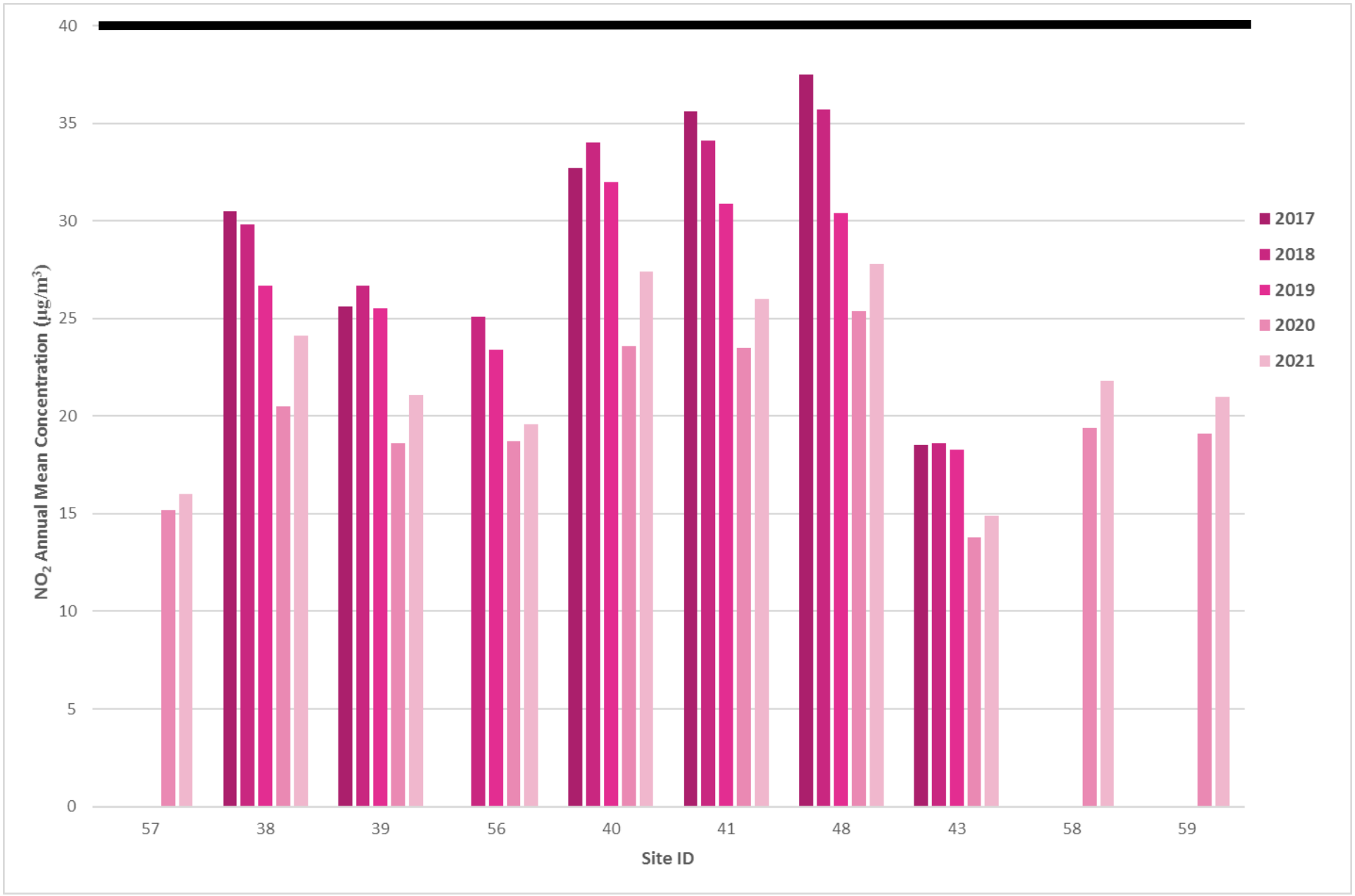
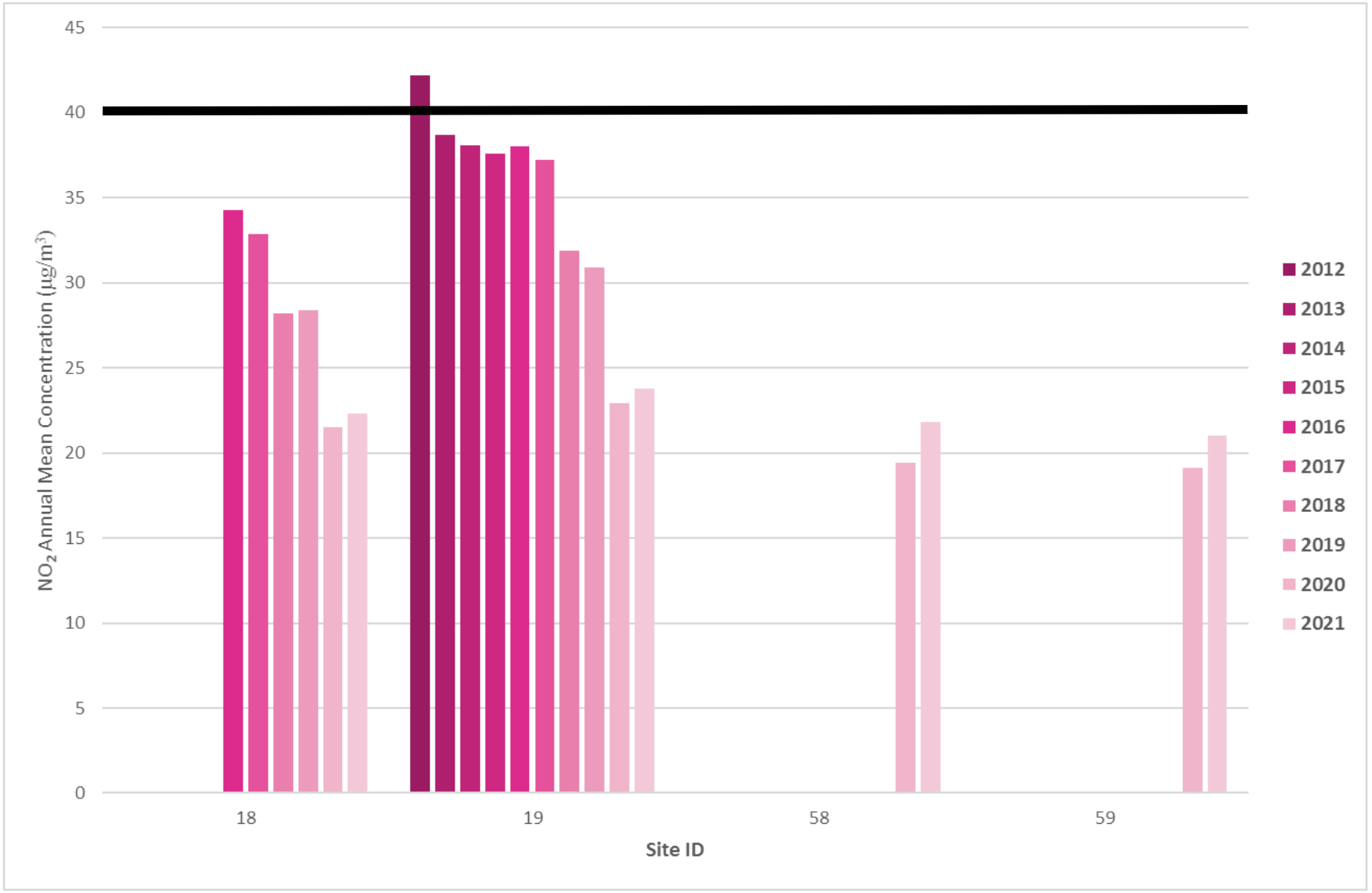

40
35
30
25
20
15
10
5
0
NO2 Annual Mean Concentration (µg/m3)
2017
2018
2019
2020
2021
57
38
39
56
40
41
48
43
58
59
Site ID

Figure A.2 – Trends in Annual Mean NO_2 Concentrations for the AQMA since 2012 to 2021.



Appendix B: Full Monthly Diffusion Tube Results for 2021

Table B.1 – NO_2 2021 Diffusion Tube Results ($\mu g/m^3$)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.84)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
1	452527	337313	29.1	28.8	26.6	21.0	23.2	20.1	20.1	18.7	27.0	26.5	30.6	28.2	25.0	21.0	-	
50	452114	338018	25.6	23.7	21.2	18.0	16.2	15.2	14.3	13.6	19.3	19.1	23.6	22.5	19.4	16.3	-	
2	452091	338122	29.7	28.5	26.9	22.0	22.2	19.2	19.2	19.3	26.7	27.0	29.0	26.8	24.7	20.8	-	
3	453659	337412	31.1	26.7	26.0	20.8	18.9	16.7	18.7	15.4	21.2	21.8	27.8	27.5	22.7	19.1	-	
4	453361	336627	31.5	27.4	27.8	20.4	22.1	18.7	18.9	16.3	23.1	26.3	28.2	27.3	24.0	20.2	-	
51	453537	336100	27.4	22.3	21.3	17.2	16.7	15.5	15.0	13.9	19.1	20.2	24.0	22.6	19.6	16.5	-	
52	453287	336349	33.5	26.0	27.7	19.9	19.2	17.4	17.1	16.2	20.8	18.3	28.8	26.0	22.6	19.0	-	
5	451782	335320	20.6	17.6	18.4	12.9	12.2	12.8	11.4	10.8	14.7	17.4	23.6	20.4	16.1	13.5	-	
7	450756	334328	31.1	26.3	21.2	18.0	17.6	14.4	16.4	13.6	22.2	23.1	27.0	26.3	21.4	18.0	-	
53	450360	334982	24.3	21.1	18.1	16.2	14.9	12.9	14.4	11.2	16.0	17.1	23.3	20.2	17.5	14.7	-	
8	450422	334243	33.0	29.9	28.5	24.8	21.9	23.8	24.4	20.6	30.8		27.6	27.7	26.6	22.4	-	
9	449876	334804	28.2	24.5	23.6	20.6	19.3	16.9		15.3	20.7	21.2	24.3	21.7	21.5	18.0	-	
11	449694	335501	33.4	27.1	29.0	22.5	24.8	23.1	24.3	24.2	29.4	29.7	31.8	28.6	27.3	23.0	-	
12	449615	335664	24.0	25.7	25.3	22.7	20.9	17.1	20.3	16.0	22.7	22.6	29.3	26.0	22.7	19.1	-	
45	449467	336220	32.2	27.2	25.2	21.0	22.0	18.6	19.4	16.8	27.1	28.8	30.6	28.9	24.8	20.8	-	
15	449406	336135	31.3	35.4	30.2	25.8	29.5	23.7	27.8	24.0	33.3	33.1	32.5	33.5	30.0	25.2	-	
13	449266	336075	28.9	27.2	27.9	25.7	20.5	19.6	20.9	18.7	25.1		25.9	26.3	24.2	20.4	-	
16	449516	336216	30.2	27.6	25.2	21.3	22.0	17.7	21.1	17.9	25.5	25.6	26.7	25.4	23.9	20.0	-	
54	448467	336591	33.0	33.2	29.0	26.2		24.7	26.3	20.7	28.5	30.1	28.6	28.5	28.1	23.6	-	
17	448890	337190	**41.0**	35.2	36.9	27.2	29.6	24.1	26.9	24.8	34.0	31.9	37.8	31.5	31.7	26.7	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.84)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
55	449814	338471	28.5	25.1	26.9	19.6	19.9	17.9	18.5	17.0	22.9	23.7	26.2	24.9	22.6	19.0	-	
18	448560	338889	33.3	24.0	32.0	22.5	24.2	20.7	22.4	23.4	25.1	28.7	34.2	27.3	26.5	22.3	-	
19	448586	339023	33.7	26.5	34.7	23.9	26.8	23.2	24.2	25.9	21.9	31.2	36.4	31.7	28.3	23.8	-	
20	448652	339652	24.6	31.6	23.1	24.8	22.7	20.1	20.8	16.1	25.9	23.1	22.3	25.9	23.4	19.7	-	
22	448832	340098	28.5	33.1	21.7	21.7	26.0	18.9	20.8	16.1	20.8	27.8	20.8	25.2	23.5	19.7	-	
44	446509	347091	35.8	35.9	33.7	29.6	32.3	30.5	30.4	27.3	34.7	35.7	33.5	35.2	32.9	27.6	-	
27	446465	346985	28.3	24.5	22.4	22.1	19.7	20.0	20.6	18.2	22.5	22.2	25.6	24.4	22.6	18.9	-	
30	448544	345241	32.5	23.9	25.4	21.4	21.7	17.9	20.1	19.3	23.1	26.1	29.4	29.8	24.2	20.3	-	
31	448826	344883	32.5	29.1	31.6	21.7		21.8	22.9	23.3	28.2	28.7	30.0	28.1	27.1	22.8	-	
32	450122	344658	27.7	30.2	29.9	29.6	26.2	22.0	25.8	22.9	29.2	26.9	29.6		27.3	22.9	-	
33	451631	344526	30.3	33.7	26.5	20.3	23.7	20.0	19.9	19.1	25.1	28.8	26.7	25.9	-	-	-	Duplicate Site with 33 and 34 - Annual data provided for 34 only
34	451631	344526	29.6	29.3	25.7	19.1	21.4	19.2	20.1		26.6	28.0	26.8	27.5	24.7	20.7	-	Duplicate Site with 33 and 34 - Annual data provided for 34 only
35	451728	344440	31.0	24.7	32.4	21.3	27.6	23.7	21.8	24.6	25.8	36.2	36.5	28.5	27.8	23.4	-	
36	452232	344033	38.5	33.8	33.0	21.8	30.5	23.0	25.1	25.6	30.9	38.5	37.2	33.7	31.0	26.0	-	
37	452331	343910	32.4	27.6	32.9	30.2	24.7	27.2	25.7	27.7	27.1	22.8	31.8	26.2	28.0	23.5	-	
57	451413	341424	24.9	19.5	21.8	16.2	17.0	15.5	17.1	14.8	17.3	19.2	23.9	20.8	19.0	16.0	-	
38	450389	337866	34.1	33.0	30.9	26.8	26.2	21.9	23.8	21.8	31.9	28.7	32.1	32.9	28.7	24.1	-	
39	450434	337781	26.8	27.3	24.9	26.7	24.5	20.7	25.0	20.4	30.2	22.7	24.5	27.6	25.1	21.1	-	
56	450570	337851	27.8	22.5	27.3	19.0	20.0	17.5	19.4	23.2	22.1	24.9	29.0	26.6	23.3	19.6	-	
40	450632	337929	34.4	32.8	33.9	29.8		26.1		32.0	34.8	31.3	36.6	34.1	32.6	27.4	-	
41	450555	337909	33.3	32.8	34.2	25.1	28.5	25.7	26.4	29.8	34.3	33.4	34.5	33.1	30.9	26.0	-	
48	450817	337592	39.3	22.9	35.9	26.5	33.6	27.9	29.8	27.3	33.9	38.2	**45.1**	36.7	33.1	27.8	-	
43	452733	336962	24.1	21.9	19.2	18.8	14.4	11.8	13.3	10.6	16.1	17.7	22.8	22.1	17.7	14.9	-	
58	448588	338940	30.8	23.5	32.2	22.7	23.0	21.5	21.9	23.7	24.0	25.5	35.4	27.0	25.9	21.8	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.84)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
59	448602	338965	30.5	23.9	30.8	21.5	22.3	18.2	20.6	23.5	22.0	26.9	32.9	26.3	24.9	21.0	-	

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

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

☒ **Broxtowe Borough Council confirm that all 2021 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System**.

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

(a) Missing tubes

(b) Result not valid

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

New or Changed Sources Identified Within Broxtowe Borough Council During 2021

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

Additional Air Quality Works Undertaken by Broxtowe Borough Council During 2021

Broxtowe Borough Council has not completed any additional works within the reporting year of 2021.

QA/QC of Diffusion Tube Monitoring

BBC diffusion tubes are supplied and analysed by Gradko Ltd. Since April 2008 BBC has entered into a contract with Gradko along with all Nottinghamshire Local Authorities to ensure that any deviations within different laboratory practices are ruled out. This enables data to be easily compared between the County authorities. The tubes are prepared using a 20% solution of triethanolamine (TEA) in de-ionised water. The tubes are exposed for one month before being returned for laboratory analysis.

Diffusion Tube Annualisation

All diffusion tube monitoring locations within Broxtowe Borough Council recorded data capture of 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.

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_x/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Broxtowe Borough Council have applied a national bias adjustment factor of 0.84 to the 2021 monitoring data. A summary of bias adjustment factors used by Broxtowe Borough Council over the past five years is presented in Table C.1.

Table C.1 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2021	National	03/22	0.84
2020	National	03/21	0.81
2019	National	03/20	0.93
2018	National	03/19	0.93
2017	National	03/18	0.89
2016	National	03/17V2	0.90

NO_2 Fall-off with Distance from the Road

No diffusion tube NO_2 monitoring locations within Broxtowe Borough Council required distance correction during 2021.

Appendix D: Map of all Monitoring Locations within the Borough of Broxtowe.

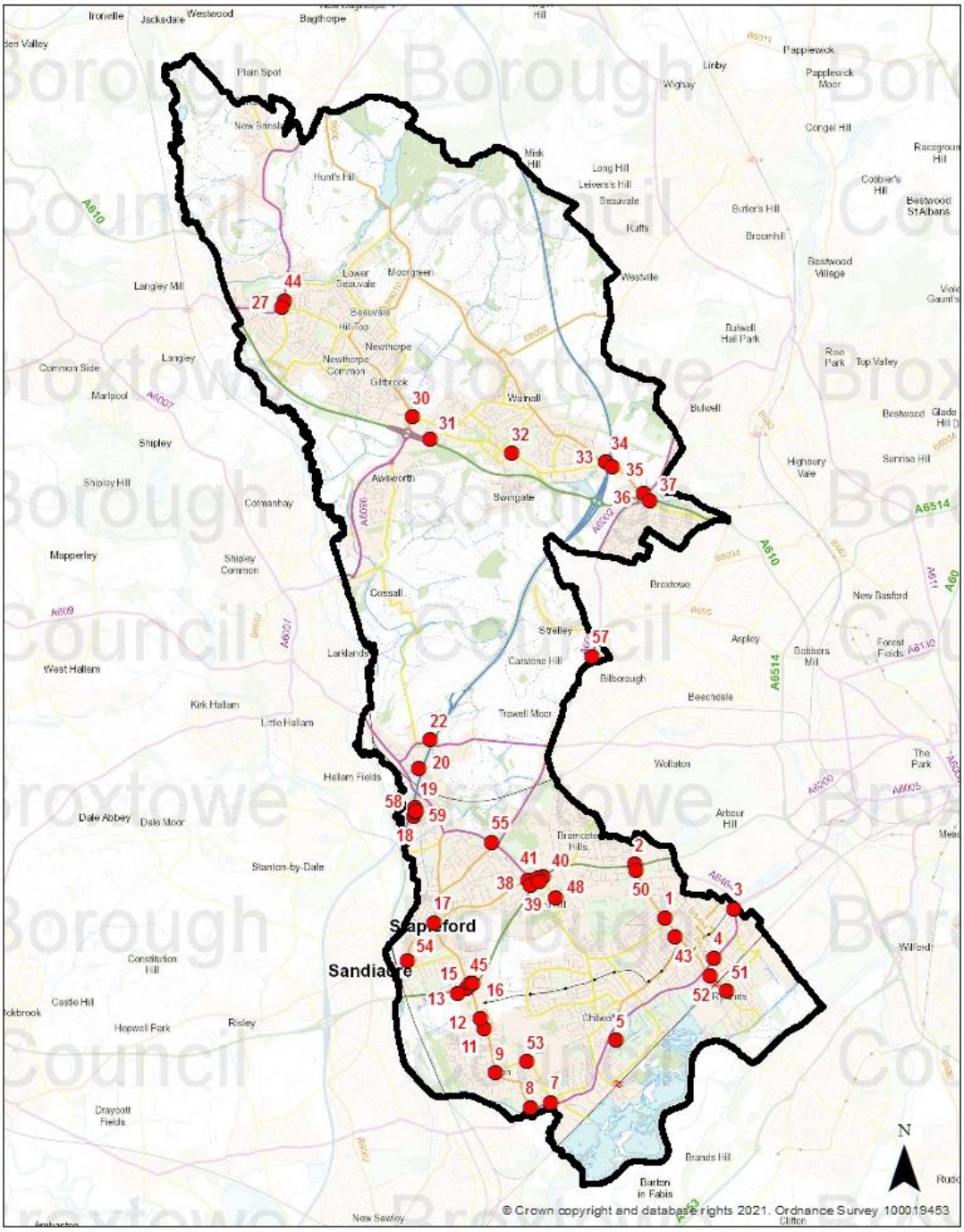


Figure D.1 – 2021 Diffusion Tube Locations.

Appendix E: Map of AQMA in Trowell.

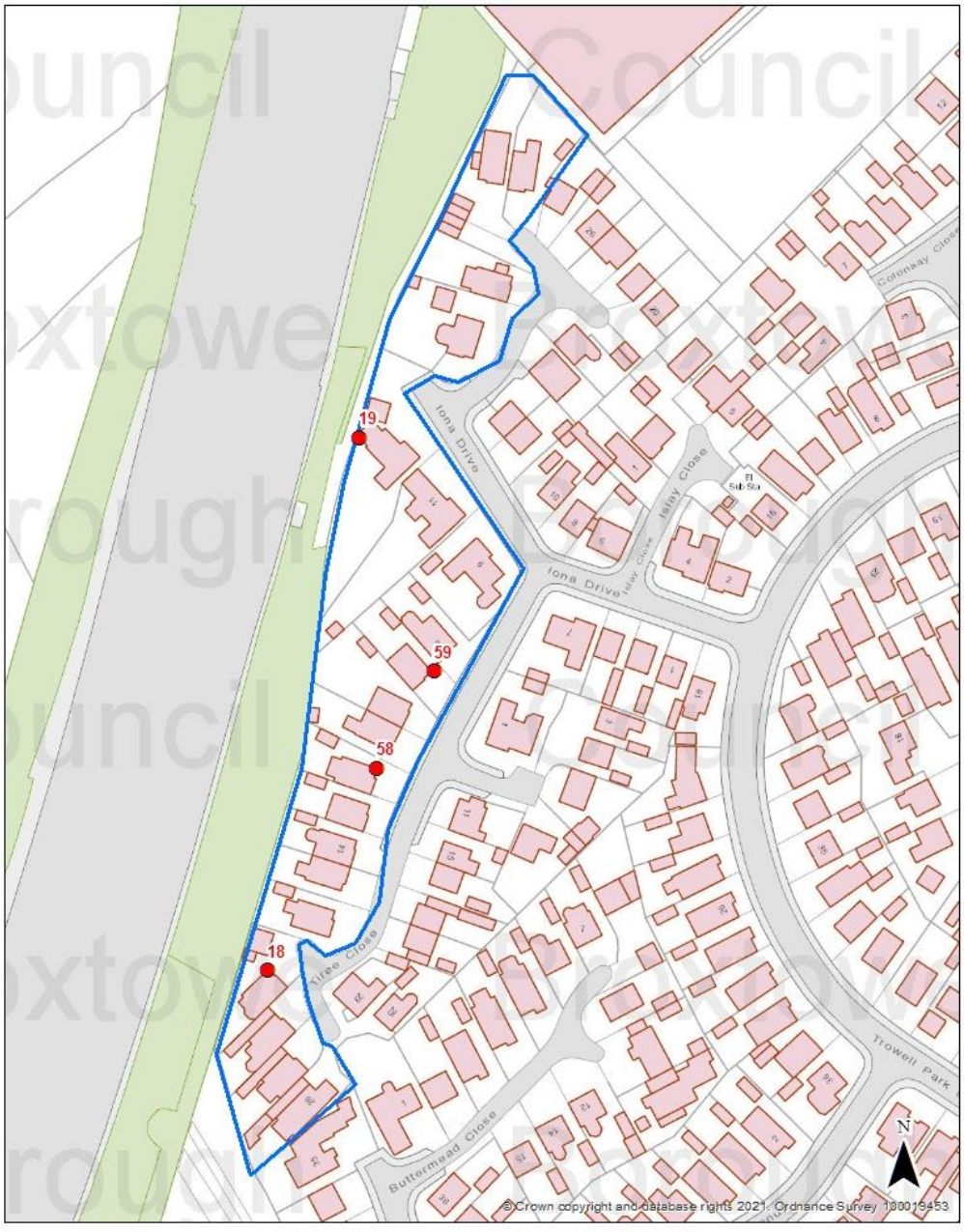


Figure E.1 - AQMA 1 encompassing twenty properties on parts of Iona Drive and Tiree Close next to the M1 motorway and the Trowell Park estate (boundary marked in blue).

Appendix F: Map of A610/B600 Nuthall Island showing the Monitoring Locations.

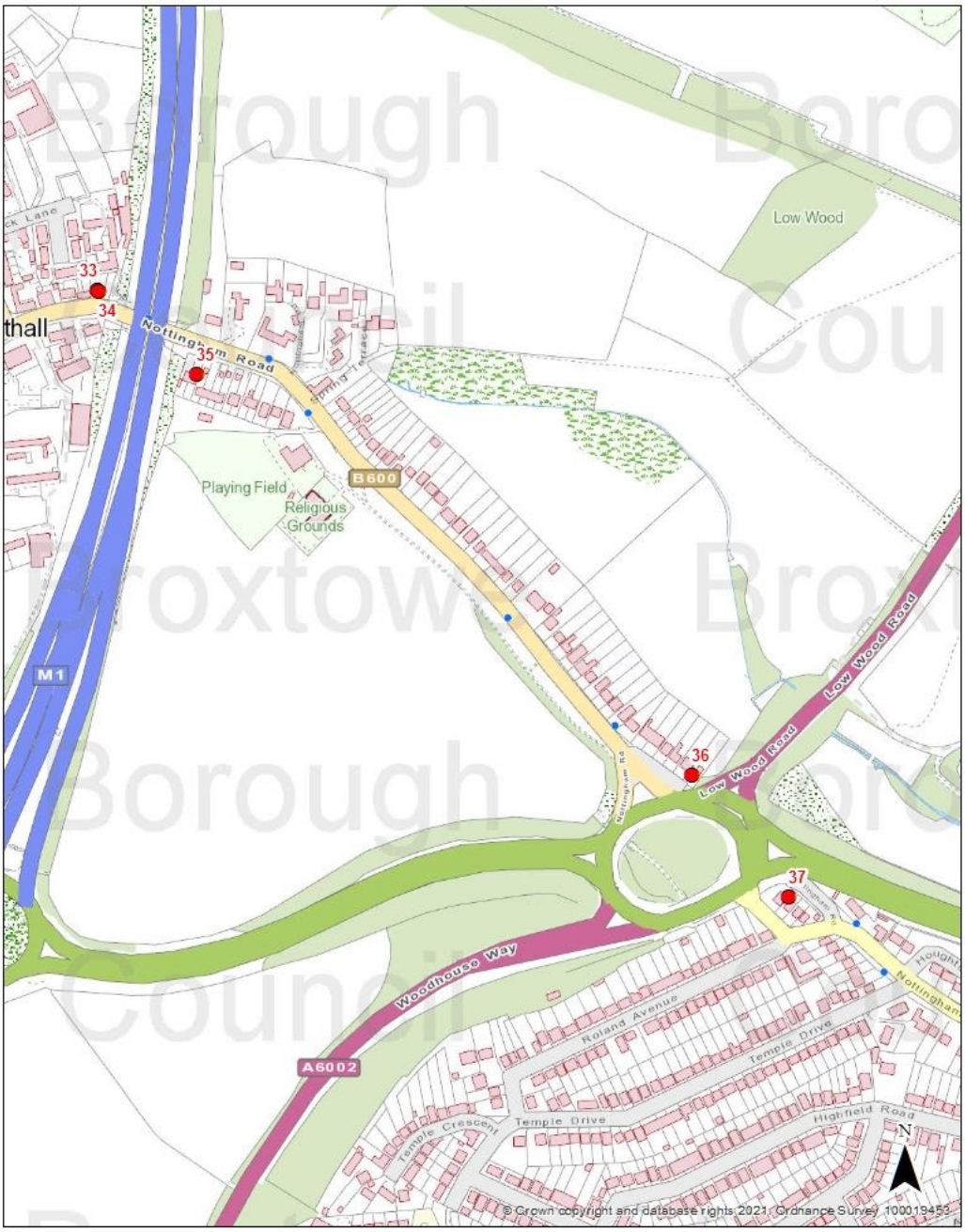


Figure F.1 – Nuthall Island and Diffusion Tube Location.

Appendix G: Map of Bramcote Island, Derby Road and Town Street showing the Monitoring Locations.

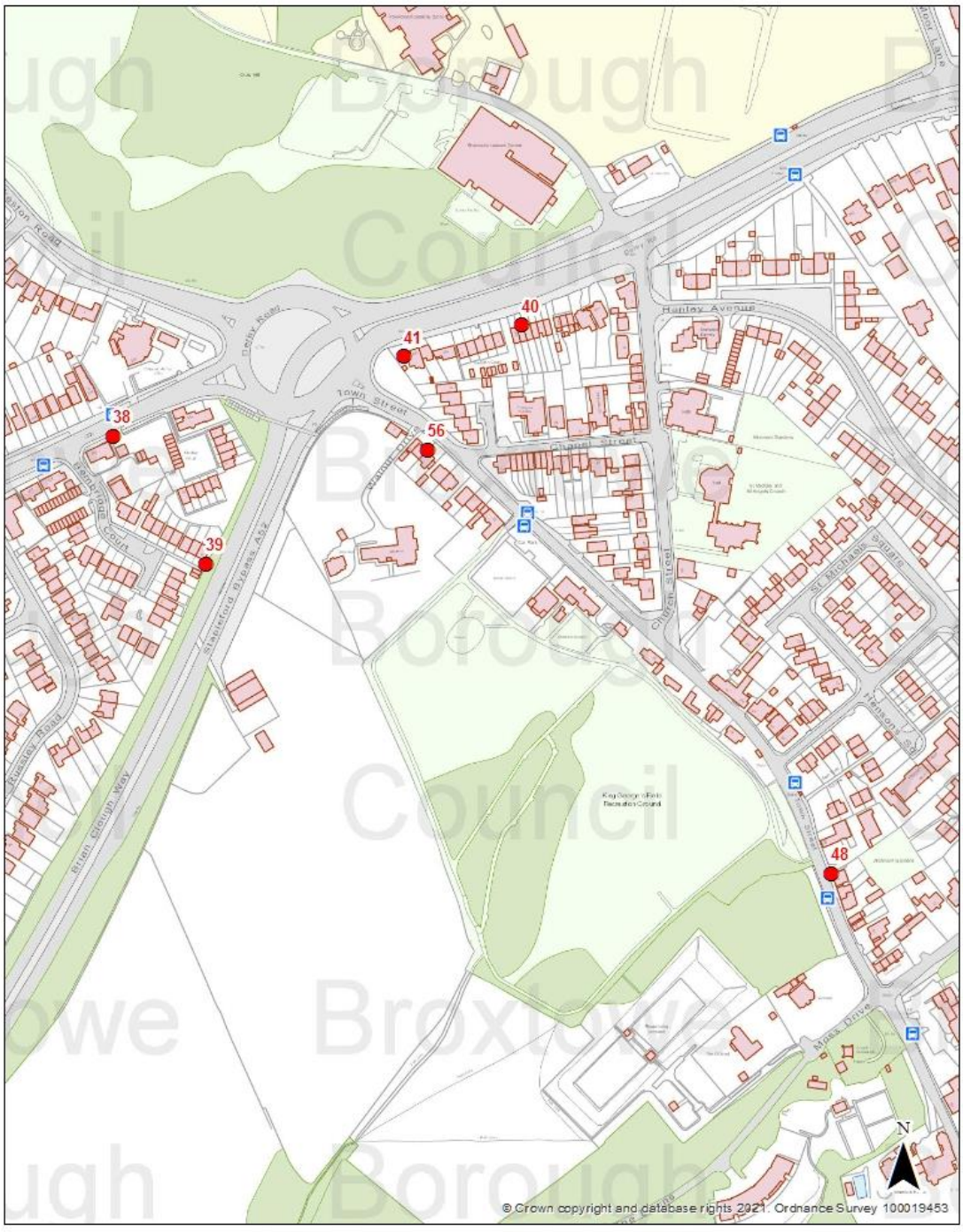


Figure G.1 – Map of Bramcote Island and Town Street Diffusion Tube Location

Appendix H: Map of the Borough showing the 2021 modelled background levels of $PM_{2.5}$.

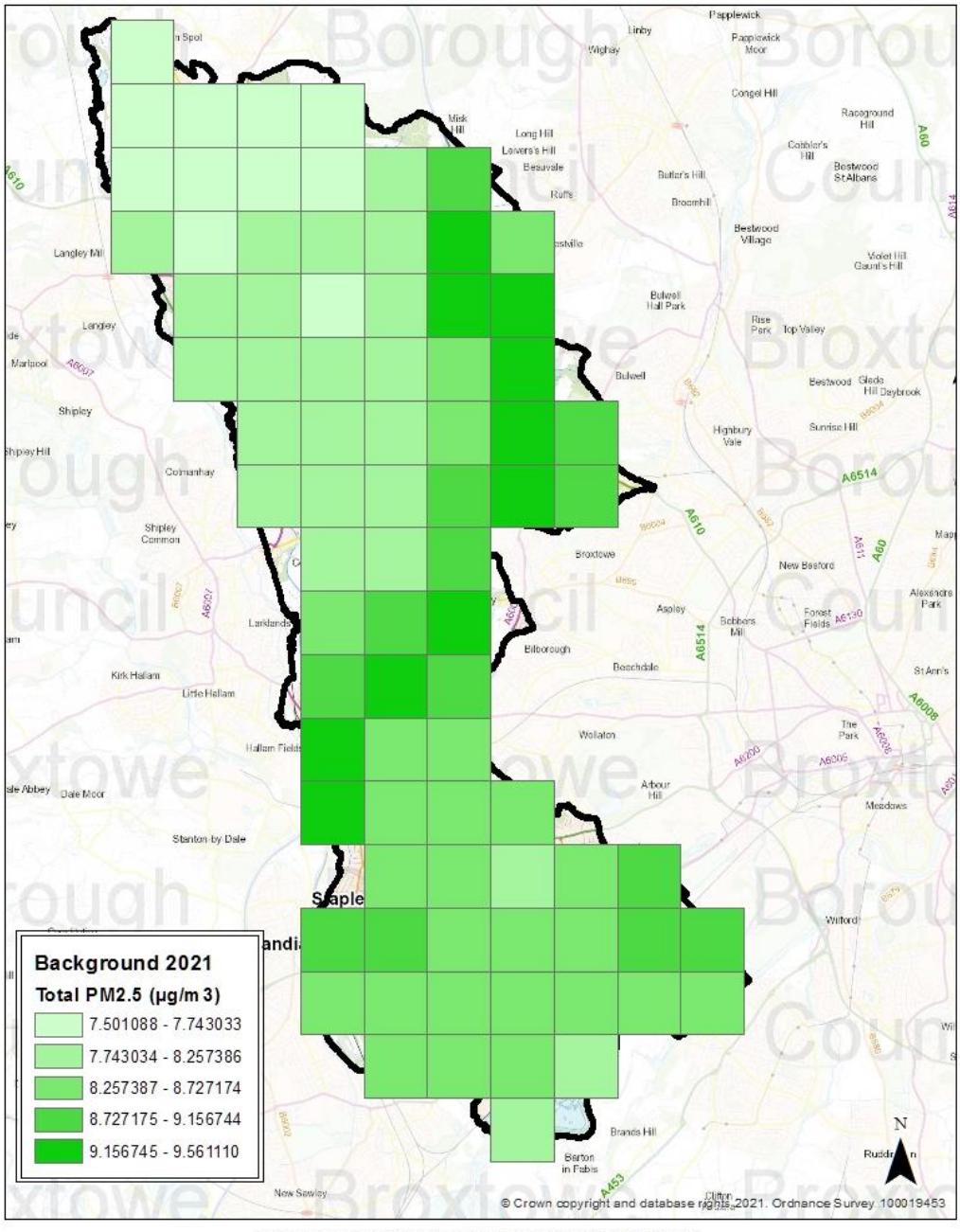


Figure H.1 – Map of the Borough showing the modelled background levels of $PM_{2.5}$.

Appendix I: Summary of Air Quality Objectives in England

Table I.1 – Air Quality Objectives in England[11]

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

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

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
AURN	Automatic Urban and Rural Network
BBC	Broxtowe Borough Council
CAZ	Clean Air Zone
COMEAP	Committee on the Medical Effects of Air Pollution
CV	Coefficient of Variation
Defra	Department for Environment, Food and Rural Affairs
Derv	Diesel Engine Road Vehicle
DfT	Department for Transport
D2N2	Local Enterprise Partnership for Derby, Derbyshire, Nottingham and Nottinghamshire
EMAQN	East Midlands Air Quality Network
EU	European Union
FDMS	Filter Dynamics Measurement System
HGV's	Heavy Goods Vehicles
HS2	High Speed Train 2
ITSO	Integrated Transport Smartcard Organisation
LAQM	Local Air Quality Management
LAQM.PG(16)	LAQM Policy Guidance 2016
LAQM.TG(16)	LAQM Technical Guidance 2016

LCWIP	Local Cycling and Walking Infrastructure Plan
LGA	Local Government Association
LSTF	Local Sustainable Transport Fund
µg/m^3	Micrograms of pollutant per cubic metre of air
NEPWG	Nottinghamshire Environmental Protection Working Group
NET	Nottingham Express Transit
NCT	Nottingham City Transport
NH	National Highways
NHS	National Health Service
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
NCiC	Nottingham City Council
NCC	Nottinghamshire County Council
O_3	Ozone
OLEV	Office for Low Emission Vehicles
PHE	Public Health England
PM	Particulate Matter
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
PTP	Personalised Travel Planning
QA/QC	Quality Assurance and Quality Control
R&A	Review and Assessment
SAFED	Safe And Fuel Efficient Driving
SO_2	Sulphur Dioxide
SQPS	Statutory Quality Partnership Schemes

TEA	Triethanolamine
UK	United Kingdom
ULEVs	Ultra Low Emission Vehicles
WASP	Workplace Analysis Scheme for Proficiency
WHO	World Health Organisation
WPL	Workplace Parking Levy

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