2021 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, 2021

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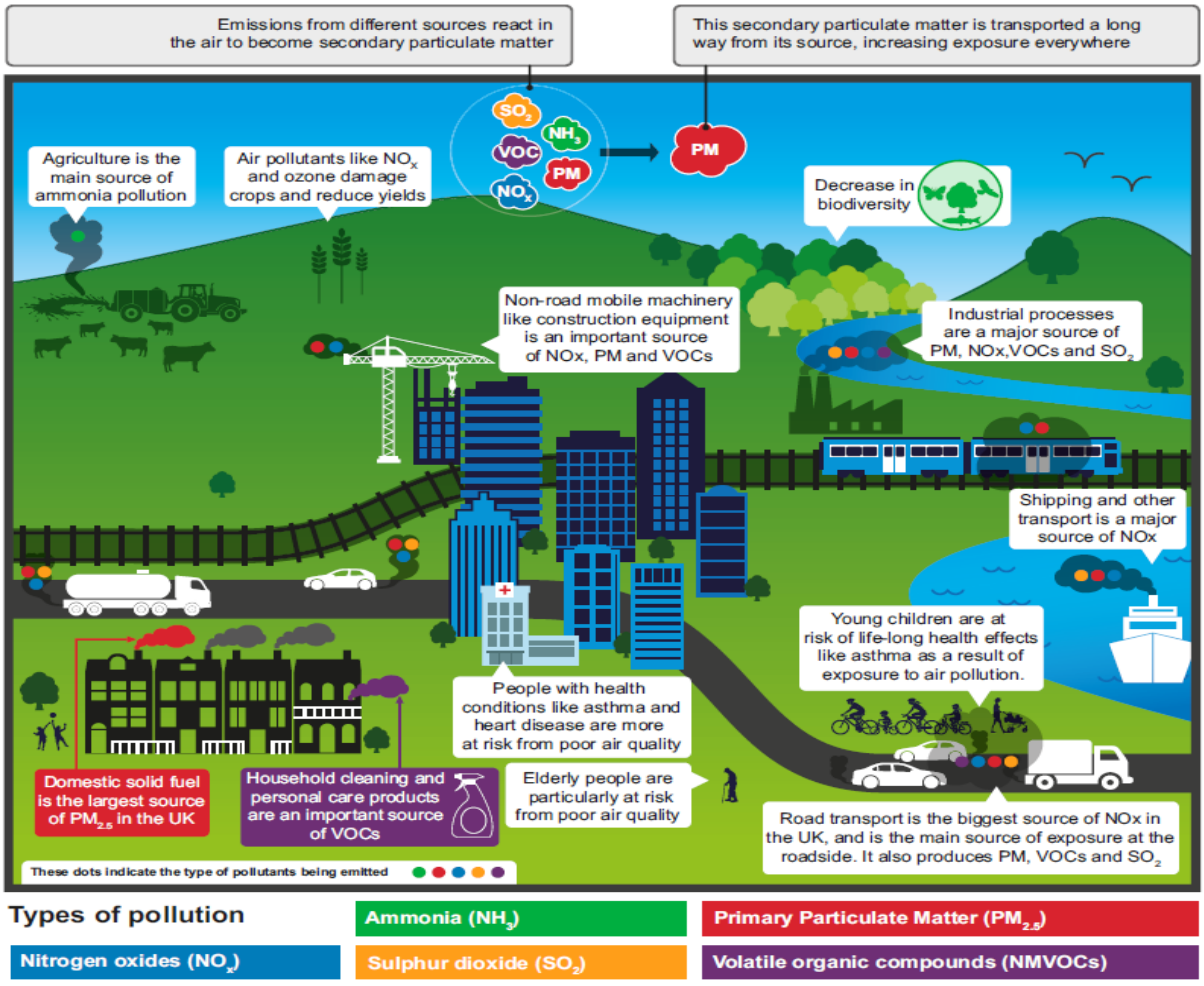
Executive Summary: Air Quality in Our Area

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.

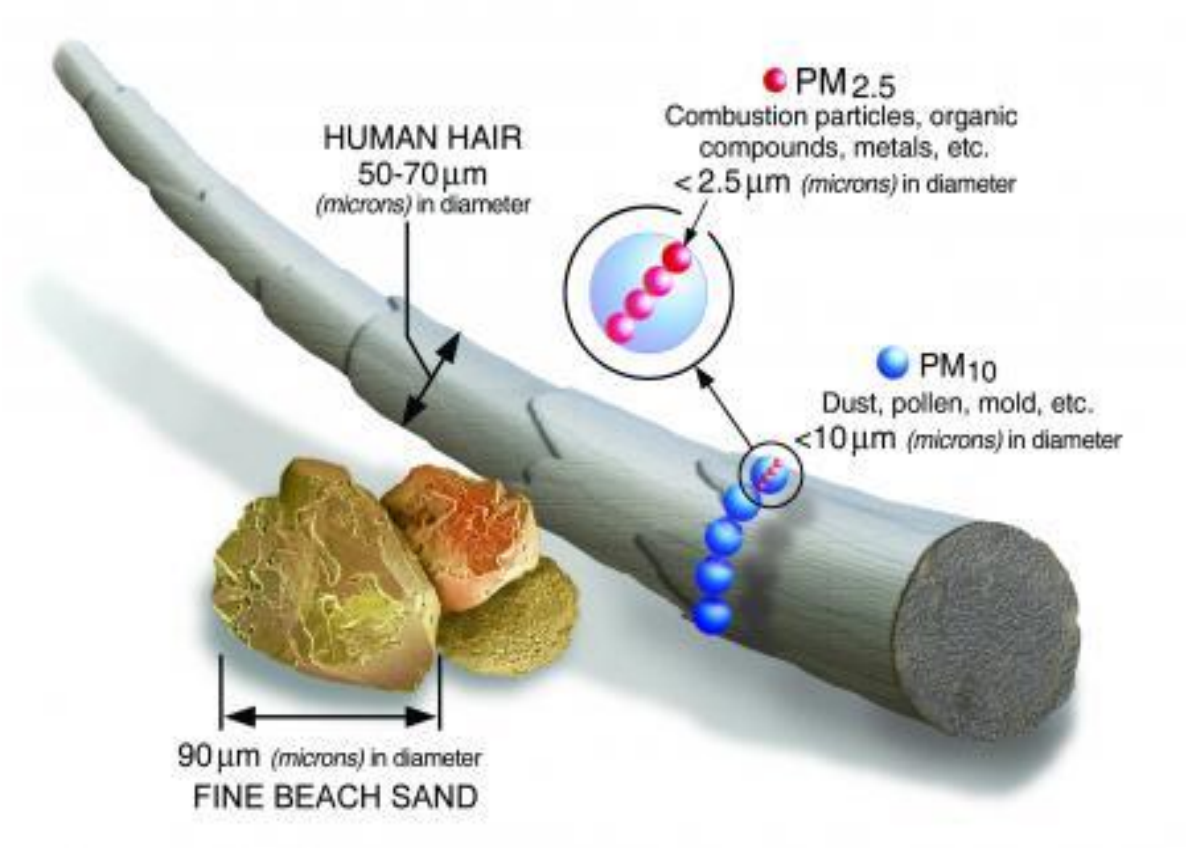
Another source of NO_2 in the atmosphere is due to a chemical reaction in the atmosphere between NO and Ozone (O_3). This is classed as a secondary source of NO_2. However, if concentrations of O_3 are low near to the source of NO then NO_2 will not be formed.

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].

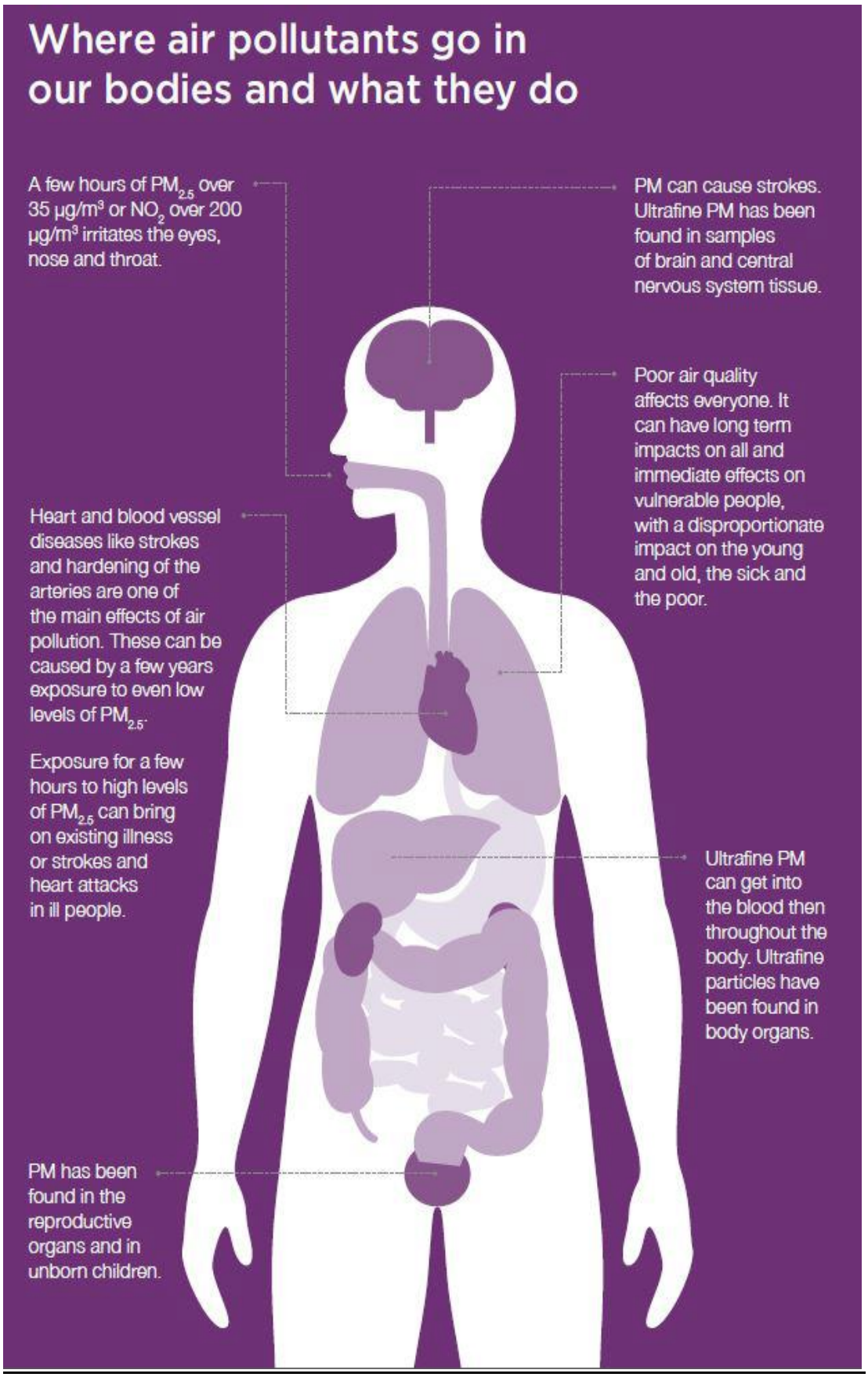
The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion[3].

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

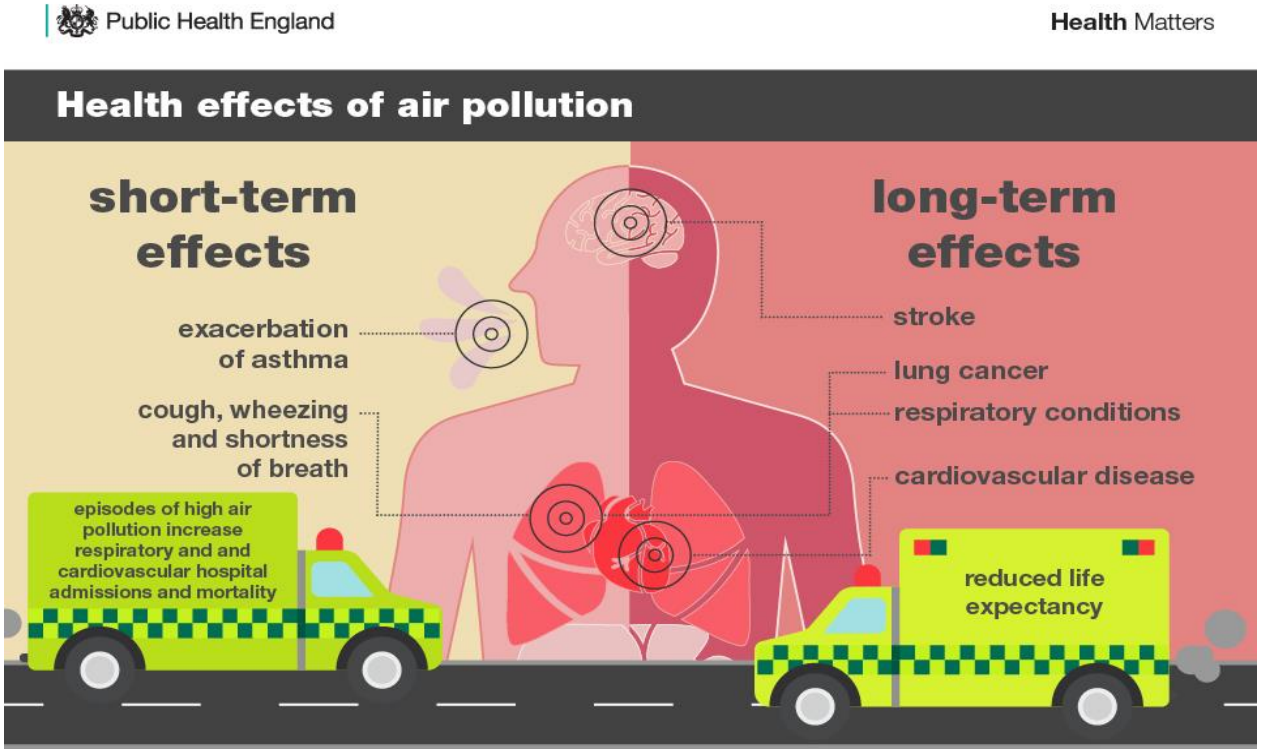
[3] Defra. Abatement cost guidance for valuing changes in air quality, May 2013



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 2019 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 Aug18)
East Midlands	3,052	30,878
Nottingham City	171	2,004
Ashfield	87	851
Newark and Sherwood	82	805
Bassetlaw	82	797
Broxtowe Borough Council	82	787
Mansfield	79	764
Gedling	78	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, 82 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 2018 of human made $PM_{2.5}$ air pollution.

Air Quality in Broxtowe Borough Council

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation with equalities issues because areas with poor air quality are also often less affluent areas[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 pollutant of concern within the Borough is Nitrogen Dioxide, which is emitted from vehicle exhausts and is prevalent in areas where there are congested roads. 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 2020 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 7.6µg/m^3 and 9.7µg/m^3 for 2020, 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 2020 being 8.5µg/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 Highways England and Nottinghamshire County Council Highways Department. Highways England manages the M1 Motorway and the A52, which run through the Borough. Nottinghamshire County Council Highways Department manage the remaining roads that run through the Borough; this includes the A610/B600 Nuthall Roundabout.

The Council works with Highways England 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

[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

out the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

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 two more Euro 6 vehicles to replace two older more polluting vehicles.
- **Electric Fleet Vans** – Two electric fleet vans have been procured by Broxtowe Borough Council and subject to satisfactory trials another two vehicles will be purchased in 2021.
- **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** - 22 have been replaced during 2020.
- **Broxtowe Borough Council Cycle to Work Scheme** - Five employees used this scheme in 2020.Since the scheme started 170 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.
- **Go-Ultra Low programme** – the County Council, in partnership with Nottingham and Derby City Councils, successfully secured £6.1m of funding to deliver the Go-Ultra Low programme between 2016 and 2020. The programme included the development and delivery of an area-wide electric vehicle charging infrastructure network. Using this funding, 21 publicly available charge points have been installed across the Borough, in Beeston, Eastwood, Kimberley and Stapleford – 20 of which are in Broxtowe Borough Council owned car parks and 1 in a Nottingham Express Transit (NET) owned car park. Funding for the programme ended in 2020.

- **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. Work undertaken in 2020 identified that only routes requiring vehicles to be retrofitted were NCT service 34 and 35 and CT4N Service 18. Work to retrofit the buses on these routes is currently under way, with some service already complete. Trentbarton also invested in Euro VI vehicles in 2020, for their Indigo and Rainbow 1 services.
- **Traffic management improvements** – general traffic management schemes have been introduced in the vicinity of the revoked AQMA during 2019/20, including the introduction of an environmental weight limit on Nottingham Road, Nuthall to help ensure HGVs follow the most appropriate route; and A610/Ikea roundabout signing and lining improvements to help improve capacity/traffic flows.
- **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.
- **Nottinghamshire Air Quality Strategy** – The Nottinghamshire City, County and District Councils have updated the Nottinghamshire Air Quality Strategy, which was formally approved by the Nottinghamshire City and County Health and Wellbeing Boards and has been endorsed by portfolio holders and is now published online
- **Environment Strategy** – development and adoption of Nottinghamshire County Council's Environment Strategy and Action Plan in 2020, which focuses on reducing emissions from its own activities
- **Cycle network improvements** – work was completed on the delivery of enhancements to a number of cycle routes in the Beeston area to improve links between the town, the City and the Nottingham Enterprise Zone.

- **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 2020 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 Highways England 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.
- Continue to attend regional HS2 meetings to ensure that suitable mitigation measures are made during the construction phase and when HS2 is operational.

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 Highways England and is not under the control of Broxtowe Borough Council. Although Broxtowe Borough Council have a close working relationship with Highways England it is unable to impose or make any changes to the M1 to improve the air quality within the neighbouring residential areas. However, Highways England 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.

The monitoring of PM_{10} and $PM_{2.5}$ is very expensive to undertake due to the costs and the maintenance of the equipment. However, the possibility of sharing equipment is being investigated. Although monitoring is not currently carried out, 'modelled' figures are received from Defra. See Section 2.3 of this report for further information

Local Engagement

Since the 2020 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.

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 at Walkit
- 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 all of Nottinghamshire, including the city and further afield are available at

Cycling Rights of Way in Nottnghamshire. 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

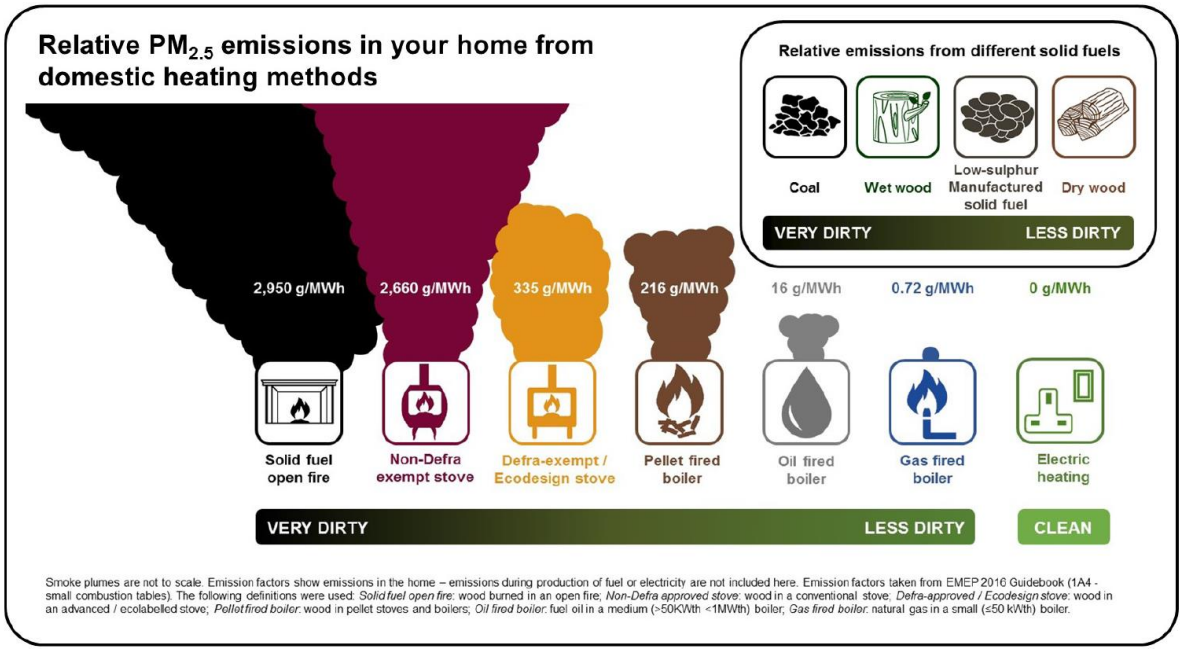
RideWise, a local cycling charity, also provide advice, training, bike rides, free bike loans and information about routes and journey planning. Further information about RideWise can be found at RideWise

- 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 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]

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Figures

Tables

1 Local Air Quality Management

This report provides an overview of air quality in Broxtowe Borough Council during 2020. 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 4oµg/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 Highways England?	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	20.5µg/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 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 Council have provided a very detailed discussion of the NO_2 trends within the borough. In addition to this they discuss the trends in relation to locations as well as providing NO_2 concentrations alongside this. This is extremely useful and this approach to data discussion is encouraged in future reports.* **– BBC will continue to report data in this manner.**

- *The Council have continued to see no exceedances of national air quality objectives in 2019 and concentrations in the Trowell AQMA continue to fall. The Council have stated that they plan to implement further measures to ensure NO_2 concentrations are below the AQOs and will not revoke the AQMA until it is consistently below 36 µg/m^3 for three or more consecutive years. Should NO_2 concentrations be below 36 µg/m^3 in 2020 (marking 3 years of compliance), it is advised for the Council to consider undertaking another detailed assessment to evaluate whether revocation of the AQMA is appropriate. However, in saying this, it should be noted there may be implications from the current Covid-19 situation on air quality within the borough. Therefore, concentrations next year may skew long term NO_2 trends within the borough and this should be considered.* -**See Section 2.4 of this report for an update on the AQMA and AQAP.**

- *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.**

- *Alongside providing a detailed discussion of priorities the Council wish to address in the coming year, they also discuss the challenges and barriers to implementation they anticipate facing. This is good to see, and the Council are encouraged to continue including this in future ASRs.* **– BBC will continue to detail any challenges and barriers.**
- *Overall the report is detailed, concise, satisfies the criteria of relevant standards and continues to be an example of good practice. The Council should continue their good work and submit an Annual Status Report in 2021.* **– BBC has done this.**

Broxtowe Borough Council has taken forward a number of direct measures during the current reporting year of 2020 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. Eighty-four 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 2020 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 Highways England 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 two more Euro 6 vehicles to replace two older more polluting vehicles.
- Electric Fleet Vans – Two electric fleet vans have been procured by Broxtowe Borough Council and subject to satisfactory trials another two vehicles will be purchased in 2021.

- 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 - 22 replaced during 2020.
- Broxtowe Borough Council Cycle to Work Scheme - Five employees used this scheme in 2020.Since the scheme started 170 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.
- Go-Ultra Low programme – the County Council, in partnership with Nottingham and Derby City Councils, successfully secured £6.1m of funding to deliver the Go-Ultra Low programme between 2016 and 2020. The programme included the development and delivery of an area-wide electric vehicle charging infrastructure network. Using this funding, 21 publicly available charge points have been installed across the Borough, in Beeston, Eastwood, Kimberley and Stapleford – 20 of which are in Broxtowe Borough Council owned car parks and 1 in a Nottingham Express Transit (NET) owned car park. Funding for the programme ended in 2020.
- 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. Work undertaken in 2020 identified that only routes requiring vehicles to be retrofitted were NCT service 34 and 35 and CT4N Service 18. Work to retrofit buses was impacted by COVID-19 and there has therefore been a delay in the completion of this. However, it is estimated that the works will be completed in 2021. Trentbarton also invested in Euro VI vehicles in 2020, for their Indigo and Rainbow 1 services.
- Traffic management improvements – general traffic management schemes have been introduced in the vicinity of the former AQMA during 2019/20, including the introduction of an environmental weight limit on Nottingham Road, Nuthall to help

ensure HGVs follow the most appropriate route; and A610/Ikea roundabout signing and lining improvements to help improve capacity/traffic flows.

- 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.
- Nottinghamshire Air Quality Strategy – The Nottinghamshire City, County and District Councils have updated the Nottinghamshire Air Quality Strategy, which was formally approved by the Nottinghamshire City and County Health and Wellbeing Boards and has been endorsed by portfolio holders and is now published online
- Environment Strategy – development and adoption of Nottinghamshire County Council's Environment Strategy and action plan in 2020 focussing on reducing emissions from its own activities
- Cycle network improvements – work was completed on the delivery of enhancements to a number of cycle routes in the Beeston area to improve links between the town, the City and the Nottingham Enterprise Zone.
- 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.
- 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, which has now been submitted to the DfT for consideration. A list of future cycling and walking improvements priorities will be identified through technical analysis undertaken as part of the LCWIP development (any schemes

identified will be subject to feasibility, consultation, and County Council Committee approval)

- ❖ Off-Street Parking Order – All of Broxtowe Borough Councils Off-street Parking orders are to be consolidated into one order and approved by BBC's cabinet.
- ❖ The County Council introduced a street works permit scheme on 1 April 2020 to help plan/coordinate roadworks on its managed highway network.
- ❖ 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:

- ★ Trial of New Heating Technology- To investigate and consider new heating technologies that are more efficient, effective and produce lower emissions. A trial is currently being undertaken for fitting air source heat pumps in two new Broxtowe Borough Council housing builds.
- ★ Bus Retrofitting Programme - Work to retrofit buses was impacted by COVID-19 and there has therefore been a delay in the completion of this. However, it is estimated that the works will be completed in 2021.
- ★ To investigate providing Supplementary Planning Guidance or a Supplementary Planning Document relating to 'Air Quality and Emissions Mitigation Guidance for Developers' This measure will be taken to Broxtowe Borough Councils Committee in 2021.
- ★ Increase the number of Electric Vehicle Charging Points in the Borough Car Parks - 2 x rapid fast charges being installed at Victoria Street car park Stapleford in 2021, BBC will dedicate 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 to be added and promoted in 2021 once installed.
- ★ To raise awareness of anti-idling legislation- with local bus companies and Taxi's that operate within the borough.

- ★ To investigate and consider new heating technologies that are more efficient, effective and produce lower emissions - A trial is currently being undertaken for fitting air source heat pumps in 2 new builds.
- ★ BBC Low Emission Vehicle Procurement – Two more BBC Council vehicles will be purchased.

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:

- Bus Retrofitting Programme -Work to retrofit buses was impacted by COVID-19 and there has therefore been a delay in the completion of this. However, it is estimated that the works will be completed in 2021.
- 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 the schemes are dependant on funding being made available for such improvements.
- Cycling Maps – To be updated following completion of improvements across the County.
- Public Cycle Hire Scheme – The scheme is dependent upon commercial cycle hire scheme providers committing to and delivering a scheme.
- Nottingham Go-Ultra Low programme the introduction of area wide EV charging network - Funding for the programme ended in 2020; additional funding to continue the programme is being sought.

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 as 5.7% increase in passenger use in comparison to 2017-2018.	Increased passenger transport patronage	• NET Phase 2 (with route through Broxtowe) opened 2015 • 2019- 2020, there were 18 million passengers using the Tram an increase of 5.7% on the previous year. • The extension of the existing tram to the HS2 Hub in Toton is 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.	Extension of the existing tram route to the proposed Toton HS2 Hub subject to feasibility, consultation and Committee 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	In 2019: 1.35 tonnes reduction in NOx; 298t reduction in CO2	In 2019: 1.35 tonnes reduction in NOx; 298t reduction in CO2	• 4592 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	• Nottm city scheme introduced in 2014 • Provider reviewed in 2018. Expansion of scheme into county dependent on its success which is still unclear • Funding for implementation to be determined	
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).	Funding for the programme ended in 2020; additional funding to continue the programme is being sought.

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
														• 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.	
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	On-going take-up of cleaner vehicles	Reduction in N02 and PM due to increased use of low emission vehicles.	• £6.1m funding secured for 2016-2020 • Promotion events held for public, businesses and fleet operators including loans of LEVs for trial use in 2018 and 2019 • Funding ended in 2020	**Complete**
6	**Joint Strategic Needs Assessment**	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2017	-	NCC/NCiC/Borough and District councils	LA	No	Funded	-	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 2019.	
7	**To contribute to Nottinghamshire Air Quality Strategy (NAQS)**	Public Information	Other	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**
8	**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 has been endorsed by portfolio holders in 2020 and it will be promoted on BBCs website.	**Complete**
9	**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	New Measure devised in late 2020 This measure will be taken to BBC Committee in 2021 and the findings will be reported on in the 2022 ASR.

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
														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.	
10	**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**
11	**Developer requirements to provide of EV charging points at new development**	Policy Guidance and Development Control	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 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.	**Complete**
12	**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 Covid -19. Defra advised that face to face inspections not required unless there were significant issues or changes to the process. Therefore, all permitted processes scheduled for an inspection where contacted via alternative means in 2020 (as per DEFRA	On-going

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														advice) to ensure that contact was maintained and that the processes remained unchanged and that the risk rating for these businesses remained unchanged	
13	**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 2020, and all permitted processes were fully compliant..	On-going
14	**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 2020	On-going
15	**To ensure that all Dust Management Plans are reviewed and approved during the planning application stage**	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 2020	On-going
16	**Encouragement of low-emission public transport fleets**	Vehicle Fleet Efficiency	Vehicle Retrofitting programmes	2018	2021	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 is investing £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 • Work undertaken in 2020 identified that the only routes requiring retrofit	Retrofitting works were impacted by Covid-19. However, they are now underway, with the retrofitting of buses on some of services already complete.

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														were NCT service 34 and 35 and CT4N Service 18. Work to retrofit buses identified is under way. • Trentbarton invested in Euro VI vehicles for indigo and Rainbow 1 in 2020	Costs of measured is funding secured to date
17	**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 will match fund 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.	
18	**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
19	**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
20	**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 works and directing timing of works. • The County Council introduced a streetworks permit scheme on 1 April 2020 to help plan/coordinate	Costs are dependent on number street works undertaken

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														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 HE 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.	
21	**Contingency planning, and effective event and incident management**	Traffic Management	UTC, Congestion management, traffic reduction	Ongoing	Ongoing	NCC/Via EM/NCiC/Highways England (HE)	NCC, NCiC, HE 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 HE 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 with the developing network hierarchy • Incidents dealt with through agreed procedures and regular partnership meetings held. Working in close collaboration with	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
														the City and HE, 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.	
22	**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	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.	Due to the National Lockdowns and reduction in traffic volumes this has resulted in fewer patrols needed.
23	**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. . • 2 x rapid fast charges being installed at Victoria Street car park Stapleford in 2021, BBC will dedicate 4 spaces for Electric Vehicle use.	Due for completion in 2021
24	**Promoting on the Council Webpage the Council's Electric Vehicle Charging Points Network within the Borough**	Public Information	Via the Internet	2020	On-going	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	28 EVCP are currently promoted on BBC's website.	•The Council currently has 28 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 to be added and promoted in 2021 once installed.	2021

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25	**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	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
26	**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 additional 2 rapid Electric Vehicle charging spaces from January 2021, totalling 30 spaces. • To be discussed in Committee in 2021, 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 2021 for consideration.
27	**Review of off-street car parking charging**	Traffic Management	Emission based parking or permit charges	2020	2020	BBC Parking services – Parking Manager	LA - BBC	No	Funded	<10K	Completed	Reduction in NO_2 and PM	Reduced Emissions	•BBC is currently consolidating all of their Off-Street Parking Orders into one Order which will be made legal in 2020. •Charges will also be reviewed on an adhoc basis with the next review being due in 2021 for the 2021/22 charges. This review will also include the use of electric vehicle charging points.	**Complete** On-going annually. The policy document is updated only when there is significant legislation or council policy changes.
28	**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.	

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29	**Bus service improvements**	Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services	-	Ongoing	NCC/PT operators	PT operators	No	Funded	-	On hold	Reduction in N02 and PM as increased bus patronage	Increased passenger transport patronage	• 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 local needs.	• 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
30	**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
31	**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	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 and taxis that operate within the borough will be notified of anti-idling legislation and the associated health affects	2021
32	**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	

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														• NCC's Travel Choice webpages include information on public transport across the county (for residents and businesses)	
33	**Sustainable Travel information for the Public**	Public Information	Via leaflets	2010	On-going	BBC Head of Public Protection and HR	LA-BBC	No	Not Funded	Within existing resources	On-going	Reduced Emissions of NO_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.70) 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.	On-going
34	**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
35	**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	
36	**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	**Complete** On-going

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														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	
37	**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
38	**To Increase the number of low emission and electric vehicles licensed as Taxis by Broxtowe Borough Council.**	Promoting Low Emission Transport	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 as cleaner vehicles	Number of LEV and Electric Vehicles licensed within the borough as Taxis	Broxtowe Borough Council currently license 1 Electric vehicle and 23 Hybrid vehicles out of the 129 Vehicles that are licensed to operate as Taxis.	On-going
39	**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.	Progress will be updated in 2022 ASR.	New Measure devised in late 2020
40	**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	Progress will be updated in 2022 ASR.	New Measure devised in late 2020
41	**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	Progress will be updated in 2022 ASR.	New Measure devised in late 2020
42	**To Replace older combination**	Other	Other	2020		BBC Capital Works Manager	LA-BBC	No	Funded	£10k - £50k	Implementation	Reduced emissions due to more	Number of boilers replaced	•The replacement of the remaining less efficient units (less	

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	boilers and system boilers to Seasonal Efficiency of a Domestic Boiler in the UK (SEDBUK) A rated condensing boilers				2022 On-going							efficient boilers		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.	
43	**To investigate and consider new heating technologies that are more efficient, effective and produce lower emissions**	Other	Other	2020	2021 and ongoing 2021	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 is currently being undertaken for fitting air source heat pumps in 2 new builds. The success of this will be reported on.	Due for completion in 2021
44	**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.	•Initially these systems will primarily be replaced with high heat retention storage heaters. •Air source heat pumps will also be considered at suitable properties where a retro fit solution is possible.	Update on surveys to be provided in 2022 ASR
45	**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 $N0_2$ 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	2024

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														•Dependant on whether funding from Central Government continues	
46	**Low Emission Vehicle Procurement**	Promoting Low emission transport	Company vehicle Procurement - prioritising uptake of low emission vehicles	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 $N0_2$ and PM due to cleaner vehicle technology	•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. •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 vehicles will be purchased in 2021 at a cost of £45k.	2024 **Complete** **Complete** **Complete** 2021
47	**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	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 2021	New Measure devised in late 2020.
48	**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 oft 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.	2024
49	**To use the on board Vehicle**	Vehicle Fleet Efficiency	Driver training and ECO driving aids	2020	2021-2022	BBC Transport and Stores Manager	LA-BBC	No	Funded	Within existing resources	On-going	Reduction in $N0_2$ and PM due to	Number of employees that have	The data obtained over the next few months will allow a driver training	2021/2022

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	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											improved driving efficiency .	undergone driver training.	program to be established in 2021/22 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.	
50	**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
51	**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
52	**To provide all allotments within the**	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	Reduction in bonfires from allotments	• Multi team meeting taken place to discuss the feasibility	New Measure devised in late 2020

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	borough with green waste recycling collections											bonfires on site	within the borough.	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.	
53	**To communicate with all allotment providers in the borough to discourage the use of bonfires to dispose of garden waste**	Public Information	Other	2020	On-going	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.	Progress will be updated in 2022 ASR.	New Measure devised in late 2020
54	**To encourage cycling and walking as alternatives to using private vehicles**	Promoting Travel Alternatives	Promotion of Walking and cycling	2020	On-going	BBC Head of Public Protection and HR	LA - BBC	No	Not Funded	Within existing resources	Planning	Reduction in $N0_2$ and PM due to increase in people travelling by cycle or by foot.	No of campaigns	Annual walking and cycling awareness will be promoted on BBCs website.	New Measure devised in late 2020. Progress will be updated in 2022 ASR.
55	**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 $N0_2$ and PM	In Broxtowe district there has been a 30% increase in cycling between 2010 and 2014	Cycling in Broxtowe has increased by 5% between 2010 and 2019. • 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**
56	**To investigate the feasibility of increased provision for cycle parking in the Borough**	Alternatives to private vehicle use	Other	2020	2023	BBC Head of Public Protection and HR	LA - BBC	No	Not yet identified	Not yet calculated	Planning	Reduced Emissions of $N0_2$ and PM	No of cycle parking spaces in the borough	Progress will be updated in 2022 ASR.	New Measure devised in late 2020
57	**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 • Future countywide priorities will be identified through technical analysis undertaken as part of the LCWIP	

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														development and will be subject to feasibility, consultation and County Council Committee approval	
58	**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 Bid to upgrade routes along A6005 • One of the proposed schemes included within NCC's Active Travel Fund (ATF) Tranche 2 bid is cycling improvements in Beeston, including the installation of additional secure cycling hubs at the rail station. This scheme is subject to feasibility/ consultation/ approval. • 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 Committee approval • 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 • Schemes dependent on funding being made available for such improvements • The ATF and Town Fund funded proposals are still subject to feasibility, consultation and County Council Committee approval
59	**Cycle hire scheme**	Transport Planning and Infrastructure	Public cycle hire scheme	TBD	Not known - dependent on commercial	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	Scheme dependent on commercial cycle hire

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					cycle hire scheme providers									• 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 providers committing to, and delivering a scheme
60	**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	• 9,383 people received cycle training during 2019/20.	
61	**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	• 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 installation of additional secure cycling hubs at the rail station. This scheme is subject to consultation/ approval. • Costs shown are for hub to be delivered in 21/22 only
62	**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 $N0_2$ and PM	In Broxtowe district there has been a 30% increase in cycling between 2010 and 2014	Cycling in Broxtowe has increased by 5% between 2010 and 2019. • 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**
63	**Marketing of cycling**	Promoting Travel Alternatives	Promotion of cycling	2010 and 2017	On-going	NCC	LA- NCC	No	Funded	within existing	Implemented and on-going	Reduced Emissions of N02 and PM	Increased cycling trips	• Cycling in Nottinghamshire has increased by 4%	

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										resources		due to increased cycling uptake		between 2010 and 2019; and in Broxtowe district there has been a 5% increase in cycling between 2010 and 2019 • 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)	
64	**To investigate the feasibility of increased provision for cycle parking in the Borough**	Alternatives to private vehicle use	Other	2020	2023	BBC Head of Public Protection and HR	LA - BBC	No	Not yet identified	Not yet calculated	Not yet started	Reduced Emissions of $N0_2$ and PM	No of cycle parking spaces in the borough	Progress will be updated in 2022 ASR.	New Measure devised in late 2020
65	**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	
66	**Cycle parking facilities**	Transport Planning and Infrastructure	Cycle network	2015	On-going	NCC/BBC; integrated transport block/developer contributions	Integrated transport block/developer contributions	No	Funded	£10k - £50k	On-going	Reduced Emissions of $N0_2$ and PM	Increased cycling trips	•Cycle hub installed in 2015 to integrate with bus/rail services •Ad-hoc parking provided where required Potential barrier: Lack of future revenue funding	**Complete** On-going Costs shown are for hub to be delivered in 21/22 only
67	**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	

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														week', 'Notts Routes & Rides'. • NCC's Travel Choice webpages include information on walking across the county (for residents and businesses)	
68	**Pedestrian infrastructure improvements**	Transport Planning and Infrastructure	Other	On-going	On-going	NCC/BBC	NCC/External	No	Funded	Schemes included in 2020/21 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 dropped kerbs, pedestrian crossings and improvements to footpaths and bridleways, were included within 20/21 Integrated Transport programme	• Potential barrier: Lack of future funding.
69	**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
70	**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
71	**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	

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														publicised and available from the County Council's website.	
72	**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 • DfT allocated NCC £2.18m towards the County Council's Active Travel Fund (ATF) Tranche 2 proposals. One of the proposed ATF schemes (subject to consultation/ approval) is cycling improvements in Beeston. This would potentially include a behaviour change support package (PTP). There may also potentially be further opportunities to offer travel planning through 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
73	**Encouraging the use of Hybrid or Electric vehicles for BBC staff**	Promoting Low Emission Transport	Other	2020	On-going	BBC Head of Public Protection and HR	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 employee used a personal Electric vehicle and five used ULEV in 2020.	
74	**Cycle to work Scheme**	Promoting Travel Alternatives	Promotion of cycling	2009	On-going	BBC Head of Public Protection and HR	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. •Five employees used this scheme in 2020.Since the scheme started 170 employees have purchased bikes through the scheme.	On-going
75	**Investigate the feasibility of a Council staff car sharing**	Alternatives to Private Vehicle Use	Car Clubs	2020	2023	BBC Head of Public Protection and HR	N/A	No	Not Funded	N/A	Not yet started	Reduction in N02 and PM	No of staff car sharing	Progress will be updated in 2022 ASR.	New Measure devised in late 2020

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
76	**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 NO_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
77	**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/m³	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 2(on Travel Plans, was adopted in 2019. It is expected in this policy that all planning applications for large development sites (10 o more dwellings or 1,00(square metres or more gross floor space) mus 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. Produce a transport map specifying the modes o transport the organisatio considers acceptable if other modes or transpor are not suitable. Feasibility study of having bus card/Ticket for employee use.	**Complete** **Complete**
78	**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

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
79	**To reschedule the dry recycling waste rounds to reduce fuel consumption and improve efficiency**	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	2020	2021	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 for 2021/22	New Measure devised in late 2020 2021/2022
80	**To reschedule the green waste rounds to reduce fuel consumption and improve efficiency**	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	2020	2021	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	New Measure devised in late 2020
81	**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	
82	**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**
83	**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 less fleet vehicle used.	Reduced emissions	•A review of the refuse collection areas at BBC to enable the areas to be zoned to ensure that the collection rounds are within the designated zone, which reduces the amount of non-productive travelling time.	**Complete** The Refuse round restructure is now complete and we have reduced the fleet size by one vehicle.
84	**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	

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
														• Further smartcard/contactless improvements being developed • The emerging Enhanced Partnership required by the National Bus Strategy is seeking to deliver further improvements to integrated ticketing and these should be clarified by March 2022. • 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	

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 currently 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 2020 the annual mean concentration is 8.7µg/m^3 for the City Centre site. The modelled background level provided by Defra for the Borough of Broxtowe are modelled to be between 7.6µg/m^3 and 9.7µg/m^3 for 2020, with the annual mean for 2020 being 8.5µg/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 2019 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 believed to be 64 deaths attributable to human-made air pollution this figure needs to be put into context as deaths that are attributable to smoking and alcohol consumption are far higher. For example, Nottingham City had 133 deaths attributable to human-made air pollution (PM and NO_2), but there are 1408 deaths attributable to smoking[11] and 153 deaths related to alcohol consumption[12].

Table 2.3 – Estimated Effects of Annual Mortality in 2019 of human-made $PM_{2.5}$ Air Pollution.

Council/Area	Attributable fraction	Attributable deaths aged 30+* (2019 deaths ONS)	Associated Life-years Lost due to PM based on 29,000 nationally (COMEAP 2010)
Nottingham City	5.7	133	1559
Ashfield District	5.3	68	662
Newark and Sherwood District	5.3	64	626
Bassetlaw District	5.1	64	620
Gedling Borough	5.4	60	628
Broxtowe Borough	5.5	64	612
Rushcliffe Borough	5.3	57	528
Mansfield District	5.3	61	594

[11] Tobacco Control Profiles 2015-2017, Public Health England. Tobacco Control Profiles 2015-2017, Public Health England

[12] Local Alcohol Profiles for England, 2017. Local Alcohol Profiles for England 2017.

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.

However, 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 assist and advice consultants working on the proposed HS2 project. This ensures that suitable dust control measures will be used throughout the project.
- 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.

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 Highways England. 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 Highways England.

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 Highways England.

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 40$\mu g/m^{3.}$ The data

showed that within this area in 2006 the annual mean was 45μg/m^3 and therefore exceeding the AQO by 5μg/m^3.

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 2020. 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 – 2020.

Site ID	NO_2 Annual Mean Concentration (μg/m^3)								
	2012	2013	2014	2015	2016	2017	2018	2019	2020
18	-	-	-	-	34.3	32.9	28.2	28.4	17.9
BX11/19	**42.2**	38.7	38.1	**42.3**	37.6	37.2	31.9	30.9	21.5
44	-	-	-	-	-	-	-	-	24.8
45	-	-	-	-	-	-	-	-	20.1

Although the data in Table 2.4.1 shows that for all of the monitoring sites bar Site 44 and Site 45 (as the only have one years worth of data, as they are new sites), 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), as the NO_2 levels have reduced by 16.4µg/m^3 from 2016 to 2020 for site 18 and 16.1µg/m^3 from 2016 to 2020 for site 19. Site 18 in 2020 is 22.1µg/m^3 below the AQO, Site 19 in 2020 is 18.5µg/m^3 below the AQO, Site 44 in 2020 is 15.2µg/m^3 below the AQO and Site 45 in 2020 is 19.9µg/m^3 below the AQO.

The results in Table 2.4.1 show that for five consecutive years the AQO has been met within the remaining AQMA and for three years the data has been below 36µg/m^3 which is a 10% reduction of the 40µg/m^3 AQO. However, due to the prevalance of Covid -19 in the UK, National lockdowns and an increase in working from home the amount of vehicles on the road has reduced. Therefore, the 2020 should be regarded as an anomaly and will not be used to make decisions or changes to the current monitoring sites.

2.4.5 SMART Motorway Scheme

The SMART Motorways is a scheme that was introduced by Highways England 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

Highways England 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 Highways England website: SMART Motorway Scheme, Highways England

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 five consecutive years, the data has been below the AQO the data has only been below 36 µg/m^3 for three consecutive years. Therefore, BBC will not revoke the AQMA until it is consistently below 36 µg/m^3 for three 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 Highways England 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 2020 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 2016 and 2020 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

3.1.2 Non-Automatic Monitoring Sites

Broxtowe Borough Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 45 sites during 2020. 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 2020 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 – 2020.

Site ID	NO_2 Annual Mean Concentration (µg/m^3)								
	2012	2013	2014	2015	2016	2017	2018	2019	2020
BX01 or 33 and BX05 or 34	30.8	32.3	30.5	28.1	29.1	27.7	25.5	25.9	18.7

Site ID	NO_2 Annual Mean Concentration (µg/m^3)								
	2012	2013	2014	2015	2016	2017	2018	2019	2020
BX13 or 35	35.0	33.5	33.7	34.1	32.2	33.6	30.0	29.7	22.6

Monitoring will continue to be undertaken at these three sites and the results will be reported in the 2022 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. 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 2020 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 – 2020.

Site ID	NO_2 Annual Mean Concentration (µg/m^3)								
	2012	2013	2014	2015	2016	2017	2018	2019	2020
18	-	-	-	-	34.3	32.9	28.2	28.4	17.9
BX11/19	**42.2**	38.7	38.1	**42.3**	37.6	37.2	31.9	30.9	21.5
44	-	-	-	-	-	-	-	-	24.8
45	-	-	-	-	-	-	-	-	20.1

Although the data in Table 3.2 shows that for all of the monitoring sites bar Site 44 and Site 45 (as the only have one years worth of data, as they are new sites), 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 16.4µg/m^3 from 2016 to 2020 for site 18 and 16.1µg/m^3 from 2016 to 2020 for site 19. Site 18 in 2020 is 22.1µg/m^3 below the AQO, Site 19 in 2020 is 18.5µg/m^3 below the AQO, Site 44 in 2020 is 15.2µg/m^3 below the AQO and Site 45 in 2020 is 19.9µg/m^3 below the AQO.

The results in Table 3.2 show that for five consecutive years the AQO has been met within the remaining AQMA and for three years the data has been below 36µg/m^3 which is a 10% reduction of the 40µg/m^3 AQO. However, due to the prevalance of Covid -19 in the UK, National lockdowns and an increase in working from home the amount of vehicles on the road has reduced. Therefore, the 2020 should be regarded as an anomaly and will not be used to make decisions or changes to the current monitoring sites.

BBC will continue to monitor NO_2 levels in this area and work alongside Highways England 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 origional 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 representaion 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 2020 results for the 'new' sites are shown below.

Table 3.3 – Results for Nuthall Island 2012 – 2020.

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

The results above show that that the origional 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 15.1µg/m^3 for site 36 and 20.7µg/m^3 for site 37 in 2020 and are showing a decreasing trend. However, consideration needs to be given to the 2020 data being an anomally due to Covid-19. Therefore, BBC will continue to monitor NO_2 levels at these sites and provide an update in the 2022 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 choosen 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 – 2020.

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

The table above shows that in 2020 Site 40 is 23.6µg/m^3, which is a reduction of 8.4µg/m^3 and Site 41 is 23.5µg/m^3, which is a reduction of 7.4µg/m^3 in comparison to the 2019 results. However, consideration needs to be given to the 2020 data being an anomally due to Covid-19.

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 1.3µg/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.

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 Highways England 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.

The new site started in January 2017 and the exact location was picked as the street is narrowed due to residents parking outside their properties, which tends to cause a 'bottle neck' situation in rush hour (See Appendix G for the Map identifying the monitoring location). The siting of the tube has been choosen 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.

Table 3.5 – Results for Town Street 2016 – 2020.

Site ID	NO_2 Annual Mean Concentration (µg/m^3)				
	2016	2017	2018	2019	2020
48	-	37.5	35.7	30.4	25.4
56	-	-	25.1	23.4	18.7

Above is the result for the sites for 2017 to 2020. The result for 2017 is 37.5µg/m^3. The result at site 48 for 2020 is 25.4µg/m^3 which is a reduction of 12.1µg/m^3 in comparison to the 2017 results, which shows a downward trend. However, consideration needs to be given to the 2020 data being an anomally due to Covid-19.

Due to the result in 2017, 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. The result at site 56 for 2020 is 18.7µg/m^3 which is a reduction of 4.7µg/m^3 in comparison to the 2019 result. Although, consideration needs to be given to the 2020 data being an anomally due to Covid-19, the 2019 data does enforce the theory that the results are higher on site 48 due to the 'Bottle neck' situation.

BBC will continue to monitor NO_2 levels at these sites and provide an update in the 2022 ASR. BBC will continue to work alongside Nottinghamshire County Council to improve air quality levels.

The Results and Trends for all Monitoring Sites in 2020.

Defra requested that trend charts were provided for all monitoring sites to identify any trends in the annual mean concentratons. The trend charts are displayed in Figure A.1 in the Appendices for all of the sites in use since 2016 to 2020.

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 2016 – 2019. 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, 34 have been in use since 2016. In 2017 one additional site was added, 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, fifteen are showing a consistent downward trend year on year. Eleven sites are showing an overall downward trend. Eleven sites showed an increase in the 2019 data in comparison to the 2018 data. Two sites have had the same concentration for two years running. Two of the sites have shown a slight year on year increase. 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 and 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.

Fifteen of the 41 sites are showing a consistent downward trend year on year (site 2, site 4, site 51, site 5, site 8, site 12, site 16, site 17, site 55, site 36, site 37, site 38, site 56, site 41 and site 48).

Eleven of the 41 sites are showing an overall downward trend of the data and that in 2019 there was a reduction in concentration in comparison to 2018 data these sites are; site 9, site 13, site 20, site 44, site 27, site 30, site 35, site 39, site 40, site 43 and site 19.

Eleven of the 41 sites showed an increase in the 2019 data in comparison to the 2018 data. Out of the eleven sites, seven have increased by less than 0.9μg/m^3 (site 1, site 7, site 33/34, site 53, site 45, site 54 and site 18), three have increased between 1μg/m^3 to 1.6μg/m^3 (site 50, site 52 and site 11) and site 31 has showed an increase of 3.1μg/m^3. As nine of the eleven sites only show a slight increase of between 0.1μg/m^3 to 1.6μg/m^3 for one year this can be due to many factors such as meteorology, traffic disruption due to road works etc. However, the two sites that show an increase between 2.4μg/m^3 to 3.1μg/m^3 will be closely monitored and will be reported on in the 2022 ASR.

Out of the eleven sites that showed an increase in the 2019 data in comparison to the 2018 data that have been discussed above, four of these sites (site 1, site 7, site 11 and site 18) have shown an overall downward trend since monitoring has been undertaken at the sites. A trend cannot be established for site 50, site, 52, site 53 and site 54 due to the sites only being in use since 2018 and the 2020 data is not being seen as a ‘normal’ year. The remaining two sites out of the eleven (site 45 and site 31) have not shown a consistent trend from 2016 to 2019 (with 2020 being discredited). However, with continuous yearly data being collected it is hoped that a clear trend can be identified in future years.

Two of the 41 sites (site 22 and site 32) have had the same concentration for the last two consecutive years (2018 and 2019). Site 22 had a 0.2 µg/m^3 difference between the 2017 and 2018/19 data. Site 32 had a 0.3 µg/m^3 difference between the 2017 and 2018/19 data. Therefore, these sites have shown a consistent trend in the data for the past three years.

The two remaining sites (site 3 and site 15) out of the 41 sites has shown that for the past two years the annual concentration has risen year on year. These sites are discussed 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 26.0µg/m^3. In 2017 it had decreased greatly by 4.0µg/m^3. In 2018 it increased by 0.5µg/m^3 and an additional 0.6µg/m^3 in 2019. Although there has been a very slight increase for the past two years (2018 and 2019), and the reason is unknown, the site is still below the air quality objective of 40µg/m^3.

Table 3.6 – Results for 8 Queens Road East, Beeston 2016 – 2020.

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

The 2020 data shows that the concentration has decreased by 5.4µg/m^3 but consideration needs to be given to the 2020 data being an anomally due to Covid-19.

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 residentail 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 2022 ASR.

Site 15 George Spencer Academy, Stapleford

Table 3.7 below shows the results for George Spencer Academy in Stapleford for 2016 to 2020, 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. Although there has been a slight increase for the past two years (2018 and 2019) and the reason is unknown, the site is still below the air quality objective of 40µg/m^3.

Table 3.7 – Results for George Spencer Academy, Stapleford 2016 – 2020.

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

The 2020 data shows that the concentration has decreased by 4.2µg/m^3 but consideration needs to be given to the 2020 data being an anomally due to Covid-19.

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 previoulsy diffusion tubes have been removed. This location also allows BBC to determine the worst case scenario for the academy. However, this site will be closely monitored and an update will be provided in the 2022 ASR.

3.2.2 Particulate Matter (PM_{10})

BBC does not currently monitor PM_{10} within the Borough. However, discussions are currently taking place with Nottinghamshire District and Borough Authorities and Nottinghamshire County Council, to collectively buy and maintain particulate monitors in the future. The outcome of this will be discussed in the 2022 ASR.

3.2.3 Particulate Matter ($PM_{2.5}$)

BBC does not currently monitor $PM_{2.5}$ within the Borough. However, discussions are currently taking place with Nottinghamshire District and Borough Authorities and Nottinghamshire County Council, to collectively buy and maintain particulate monitors in the future. The outcome of this will be discussed in the 2022 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
21	71 Nottingham Road, Trowell	Roadside	448772	340084	NO_2	No	0	8*	N	1.8
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)
26	Nelson Pub, Nottingham Road, Eastwood	Roadside	446511	346969	NO_2	No	0	2	N	1.8
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
29	14 Great Northern	Roadside	445886	346712	NO_2	No	0	2	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)
	Road, Eastwood									
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
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

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)
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
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

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)
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
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
42	134 Bramcote Lane, Chilwell	Roadside	451367	336621	NO_2	No	0	4	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)
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
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

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)
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 2020 (%) (2)	2016	2017	2018	2019	2020
1	452527	337313	Roadside	100	100	29.9	27.8	25.6	26.8	19.0
50	452114	338018	Roadside	100	100	-	-	28.2	29.2	18.9
2	452091	338122	Roadside	100	100	30.8	28.5	26.6	26.5	18.9
3	453659	337412	Roadside	100	100	26.0	22.0	22.5	23.1	17.7
4	453361	336627	Roadside	92	92	29.6	28.4	26.0	25.8	19.1
51	453537	336100	Roadside	100	100	-	-	18.3	15.9	15.0
52	453287	336349	Roadside	100	100	-	-	22.9	24.5	18.0
5	451782	335320	Urban Background	100	100	20.4	18.8	16.7	15.7	13.2
6	451482	334936	Roadside	-	-	26.4	24.7	-	-	-
7	450756	334328	Roadside	100	100	26.8	26.4	23.0	23.4	16.2
53	450360	334982	Roadside	100	100	-	-	19.3	19.9	13.9
8	450422	334243	Roadside	100	100	30.9	28.7	27.1	24.3	20.8

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 2020 (%) (2)	2016	2017	2018	2019	2020
9	449876	334804	Roadside	100	100	24.4	20.9	21.9	21.5	16.2
10	449748	335472	Roadside	92	-	26.0	25.6	20.8	21.6	-
11	449694	335501	Roadside	100	100	30.0	29.4	26.1	27.6	20.8
12	449615	335664	Roadside	100	100	28.9	25.3	23.6	20.5	17.3
45	449467	336220	Roadside	100	100	28.3	29.2	25.9	26.7	20.1
15	449406	336135	Roadside	75	75	35.6	25.7	28.2	28.6	24.4
13	449266	336075	Roadside	75	75	30.8	33.8	26.0	24.9	18.1
16	449516	336216	Roadside	100	100	27.9	26.3	25.9	25.4	18.4
54	448467	336591	Roadside	100	100	-	-	29.8	29.9	21.9
17	448890	337190	Roadside	100	100	37.3	34.8	33.0	32.7	25.1
55	449814	338471	Roadside	100	100	-	-	24.6	23.8	17.9
18	448560	338889	Roadside	100	100	34.3	32.9	28.2	28.4	21.5
19	448586	339023	Roadside	100	100	37.6	37.2	31.9	30.9	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 2020 (%) (2)	2016	2017	2018	2019	2020
20	448652	339652	Roadside	100	100	26.0	23.6	24.1	23.3	17.3
21	448772	340084	Roadside	-	-	24.5	-	-	-	-
22	448832	340098	Roadside	100	100	26.8	24.0	24.2	24.2	18.7
23	448195	342287	Roadside	-	-	23.9	22.4	-	-	-
24	448230	344446	Roadside	-	-	26.4	24.1	-	-	-
26	446511	346969	Roadside	-	-	28.6	-	-	-	-
44	446509	347091	Roadside	92	92	36.0	33.2	33.7	31.7	24.8
27	446465	346985	Roadside	92	92	25.8	23.7	24.1	20.4	17.8
28	44601	346920	Roadside	100	-	24.7	20.7	-	-	-
29	445886	346712	Roadside	-	-	21.5	-	-	-	-
30	448544	345241	Roadside	100	100	27.4	27.9	23.1	21.9	18.3
31	448826	344883	Roadside	100	100	30.2	31.9	25.7	28.8	21.2

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 2020 (%) (2)	2016	2017	2018	2019	2020
32	450122	344658	Roadside	92	92	30.0	28.6	28.9	28.9	21.3
33 and 34	451631	344526	Roadside	100	100	29.1	27.7	25.5	25.9	18.7
35	451728	344440	Roadside	100	100	32.2	33.6	30.0	29.7	22.6
36	452232	344033	Roadside	100	100	35.2	35.2	32.8	31.7	24.9
37	452331	343910	Roadside	92	92	32.2	29.5	28.9	26.4	19.3
57	451413	341424	Roadside	92	92	-	-	-	-	15.2
38	450389	337866	Roadside	100	100	33.7	30.5	29.8	26.7	20.5
39	450434	337781	Roadside	100	100	30.6	25.6	26.7	25.5	18.6
56	450570	337851	Roadside	92	92	-	-	25.1	23.4	18.7
40	450632	337929	Roadside	100	100	37.5	32.7	34.0	32.0	23.6
41	450555	337909	Roadside	100	100	37.4	35.6	34.1	30.9	23.5
42	451367	336621	Roadside	-	-	23.2	-	-	-	-

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 2020 (%) (2)	2016	2017	2018	2019	2020
43	452733	336962	Urban Background	100	100	21.1	18.5	18.6	18.3	13.8
46	452914	336650	Roadside	-	-	-	23.8	-	-	-
47	452593	337186	Roadside	-	-	-	24.6	-	-	-
48	450817	337592	Roadside	100	100	-	37.5	35.7	30.4	25.4
49	452804	336940	Roadside	-	-	-	24.3	-	-	-
58	448588	338940	Roadside	100	83	-	-	-	-	19.4
59	448602	338965	Roadside	100	83	-	-	-	-	19.1

☐ **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**.

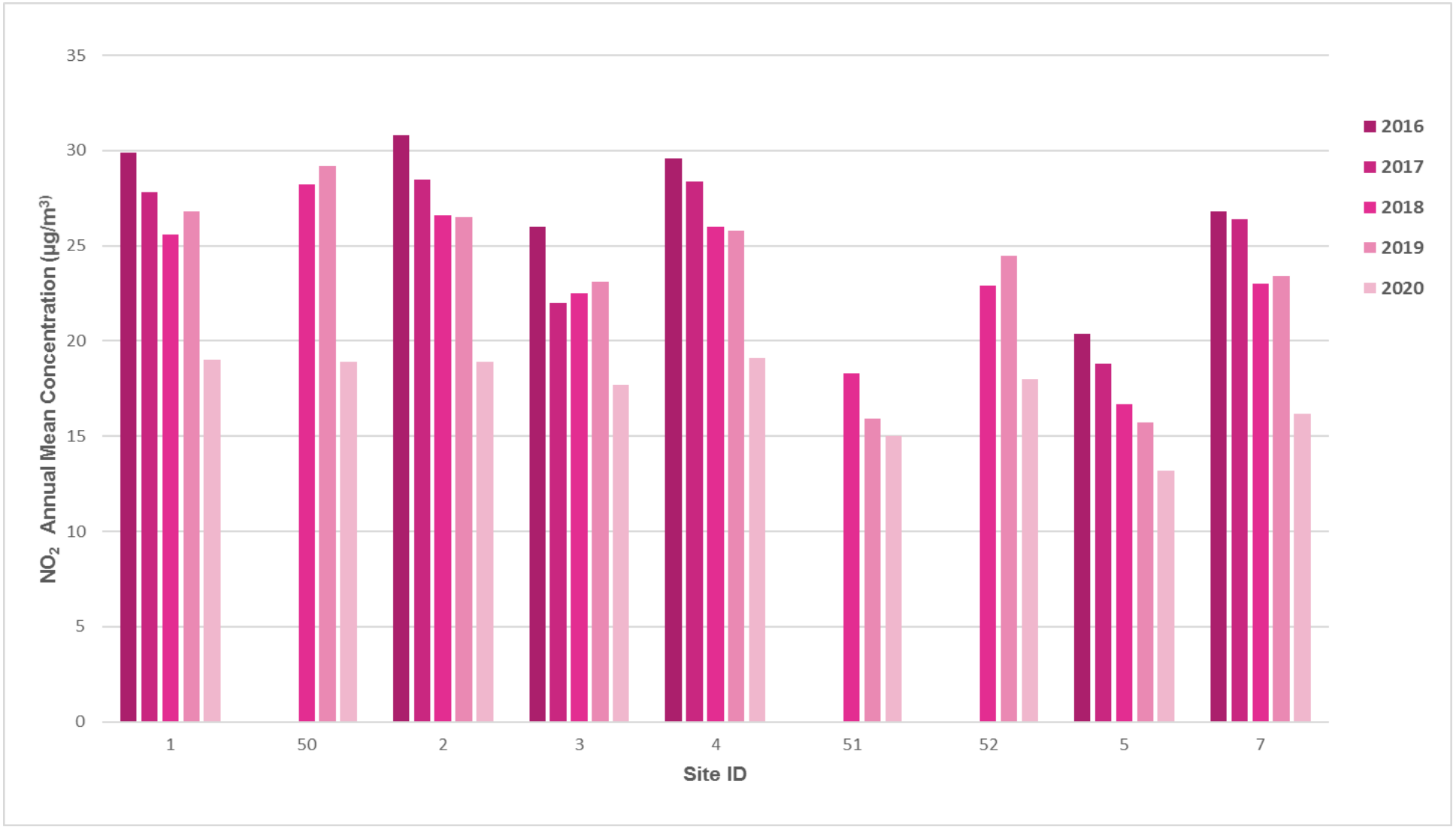
Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

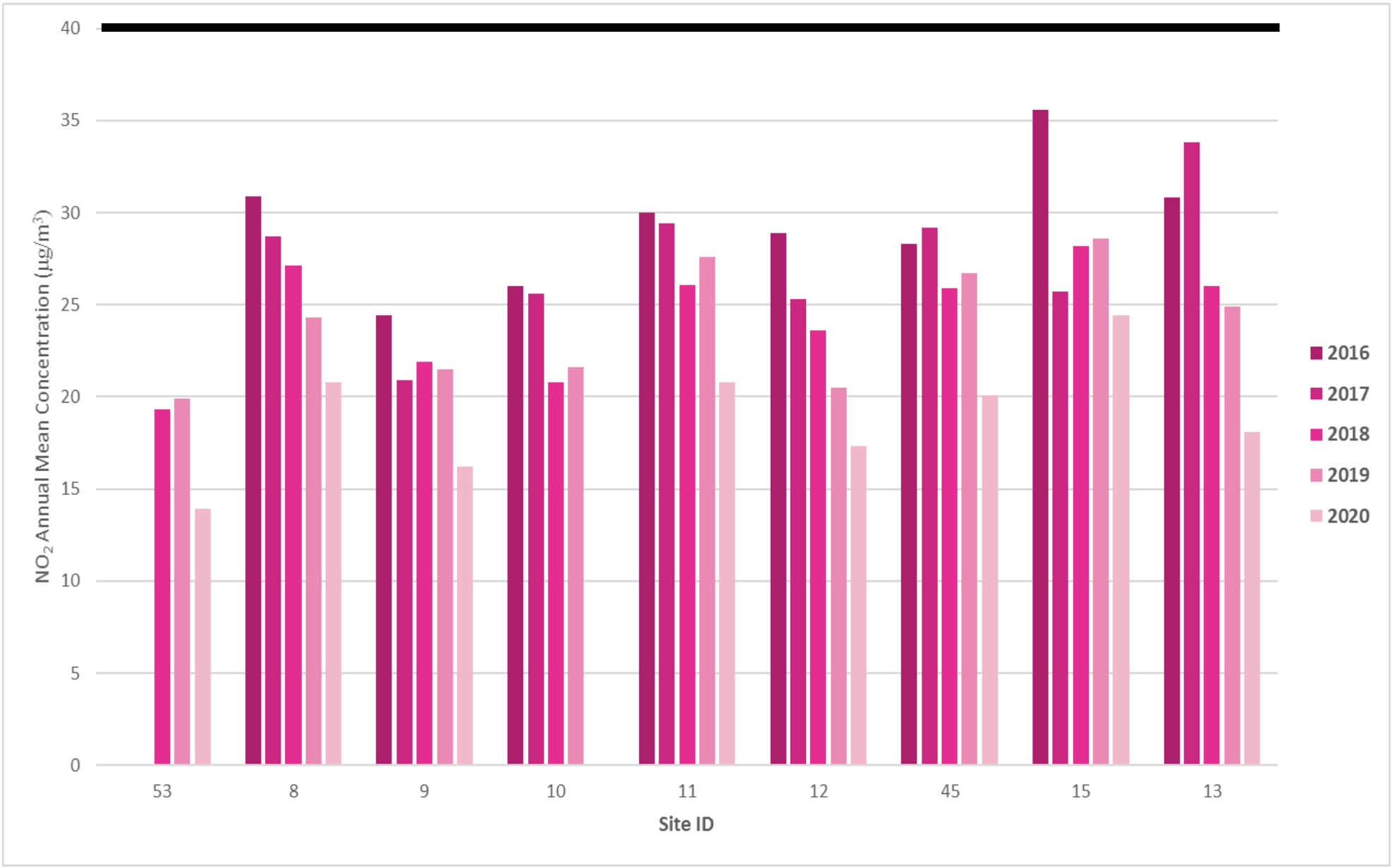
Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

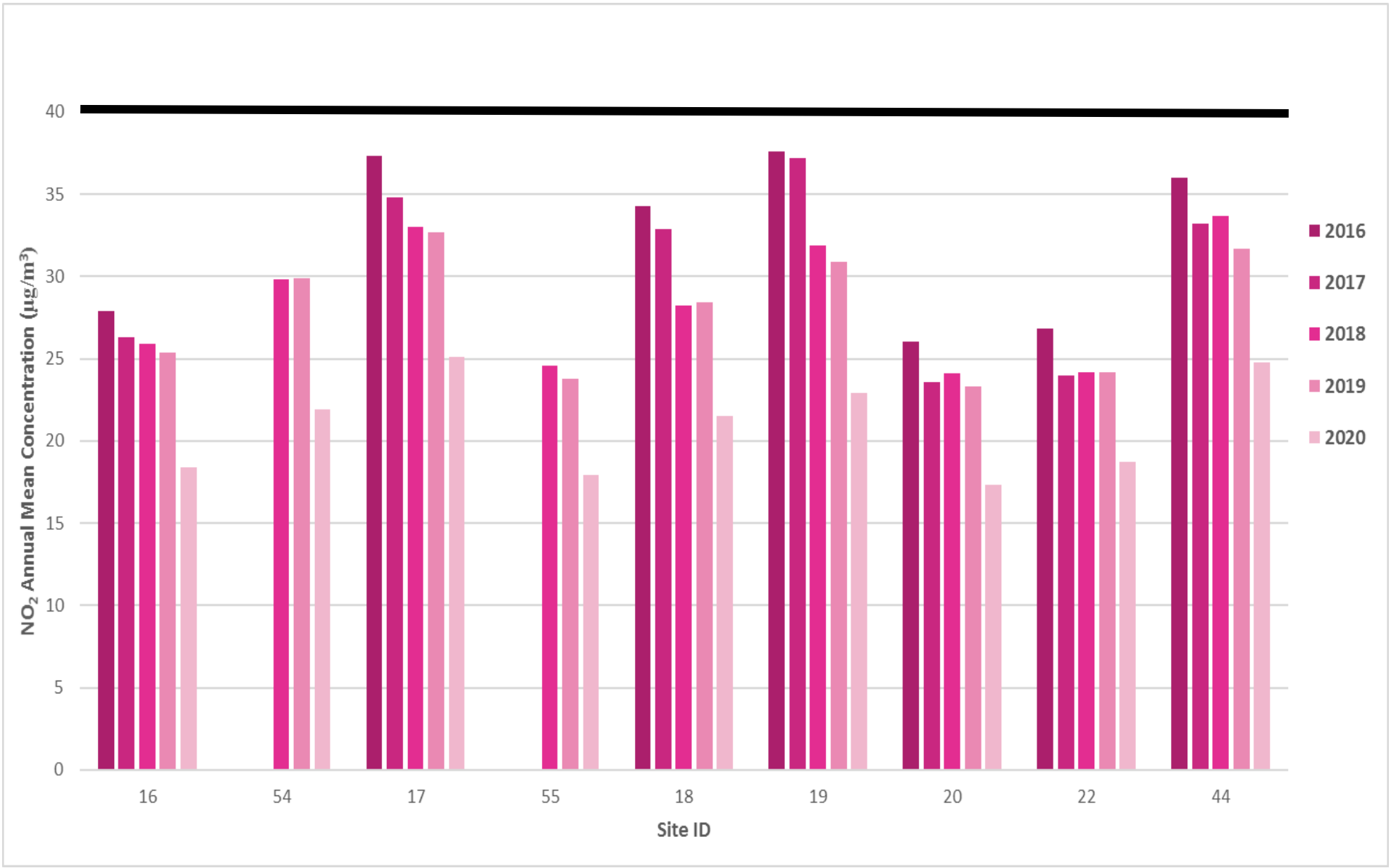
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

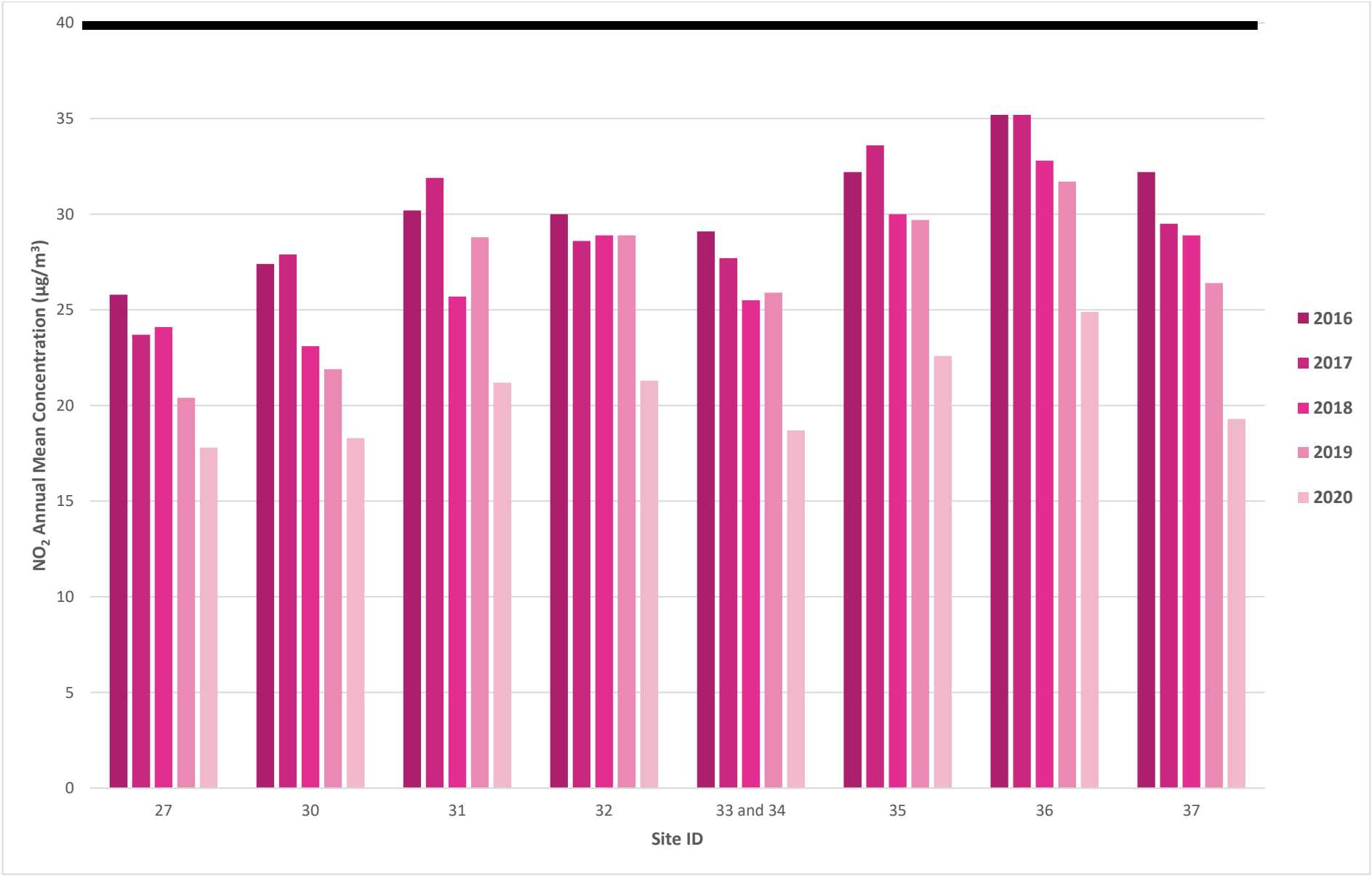
(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Figure A.1 – Trends in Annual Mean NO_2 Concentrations for all sites since 2016 to 2020.




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
2016
2017
2018
2019
2020


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
2016
2017
2018
2019
2020


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
2016
2017
2018
2019
2020

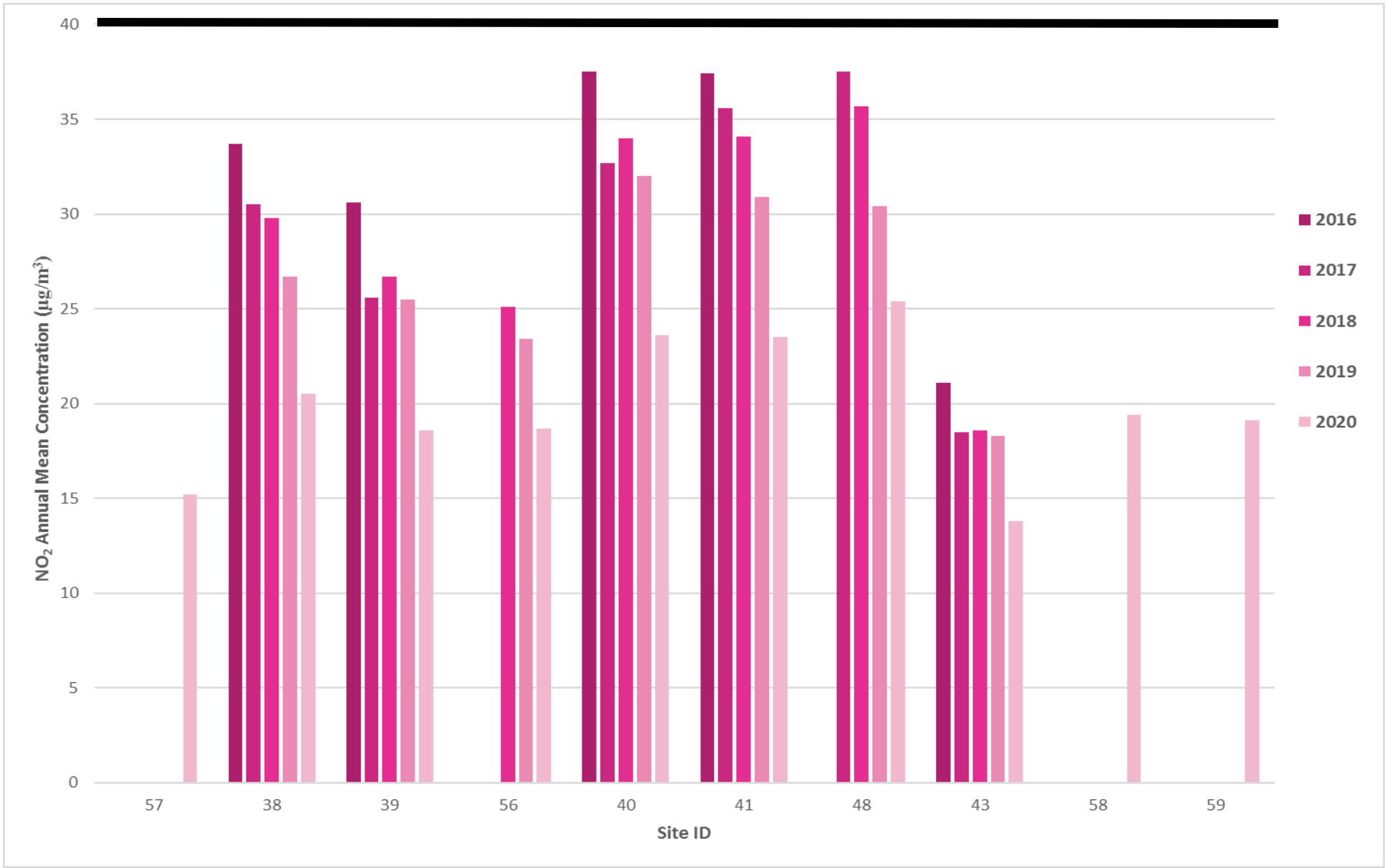
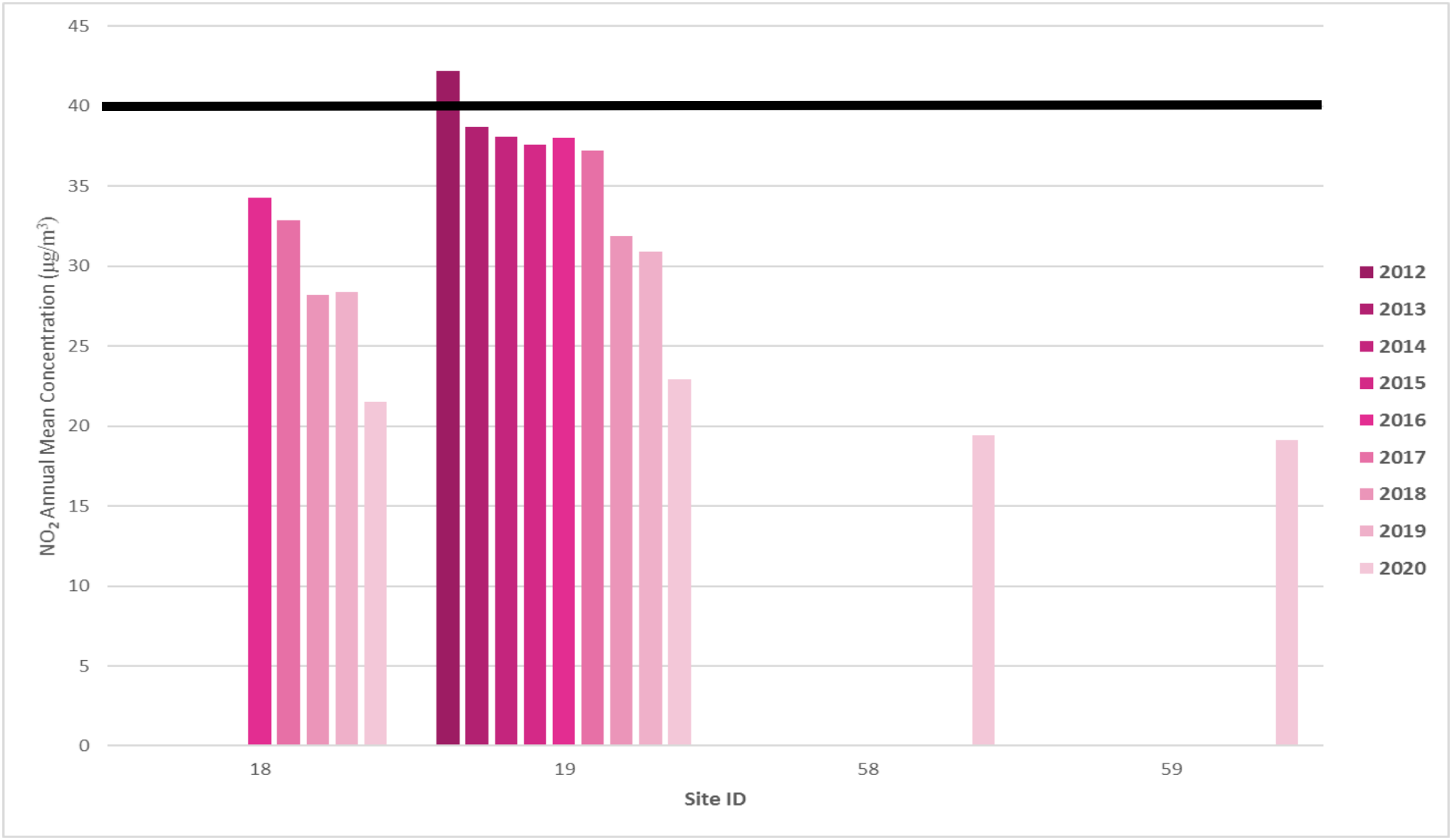

40
35
30
25
20
15
10
5
0
NO2 Annual Mean Concentration (µg/m3)
2016
2017
2018
2019
2020
57
38
39
56
40
41
48
43
58
59
Site ID

Figure A.2 – Trends in Annual Mean NO_2 Concentrations for the AQMA since 2016 to 2020.



Appendix B: Full Monthly Diffusion Tube Results for 2020

Table B.1 – NO_2 2020 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 (0.81)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
1	452527	337313	35.6	29.3	20.2	15.9	16.5	18.1	16.5	20.3	24.5	24.5	29.2	30.7	23.4	19.0	-	
50	452114	338018	**42.0**	30.9	30.8	29.1	23.4	16.5	11.2	14.1	17.6	17.4	24.2	23.4	23.4	18.9	-	
2	452091	338122	32.6	27.0	20.7	16.3	15.6	18.5	14.5	21.8	25.0	25.2	32.3	30.5	23.3	18.9	-	
3	453659	337412	31.9	23.9	24.9	20.3	16.2	17.7	9.6	17.5	21.4	22.8	27.5	28.9	21.9	17.7	-	
4	453361	336627	32.6	27.9	25.0	16.4	16.7		14.8	18.1	22.4	22.8	31.3	31.2	23.6	19.1	-	
51	453537	336100	25.0	18.9	19.6	13.3	12.4	13.8	11.8	14.7	20.0	20.6	27.2	24.2	18.5	15.0	-	
52	453287	336349	31.7	28.5	25.3	15.4	15.0	15.7	12.6	15.3	21.1	24.6	32.0	29.2	22.2	18.0	-	
5	451782	335320	27.2	17.2	16.5	10.7	9.6	10.5	10.0	11.9	16.0	18.5	24.9	22.1	16.3	13.2	-	
7	450756	334328	28.9	21.2	19.4	14.5	12.2	15.5	13.1	15.6	20.2	20.5	30.0	29.2	20.0	16.2	-	
53	450360	334982	24.1	21.1	19.1	13.4	10.7	11.1	11.4	12.7	17.0	18.5	23.4	24.1	17.2	13.9	-	
8	450422	334243	33.6	25.2	25.2	19.3	18.0	24.3	19.1	26.4	30.0	25.1	31.9	29.4	25.6	20.8	-	
9	449876	334804	26.2	19.6	21.6	16.5	13.6	18.0	12.5	18.7	22.5	21.5	25.2	24.7	20.0	16.2	-	
11	449694	335501	33.6	29.8	25.5	16.8	19.7	22.7	21.5	23.9		26.1	32.1	30.3	25.7	20.8	-	
12	449615	335664	26.8	22.4	19.8	16.3	16.5	17.7	13.6	18.4	22.8	23.5	28.6	30.2	21.4	17.3	-	
45	449467	336220	38.2	30.1	26.8	16.4	16.0	18.0	17.1	21.8	25.5	27.2	32.8	27.9	24.8	20.1	-	
15	449406	336135	**43.1**	36.7				20.1	20.1	27.8	29.6	30.0	29.8	34.4	30.2	24.4	-	

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 (0.81)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
13	449266	336075	26.3	22.5				16.2	14.1	18.3	24.2	23.4	30.7	24.9	22.3	18.1	-	
16	449516	336216	29.1	26.5	25.1	15.7	15.5	17.3	13.2	20.6	23.2	24.7	33.3	27.8	22.7	18.4	-	
54	448467	336591	35.2	25.1	29.1	21.0	20.5	25.7	17.6	28.3	27.4	27.4	35.4	31.8	27.0	21.9	-	
17	448890	337190	33.8	33.4	32.0	20.4	21.9	26.3	23.7	29.8	34.3	34.2	**42.5**	39.4	31.0	25.1	-	
55	449814	338471	32.9	24.4	21.8	15.1	16.4	16.7	16.4	18.6	23.0	21.1	30.1	28.5	22.1	17.9	-	
18	448560	338889	36.1	34.7	29.3	16.9	18.8	19.5	24.6	22.0	29.0	27.4	32.3	27.8	26.5	21.5	-	
19	448586	339023	**40.6**	37.5	29.0	17.1	21.1	20.1	25.8	24.5	30.6	27.7	36.4	29.5	28.3	22.9	-	
20	448652	339652	24.1	19.6	24.7	20.2	15.9	25.1	12.1	20.7	19.9	20.2	26.7	27.6	21.4	17.3	-	
22	448832	340098	31.9	23.4	25.8	18.6	15.3	26.6	11.7	24.2	20.3	22.3	28.3	27.8	23.0	18.7	-	
44	446509	347091	37.5	32.1	31.8	20.5	22.2	29.5	22.9	31.1	31.2	32.1	38.6	38.1	30.6	24.8	-	
27	446465	346985		29.0	24.2	15.9	16.9	19.6	14.0	21.0	21.9	22.4	27.8	28.4	21.9	17.8	-	
30	448544	345241	36.6	23.3	24.1	14.4	13.1	17.9	16.1	19.9	21.6		29.1	31.7	22.5	18.3	-	
31	448826	344883	39.2	30.0	26.5	16.6	17.7	20.2	21.8		27.3	26.8	32.5	29.3	26.2	21.2	-	
32	450122	344658	31.0	25.9	29.7	20.6	21.3	25.2	18.6	26.8	28.2	25.5	31.7	31.4	26.3	21.3	-	
33	451631	344526	23.2	24.3	25.7	15.8	15.4	21.0	14.7	23.3	21.6	21.9	31.5	32.0			-	Duplicate Site with 33 and 34 - Annual data provided for 34 only
34	451631	344526	32.6	24.5	25.9	16.6	14.7	22.3	14.9	24.3	21.7	26.6	30.7	29.6	23.1	18.7	-	Duplicate Site with 33 and 34 - Annual data provided for 34 only
35	451728	344440	39.3	36.1	28.7	16.2	19.5	21.8	27.3	25.5	29.9	28.2	33.2	29.2	27.9	22.6	-	
36	452232	344033	**46.5**	32.9	28.8	19.9	21.3	24.4	25.8	27.1	33.8	32.1	**43.1**	32.9	30.7	24.9	-	
37	452331	343910	24.8	23.7	28.3	20.5	23.5	21.7	13.6	24.3		25.1	28.3	28.5	23.8	19.3	-	

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 (0.81)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
57	451413	341424	26.0	18.6	18.2	12.4	14.0	13.6		16.1	19.3	19.6	25.9	23.3	18.8	15.2	-	
38	450389	337866	31.7	28.8	29.8	18.1	18.2	22.0	15.9	23.0	27.9	26.3	31.5	30.0	25.3	20.5	-	
39	450434	337781	30.5	21.1	26.0	19.1	18.3	22.3	12.7	22.6	24.3	22.1	29.0	27.6	23.0	18.6	-	
56	450570	337851	32.8	26.9	24.3		16.4	16.1	18.0	18.7	22.4	24.2	26.2	27.7	23.1	18.7	-	
40	450632	337929	39.1	31.0	31.6	21.1	21.8	25.9	20.1	27.8	32.6	30.4	37.7	30.3	29.1	23.6	-	
41	450555	337909	38.0	30.6	33.4	19.1	23.7	24.6	23.4	27.4	32.4	29.2	34.4	32.6	29.1	23.5	-	
48	450817	337592	**47.5**	35.2	32.2	19.0	10.0	27.4	28.5	33.0	35.6	32.2	39.3	37.0	31.4	25.4	-	
43	452733	336962	24.6	19.4	18.9	12.6	19.6	11.2	7.9	11.6	15.5	17.1	21.9	24.0	17.0	13.8	-	
58	448588	338940	-	-	29.0	16.3	18.0	17.4	21.6	21.1	28.3	24.7	32.6	30.1	23.9	19.4	-	
59	448602	338965	-	-	27.3	15.1	23.0	16.0	21.5	21.2	27.8	25.4	30.1	29.1	23.6	19.1	-	

☒ **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 2020 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

(c) Unable to collect Tubes due to Covid -19 restrictions.

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

New or Changed Sources Identified Within Broxtowe Borough Council During 2020

Broxtowe Borough Council has not identified any new sources relating to air quality within the reporting year of 2020.

Additional Air Quality Works Undertaken by Broxtowe Borough Council During 2020

Broxtowe Borough Council has not completed any additional works within the reporting year of 2020.

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 2021 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG16 provides

guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_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 0.81 to the 2020 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
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 2020.

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

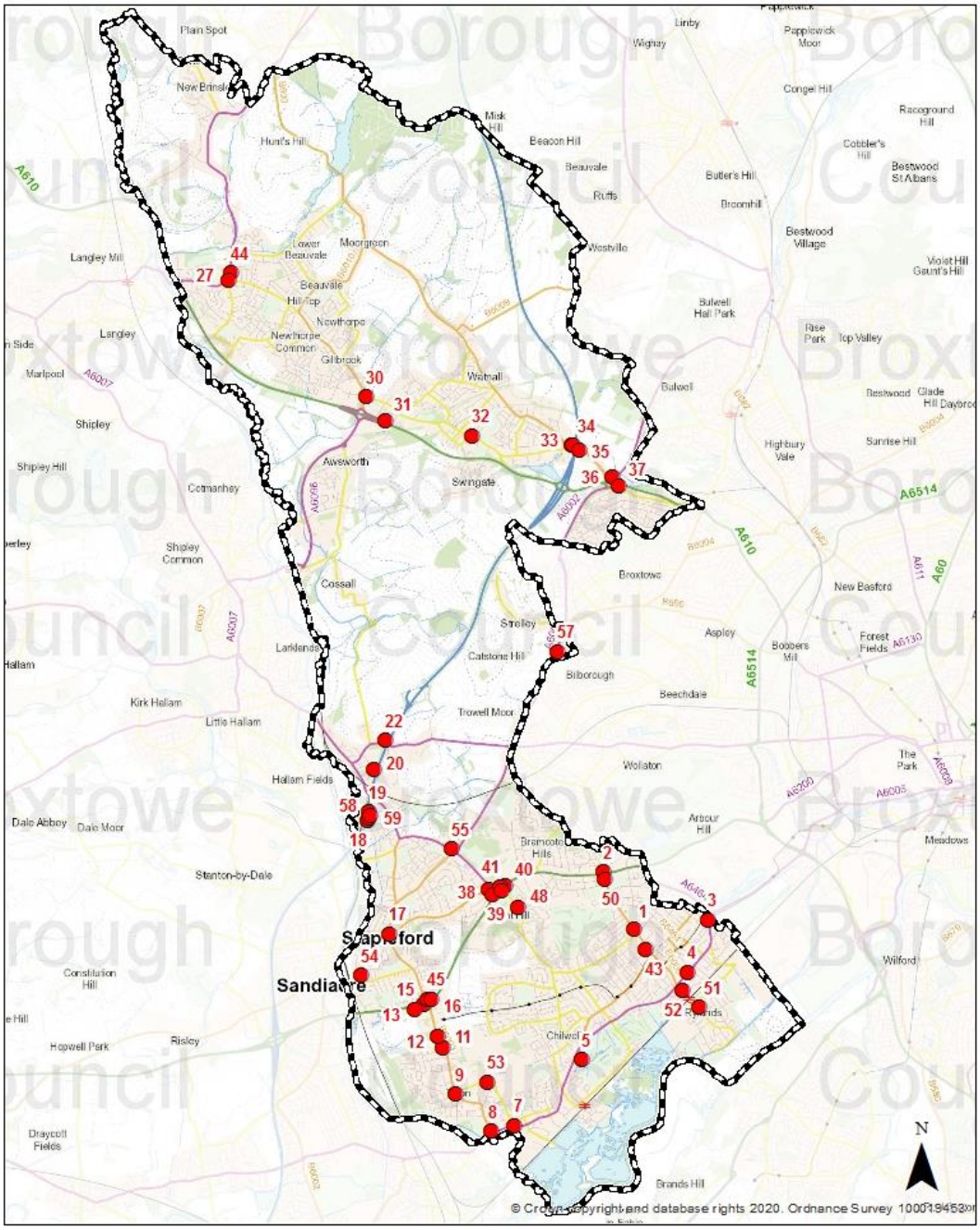


Figure D.1 – 2020 Diffusion Tube Locations.

Appendix E: Map of AQMA in Trowell.

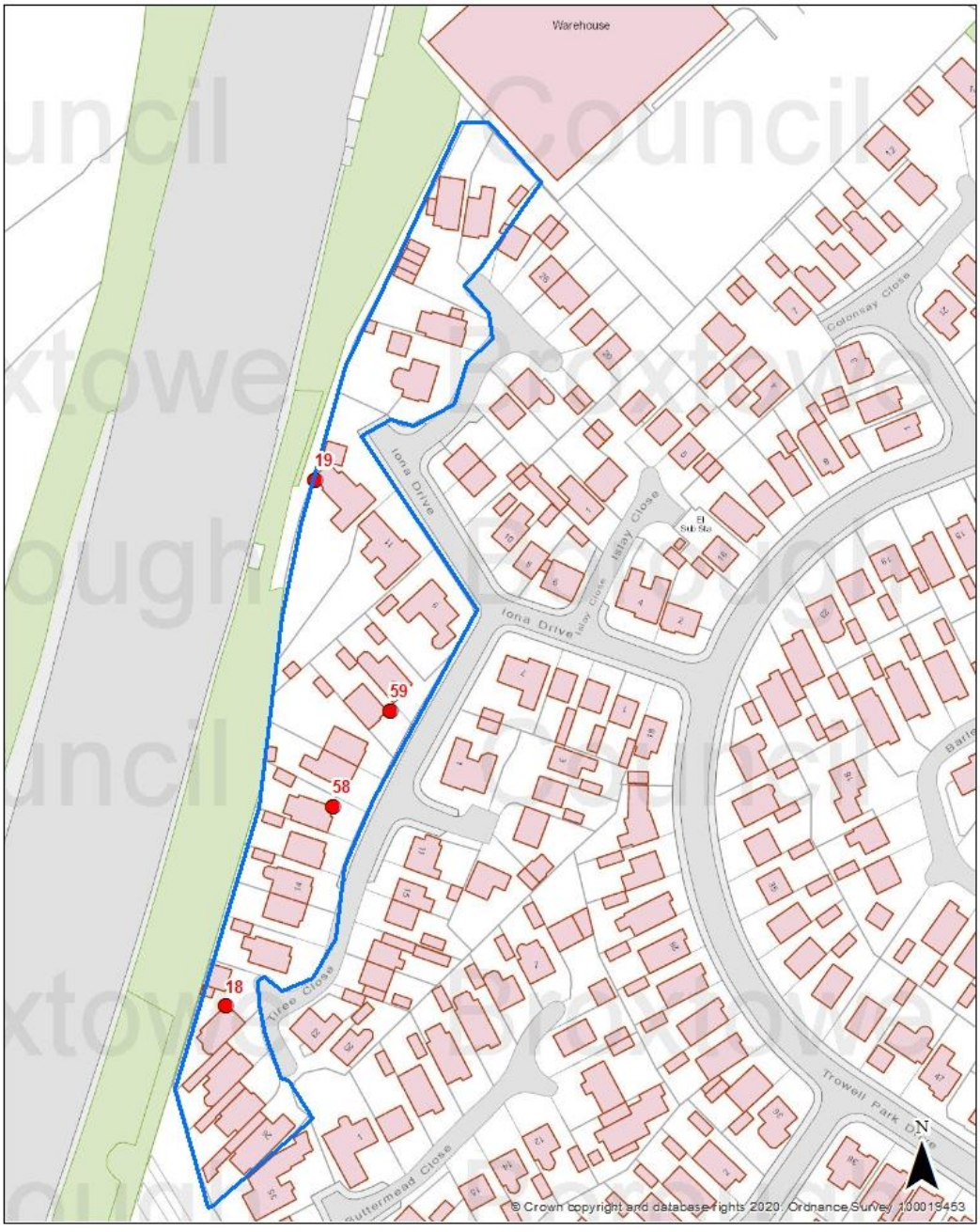


Figure E.1 - AQMA 1 encompassing twenty properties on parts of Iona Drive and Tiree Close next to the M1 motorway and the Trowell Park estate (boundary marked in blue).

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

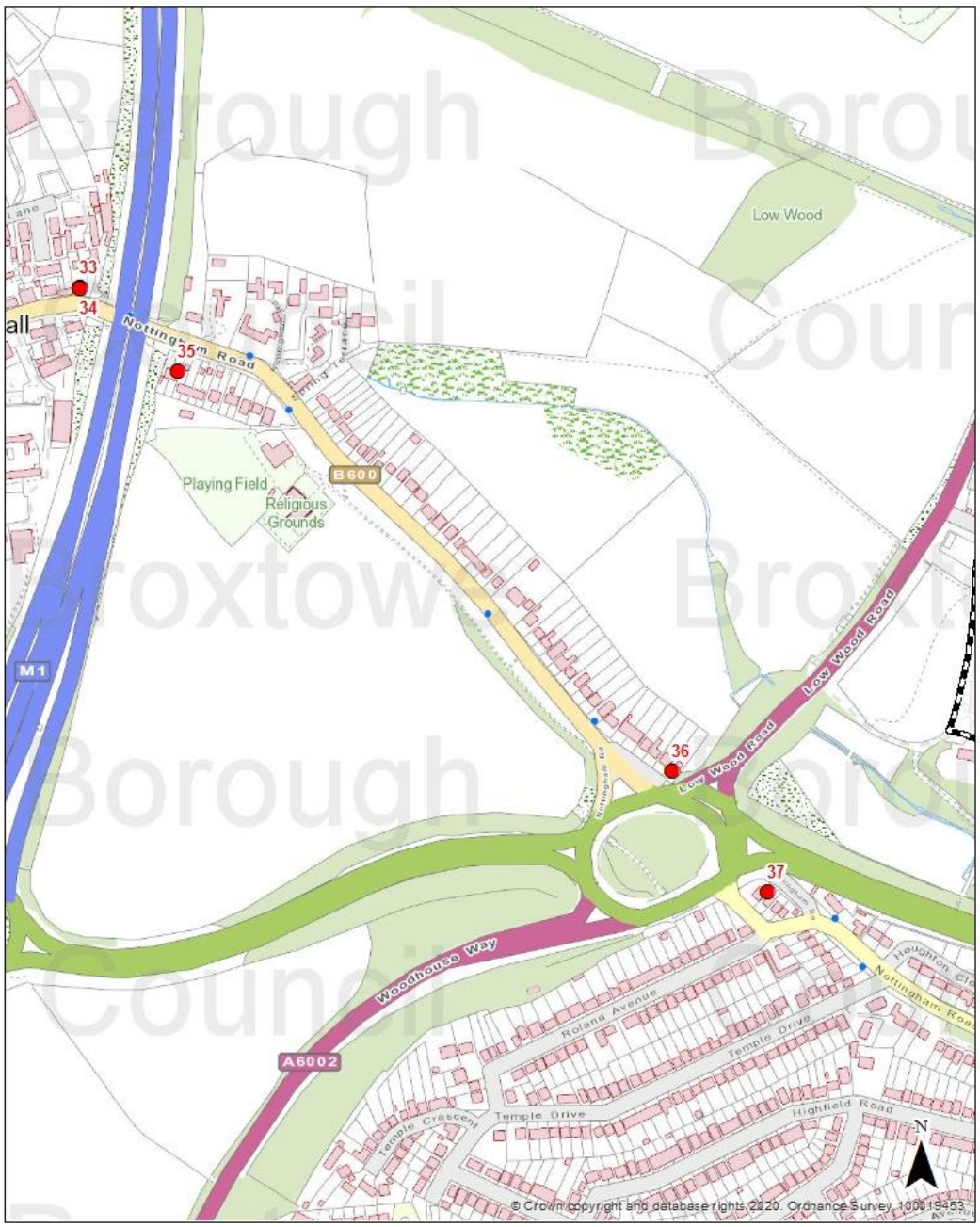


Figure F.1 – Nuthall Island and Diffusion Tube Location.

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

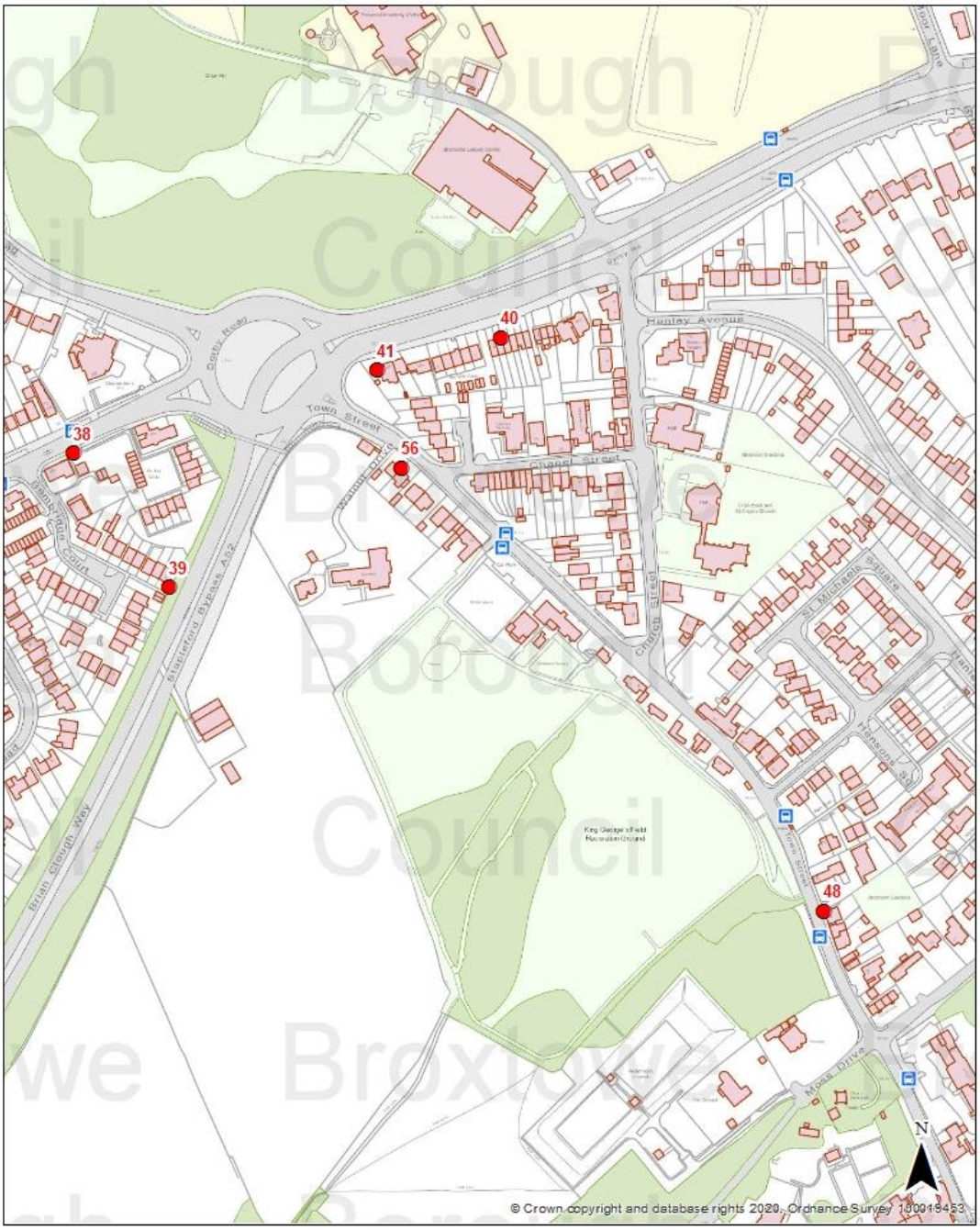


Figure G.1 – Map of Bramcote Island and Town Street Diffusion Tube Location

Appendix H: Map of the Borough showing the 2020 modelled background levels of $PM_{2.5}$.

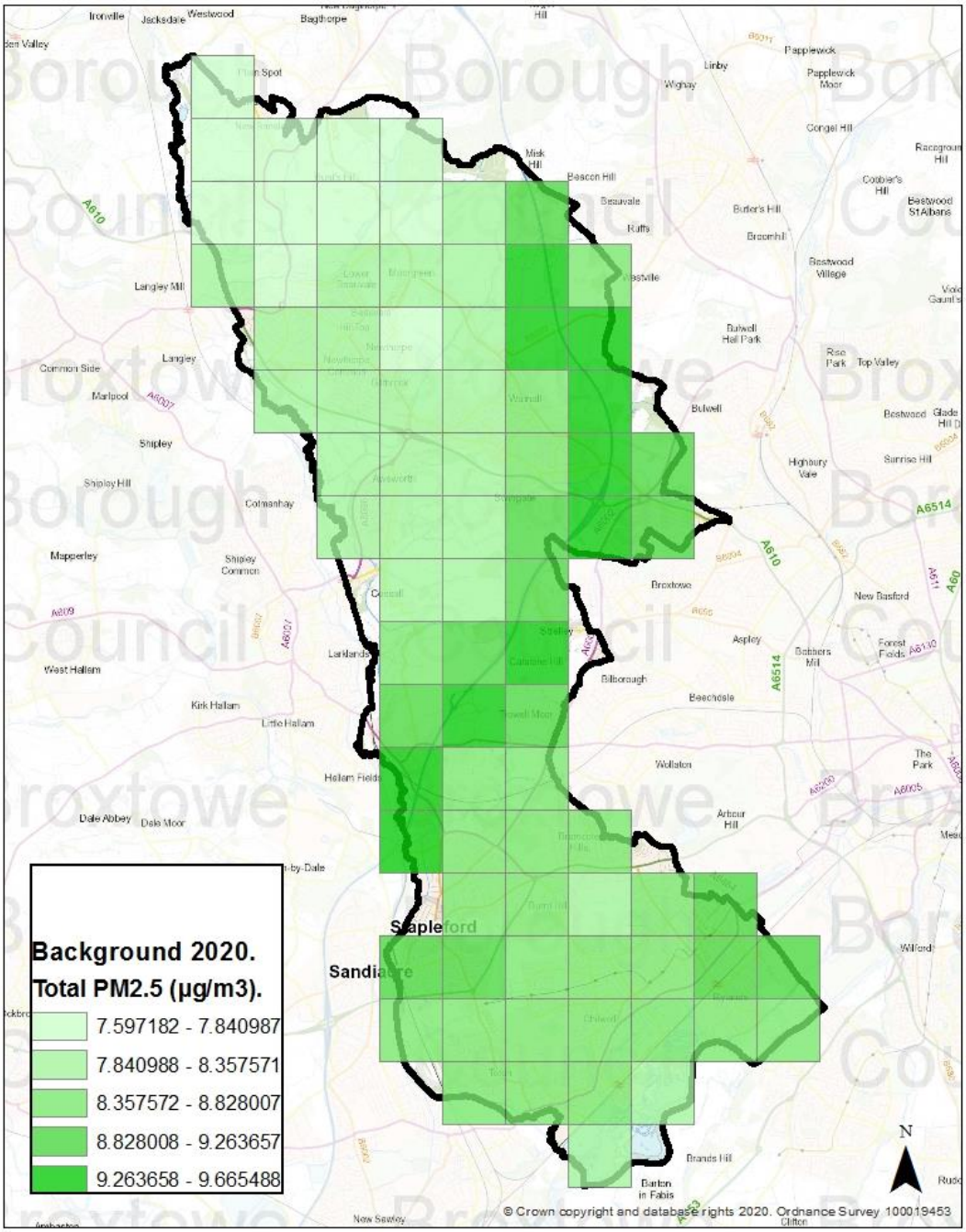


Figure H.1 – Map of the Borough showing the modelled background levels of $PM_{2.5}$.

Appendix I: Summary of Air Quality Objectives in England

Table I.1 – Air Quality Objectives in England[13]

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

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

Appendix J: Impact of COVID-19 upon LAQM

COVID-19 has had a significant impact on society. Inevitably, COVID-19 has also had an impact on the environment, with implications to air quality at local, regional and national scales.

COVID-19 has presented various challenges for Local Authorities with respect to undertaking their statutory LAQM duties in the 2021 reporting year. Recognising this, Defra provided various advice updates throughout 2020 to English authorities, particularly concerning the potential disruption to air quality monitoring programmes, implementation of Air Quality Action Plans (AQAPs) and LAQM statutory reporting requirements. Defra has also issued supplementary guidance for LAQM reporting in 2021 to assist local authorities in preparing their 2021 ASR. Where applicable, this advice has been followed.

Despite the challenges that the pandemic has given rise to, the events of 2020 have also provided Local Authorities with an opportunity to quantify the air quality impacts associated with wide-scale and extreme intervention, most notably in relation to emissions of air pollutants arising from road traffic. The vast majority (>95%) of AQMAs declared within the UK are related to road traffic emissions, where attainment of the annual mean objective for nitrogen dioxide (NO_2) is considered unlikely. On 23rd March 2020, the UK Government released official guidance advising all members of public to stay at home, with work-related travel only permitted when absolutely necessary. During this initial national lockdown (and to a lesser extent other national and regional lockdowns that followed), marked reductions in vehicle traffic were observed; Department for Transport (DfT) data[14] suggests reductions in vehicle traffic of up to 70% were experienced across the UK by mid-April, relative to pre COVID-19 levels.

This reduction in travel in turn gave rise to a change of air pollutant emissions associated with road traffic, i.e. nitrous oxides (NO_x), and exhaust and non-exhaust particulates (PM).

[14] Prime Minister's Office, COVID-19 briefing on the 31st of May 2020

The Air Quality Expert Group (AQEG)[15] has estimated that during the initial lockdown period in 2020, within urbanised areas of the UK reductions in NO_2 annual mean concentrations were between 20 and 30% relative to pre-pandemic levels, which represents an absolute reduction of between 10 to 20µg/m^3 if expressed relative to annual mean averages. During this period, changes in $PM_{2.5}$ concentrations were less marked than those of NO_2. $PM_{2.5}$ concentrations are affected by both local sources and the transport of pollution from wider regions, often from well beyond the UK. Through analysis of AURN monitoring data for 2018-2020, AQEG have detailed that $PM_{2.5}$ concentrations during the initial lockdown period are of the order 2 to 5µg/m^3 lower relative to those that would be expected under business-as-usual conditions.

As restrictions are gradually lifted, the challenge is to understand how these air quality improvements can benefit the long-term health of the population.

Impacts of COVID-19 on Air Quality within Broxtowe Borough Council

Due to COVID-19 and the National Lockdowns there has been a reduction in vehicles on the road and this has been shown in the traffic volumes and a reduction in the monitored NO_2 levels. Below is a summary of the effects that this has had on Air quality within the Borough;

- There is a 24% reduction in NO_2 annual mean concentration for 2020, in comparison to the 2019 data for all of the sites within the borough.
- April 2020 NO_2 concentrations were 35% lower than April 2019 concentrations.
- May 2020 NO_2 concentrations were 29% lower than in May 20019 concentrations.
- June 2020 NO_2 concentrations were 11% lower than in June 2019 concentrations.

[15] Air Quality Expert Group, Estimation of changes in air pollution emissions, concentrations and exposure during the COVID-19 outbreak in the UK, June 2020

- Comparing the average weekday traffic volumes between April and December 2020, with pre Covid-19 pandemic levels (March 2020) there was around a 25% reduction in traffic across Nottinghamshire, with a 26% reduction in Broxtowe. However, recent traffic data indicates that traffic volumes in Broxtowe are now at around 92% of what they were pre pandemic.

- Cycle counters installed across the county show cycling levels on an average day in April to May 2020 (during the Covid-19 pandemic) were up 53% on the previous year (2019). In Broxtowe, there was an average increase of 58%.
  Although the percentage change was less than at the start of the pandemic, cycling levels in September to November 2020 were still higher than the previous year's levels, with a 30% increase in Broxtowe and 41% increase countywide.

Opportunities Presented by COVID-19 upon LAQM within Broxtowe Borough Council

The opportunity to sustain and increase cycling that increased during 2020, which can be directly attributed to the pandemic. Is discussed in greater detail below.

- There is the opportunity to sustain longer term, the increased cycling levels which occurred in 2020 during/following the Covid-19 pandemic. The County Council proposes to fund a scheme in the Beeston using Active Travel Fund Tranche 2 funding (and should this scheme progress to construction a behaviour change programme will be offered alongside it). Similarly, Broxtowe Borough Council has potentially secured funding for the delivery of proposed cycling improvements in Stapleford through its Town Fund allocation (subject to Board approval). Both of these schemes are also still subject to the necessary feasibility, consultation and approval processes.

Challenges and Constraints Imposed by COVID-19 upon LAQM within Broxtowe Borough Council

The challenges and constraints imposed by COVID-19 for Broxtowe Borough Council and Nottinghamshire County Council are shown below, for each challenge and/or constraint, an impact rating has been applied with guidance presented within the LAQM Impact Matrix of Table J.1.

- The supply of NO2 tubes from the laboratory in April 2020 were delayed by a week and therefore the tubes were changed 7 days later, which is not within the dates recommended by the national diffusion tube monitoring calendar. However, the results were time weighted for April and May and all of the other months followed the national calendar. **No Impact**

- During 2020 access to sites 13 and 15, which are located at George Spencer Academy was restricted. Therefore, it was not possible to maintain diffusion tube exposure periods from March till May. This has affected data capture within 2020 for these two sites as there is 75% data capture as opposed to a 100%. However, annualisation was not required **No Impact**

- The implementation of action plan measure 16: Work to retrofit buses was impacted by COVID-19 and there has therefore been a delay in the completion of this. However, it is estimated that the works will be completed in 2021. **Small Impact**

- The implementation of action plan measure 29: 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. **Small Impact**

Table J.1 – Impact Matrix

Category	Impact Rating: None	Impact Rating: Small	Impact Rating: Medium	Impact Rating: High
Automatic Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Automatic Monitoring – QA/QC Regime	Adherence to requirements as defined in LAQM.TG16	Routine calibrations taken place frequently but not to normal regime. Audits undertaken alongside service and maintenance programmes	Routine calibrations taken place infrequently and service and maintenance regimes adhered to. No audit achieved	Routine calibrations not undertaken within extended period (e.g. 3 to 4 months). Interruption to service and maintenance regime and no audit achieved
Passive Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Passive Monitoring – Bias Adjustment Factor	Bias adjustment undertaken as normal	<25% impact on normal number of available bias adjustment colocation studies (2020 vs 2019)	25-50% impact on normal number of available bias adjustment studies (2020 vs 2019)	>50% impact on normal number of available bias adjustment studies (2020 vs 2019) and/or applied bias adjustment factor studies not considered representative of local regime
Passive Monitoring – Adherence to Changeover Dates	Defra diffusion tube exposure calendar adhered to	Tubes left out for two exposure periods	Tubes left out for three exposure periods	Tubes left out for more than three exposure periods
Passive Monitoring – Storage of Tubes	Tubes stored in accordance with laboratory guidance and analysed promptly.	Tubes stored for longer than normal but adhering to laboratory guidance	Tubes unable to be stored according to be laboratory guidance but analysed prior to expiry date	Tubes stored for so long that they were unable to be analysed prior to expiry date. Data unable to be used
AQAP – Measure Implementation	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP
AQAP – New AQAP Development	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP

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
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
HE	Highways England
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
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

References

- COMEAP, Associations of long-term average concentrations of nitrogen dioxide with mortality, 2018. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/734799/COMEAP_NO2_Report.pdf (Accessed June 2021).
- Defra, Abatement cost guidance for valuing changes in air quality, May 2021.
- Defra, *Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006*. Department for Environment Food and Rural Affairs.
- Defra, *Clean Air Strategy, 2019* Department for Environment Food and Rural Affairs, Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/clean-air-strategy-2019.pdf (Accessed 22st May 2021).
- Defra, PHE and LGA, *Air Quality – A Briefing for Directors of Public Health 2017* Department for Environment Food and Rural Affairs, Public Health England and Local Government Association Available at : https://laqm.defra.gov.uk/assets/63091defraairqualityguide9web.pdf (Accessed 17th May 2021).
- Defra, *Environmental equity, air quality, socioeconomic status and respiratory health*, *2010.* Department for Environment Food and Rural Affairs.
- Defra, *Local Air Quality Management Technical Guidance (TG16)*: Department for Environment Food and Rural Affairs: 2016.
- Defra, *Nitrogen Dioxide Fall off with Distance 2018* Department for Environment Food and Rural Affairs, Available at : https://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.htmlm (Accessed 17th May 2021).
- Gowers, A.M. et al *Estimating Local Mortality Burdens associated with Particulate Air Pollution*, Public Health England: 2014.
- Local Air Quality Management Technical Guidance LAQM.TG16. April 2021. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.

- Local Air Quality Management Policy Guidance LAQM.PG16. May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- LTP3, *3rd Local Transport Plan for Nottingham, 2011-2026*: Nottingham County Council: 2011.
- Public Health England, *Public Health Matters: Air pollution – sources, impacts and actions.* Available at: https://publichealthmatters.blog.gov.uk/2018/11/14/health-matters-air-pollution-sources-impacts-and-actions/ (Accessed 21st May 2021).
- 'Public Health England. Public Health Outcomes Framework. [Accessed 28th May 2021] https://fingertips.phe.org.uk/profile/public-health-outcomes-framework © Crown copyright 2020.
- Public Health England, Local Alcohol Profiles for England, 20167 Available at https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data#page/0/gid/1000043/pat/6/par/E12000004/ati/201/are/E06000018 (Accessed 17th May 2021).
- Public Health England, Tobacco Control Profiles 2014-2016 Available at http://fingertipsreports.phe.org.uk/health-profiles/2017/e06000018.pdf (Accessed 17th May 2021).