



**Broxtowe
Borough
COUNCIL**

2023 Air Quality Annual Status Report (ASR) for Broxtowe Borough Council

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

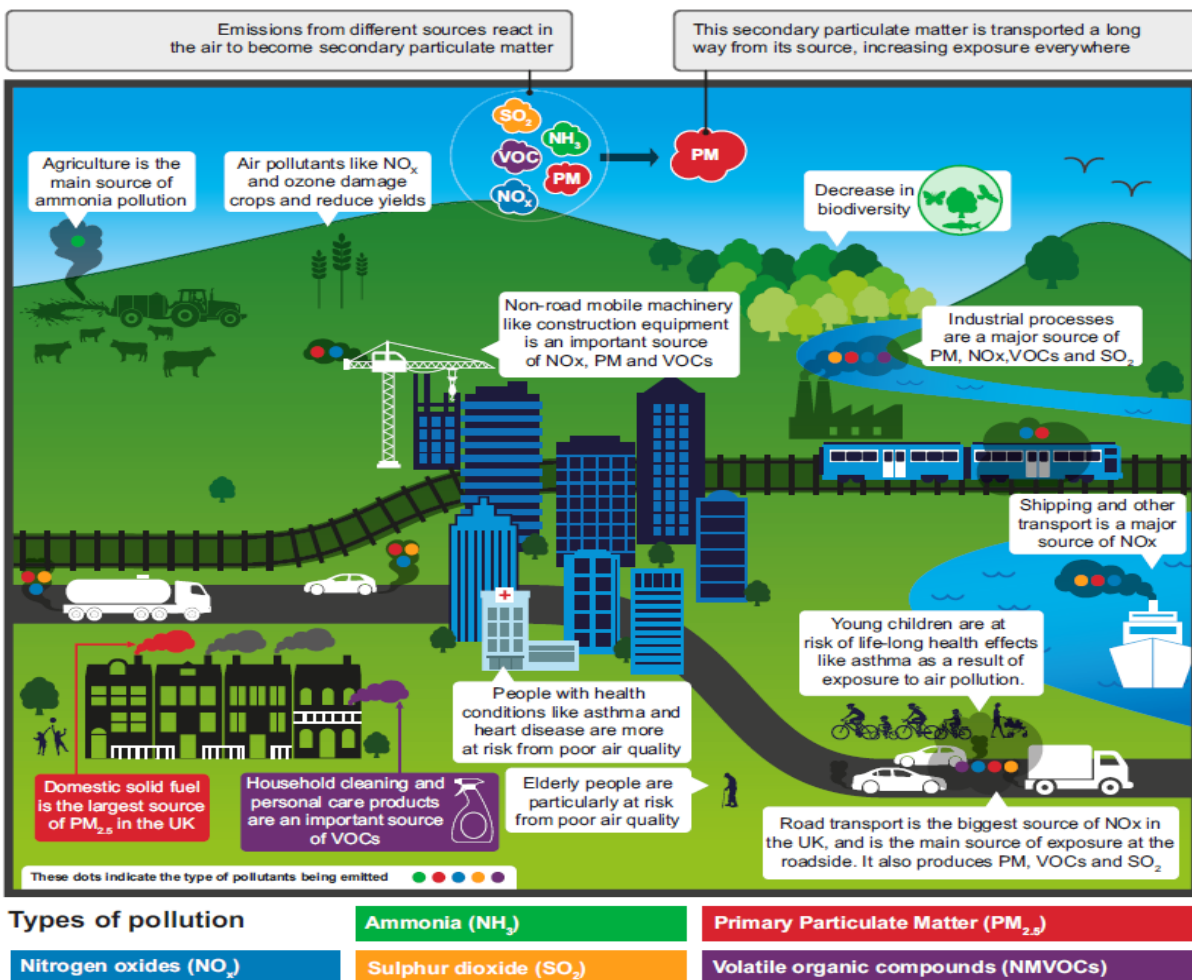
June, 2023

Information	Broxtowe Borough Council Details
Local Authority Officer	Kate Ratcliffe
Department	Environmental Health
Address	Council Offices Foster Avenue Beeston Nottingham NG9 1AB
Telephone	0115 9177777
E-mail	health@broxtowe.gov.uk
Report Reference Number	BBC/AQ/ASR/2023
Date	June 2023

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 (NO₂) and Particulate Matter (PM₁₀ 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 NO₂. Nitrogen Monoxide is a colourless gas with the chemical formula NO. Collectively NO₂ and NO are known as Oxides of Nitrogen and the chemical formula is NO_x.

As mentioned previously NO_x 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 NO_x release NO_x in the form of NO₂ into the atmosphere, these are known as primary sources of NO₂, which are mainly emitted from vehicle exhausts. It was previously believed that it was petrol vehicles that were the main source of NO₂ however the use of diesel particulate filters within the exhaust systems of diesel vehicles have resulted in high concentrations of NO₂ being emitted into the atmosphere.

Another source of NO₂ in the atmosphere is due to a chemical reaction in the atmosphere between NO and Ozone (O₃). This is classed as a secondary source of NO₂. However, if concentrations of O₃ are low near to the source of NO then NO₂ 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' (PM₁₀). The particles are measured in size and referred to as microns (µm). PM₁₀ 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 healthcare cost to the NHS and social care in the UK is estimated to be around £157 million in 2017³.

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 Office for Health Improvement & Disparities . Air Quality: A Briefing for Directors of Public Health, 2017

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

³ Office for Health Improvement & Disparities . Estimation of costs to the NHS and Social Care due to the health impacts of air pollution: summary report, May 2018

Where air pollutants go in our bodies and what they do

A few hours of PM_{2.5} over 35 µg/m³ or NO₂ over 200 µg/m³ irritates the eyes, nose and throat.

PM can cause strokes. Ultrafine PM has been found in samples of brain and central nervous system tissue.

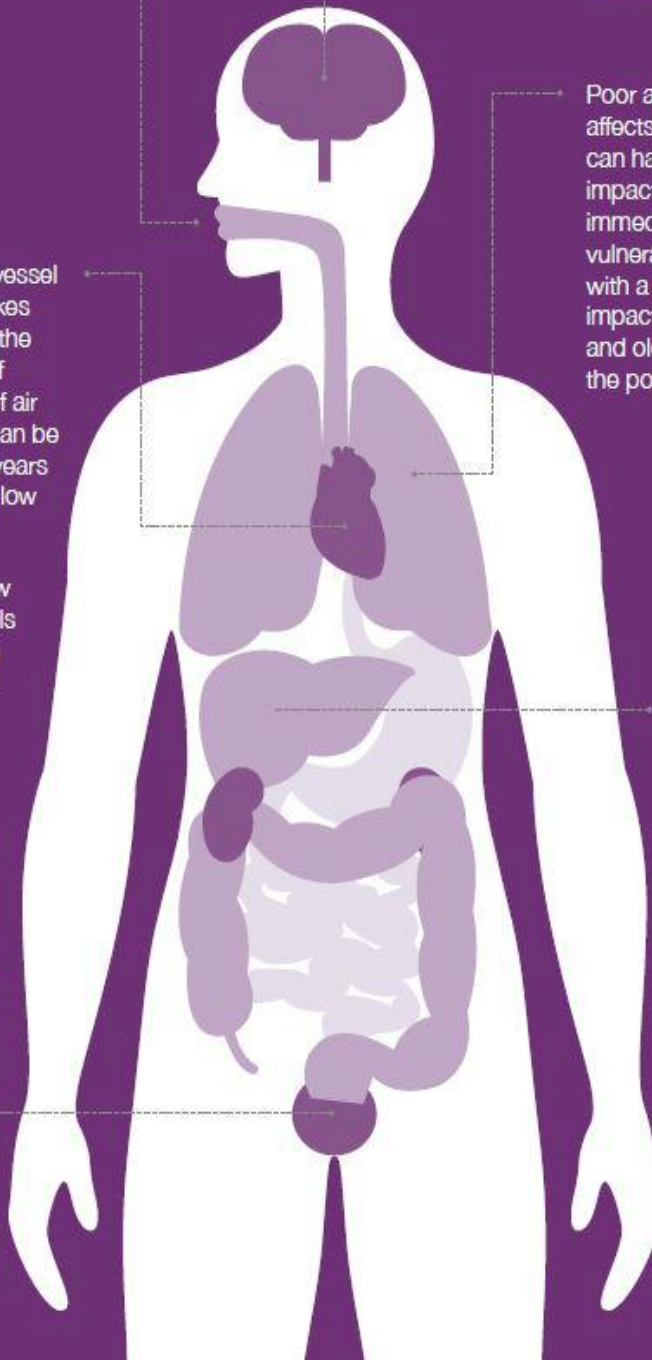
Heart and blood vessel diseases like strokes and hardening of the arteries are one of the main effects of air pollution. These can be caused by a few years exposure to even low levels of PM_{2.5}.

Poor air quality affects everyone. It can have long term impacts on all and immediate effects on vulnerable people, with a disproportionate impact on the young and old, the sick and the poor.

Exposure for a few hours to high levels of PM_{2.5} can bring on existing illness or strokes and heart attacks in ill people.

Ultrafine PM can get into the blood then throughout the body. Ultrafine particles have been found in body organs.

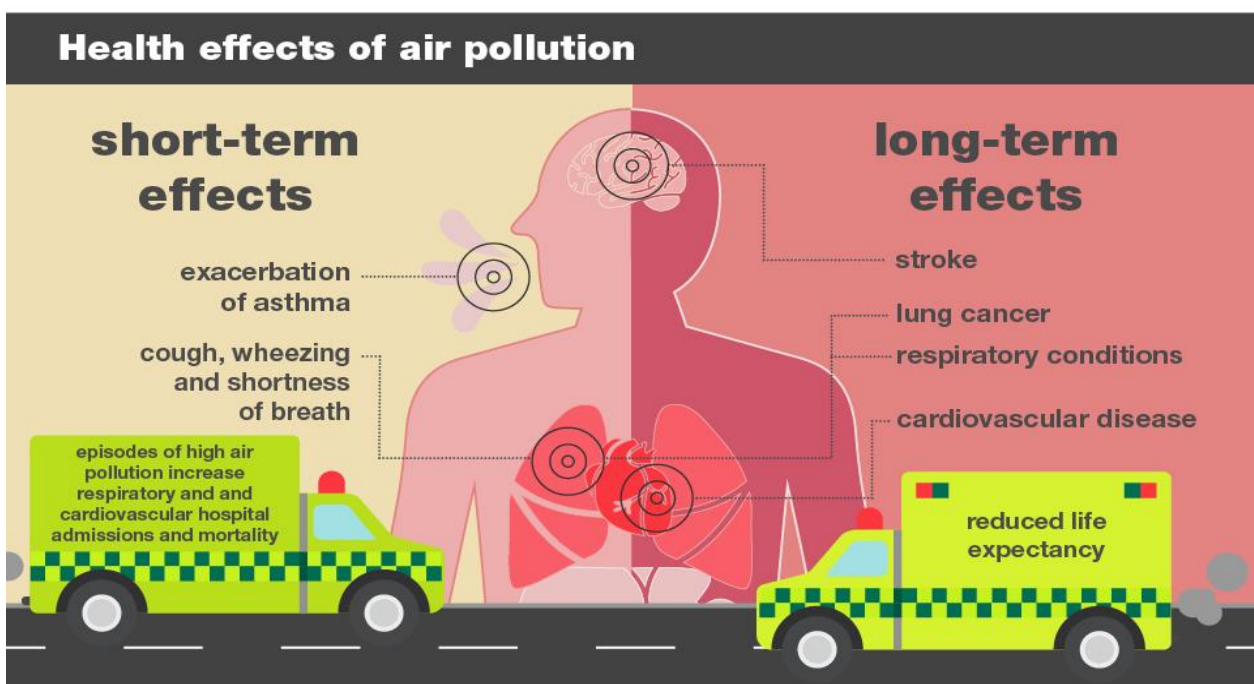
PM has been found in the reproductive organs and in unborn children.



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, Office for Health Improvement & Disparities

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 NO₂ 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 2021 due to NO₂ and Particulate Matter based on 36,000.

Area	Attributable deaths Age 25+ due to NO₂ and PM based on 36,000	Associated Life-years Lost based on 36,000 (COMEAP Aug 18)
East Midlands	3,595	30,878
Nottingham City	202	2,004
Ashfield	101	851
Newark and Sherwood	96	805
Bassetlaw	87	797
Broxtowe Borough Council	89	787
Mansfield	90	764
Gedling	92	807
Rushcliffe	80	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, 89 of these are attributable to NO₂ 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 mortality⁴. Office for Health Improvement & Disparities 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 2021 of human made PM_{2.5} air pollution.

Air Quality in the Borough of Broxtowe

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation with health inequalities issues because areas with poor air quality are also often less affluent areas^{5,6}.

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

⁵ Office for Health Improvement & Disparities . 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 29,000 to 343,000 deaths at typical ages⁷, with a total estimated healthcare cost to the NHS and social care of £157 million in 2017⁸.

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

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

Broxtowe Borough Council participates in the United Kingdom Nitrogen Dioxide diffusion tube network and has 51 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 2022 nitrogen dioxide results show that the air quality levels are below the objective of 40µg/m³ 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.

⁷ Defra. Air quality appraisal: damage cost guidance, January 2023

⁸ Office for Health Improvement & Disparities . Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

In respect of particulates, the modelled background level provided by Defra for the Borough of Broxtowe indicated levels between $7.4\mu\text{g}/\text{m}^3$ and $9.5\mu\text{g}/\text{m}^3$ for 2022, with the annual mean for 2022 being $8.3\mu\text{g}/\text{m}^3$. The World Health Organisation (WHO) guideline level for $\text{PM}_{2.5}$ is $10\mu\text{g}/\text{m}^3$.

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

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

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

Actions to Improve Air Quality

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

The Environmental Improvement Plan⁹ sets out actions that will drive continued improvements of air quality and to meet the new national interim and long-term PM_{2.5} targets. The National Air Quality Strategy, due to be published in 2023, will provide more information on local authorities' responsibilities to work towards these new targets and reduce PM_{2.5} in their areas. The Road to Zero¹⁰ details 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 received 4 electric vehicles in 2022 to replace two older more polluting vehicles.
- **Electric Fleet Vans** – A further four electric fleet vehicles were purchased in 2022 due to satisfactory trials of two electric fleet vans in 2020.
- **To replace Broxtowe Borough Council older combination boilers and system boilers to Seasonal Efficiency of a Domestic Boiler in the UK (SEDBUK) A rated condensing boilers** – in 2022, BBC have replaced a total of 273 domestic boilers. Of these, all were of low efficiency, the others being lifecycle changes.
- **Broxtowe Borough Council Cycle to Work Scheme** – Three employees purchased bikes through this scheme in 2022. Since the scheme started, 180 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

⁹ Defra. Environmental Improvement Plan 2023, January 2023

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

well as marketing materials and campaigns developed in partnership with stakeholders such as passenger transport operators.

- **Electric Vehicle Cable Channels** – The County Council continues to work on developing the EV charging infrastructure network within the county. A report on ‘On-street Electric Vehicle Charging Infrastructure’ was considered at the February 2022 Transport & Environment Committee, and approval was granted for the introduction of an Electric Vehicle Cable Channel pilot scheme.
- **Traffic management improvements** – general traffic management schemes have been introduced in the borough, including signal improvements/upgrades to help improve capacity/traffic flows on the A6005 Queens Road/Station Road, Beeston and A608 Derby Road/Mansfield Road/Nottingham Road, Eastwood.
- **Effective Network Management** – the County Council continues to work with stakeholders to effectively manage its highway network. This includes the co-ordination of works, contingency planning, and effective event and incident planning.
- **Workplace Travel Plans** – Broxtowe Borough Council and Nottinghamshire County Council have completed a Council Travel Plan to help promote sustainable travel amongst staff as part of both their journeys to work and whilst undertaking Council business. Travel Plans are also developed with businesses through the development control process.
- **Local Cycling and Walking Infrastructure Plan (LCWIP)** – The County Council (in partnership with Derby City, Derbyshire County and Nottingham City Councils) undertook public engagement on the D2N2 LCWIP between December 2022 and March 2023. The public engagement focused on cycle corridors only, and not specific schemes. Any future cycle improvement schemes will be subject to funding availability, feasibility consultation, and approvals.

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 2022 Nitrogen Dioxide results show that the air quality levels are below the objective of 40µg/m³ 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 NO₂ 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 NO₂ in the Borough by working with National Highways and Nottinghamshire County Council.
- Continue to be a member of the East Midlands Air Quality Network (EMAQN), to liaise with colleagues in Public Health and other local authorities.
- Continue to promote the final version of the "EMAQN Air Quality and Emissions Mitigation: guidance for developers" document.
- Continue to be a member of the Nottinghamshire Environmental Protection Working Group, and to liaise with colleagues in Public Health and the Health and Wellbeing Boards (Nottingham City and Nottinghamshire County) to ensure that Air Quality continues to be included in the Joint Strategic Needs Assessment for the County and any future work that involves air quality issues.
- Engage with the public about air quality and raise awareness of the health effects of air quality.
- Continue to provide the public, companies and businesses within the Borough with methods that they can use to improve air quality for themselves and also the health of their employees.
- Continue to provide information on green travel e.g. walking, cycling by providing leaflets.
- Continue to support bus companies and taxis that operate within the Borough to reduce emissions.
- Continue to review suitable research methods for reducing air quality levels for both NO₂ and particulate matter.

- Broxtowe Borough Council to continue as an active member in the Air Quality Strategy Task Group.
- Ensure that the new Nottinghamshire Air Quality Strategy is promoted and used once more as a valuable working document.
- Review the measures in Broxtowe Borough Council's Air Quality Action Plan and to continue to report on them in the next ASR as well as all the measures that are being implemented in the Borough to reduce air pollution levels.

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

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

BBC purchased a Zephyr real time monitor in late 2021, which was installed in 2022 to monitor PM₁₀, PM_{2.5} and NO₂ in the Trowell AQMA. There were a variety of issues with the monitor throughout 2022, and as a result BBC feel that the data was not reliable enough to report on. Therefore, to determine the PM₁₀ and PM_{2.5} concentrations in 2022, 'modelled' figures are obtained from Defra and are discussed in greater detail in Section 2.3 of this report. The issues with the Zephyr were rectified and the 2023 data will be reported on in the 2024 ASR.

Local Engagement

Since the 2022 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 the Office for Health Improvement & Disparities (OHID). EMAQN has collectively produced a report to assist local authorities and developers when determining whether an air quality assessment is needed during the planning application process. The aim of EMAQN is to engage decision makers from different disciplines to assist in reducing AQ levels as a whole in the East Midlands. This also enables neighbouring counties to communicate more openly, which is vital for Broxtowe Borough Council due to it being next to Derbyshire because the A52 is a major source of air pollution, which runs through Derbyshire and Nottinghamshire.

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

Broxtowe Borough Council was selected in 2018 to be in the Air Quality Task and Finish Group, which was set up to update the Nottinghamshire Air Quality Strategy (NAQS). The draft NAQS was approved at the Nottinghamshire County and City Health & Wellbeing Boards in 2019 and the finished format of the NAQS has been endorsed by the portfolio holders and is now published online. Improving Air Quality is now a priority of the 2022-2026 Nottinghamshire Joint Health and Wellbeing Strategy as part of the Ambition to develop Healthy and Sustainable Places.

How to get Involved

Residents and businesses living or working in Nottinghamshire can improve the air quality in the area by taking simple measures. One of the main changes that can be made is to

use sustainable travel more and reduce dependency on the car when possible. Below are some of the actions that people can take, and particularly for short journeys.

- Travel Choice – Nottinghamshire County Council’s Travel Choice webpages provide information and advice on the different ways to travel around Nottinghamshire, whether that’s walking, cycling, public transport or car sharing. Residents, jobseekers, businesses and employees can find travel information and advice for the county (including bus and cycle maps, leisure ‘Routes and Rides’ and a journey planner) at [Travel Choice](#)
- School Travel Toolkit – Aimed at school leaders, teachers, parents/carers, children, and those living near to our schools, the Nottinghamshire School Travel Planning Toolkit provides information and advice on improving travel to and from Nottinghamshire’s schools, including the sustainable and active travel modes available. The toolkit can be found at [School Travel Toolkit](#)
- Public transport – To use all means of public transport whenever possible e.g. trams, buses and trains. In addition to printed materials, an integrated public transport planning tool detailing local bus, rail and tram networks, as well as for trips further afield can be found at [Travel Choice Journey Planner](#) and [Traveline](#). Details on travelling on school buses to Nottinghamshire schools and assistance available to do so, can be found at [Travel to Schools](#). The tram timetable is available at [Tram Timetable](#).
- Car share – The Nottinghamshire car share scheme, ‘*nottinghamshare*’, is available to anyone [Car Share Scheme](#) but all businesses can produce their own.
- Park and Ride – There are a variety of Park and Ride sites within Nottinghamshire, which serve the Nottingham Tram and buses. Information for these Park and Ride sites which includes maps of their locations are found at [Park and Ride](#)

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

Walking -

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

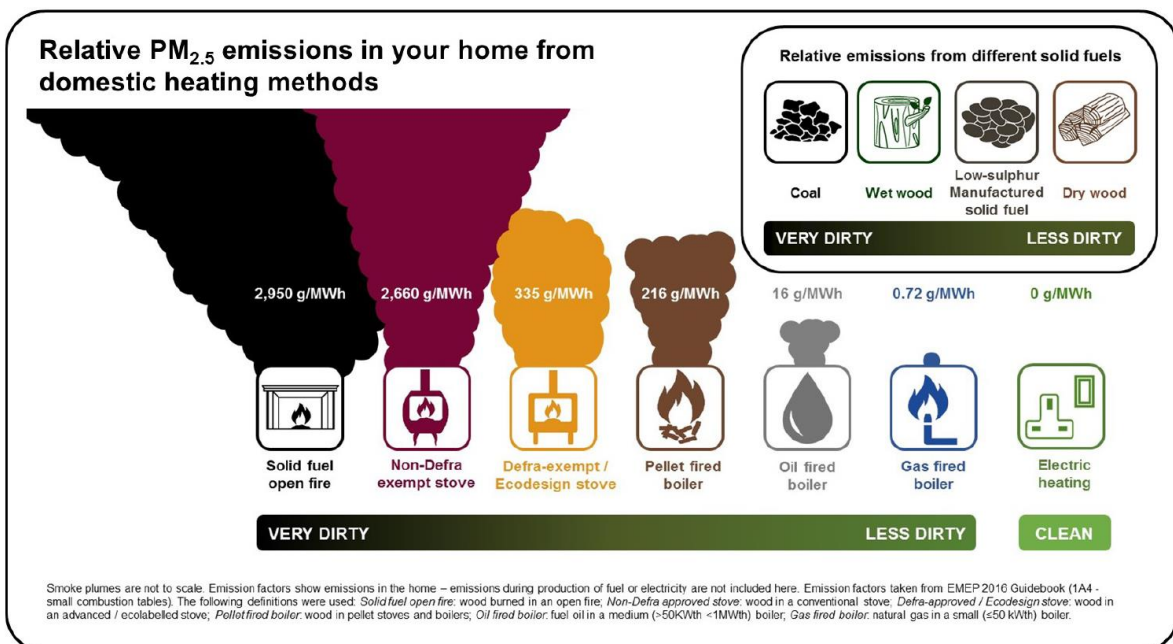
Cycling –

Use the extensive cycle routes that are available throughout Nottinghamshire. Maps and cycling journey planners that cover Nottinghamshire, including Broxtowe are available on the [Travel Choice](#) website and at [Cycling Rights of Way in Nottinghamshire](#). Maps of just the city cycle routes for Nottingham are available at [Cycle Maps for Nottingham](#). Sustrans is a charity that promotes sustainable travel and further information can be found at [Sustrans](#)

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

- Driving- When you have to drive you can still help to improve air quality by;
 - Make sure that your car is at its most efficient and think about how you drive, this will also save you money. Tips on how to save money on fuel and reduce your emissions are available at [Driving Advice from Energy Saving Trust](#).

- If you are thinking about changing your car consider buying a low-emission vehicle, you can get more information on these vehicles and the support available at [Electric vehicle charging in and around Nottinghamshire](#)
- Bonfires – To not have bonfires at all and to compost all garden waste and recycle rubbish rather than burn it.
- Heating your home –
 - Smoke Control Area – Large parts of Nottinghamshire are smoke control areas; therefore, you cannot emit smoke from a chimney unless you are burning an authorised fuel or using an exempt appliance e.g. some burners or stoves. Further information on suitable fuels and exempt appliances can be found at [Smoke Control Information from Defra](#) All appliances must be kept in good working order to ensure that they are working efficiently and it is advised that you contact your Local Council to determine whether you are in a smoke control area or not.
 - House Boilers – Ensure that boilers are serviced regularly and kept in good working order. If a boiler needs replacing, then purchase one that has a low NOx emission rating





Source – Clean Air Strategy 2019, DEFRA [Clean Air Strategy, Defra 2019](#)

Local Responsibilities and Commitment

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

- ❖ Suzanne Hickey, Chief Environmental Health Officer - BBC Public Protection Department.
- ❖ Steven Mills, Environmental Health Technical Officer - BBC Public Protection Department.
- ❖ Dave Lawson, Planning Policy Team Leader - BBC Planning Policy Department.
- ❖ Derek Musto, Parking Manager - BBC Parking Services Department.
- ❖ John Miley, Licensing Manager - BBC Licensing Team.
- ❖ David Howkins, Capital Works Manager – BBC Capital Works Department.
- ❖ Paul Wolverson, Head of Environmental Services – BBC Executive Director Department (Environment Division)
- ❖ Chris Alldread, Transport and Stores Manager - BBC Transport and Stores Department.
- ❖ Nick Hawkes, Asset Manager – BBC Asset Management and Development Department.
- ❖ Hugh Turrell, Environmental Development Officer - BBC Parks and Open Spaces
- ❖ Stephen Grimes, Project Manager – BBC Asset Management and Development Department.
- ❖ Sam Comerie, Regeneration Projects Manager – BBC Economic Development Planning Department
- ❖ Sean Parks, Team Manager – Nottinghamshire County Council Local Transport Plans & Programme Development Place Department.
- ❖ Ellie Jaycock, Senior Local Transport Plan Officer - Nottinghamshire County Council Local Transport Plans & Programme Development Place Department.
- ❖ John Wilcox, Senior Public Health & Commissioning Manager, Public Health, Nottinghamshire County Council.
- ❖ Councillor Helen E Skinner, Chair of the Environment and Climate Change Committee, Broxtowe Borough Council.

This ASR has been approved and signed off by:

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

If you have any comments on this ASR, please send them to Kate Ratcliffe at:

Broxtowe Borough Council,
Council Offices,
Foster Avenue,
Beeston,
Nottingham,
NG9 1AB.
Telephone: 0115 917 7777
Email at: health@broxtowe.gov.uk

Table of Contents

Executive Summary: Air Quality in Our Area	i
What is Air Pollution and where does it come from?	i
What is Nitrogen Dioxide?	ii
What is Particulate Matter?	ii
What are the Health Effects of Poor Air Quality?	iv
Health Effects of Nitrogen Dioxide	vi
Health Effects of Particulate Matter	viii
Air Quality in the Borough of Broxtowe	viii
Actions to Improve Air Quality	x
Conclusions and Priorities	xii
Local Engagement	xv
How to get Involved	xv
Local Responsibilities and Commitment	xix
1 Local Air Quality Management	4
2 Actions to Improve Air Quality	5
2.1 Air Quality Management Areas	5
2.2 Progress and Impact of Measures to address Air Quality in Broxtowe Borough Council ...	7
2.3 PM _{2.5} – Local Authority Approach to Reducing Emissions and/or Concentrations	42
2.4 Update on the 2008 Air Quality Action Plan	46
2.4.1 The history of Broxtowe Borough Council’s Air Quality Acton Plan.	46
2.4.2 Limitations to the Air Quality Action Plan.....	46
2.4.3 Update on the four AQMAs.....	47
2.4.4 The NO ₂ Annual Mean Concentrations for the remaining AQMA.	47
2.4.5 SMART Motorway Scheme	49
2.4.6 Defra’s recommendations for Broxtowe Borough Council.	50
2.4.7 Agreed Methodology for not producing a new AQAP.....	51
3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance	53
3.1 Summary of Monitoring Undertaken	53
3.1.1 Automatic Monitoring Sites	53
3.1.2 Non-Automatic Monitoring Sites	53
3.2 Individual Pollutants.....	53
3.2.1 Nitrogen Dioxide (NO ₂)	54
3.2.2 Particulate Matter (PM ₁₀)	63
3.2.3 Particulate Matter (PM _{2.5}).....	63
3.2.4 Sulphur Dioxide (SO ₂).....	63
Appendix A: Monitoring Results	64
Appendix B: Full Monthly Diffusion Tube Results for 2022	87

Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC	90
.....	
New or Changed Sources Identified Within Broxtowe Borough Council During 2022	90
Additional Air Quality Works Undertaken by Broxtowe Borough Council During 2022	90
QA/QC of Diffusion Tube Monitoring	90
Diffusion Tube Annualisation	90
Diffusion Tube Bias Adjustment Factors	90
NO ₂ Fall-off with Distance from the Road.....	91
Appendix D: Map of all Monitoring Locations within the Borough of Broxtowe.....	92
Appendix E: Map of AQMA in Trowell.....	93
Appendix F: Map of A610/B600 Nuthall Island showing the Monitoring Locations...94	
Appendix G: Map of Bramcote Island, Derby Road and Town Street showing the Monitoring Locations.	95
Appendix H: Map of the Borough showing the 2022 modelled background levels of PM_{2.5}.	96
Appendix I: Summary of Air Quality Objectives in England	97
Glossary of Terms	98
References	101

Figures

Figure A.1 – Trends in Annual Mean NO ₂ Concentrations for all sites since 2017 to 2022.....	80
Figure A.2 – Trends in Annual Mean NO ₂ Concentrations for the AQMA since 2012 to 2022.....	86
Figure D.1 – 2022 Diffusion Tube Locations.....	92
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).....	93
Figure F.1 – Nuthall Island and Diffusion Tube Location.....	94
Figure G.1 – Map of Bramcote Island and Town Street Diffusion Tube Location.....	95
Figure H.1 – Map of the Borough showing the 2022 modelled background levels of PM _{2.5}	96

Tables

Table 2.1 – Declared Air Quality Management Areas	6
Table 2.2 – Progress on Measures to Improve Air Quality.....	13
Table 2.3 – Estimated Effects of Annual Mortality in 2019 of human-made PM2.5 Air Pollution.....	43
Table 2.4 – The four AQMAs in the Borough.....	47
Table 2.4.1 – Results for AQMA in Trowell 2012 – 2022.....	48
Table 2.4.2 – SMART Motorway Scheme on the M1 between Junctions 23a – 35a.....	40
Table 3.1 – Results for the Revoked AQMA in Nuthall 2013 – 2022.....	54
Table 3.2 – Results for AQMA in Trowell 2013 – 2022.....	55
Table 3.3 – Results for Nuthall Island 2013 – 2022.....	57
Table 3.4 – Results for Bramcote Island 2013 – 2022.....	58
Table 3.5 – Results for Town Street 2017 – 2022.....	59
Table 3.6 – Results for George Spencer Academy, Stapleford 2016 –2022.....	62
Table 3.7 – Results for 12 Ilkeston Road, Stapleford 2016 – 2022.....	62
Table A.1 – Details of Non-Automatic Monitoring Sites.....	64
Table A.2 – Annual Mean NO ₂ Monitoring Results: Non-Automatic Monitoring (µg/m ³).....	75
Table B.1 – NO ₂ 2020 Diffusion Tube Results (µg/m ³).....	87
Table C.1 – Bias Adjustment Factor	91
Table I.1 – Air Quality Objectives in England.....	97

1 Local Air Quality Management

This report provides an overview of air quality in Broxtowe Borough Council during 2022. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995), as amended by the Environment Act (2021), 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 order to achieve and maintain the objectives and the dates by which each measure will be carried out. 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 (AQMA) 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 18 months. The AQAP should specify how air quality targets will be achieved and maintained, and provide dates by which measures will be carried out.

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 NO₂ annual mean of 40µg/m³. [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. Although, BBC will be revoking this remaining AQMA in 2023/2024, it will continue to monitor NO₂ levels in this area and work alongside National Highways to improve air quality levels, the Council will continue to review and implement measures stated within Table 2.2 of this and future ASR's .

Further information related to declared, or revoked AQMAs, including maps of AQMA boundaries, are available online at Broxtowe Borough Councils Air Quality Webpage, or reviewed in this report.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by National Highways?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
AQMA 1 Trowell	Declared 1 st 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	21.5µg/m ³ *	7	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 seven monitoring tubes located with the AQMA.

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

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

- ❖ *The executive summary provides additional information about NO₂ and particulate matter, as well as the health impacts of both. This is a welcome addition – **BBC will continue to do this.***
- ❖ *The “how to get involved” section of the executive summary provides numerous suggestions. Along with the additional information provided about pollutants, this is useful for informing the general public – **BBC will continue to do this.***
- ❖ *The trends observed in the data reported in this ASR are discussed for the AQMA, former AQMAs, individual tubes and small areas. This provides significant detail about the air quality in the borough and is appreciated. The colour scales used for the figures within this section could be changed as it is difficult to distinguish the shades when data is not available for all years, especially in Figure A.2 due to the number of shades used – **BBC has changed the colours in this report.***
- ❖ *The report is descriptive and informative throughout with each section providing a significant amount of detail, this is appreciated and encouraged to continue in future ASRs. In particular, the measures to manage PM_{2.5} by the Council and individuals, discussion about the Trowell AQMA and why it exists as well as clear criteria that would allow this AQMA to be revoked, the key priorities for the next reporting year and the measures completed in this reporting year – **BBC will continue to do this.***
- ❖ *This report is an example of good practice due to the required information and significant detail provided throughout – **BBC will continue to produce reports of this standard.***

Broxtowe Borough Council has taken forward a number of direct measures during the current reporting year of 2022 in pursuit of improving local air quality. Details of all measures completed, in progress, or planned are set out in Table 2.2. Ninety-eight 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 2022 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

More detail on these measures can be found in their respective Action Plans BBC Air Quality Action Plan, BBC Improving the Air We Breathe Action Plan, BBC Local Plan 2018 – 2028, The Nottinghamshire Local Transport Plan 2011 -2026 (and its Implementation Plans), Nottinghamshire County Council’s Environment Strategy and Action Plan 2020 and National Highways Reports (post opening project evaluation reports for the M1 Junction 25 to 28 widening and the A52 West of Nottingham Corridor Improvements).

Key completed and on-going measures are:

- ❖ Low Emission Fleet Vehicles – Broxtowe Borough Council received 4 electric vehicles in 2022 to replace two older more polluting vehicles.
- ❖ Electric Fleet Vans – A further four electric fleet vehicles were purchased in 2022 due to satisfactory trials of two electric fleet vans in 2020.
- ❖ Electric Vehicle Fleet Procurement for small vans below 2 tonnes - All 9 vehicles (small vans) have now been replaced with Electric Vehicles.
- ❖ To replace Broxtowe Borough Council older combination boilers and system boilers to Seasonal Efficiency of a Domestic Boiler in the UK (SEDBUK) A rated condensing boilers – in 2022, BBC have replaced a total of 273 domestic boilers. Of these, all were of low efficiency, the others being lifecycle changes Trial of New Heating Technology- A trial was undertaken for fitting air source heat pumps in 7 new builds in 2021. The success of this will be reported on.
- ❖ To investigate and consider new heating technologies that are more efficient, effective and produce lower emissions - A trial was undertaken for fitting air source heat pumps in 7 new builds in 2021 and in 5 new builds in 2022.
- ❖ To investigate and consider suitable alternative replacements for the remaining electrically heated Council properties - High heat retention units were being fitted as replacements in 2022 and this will be continuing in future years

- ❖ To raise awareness of anti-idling legislation with taxis – All taxi drivers that operate within the borough were notified of anti-idling legislation and the associated health affects in 2022.
- ❖ To take on the provision of the cycle store at Beeston's Railway Station - Due to the risk of closure, the Council have taken over the provision of the cycle store at Beeston Railway station in 2022, to ensure that it is still available for the public to use.
- ❖ Cycle Repair Workshops - A Bicycle Repair Workshops undertaken by RideWise was installed in Nov 2022 at Ilkeston Road Recreational Ground, where training can be provided, bikes can be donated and repairs to bikes can be made. To date 350 bikes have been made roadworthy.
- ❖ Broxtowe Borough Council Cycle to Work Scheme – Three employees purchased bikes through this scheme in 2022. Since the scheme started, 180 employees have purchased bikes through the scheme.
- ❖ To consult all tenants on one allotment site in the borough about a total ban on bonfires on allotment sites as a means of disposing of green waste - A questionnaire was sent to all allotment holders at one allotment site re waste and the results were varied. 118 questionnaires were sent, 57 were returned. 14 supported a ban 41 said No, 2 didn't answer.
- ❖ 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.
- ❖ Electric Vehicle Cable Channels – The County Council continues to work on developing the EV charging infrastructure network within the county. A report on 'On-street Electric Vehicle Charging Infrastructure' was considered at the February 2022 Transport & Environment Committee, and approval was granted for the introduction of an Electric Vehicle Cable Channel pilot scheme.
- ❖ Local Cycling and Walking Infrastructure Plan (LCWIP) – The County Council (in partnership with Derby City, Derbyshire County and Nottingham City Councils)

undertook public engagement on the D2N2 LCWIP between December 2022 and March 2023. The public engagement focused on cycle corridors only, and not specific schemes. Any future cycle improvement schemes will be subject to funding availability, feasibility consultation, and approvals.

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

- ★ 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 2023.
- ★ Investigation into whether it is feasible for free parking in the borough car parks for Electric and Hybrid vehicles - To be taken to BBC's Committee in 2023/2024 for consideration.
- ★ To develop a plan for future infrastructures to support growth in BBC's Electric Fleet and the domestic use of Electric Vehicles - A review has estimated that the cost is in the region on 12.4 million for a complete decarbonisation and infrastructure modification to the Kimberley Depot. A report is currently being written and the proposal will be submitted to BBC Committee in 2023/2024
- ★ Investigate ways to decarbonise BBC's fleet through alternative fuels - Report submitted to Cabinet in 2022 which was approved by Members to use of Hydrotreated Vegetable Oil (HVO) instead of Diesel Engine Road Vehicle (DERV) for vehicles which are compatible. Unfortunately, the price of HVO increased significantly above the budgeted level. A further report will be submitted to Cabinet in July 2023 for Members to make a decision on whether to transition to HVO.
- ★ To install a cycle track on the Ilkeston Road Recreational Ground in Stapleford - Funds have been sourced through the Stapleford Towns Deal to improve and encourage cycling within Stapleford. A new cycle track will be installed on the Ilkeston Road Recreational Ground in Stapleford in 2023.
- ★ To install a Cycling proficiency track to assist children/adults when learning to ride bikes - Funds have been sourced through the Stapleford Towns Deal to encourage cycling within Stapleford. A new cycle proficiency track will be installed on the Ilkeston Road Recreational Ground in Stapleford in 2023.

- ★ To install bicycle parking stands at the Ilkeston Road Recreational Ground in Stapleford – Funds have been sourced through the Stapleford Towns Deal to encourage cycling within Stapleford. Nine new bicycle parking stands will be installed on the Ilkeston Road Recreational Ground in Stapleford in 2023.

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
- 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 Stapleford Town Deal cycling improvements.

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:

- Cycling Networks – cycling improvements are developed and delivered as part of the annual integrated transport programme but due to the high cost of delivering such scheme, they are dependent on securing external funding.

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.

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 NO ₂ and PM	Increased passenger transport patronage	<ul style="list-style-type: none"> NET Phase 2 (with route through Broxtowe) opened 2015 2021-2022, there were 9,098,138 passengers using the tram, which was a percentage increase of 167.6% in comparison to the previous year, and the figures for 2022/23 so far are 13,467,235 passengers using the tram With the current HS2 station proposed to be at East Midlands Parkway and not Toton the opportunity and justification for any tram extension to Toton is now less clear and unlikely in the short term. 	Passenger numbers are still less than the year before the pandemic, but significantly more than the 2.9m in 2020-21.
2	Car sharing scheme	Alternatives to private vehicle use	Car & lift sharing schemes	Early 2000s	Ongoing	NCC	Local Authority	No	Funded	<£10k annually	Implemented	Reduction in NO ₂ and PM	Restrain average journey times in the morning peak to a 1% increase per year	<ul style="list-style-type: none"> 3,250 Nottinghamshare members countywide Covid-19 pandemic has impacted on peoples travel to work patterns/behaviour, which has impacted on car sharing requirements. 	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 NO ₂ and PM	Restrain average journey times in the morning peak to a 1% increase per year A reduction in staff business emissions and cost, through both a car club and a wider review of staff travel habits.	<ul style="list-style-type: none"> Nottm city scheme introduced in 2014 Provider reviewed in 2018. Expansion of scheme into county dependent on its success which is still unclear Work has been undertaken to look at the feasibility of a partnership with a Car Club operator in the county, for both residents and internal use (i.e. staff travel). This will feed into a wider fleet review and review of 	Dependent on the determination of business case and commercial operator coming forward Barriers include financial risk, organisational culture (i.e. using personal cars less) and specific service needs

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation	
															staff business travel, with a few more aspects to be expanded upon. <ul style="list-style-type: none"> Funding for implementation to be determined, Scheme is dependent on the determination of business case and commercial operator coming forward 	
4	Nottingham Go-Ultra Low programme - introduction of area wide EV charging network	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2016	2020	NCiC/NCC/BBC	OLEV funding	No	Funded	£1 Million-£10 Million	Completed	Reduction in NO ₂ and PM due to increased use of low emission vehicles.	On-going take-up of cleaner vehicles	<ul style="list-style-type: none"> £6.1m funding secured for 2016-2020 through the Go Ultra Low programme 123 locations in the county have been investigated for the potential provision of EV charge points as part of GUL project - 24 in Broxtowe; of which five were currently feasible; providing one rapid and 20 fast charge points within car parks in four towns within the borough (Beeston, Eastwood, Kimberley and Stapleford). A total of 68 chargers across 22 sites in Nottinghamshire were installed during 2019-20 as part of the GUL programme. This include 21 chargers in Broxtowe. 	Complete	
5	Nottingham Go-Ultra Low programme - promoting uptake of LEVs	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2016	2020	NCiC/NCC	OLEV funding	No	Funded	£1 Million-£10 Million	Completed	Reduction in pollutants and emissions due to increased use of low emission vehicles.	On-going take-up of cleaner vehicles	<ul style="list-style-type: none"> £6.1m funding secured for 2016-2020 through the Go Ultra Low programme. Promotion events held for public, businesses and fleet operators including loans of LEVs for trial use in 2018 and 2019 Funding ended in 2021 	Complete	
6	Nottinghamshire on-street EV charging pilot scheme - electric vehicle	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low	2022	2023	NCC / Via EM Ltd	Privately funded by resident and OZEV LEVI Pilot Funding	No	Privately funded by resident and OZEV	Funded	Planning	Reduction in pollutants and emissions due to	Number of EVCC installed and back-office	<ul style="list-style-type: none"> County Council approved the trialling of on-street EV charging cable channels at 	The County Council trial is in progress	

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
	cable channels (EVCC)		Emission Vehicles, EV recharging, Gas fuel recharging						LEVI Pilot Funding			increased use of low emission vehicles.	data from EV charge point	Transport & Environment Committee in February 2022. • All delivery processes, design specifications, and internal approvals have been finalised.	
7	Nottinghamshire EV charging infrastructure (potentially on and off street)	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2023	2026	NCC / districts	OZEV funding (LEVI)	No	Funded - LEVI revenue funding secured for EV infrastructure programme development and NCC are currently developing a bid for future LEVI capital funding allocations	Costs to be determined	planning	Reduction in pollutants and emissions due to increased use of low emission vehicles.	Number of EV charging installed and back-office data from EV charge point	<ul style="list-style-type: none"> The County Council is working to determine the Council's long term on-street EV strategy NCC is developing a bid in partnership with the district councils for LEVI capital funding for EV infrastructure. 	Measure is reliant on a successful LEVI bid
8	Joint Strategic Needs Assessment	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2017	2020	NCC/NCiC/Borough and District councils	LA	No	Funded	N/A	Completed	Reduced Emissions from raising awareness	Raising awareness and reduced emissions	<ul style="list-style-type: none"> Air Quality is now a chapter in the Joint Strategic Needs Assessment and part of the Health and wellbeing Board considerations. Reviewed and updated in 2020. 	Complete
9	To contribute to Nottinghamshire Air Quality Strategy (NAQS)	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2018	2020	NCC/NCiC/ Borough and District councils	N/A	No	Not Funded	N/A	Completed	Reduced Emissions from raising awareness	Improving Air Quality, reduced Emissions and Raising awareness	<ul style="list-style-type: none"> 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
10	To promote the Nottinghamshire Air Quality Strategy	Public Information	Via the Internet	2020	On-going	BBC Public Protection – Environmental Health Officer	N/A	No	Not Funded	N/A	Completed	Reduced Emissions from raising awareness	Improving Air Quality, reduced Emissions and Raising awareness	•The NAQS was endorsed by portfolio holders in 2020 and it is promoted on BBCs website.	Complete
11	To have Air Quality as a priority in the Nottinghamshire Joint Health and Wellbeing Strategy and the Nottinghamshire	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2021	2021	NCC and NHS	N/A	No	Funded	N/A	Completed	Reduced Emissions from raising awareness	Raising awareness and reduced emissions	Air Quality is now a priority in the 2022 - 2026 Nottinghamshire Joint Health and Wellbeing Strategy and the Nottinghamshire ICS Green Plan [led by the NHS].	Complete

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
	re ICS Green Plan [led by the NHS].														
12	To investigate providing Supplementary Planning Guidance or a Supplementary Planning Document relating to 'Air Quality and Emissions Mitigation Guidance for Developers'	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2021	2024	BBC Planning Policy Department – Planning Policy Team Leader	LA-BBC	No	Not Funded	N/A	Planning	Reduced Emissions of NO2 and PM	Reduced emissions	<p>Possible measures could involve:</p> <ul style="list-style-type: none"> • Supplementing Part 1 of Policy 20 of the Local Plan to provide further guidance on what reasonable steps are required in order to encourage the use of public transport. • Supplementing Part 2 of Policy 20 of the Local Plan to say what would constitute a "significant deterioration" in air quality. • Supplementing Part 3 Policy 20 of the Local Plan to set a ratio of Electric Vehicle Charging Points to new dwellings. • Promoting Travel Choices – Encouraging developers to provide occupants with 'travel packs' regarding public transport, walking and cycling to all new built homes. 	This measure is likely to be taken to BBC committee/cabinet in 2023 and the findings will be reported on in the 2024 ASR.
13	Planning and Policy Guidance	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2019	2019	BBC Planning Policy Department – Planning Policy Team Leader	N/A	No	Not Funded	N/A	Completed	Reduction in NO2 and PM	Reduced Emissions	Broxtowe Part 2 of the Local Plan (2018-2028), which includes Policy 20 on Air Quality, was adopted in 2019. This policy ensures that air quality remains an important consideration when granting planning permission and to encourage developers to include sustainable travel measures as part of the planning application.	Complete
14	Developer requirements to provide of EV charging 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	Completed	Reduction in NO2 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	Complete

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
														more dwellings or 1,000 square metres or more floor space. This policy was adopted in September 2019.	
15	Inspection of Permitted Processes	Environmental Permits	Other Measures through permit systems and economic instruments	2012	On-going	BBC Public Protection – Environmental Health Technical Officer	N/A	No	Not Funded	N/A	On-going	Reduced Emissions	Reduction in airborne pollutants from the various processes throughout the Borough.	All scheduled inspections completed on time.	On-going
16	To ensure that all Permitted Processes (where feasible) continue to be rated as 'low environmental risk'	Environmental Permits	Measures to reduce pollution through IPPC Permits going beyond BAT	On-going	On-going	BBC Public Protection – Environmental Health Technical Officer	N/A	No	Not Funded	N/A	On-going	Reduced Emissions	Reduction in airborne pollutants from the various processes throughout the Borough.	The risk rating did not change in 2022, and all permitted processes were fully compliant.	On-going
17	To Inspect Crushers that are used within the Borough on demolition sites when notifications are received to ensure compliance with the process permit and ensure good housekeeping is being maintained	Environmental Permits	Other measure through permit systems and economic instruments	On-going	On-going	BBC Public Protection – Environmental Health Technical Officer	N/A	No	Not Funded	N/A	On-going	Reduction in airborne particulates from the crushers used throughout the Borough.	Reduction in airborne particulates from the crushers used throughout the Borough	Reduction in airborne particulates from the crushers used throughout the Borough	On-going
18	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 Health Officers	N/A	No	Not Funded	N/A	On-going	Reduction in airborne 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 2022.	On-going
19	Encouragement of low-emission public transport fleets	Vehicle Fleet Efficiency	Vehicle Retrofitting programmes	2018	2022	NCC/Operators	NCC/OLEV - Clean Bus Technology Fund	No	Partially Funded	£500k-£1Million	Implemented	Reduction in NO ₂ and PM due to increased use of low emission vehicles.	Reduced Emissions and On-going take-up of cleaner vehicles	<ul style="list-style-type: none"> NCC has invested £0.94m from the Clean Bus Technology Fund in Feb 2018 to retrofit older buses. This is in addition to operator investment in new Euro VI 	Costs of measured is funding secured to date

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
														standard buses on some routes <ul style="list-style-type: none"> Trentbarton invested in Euro VI vehicles for indigo and Rainbow 1 in 2020 	
20	Encouragement of low-emission public transport fleets	Vehicle Fleet Efficiency	Promoting low emission public transport	2017	2017	NCC	NCC/OLEV - Low Emission Bus Scheme	No	Funded	£100k-£500k	completed	Reduction in NO ₂ and PM due to increased use of low emission vehicles.	Reduced Emissions and On-going take-up of cleaner vehicles	<ul style="list-style-type: none"> NCC secured £527,000 OLEV funding and match funded the scheme with £410,000 from its transport budget. Introduction of two electric buses (and their associated infrastructure) on route 510, serving communities in Beeston and Stapleford. 	Complete
21	Encouragement of low-emission public transport fleets	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	-	On-going	NCC/NCiC/PT operators	NCT (operator) funding	No	-	-	On-going	Reduction in NO ₂ and PM due to increased use of low emission vehicles.	Reduced Emissions	<ul style="list-style-type: none"> All vehicles into Nottingham City Centre are now Euro VI or better. Nottinghamshire BSIP targeting Euro IV by March 2025. 	Funding details not known as dependent on private commercial operators
22	Traffic control and information	Traffic Management	UTC, Congestion management, traffic reduction	On-going	On-going	Nottinghamshire County Council (NCC)/Via EM Ltd/Nottingham City Council (NCiC)	NCC and NCiC revenue funding	No	Funded	£100k - £500k	On-going	Reduced emissions by reducing congestion on the roads	Restrain average journey times in the morning peak to a 1% increase per year	<ul style="list-style-type: none"> Traffic control centre that monitors traffic movement on the local highway network (not the trunk road/motorways) and provides real time traffic control over many traffic signal installations, including on A610 at Nuthall 	Lack of future revenue funding The UTCC is a shared facility between Nottinghamshire County Council and the City Council. Estimated cost shown is the County Council's annual contribution
23	Co-ordination of street works	Traffic Management	UTC, Congestion management, traffic reduction	On-going	On-going	NCC/Via EM/NCiC	NCC and NCiC revenue funding	No	Funded	Funded within existing resources	On-going	Reduced emissions by reducing congestion on the roads	Restrain average journey times in the morning peak to a 1% increase per year	<ul style="list-style-type: none"> 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 roadworks on its managed highway network. <ul style="list-style-type: none"> Street designations/network hierarchy review 	Costs are dependent on number street works undertaken

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
														is on-going to improve data quality for works promoters and network managers and to prioritise works management. <ul style="list-style-type: none"> Regular coordination meetings held between all works promoters and regional partners in addition to regular meetings between National Highways and regional partners to create a framework programme of planned works affecting strategic and local routes. Detailed journey time monitoring undertaken annually since 2005/06. 	
24	Contingency planning, and effective event and incident management	Traffic Management	UTC, Congestion management, traffic reduction	Ongoing	Ongoing	NCC/Via EM/NCiC/ National Highways (NH)	NCC, NCiC, National Highways revenue funding	No	Funded	-	Implemented and on-going	Reduced emissions by reducing congestion on the roads	Restrain average journey times in the morning peak to a 1% increase per year	<ul style="list-style-type: none"> The local operating agreement between NCC and NH has been comprehensively reviewed to identify the relevant parts of the network which have interaction on each authority and to put in place appropriate communication channels for management of incidents and dissemination of information Key locations on the local network have been identified and associated diversion routes investigated in line with the developing network hierarchy Incidents dealt with through agreed procedures and regular partnership meetings held. Working in close collaboration with the City and NH, tactical diversion routes have been 	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
														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	
25	Traffic management control patrols on arterial route through the Borough at peak period travel times to identify hot spots where parking affects the traffic flow	Traffic Management	UTC, Congestion management, traffic reduction	2019	On-going	NCC	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.	<ul style="list-style-type: none"> 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. <p>Update - On-street parking patrol activities now comes directly under Nottinghamshire County Council</p>	On-street parking patrol activities now comes directly under Nottinghamshire County Council
26	Increase the number of Electric Vehicle Charging Points in the Borough Car Parks.	Transport Planning and Infrastructure	Other	2020	2021	BBC Parking services – Parking Manager	BP charge master	No	Funded	70K for 14 x 7kw units and £90K for 2 x 50kw units	Completed	Reduction in NO ₂ and PM due to increased use of electric vehicles.	% Usage of EVCP	<ul style="list-style-type: none"> 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. <p>2 x rapid fast charges were installed at Victoria Street car park Stapleford in 2021, BBC has dedicated 4 spaces for Electric Vehicle use.</p>	Complete
27	Promoting on the Council Webpage the Council's Electric Vehicle Charging Points Network within the Borough	Public Information	Via the Internet	2020	On-going	BBC Parking services – Parking Manager	LA - BBC	No	Not Funded	Within existing resources	On-going	Reduction in NO ₂ and PM due to raising awareness of where people can use the charge points for their electric vehicles	30 EVCP are currently promoted on BBC's website.	<ul style="list-style-type: none"> The Council currently has 30 electric vehicle charging points in Beeston, Stapleford, Kimberley and Eastwood these are displayed with the postcodes for easy identification on the Council website and this is updated when necessary. 	On-going

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
					2021									2 new 50KW charges were added and promoted in 2021.	Complete
28	To continue investigating the installation of Electric Vehicle Charging Points for staff and visitors to the Council to use	Promoting Low Emission Transport	Other	2020	2020 On-going	BBC Parking services – Parking Manager	LA - BBC	No	Not Funded	Within existing resources	On-going	Reduction in NO ₂ and PM by encouraging Electric Vehicle use	Number of EVCP installed for employees and visitors to the Council to use.	<ul style="list-style-type: none"> Investigation into this has been undertaken and the infrastructure and power supply has already been installed within Devonshire Avenue car park. Broxtowe Borough Council's Climate Change strategy is currently being refreshed. An action falling from this revised strategy is to look at and produce an Electric Vehicle charging strategy for the borough. 	<p>Infrastructure and power supply complete</p> <p>On-going</p> <p>On-going</p>
29	Investigation into whether it is feasible for free parking in the borough car parks for Electric and Hybrid vehicles	Traffic Management	Emission based parking or permit charges	2020	2021 2023	BBC Parking services – Parking Manager	LA - BBC	No	Funded	Currently unknown	Planning	Reduction in NO ₂ and PM by encouraging ULEV to utilise free parking	% Usage of spaces for Electric and Hybrid vehicles if this measure is introduced	<ul style="list-style-type: none"> There are currently 28 x 7KW Electric Vehicle spaces, an x 2 rapid Electric Vehicle charging spaces, totalling 30 spaces. To be explored as part of the new Electric Vehicle strategy. 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 2023 for consideration.
30	Review of off-street car parking charging	Traffic Management	Emission based parking or permit charges	2020	2021 2023	BBC Parking services – Parking Manager	LA - BBC	No	Funded	<10K	Completed	Reduction in NO ₂ and PM	Reduced Emissions	<ul style="list-style-type: none"> BBC has consolidating all of their Off-Street Parking Orders into one Order which was made legal in 2021. Charges will also be reviewed on an adhoc basis with the next review being due in 2023. This review will also include the use of 	<p>Complete</p> <p>On-going annually. The policy document is updated only when there is</p>

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
														electric vehicle charging points.	significant legislation or council policy changes.
31	Real time travel information	Public Information	Other	-	Ongoing	NCC/Via EM Ltd	NCC revenue funding	No	Funded	-	Implemented and on-going	Reduced Emissions	Restrain average journey times in the morning peak to a 1% increase per year	<ul style="list-style-type: none"> Information conveyed by all forms of media (press, radio, website, social media etc.). The Travelwise centre remains in operation 24hrs a day, every day. 	
32	Bus service improvements	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	-	Ongoing	NCC/NCiC/PT operators	PT operators	No	Funded	-	On hold	Reduction in NO ₂ and PM as increased bus patronage	Increased passenger transport patronage	<ul style="list-style-type: none"> NCC have developed two Bus Service Improvement Plans (BSIP) for Nottinghamshire; the BSIP for the Greater Nottinghamshire (Robin Hood) area which was developed in partnership with Nottingham City Council, and the BSIP for Nottinghamshire. The plans, which were approved at the Transport and Environment Committee in November 2021, outline the Council's ambitions for improving bus services within the county. Phase 1 review of all of the bus services in the county, including commercial, supported and specialist services completed. Phase 2 now commenced. The aim of this work is to review and design cost effective services that meet the travel needs of residents and visitors. 	
33	Bus infrastructure	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	<ul style="list-style-type: none"> An annual programme of updates and maintenance of all stops including updating network 	Costs vary year on year dependent on priorities identified for investment

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
														maps to ensure all information is current and accurate is on-going. <ul style="list-style-type: none"> BBC provides 50% of the funds for the installation of new bus shelters and real time bus information at bus stops. 	
34	Under 22s Young Persons' Ticket	Transport Planning and Infrastructure	Other	2022/2023	On-going	NCC/NCiC/PT operators	PT operators	No	Funded	-	Implemented	Reduction in NO2 and PM due to increased passenger transport patronage	Increased passenger transport patronage	BSIP funding secured to launch an Under 22 young persons' ticket for use in Greater Nottingham and Nottinghamshire providing an extension of under 19s discounted travel to under 22s.	
35	To raise awareness of anti-idling legislation with local bus companies and Taxi's that operate within the borough	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	2020	2021 2022	BBC Public Protection – Environmental Health Officer	N/A	No	Not Funded	N/A	Complete	Reduced Emissions from raising awareness	Improving Air Quality, reduced Emissions and Raising awareness	All local bus companies that operate within the borough were notified of anti-idling legislation and the associated health affects in 2021. All taxis that operate within the borough were notified of anti-idling legislation and the associated health affects via a leaflet in 2022	Complete Complete
36	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 NO ₂ and PM as increased bus patronage	Increased passenger transport patronage	<ul style="list-style-type: none"> NCC undertakes various marketing campaigns in partnership with operators and NCiC – coordinated through the Greater Enhanced Partnership. Post-COVID Sales & Marketing Plan launched to help promote public transport. Network maps produced to coincide with route/timetable changes NCC's Travel Choice webpages include information on public transport across the county (for residents and businesses) 	On-going

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
37	Sustainable Travel information for the Public	Public Information	Via the internet	2010	On-going	BBC Human Resources - Human Resources Manager	LA-BBC	No	Not Funded	Within existing resources	On-going	Reduced Emissions of NO ₂ and PM	Increased use of public transport	<ul style="list-style-type: none"> 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.82) <p>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.</p> <p>•Sustainable Travel methods are also available on the main council website.</p>	On-going
38	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	<ul style="list-style-type: none"> 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
39	Nottingham city workplace parking levy (WPL)	Traffic Management	Workplace Parking Levy, Parking Enforcement on highway	2012	On-going	NCiC	LA- NCiC	No	Funded	-	On-going	Reduced emissions	Restrain average journey times in the morning peak to a 1% increase per year	<ul style="list-style-type: none"> NCiC introduced WPL within the city in 2012 and have used funding to make passenger transport improvements in the city 	
40	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	-	Complete and on-going	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	<ul style="list-style-type: none"> Introduction of junction protection and targeted roadside parking restrictions (including bus stop clearways) along feeder corridors into the AQMA to help traffic flows/journey times. Parking restrictions already in place, no additional side-road/off-line locations currently identified as requiring restrictions to aid traffic flow; but annual programmes of such schemes 	<p>Complete</p> <p>On-going</p>

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
														are developed should any be required in the future	
41	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 vehicle older than 5 years will be licensed on first application. Petrol fuelled vehicles must be Euro 5 or above Diesel fuelled vehicles must be Euro 6 No cars normally older than 8 years will be licensed as a taxi within the borough.	On-going
42	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 5 Electric vehicles, 35 Hybrid vehicles and 86 Euro 6 Vehicles out of the 126 Vehicles that are licensed to operate as Taxis.	On-going
43	To Investigate the feasibility of incentives for Taxi Drivers to purchase low emission or electric vehicles	Promoting Low Emission Transport	Taxi emission incentives	2020	2024	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.	Measure devised in late 2020. There has been no progress in 2021 as the Implementation of National Standards has delayed investigation. No further progress currently Any Progress will be updated in 2024 ASR.	2024
44	To consult with Taxi Trade about Increasing the number of Low Emission and Electric vehicles licensed	Promoting Low Emission Transport	Other	2020	2024	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	Measure devised in late 2020. There has been no progress in 2021 as the Implementation of National Standards has delayed the consultation. No further progress currently Any Progress will be updated in 2024 ASR.	2024

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
45	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	Measure devised in late 2020. There has been no progress in 2021 as the Implementation of National Standards has delayed the amendment. No further progress currently. Any Progress will be updated in 2024 ASR.	2024
46	To Replace older combination boilers and system boilers to Seasonal Efficiency of a Domestic Boiler in the UK (SEDBUK) A rated condensing boilers	Other	Other	2020	2022 On-going	BBC Capital Works - Capital Works Manager	LA-BBC	No	Funded	£10k - £50k	Implementation	Reduced emissions due to more efficient boilers	Number of boilers replaced	<ul style="list-style-type: none"> The replacement of the remaining less efficient units (less than 1%) is planned over the next 18 months -22 replaced during 2020. The typical life cycle of a unit is 15 years. Therefore, the current stock needs to be replaced as it becomes beyond its serviceable life. This is a 15 year Rolling program. UPDATE in 2022, BBC have replaced a total of 273 domestic boilers. Of these, all were of low efficiency, the others being lifecycle changes 	On -going
47	To investigate and consider new heating technologies that are more efficient, effective and produce lower emissions	Other	Other	2020	2021 and ongoing 2023	BBC Capital Works - 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	<ul style="list-style-type: none"> Currently reviewing the development of hydrogen technology for boilers. Studies show that the emissions are reduced greatly. Subject to existing networks and Government. A trial was undertaken for fitting air source heat pumps in 7 new builds in 2021 and in 5 new builds in 2022. The success of this will be reported on. 	On-going
48	To investigate and consider suitable alternative replacements for the	Other	Other	2020	2024 On-going consideration	BBC Capital Works - 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	Efficiency rating of new heating replacements.	<ul style="list-style-type: none"> High heat retention units were being fitted as replacements in 2022 and this will be continuing in future years 	On-going

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
	remaining electrically heated Council properties											to heat the council properties		<ul style="list-style-type: none"> •Air source heat pumps will also be considered at suitable properties where a retro fit solution is possible. 	
49	Public sector LEV procurement	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	2015	2024 and On-going	NCC/BBC	LA-BBC LA-NCC	No	Funded	-	On-going	Reduction in NO ₂ and PM due to increased use of low emission vehicles.	Reduction in vehicle emissions due to less polluting vehicles replacing older more polluting vehicles	<ul style="list-style-type: none"> •NCC upgraded its pool vehicles to lower emission diesel vehicles. •All new fleet vehicles at BBC are Euro6 emissions compliant. There are 90+ fleet vehicles and they are on a 10 year replacing rolling programme •Procurement strategies for such measures are being reviewed as part of NCC's Environmental Strategy •Dependant on whether funding from Central Government continues 	2024
50	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 NO ₂ and PM	Reduction in NO ₂ and PM due to cleaner vehicle technology	<ul style="list-style-type: none"> •All new fleet vehicles at BBC are Euro6 emissions compliant. There are 90+ fleet vehicles and they are on a 10 year replacing rolling programme. •BBC has purchased three new Euro 6 vehicles in 2017/2018 replacing three older vehicles. •Two new Euro 6 vehicles purchased in 2019 / 2020 •BBC have procured two electric vans in 2019 •Subject to satisfactory trials another two Electric vehicles were purchased in 2021 at a cost of £45k. •BBC have purchased 8 new Euro 6 Vehicles in 2021. •BBC received 4 electric vehicles in 2022. 	<p>2024</p> <p>Complete</p> <p>Complete</p> <p>Complete</p> <p>Complete</p> <p>Complete</p> <p>Complete</p>

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
51	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	2022-2024	BBC Transport and Stores Manager	LA-BBC and External grant – Grant provider not currently known	No	-	>£10 Million	Planning	Reduction in NO ₂ and PM due to increased use of low emission vehicles.	Reduction in NO 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. Update: A review has estimated that the cost is in the region on 12.4 million for a complete decarbonisation and infrastructure modification to the Kimberley Depot. A report is currently being written and the proposal will be submitted to BBC Committee in 2023/2024	2023/2024
52	Electric Vehicle Fleet Procurement for small vans below 2 tonnes	Vehicle Fleet Efficiency	Other	2019	2022	BBC Transport and Stores Manager	LA-BBC	No	Funded	£100k-£500k	Complete	Reduced Emissions of NO ₂ and PM	Reduction in NO ₂ and PM due to cleaner vehicle technology and the procurement of two electric fleet vehicles.	<ul style="list-style-type: none"> The Council currently has a fleet of 9 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 7 vehicles where practical and economic (As they reach a life of 12 years) will be replaced with electric vehicles <p>Update - All 9 vehicles (small vans) have now been replaced with Electric Vehicles.</p>	Complete
53	To investigate the viability of obtaining equipment and software that will record BBC Fleet Vehicle driver's behaviour, and enable a	Vehicle Fleet Efficiency	Driver training and ECO driving aids	2020	2023-2024	BBC Transport and Stores Manager	LA-BBC	No	Funded	Within existing resources	Planning	Reduction in NO ₂ and PM due to improved driving efficiency.	Number of employees that have undergone driver training.	An investigation into the viability of obtaining equipment and software that will record driver behavior, and enable a training programme to be established.	2024

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
	training programme to be established to improve efficiency														
54	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	<ul style="list-style-type: none"> 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
55	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	<p>All BBC Fleet vehicles (92 road vehicles including 20 LGV's) are annually emission tested in house prior to MOT Emission testing.</p> <ul style="list-style-type: none"> 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
56	Investigate ways to decarbonise BBC's fleet through alternative fuels	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	2021	2023	BBC Environment - Head of Environment	LA-BBC	No	Not Funded	£100k - £500k	Planning	Reduction in NO ₂ and PM	Reduced emissions	<ul style="list-style-type: none"> Report submitted to Cabinet in 2022 which was approved by Members to use of Hydrotreated Vegetable Oil (HVO) instead of Diesel Engine Road Vehicle (DERV) for vehicles which are compatible. Unfortunately, the price of HVO increased significantly above the budgeted level. A further report will be submitted to Cabinet in July 2023 for Members to make a 	Cost is the main barrier

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
														decision on whether to transition to HVO.	
57	To Investigate providing all allotments within the borough with green waste recycling collections	Other	Other	2020	On-going	BBC Environment - Head of Environment	LA-BBC	No	Not Funded	Within existing resources	Complete	Reduction in Particulates due to reduction of bonfires on site	Reduction in bonfires from allotments within the borough.	<ul style="list-style-type: none"> Multi team meeting taken place to discuss the feasibility of this. Several factors need resolving to determine whether this is a viable option. One allotment holders group has been written too, in order to ascertain the extent of the waste produced. Update: The investigation determined that providing all allotments with a garden waste collection was not feasible. 	Complete
58	To consult all tenants on one allotment site in the borough about a total ban on bonfires on allotment sites as a means of disposing of green waste	Public Information	Other	2020	2021	BBC Parks and Open Spaces – Environmental Development Officer	LA-BBC	No	Not Funded	N/A	Complete	Reduction in Particulates due to reduction of bonfires on site	Reduction in bonfires from allotments within the borough.	A questionnaire was sent to all allotment holders at one allotment site re waste and the results were varied. 118 questionnaires were sent, 57 were returned. 14 supported a ban 41 said No, 2 didn't answer. 54 of the responses said that they do compost their green waste.	Complete
59	To provide all new allotment tenants within the borough, a Tenancy agreement regarding bonfires.	Public Information	Other	2012	On-going	BBC Parks and Open Spaces – Environmental Development Officer	LA-BBC	No	Not Funded	N/A	On-going	Reduction in Particulates due to reduction of bonfires on site	Reduction in bonfires from allotments within the borough.	All new allotment tenants within the borough are provided with a tenancy agreement which includes the following information; bonfires should only be used on very rare occasions, and due consideration for other allotment holders and neighbouring properties must be used at all times. They must only be in the period 1st October to 31st March and only used to burn non compostable garden waste that is produced on the allotment.	On-going

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
60	To regularly communicate with all allotment providers in the borough to discourage the use of bonfires to dispose of garden waste	Public Information	Other	2023	2024	BBC Parks and Open Spaces – Environmental Development 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.	Due to the heatwave in Summer 2022, the emphasis within the newsletter that goes to all allotment tenants within the borough in January 2023 was about conserving, collecting and utilising the water on the allotments. In January 2024 the allotment newsletter will include a section about bonfires and discouraging them, and using alternative methods to dispose of garden waste.	2024
61	Marketing of cycling	Promoting Travel Alternatives	Promotion of cycling	2010 and 2017	On-going	BBC	LA - BBC	No	Not Funded	Within existing resources	On-going	Reduced Emissions of NO ₂ and PM	In Broxtowe district there has been a 30% increase in cycling between 2010 and 2014	<ul style="list-style-type: none"> Prior Covid-19 (2019) cycling levels had increased in Nottinghamshire by 4% and in Broxtowe by 5%. Cycling levels, particularly on urban/commuter route, across the county have been impacted by the Covid-19 pandemic and have not yet fully recovered New cycle stands were installed at Beeston Train station and in Eastwood and Beeston Town Centres. Improved more stands Kimberley Leisure Centre and Council Offices. 	On-going Complete
62	To investigate the feasibility of increased provision for cycle parking in the Borough	Alternatives to private vehicle use	Other	2022	2024	BBC Head of Asset Management	LA - BBC	No	Not yet identified	Not yet calculated	Planning	Reduced Emissions of NO ₂ and PM	No of cycle parking spaces in the borough	A feasibility study has not been undertaken yet. However, several projects have, and are being undertaken in 2022 and 2023 to increase cycling provision in the Borough. These projects are discussed in this Table as separate measures	
63	To take on the provision of the cycle store at Beeston's Railway Station	Alternatives to private vehicle use	Other	2022	2022	BBC Head of Asset Management	LA-BBC	No	Funded	<£10k	Completed	Reduced Emissions of NO ₂ and PM	Number of bikes using the cycle store	Due to the risk of closure, BBC have taken over the provision of the cycle store at Beeston Railway station, to ensure that it is still available for the public to use.	Complete

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
64	To install a cycle track on the Ilkeston Road Recreational Ground in Stapleford	Promoting travel Alternatives	Promotion of Cycling	2022	2023	BBC Project Manager, Capital Works	Stapleford Towns Deal	No	Funded	£100k-£500k	Planning	Reduced Emissions of NO ₂ and PM	Reduced emissions due to increase in cycling	Funds have been sourced through the Stapleford Towns Deal to improve and encourage cycling within Stapleford. A new cycle track will be installed on the Ilkeston Road Recreational Ground in Stapleford in 2023	An update on this new measure will be in the 2024 ASR.
65	To install a Cycling proficiency track to assist children/adults when learning to ride bikes	Promoting travel Alternatives	Promotion of Cycling	2022	2023	BBC Project Manager, Capital Works	Stapleford Towns Deal	No	Funded	£100k-£500k	Planning	Reduced Emissions of NO ₂ and PM	Reduced emissions due to increase in cycling	Funds have been sourced through the Stapleford Towns Deal to encourage cycling within Stapleford. A new cycle proficiency track will be installed on the Ilkeston Road Recreational Ground in Stapleford in 2023	An update on this new measure will be in the 2024 ASR.
66	To install bicycle parking stands at the Ilkeston Road Recreational Ground in Stapleford	Promoting travel Alternatives	Promotion of Cycling	2022	2023	BBC Project Manager, Capital Works	Stapleford Towns Deal	No	Funded	£10k-£50k	Planning	Reduced Emissions of NO ₂ and PM	Reduced emissions due to increase in cycling	Funds have been sourced through the Stapleford Towns Deal to encourage cycling within Stapleford. Nine new bicycle parking stands will be installed on the Ilkeston Road Recreational Ground in Stapleford in 2023	An update on this new measure will be in the 2024 ASR.
67	Improving the cycle network in Stapleford	Transport Planning and Infrastructure	Cycle Network	2022	2025	BBC Economic Development -Regeneration Projects Manager	Stapleford Towns Deal	No	Funded	£1m-£10m	Planning	Reduced Emissions of NO ₂ and PM	Reduced emissions due to increase in cycling	Funds have been sourced through the Stapleford Towns Deal to improve and encourage cycling within Stapleford by improving the cycling infrastructure. Feasibility work is underway in three phases.	Potential increase in costs following the feasibility study.
68	Cycle Repair Workshops	Alternatives to Private Vehicle use	Other	2022	2023	BBC Economic Development -Regeneration Projects Manager/ RideWise	Stapleford Towns Deal/ RideWise	No	Funded	£10-£50k	Implemented	Reduced Emissions of NO ₂ and PM	Reduced emissions due to increase in cycling	A Bicycle Repair Workshops undertaken by RideWise was installed in Nov 2022 at Ilkeston Road Recreational Ground, where training can be provided, bikes can be donated and repairs to bikes can be made. To date 350 bikes have been made roadworthy.	
69	Cycling networks - development of Local Cycling and Walking	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	On-going	Reduced Emissions of NO ₂ and PM	Increased levels of cycling	<ul style="list-style-type: none"> Funding secured to develop D2N2 wide LCWIP. Data collected; three stakeholder events held to date 	The D2N2 LCWIP public engagement will be focus on cycle corridors only, and not

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
	Infrastructure Plan (LCWIP)													<ul style="list-style-type: none"> Public engagement on the D2N2 LCWIP took place between December 2022 and March 2023. The LCWIP document will be reviewed and continue to evolve and develop over time. Future countywide priorities will be identified through technical analysis undertaken as part of the LCWIP development and will be subject to feasibility, consultation, and County Council Cabinet Member approval 	<p>specific schemes. Any future cycle improvement schemes will be subject to funding availability, feasibility consultation, and approvals</p>
70	Cycling networks	Transport Planning and Infrastructure	Cycle network	2018	On-going	NCC/Via EM/NCiC	LGF, s106 funding	No	Funded	>£10 million	Implementation	Reduced Emissions of N02 and PM	Increased cycling trips	<ul style="list-style-type: none"> Construction of improved cycle links between Beeston, Enterprise Zone and the City are completed. NCC, working in partnership with NCiC, has secured funding through NCiC's Transforming Cities Fund to potentially upgrade routes along A6005 Other small-scale cycling improvements are developed and delivered as part of the annual integrated transport programme and through developer funded improvements 	<ul style="list-style-type: none"> Future schemes will be determined by members following finalisation of LCWIP Any future cycle improvement schemes will be subject to funding availability, feasibility consultation, and approvals.
71	Cycling networks as part of Active Travel Funding (ATF)	Transport Planning and Infrastructure	Cycle network	2020	On-going	NCC / Via EM	LGF	No	Funded	>£10 million	Planning	Reduced Emissions of N02 and PM	Increased cycling trips	<ul style="list-style-type: none"> NCC has secured £1m from the Active Travel Fund (ATF) for the development of a new walking and cycling facility along Baulk Lane, Stapleford. The scheme is subject to feasibility, consultation, and County Council Cabinet Member approval 	<ul style="list-style-type: none"> Scheme will be subject to feasibility, consultation, and approvals

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
72	Cycling networks as part of Towns Fund	Transport Planning and Infrastructure	Cycle network	2021		BBC/NCC / Via EM	LGF	No	Funded	£1 million - £10 million	Planning	Reduced Emissions of NO2 and PM	Increased cycling trips	<ul style="list-style-type: none"> BBC's Town Fund bid includes proposals for cycle infrastructure improvements in Stapleford (funding amount to be determined by Board and scheme proposals subject to feasibility, consultation, and County Council Cabinet approval. BBC's Town Fund includes potential cycle infrastructure, including a Cycle Superhighway, comprising of 3 connecting cycle links in Stapleford (funding amount to be determined by Board and scheme proposals subject to feasibility, consultation, and County Council Cabinet member approval. 	<ul style="list-style-type: none"> The Towns Fund funded proposals are still subject to feasibility, consultation, and County Council Cabinet approval
73	Cycle hire scheme	Transport Planning and Infrastructure	Public cycle hire scheme	2021	Not known - dependent on commercial cycle hire scheme providers	NCiC/NCC	Funding source to be determined	No	TBC	-	Planning	Reduced Emissions of NO2 and PM	Increased cycling trips	<ul style="list-style-type: none"> Hire schemes at the nearby University of Nottingham in place Feasibility study undertaken on a city based hire scheme which potentially could include parts of the county such as Beeston Scheme dependent on commercial cycle hire scheme providers committing to, and delivering a scheme 	Scheme dependent on commercial cycle hire scheme providers committing to, and delivering a scheme
74	Cycle training	Promoting Travel Alternatives	Promotion of cycling	Circa 1970s	Ongoing	NCC	DfT funding/PH funding	No	Funded	Various	Implemented	Reduced Emissions of NO2 and PM	Increased cycling trips	<ul style="list-style-type: none"> Across the county, 7,089 people received cycle training during 2022/23 and in Broxtowe specifically, 599 people received training. Implementation is ongoing. 	
75	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 NO2 and PM	Increased cycling trips	<ul style="list-style-type: none"> Cycle hub installed in 2015 to integrate with bus/rail services 	<ul style="list-style-type: none"> Potential barrier: Lack of future revenue funding

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation	
															<ul style="list-style-type: none"> Ad-hoc parking provided where required BBC's Town Fund bid includes proposals for cycle hub in Stapleford Town Centre. 	
76	Marketing of cycling	Promoting Travel Alternatives	Promotion of cycling	2010	On-going	BBC	LA - BBC	No	Not Funded	Within existing resources	On-going	Reduced Emissions of NO ₂ and PM	In Broxtowe district there has been a 30% increase in cycling between 2010 and 2014	<ul style="list-style-type: none"> Prior Covid-19 (2019) cycling levels had increased in Nottinghamshire by 4%; and in Broxtowe by 5%. Cycling levels, particularly on urban/commuter route, across the county have been impacted by the Covid-19 pandemic and have not yet fully recovered New cycle stands were installed at Beeston Train station and in Eastwood and Beeston Town Centres. Improved more stands Kimberley Leisure Centre and Council Offices. 	<p>On-going</p> <p>Complete</p>	
77	Marketing of cycling	Promoting Travel Alternatives	Promotion of cycling	2010	On-going	NCC	LA- NCC	No	Not Funded	within existing resources	Implemented and on-going	Reduced Emissions of NO ₂ and PM due to increased cycling uptake	Increased cycling trips	<ul style="list-style-type: none"> Prior Covid-19 (2019) cycling levels had increased in Nottinghamshire by 4%; and in Broxtowe by 5%. Cycling levels, particularly on urban/commuter route, across the county have been impacted by the Covid-19 pandemic and have not yet fully recovered. Marketing of cycling is undertaken in a variety of formats for both commute and leisure trips. Various NCC campaigns have been undertaken including 'cycling week', 'Notts Routes & Rides' NCC's Travel Choice webpages include information on cycling across the county (for 		

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
														residents and businesses)	
78	Cycle maps	Promoting Travel Alternatives	Promotion of cycling	2018	On-going	NCC	LA-NCC	No	Funded	Within existing resources	Implemented and on-going	Reduced Emissions due to increased cycling uptake	Increased cycling trips	<ul style="list-style-type: none"> Greater Nottingham cycling maps reviewed during 2018, updated and available as a leaflet and online Cycling maps reviewed as/when the network is enhanced 	
79	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 NO2 and PM due to more people walking	Increased walking trips	<ul style="list-style-type: none"> Marketing of walking is undertaken in a variety of formats for both commute and leisure trips. Various NCC campaigns have been undertaken including 'walk week', 'Notts Routes & Rides'. NCC's Travel Choice webpages include information on walking across the county (for residents and businesses) 	
80	Pedestrian infrastructure improvements	Transport Planning and Infrastructure	Other	2020	On-going	NCC/BBC	NCC/External	No	Funded	Schemes included in 2022/23 programme worth £100k - £200k	On-going	Reduction in NO ₂ and PM emissions as more people are walking	Increased walking trips	<ul style="list-style-type: none"> Pedestrian improvements developed and delivered as part of the annual integrated transport programme. Funding also secured to deliver improvements through the planning process. Schemes including footpath improvements, included within the 2022/23 Integrated Transport programme 	<ul style="list-style-type: none"> Potential barrier: Lack of future funding.
81	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 NO ₂ and PM	Reduced Emissions and on-going take-up of cleaner vehicles	<ul style="list-style-type: none"> On-going take-up of LEV 	Funding details not known as its funded commercial private operators
82	School travel plans	Promoting Travel Alternatives	School Travel	2000	On-going	NCC	LA-NCC	No	Funded	£10k - £50k	Implemented	Reduced Emissions of NO ₂ and PM if alternative methods of	Restrain average journey times in the morning peak to a 1%	<ul style="list-style-type: none"> Following the trial with four pilot schools in 2019/20, the online school travel toolkit was 	Costs detailed are for the School Travel Toolkit only.

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
												sustainable travel are used	increase per year	rolled out to all County schools during the 2020/21 academic year. <ul style="list-style-type: none"> The Nottinghamshire School Travel Toolkit provides information and advice on improving travel to and from Nottinghamshire's schools. 	There currently is not any funding available for delivering travel planning to individual schools
83	Web based journey planners	Public Information	Via the Internet	2012	On-going	NCC	LA-NCC	No	Funded	within existing resources	Implemented	Reduction in NO ₂ and PM due to increase in sustainable travel	Increased walking/cycling/ passenger transport trips	<ul style="list-style-type: none"> Nottinghamshire is part of the national, multi-modal Traveline journey planner Web links to the Traveline site are publicised and available from the County Council's website. New Live Travel Suite to be launched in July 2023 to replace Traveline offering enhanced features for journey planning. 	
84	Personalised travel planning	Promoting Travel Alternatives	Personalised Travel Planning	2016	2017	NCC/AECOM	DfT	No	Funded	£50k - £100k	Completed	Reduction in NO ₂ and PM due to increase in sustainable travel	Restrain average journey times in the morning peak to a 1% increase per year	<ul style="list-style-type: none"> Personalised Travel Planning undertaken in Beeston during 2016/17. There may also potentially be further opportunities to offer travel planning through future rounds of the Capability Fund, although this is yet to be confirmed. 	Cost detailed are associated with personalised travel planning undertaken in Beeston in 2016/17, not for any opportunities which may be identified in the future
85	To investigate the feasibility of BBC employees having staff discounts with NET when using their trams	Alternatives to private Vehicles use	Other	2022	2024	BBC Human Resources - Human Resources Manager	LA-BBC	No	Not Funded	-	Planning	Reduction in NO ₂ and PM due to increase in sustainable travel	Restrain average journey times in the morning peak to a 1% increase per year	<p>To investigate the feasibility of BBC employees having staff discounts with NET when using their trams. Employees were surveyed to express an interest to determine feasibility of progressing discussions.</p> <p>A meeting between BBC and Net was undertaken in March 2022. An update on this measure will be</p>	

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
														provided in the 2024 ASR.	
86	Car Lease Scheme for BBC employees	Promoting low emission transport	other	2021	On-going	BBC Human Resources - Human Resources Manager	LA-BBC	No	Not Funded	-	Implementation	Reduction in NO ₂ and PM	Number of employees leasing ULEV	BBC has introduced a Car Lease Scheme in 2021 for employees, to encourage and uptake in ULEV to reduce emissions. This also includes electric vehicles. In 2022 one employee has leased a hybrid vehicle under this scheme	Covid/post-covid silicon chip shortage which is severely impacting on car manufacturing and therefore limiting delivery times for vehicles and general availability. Increase car costs also may limit affordability.
87	Encouraging the use of Hybrid or Electric vehicles for BBC employees	Promoting Low Emission Transport	Other	2020	On-going	BBC Human Resources - Human Resources Manager	LA-BBC	No	Funded	Within existing resources	Implementation	Reduction in NO ₂ and PM	Number of employees using hybrid or electric vehicles	<ul style="list-style-type: none"> To encourage employees of BBC to purchase hybrid vehicles and electric vehicles for their personal and business use. Six employees used a personal Electric vehicle and three used a ULEV in 2022. 	On-going
88	Investigate the feasibility of a Council staff car sharing	Alternatives to Private Vehicle Use	Car Clubs	2020	On-going	BBC Human Resources - Human Resources Manager	N/A	No	Not Funded	N/A	Planning	Reduction in NO ₂ and PM	No of staff car sharing	Due to Covid-19 being prevalent and it is transmissible in confined spaces, this measure has been put on hold temporarily. However, staff in the future will be encouraged to travel together. An update will be provided in the next ASR.	
89	Cycle to work Scheme	Promoting Travel Alternatives	Promotion of cycling	2009	On-going	BBC Human Resources - Human Resources Manager	N/A	No	Not Funded	Within existing resources	System in place	Reduction in NO ₂ and PM	No of bikes purchased through scheme	<ul style="list-style-type: none"> Cycle to work Scheme – to assist and give tax relief on bike purchases for employees of BBC. Three employees purchased a bike through this scheme in 2022. Since the scheme started 180 employees have purchased bikes through the scheme. 	On-going
90	Flexible working arrangements	Promoting Travel Alternatives	Encourage/Facilitate Home Working	2012	On-going	NCC and BBC Human Resources - Human Resources Manager	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	<ul style="list-style-type: none"> NCC operates flexible working arrangements for all its staff. BBC New Ways of Working was introduced in 2019, 	<p>On-going</p> <p>On-going</p>

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
														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
91	Workplace travel plans	Promoting Travel Alternatives	Workplace Travel Planning	2018	2020	BBC Planning Policy Department – Planning Policy Team Leader and NCC	LA – BBC and NCC	No	Not Funded	N/A	Complete	0.2µg/m ³	Restrain average journey times in the morning peak to a 1% increase per year	<ul style="list-style-type: none"> •Broxtowe Part 2 of the Local Plan (2018-2028) which includes Policy 26 on Travel Plans, was adopted in 2019. It is expected in this policy that all planning applications for large development sites (10 or more dwellings or 1,000 square metres or more gross floor space) must include a travel plan. •BBC and NCC have a travel plan •BBC has undertaken a review of the Council's travel plan by reviewing Lease cars, car allowances and work place parking. Produced a transport map specifying the modes of transport the organisation considers acceptable if other modes or transport are not suitable. Feasibility study of having bus card/ Tickets for employee use. 	<p>Complete</p> <p>Complete</p> <p>Complete</p>
92	NCC car pool vehicles	Alternatives to private vehicle use	Car Clubs	2016	On-going	NCC	N/A	No	Not Funded	-	Complete	0.2µg/m ³	Restrain average journey times in the morning peak to a 1% increase per year	<ul style="list-style-type: none"> • 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
93	To reschedule the dry recycling waste rounds to reduce fuel consumption and improve efficiency	Vehicle Fleet Efficiency	Other	2020	2024	BBC Environment – Head of Environment	N/A	No	Not Funded	N/A	Planning	Reduction in NO ₂ and PM due to efficient routes.	Reduced emissions	Improved vehicle utilisation has been undertaken to improve service delivery. Further investigation for rescheduling is planned in 2023/24 to take account of new builds and increased tonnages	2023/2024
94	To reschedule the green waste rounds to reduce fuel consumption and improve efficiency	Vehicle Fleet Efficiency	Other	2020	On-going	BBC Environment – Head of Environment	N/A	No	Not Funded	N/A	Planning	Reduction in NO ₂ and PM due to efficient routes	Reduced emissions	Improved vehicle utilisation has been undertaken to improve service delivery. The garden waste rounds are dictated by the number of subscribers to the service this is reviewed on an annual basis	On-going
95	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 NO ₂ and PM due to improved driving efficiency.	Reduced emissions	Eco-driving training sessions held for NCC staff	Complete
96	Fleet vehicle tracking system	Vehicle Fleet Efficiency	Driver Training and ECO driving aids	2015	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	<ul style="list-style-type: none"> 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. 	<p>Complete</p> <p>Complete</p>
97	Zoning of refuse collections	Vehicle Fleet Efficiency	Other	2016	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	<ul style="list-style-type: none"> 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. 	<p>Complete</p> <p>The Refuse round restructure is now complete and we have reduced the fleet size by one vehicle.</p>
98	Integrated ticketing	Transport Planning and Infrastructure	Other	2014	On-going	NCC/NCiC/PT operators	PT operators	No	Funded	-	Implemented	Reduction in NO ₂ and PM due to increased passenger transport patronage	Increased passenger transport patronage	<ul style="list-style-type: none"> Integrated ticketing strategy developed in 2014/15. New smartcard platform introduced in 2014. Robin Hood card scheme introduced in 2015 	Robin hood add-on to launch: March 2024

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
														<ul style="list-style-type: none"> • Further smartcard/contactless improvements being developed • The major bus operators have now all introduced contactless payments for their own ticketing products alongside the Robinhood card and this was completed in around March 2020 • The first multi-operator contactless ticketing system in the UK outside London was launched in the Nottingham area in May 2022. • Public transport users can now pay a single daily capped fare across the majority of the city's buses and trams using their chosen contactless payment method <ul style="list-style-type: none"> • The Nottinghamshire Enhanced Partnership is seeking to use indicative BSIP funding to deliver a multi operator ticket (MOT) in Newark & Mansfield, alongside development of an add-on for passengers travelling into the Robinhood network in Greater Nottingham. - MOT strategy completed: December 2022 • Robinhood add-on to launch: March 2024 	

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

2.3 PM_{2.5} – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG22 (Chapter 8), 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.

BBC purchased a Zephyr real time monitor in late 2021, which was installed in 2022 to monitor PM₁₀, PM_{2.5} and NO₂ in the Trowell AQMA. There were a variety of issues with the monitor throughout 2022, and as a result BBC feel that the data was not reliable enough to report on. However, these issues were rectified and the 2023 data will be reported on in the 2024 ASR.

In 2022 the method 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 2022 the annual mean concentration is 10.4µg/m³ for the City Centre site. The modelled background level provided by Defra for the Borough of Broxtowe are modelled to be between 7.4µg/m³ and 9.5µg/m³ for 2022, with the annual mean for 2022 being 8.3µg/m³. 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/m³. However, the World Health Organisation guideline value are more stringent for PM_{2.5}, as it is currently 10µg/m³ 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 Office for Health Improvement & Disparities 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.

Table 2.3 below provides the estimated effects of annual mortality in 2021 of human-made PM_{2.5} air pollution for Nottingham City, Broxtowe Borough Council and other neighbouring local authorities. The figures show that within the Borough of Broxtowe there are modelled to be 70 deaths attributable to human-made air pollution.

Table 2.3 – Estimated Effects of Annual Mortality in 2021 of human-made PM_{2.5} Air Pollution.

Council/Area	Attributable fraction	Attributable deaths aged 30+* (2021 deaths ONS)	Associated Life-years Lost due to PM based on 29,000 nationally (COMEAP 2010)
Nottingham City	5.9	157	1559
Ashfield District	5.4	79	662
Newark and Sherwood District	5.3	74	626
Bassetlaw District	4.9	68	620
Gedling Borough	5.6	72	628
Broxtowe Borough	5.7	69	612
Rushcliffe Borough	5.4	62	528
Mansfield District	5.3	70	594

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

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

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

- Ensuring that dust management plans are requested during the planning application stage for all sites that involve large scale demolition and building works.
- To ensure that best practicable means of dust control measures are being used regardless of how large the development is. These measures can include the use of bowsers, road sweepers and dust suppression to prevent 'trackout'. Also minimise dust generating activities on dry windy days, and if there are stockpiles ensure they are covered to prevent wind-whipping.
- Ensuring that developers are carrying out dust suppression monitoring on site at large development sites.
- Ensuring that water suppressants are in use when Nibblers and mobile crushers are on site.
- Educating the public in matters that contribute to air quality e.g. not having bonfires.
- Educate and advise the public about using exempt appliances with the correct fuel for that appliance in BBCs smoke control areas.
- Enforcing the Clean Air Act 1993 and the Environmental Protection Act 1990 where necessary to minimise the risk of particulates becoming air borne.
- To continue to manage, advice and enforce the Pollution Prevention and Control Regulations 1999 and the Environmental Permitting (England and Wales) Regulations 2010 (Amended in 2013) on permitted processes when necessary.
- To encourage, support and promote sustainable travel within the Borough by working with a variety of organisations and neighbouring local authorities.
- To continue to promote green travel e.g. walking, cycling, low emissions/ electric vehicles and the tram network.

- To continue to support bus companies and taxis that operate within the Borough to reduce emissions.
- To continue to review suitable research methods for reducing air quality levels for particulate matter e.g. the use of vegetation.
- Promote and encourage the use of the final version of the “EMAQN Air Quality and Emissions Mitigation: guidance for developers” document.
- To inspect Crushers that are used within the Borough on demolition sites when notifications are received, to ensure compliance with the process permit, and good housekeeping so that dust levels are reduced.
- To communicate with all allotment providers in the Borough, to discourage the use of bonfires to dispose of green waste.
- To educate the public that electric motor vehicles whilst being positive for reducing NO₂ and CO₂, will still emit Particulate Matter and therefore active travel is still recommended as an alternative.

2.4 Update on the 2008 Air Quality Action Plan

2.4.1 The history of Broxtowe Borough Council's Air Quality Action 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 exceedance 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 (NO₂) concentrations in certain locations would not achieve the air quality objective of 40µg/m³ or less by the end of 2005.

Broxtowe Borough Council (BBC) declared four Air Quality Management Areas (AQMA) within the borough along the M1 corridor. A NO₂ reduction of around 6µg/m³ 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 NO₂ within the AQMA is from vehicle emissions from the M1 Motorway. Unfortunately, the motorway's control is outside the Council's management as the responsibility lies with National Highways. However, BBC considered various motorway strategies, taking into account factors such as whether the Council has the ability to implement the options identified, cost, feasibility and non-air quality benefits.

The conclusion of the AQAP was that whilst the primary source of NO₂ within the AQMAs is outside the Council's management, BBC had identified other measures that would have an effect on the contributing levels of NO₂ to improve the air quality both in the AQMAs, as well as the rest of the borough, whilst also continuing to work alongside National Highways.

2.4.3 Update on the four AQMAs.

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

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

Table 2.4 – The four AQMAs in the Borough.

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

2.4.4 The NO₂ Annual Mean Concentrations for the remaining AQMA.

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

data showed that within this area in 2006 the annual mean was $45\mu\text{g}/\text{m}^3$ and therefore exceeding the AQO by $5\mu\text{g}/\text{m}^3$.

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 2022. 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 58 and 59. 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. In 2022, a Zephyr air quality monitor was installed in the AQMA on a street light in Iona Drive. A co-location study of triplicate tubes (Site ID 61, 62 and 63) were also sited next to the monitor to compare the accuracy between the two different types of monitoring methods.

Table 2.4.1 – Results for AQMA in Trowell 2012 – 2022.

Site ID	NO_2 Annual Mean Concentration ($\mu\text{g}/\text{m}^3$)										
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
18	-	-	-	-	34.3	32.9	28.2	28.4	17.9	22.3	21.5
19	42.2	38.7	38.1	42.3	37.6	37.2	31.9	30.9	22.9	23.8	22.3
58	-	-	-	-	-	-	-	-	24.8	27.6	20.7
59	-	-	-	-	-	-	-	-	20.1	20.8	20.3
61	-	-	-	-	-	-	-	-	-	-	21.8
62	-	-	-	-	-	-	-	-	-	-	21.6
63	-	-	-	-	-	-	-	-	-	-	22.1

Although the data in Table 2.4.1 shows a downward trend (not including the 2020 data as it is an anomaly due to National Lockdowns to stop the spread of Covid-19), there has been a steady decrease year on year. However, the 2015 data did show an increase in NO₂ 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. The SMART Motorway scheme will be discussed in greater detail in Section 2.4.5.

However, the results do show that there is a decreasing trend (if the 2015 data is seen as an anomaly due to the SMART Motorway Scheme and the 2020 data is discredited), as the NO₂ levels have reduced by 12.5µg/m³ from 2016 to 2022 for Site 18 and 15.3µg/m³ from 2016 to 2022 for Site 19. Site 18 in 2022 is 18.5µg/m³ below the AQO, Site 19 in 2022 is 17.7µg/m³ below the AQO, Site 58 in 2022 is 19.3µg/m³ below the AQO and Site 59 in 2022 is 19.7µg/m³ below the AQO. The three new sites (Site 61, 62 and 63) in 2022 when averaged (as they are co-location tubes) are below the AQO by 18.2µg/m³.

The results in Table 2.4.1 show that for seven consecutive years the AQO has been met within the remaining AQMA, and for five years the data has been below 36µg/m³ which is a 10% reduction of the 40µg/m³ AQO.

2.4.5 SMART Motorway Scheme

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

SMART motorways use technology to:

- monitor traffic levels

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

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

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

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

Further information about the Smart Motorway scheme can be found on the National Highways website: [SMART Motorway Scheme, National Highways](#)

2.4.6 Defra's recommendations for Broxtowe Borough Council.

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

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

The recommendations that BBC have received from Defra are:

- ❖ The borough has made some good progress towards developing their AQAP and implementing AQAP measures in the last year, which is commended.
- ❖ The borough has stated that they will continue to monitor and keep the AQMA under review whilst the effects of the SMART motorway scheme are being determined, and until a significant decreasing trend can be demonstrated. This is supported, and it is suggested that the AQMA could be considered for revocation after demonstrating compliant NO₂ concentrations below 36 µg/m³ 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 NO₂ concentrations are below the AQOs and when long-term compliance is achieved they will revoke the AQMA. If current NO₂ trends continue and concentrations decline, then the revocation of the AQMA is strongly supported.

As the data above has shown to be below the AQO for the past seven consecutive years, and the data has been below 36 µg/m³ for five consecutive years (not including 2020 Data due to Covid-19 restrictions). BBC will revoke the remaining AQMA in 2023/2024.

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 NO₂ 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, and a further three tubes (co-location study) have been added next to the Zephyr Real Time Monitor in 2022, 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.***

Although BBC will be revoking this remaining AQMA in 2023/2024, it will continue to monitor NO₂ levels in this area and work alongside National Highways to improve air quality levels, the Council will continue to review and implement measures stated within Table 2.2 of this and future ASR's .

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

This section sets out the monitoring undertaken within 2022 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 2018 and 2022 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

BBC purchased a Zephyr real time monitor in late 2021, which was installed in 2022 to monitor PM₁₀, PM_{2.5} and NO₂ in the Trowell AQMA. There were a variety of issues with the monitor throughout 2022, and as a result BBC feel that the data was not reliable enough to report on. However, these issues were rectified and the 2023 data will be reported on in the 2024 ASR.

3.1.2 Non-Automatic Monitoring Sites

Broxtowe Borough Council undertook non-automatic (i.e. passive) monitoring of NO₂ using 51 diffusion tubes during 2022. Table A.1 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 (NO₂)

Table A.2 in Appendix A compare the ratified and adjusted monitored NO₂ annual mean concentrations for the past five years with the air quality objective of 40µg/m³. 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 2022 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 NO₂ 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 revoked AQMA in Nuthall and the current AQMA in Trowell. 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 2013 the levels of NO₂ are consistently below the objective of 40µg/m³ 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 2013 – 2022.

Site ID	NO ₂ Annual Mean Concentration (µg/m ³)									
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
33 & 34	32.3	30.5	28.1	29.1	27.7	25.5	25.9	18.7	20.7	19.6

Site ID	NO ₂ Annual Mean Concentration (µg/m ³)									
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
35	33.5	33.7	34.1	32.2	33.6	30.0	29.7	22.6	23.4	22.9

The data in Table 3.1 shows that there has been an overall downward trend and the data is below the AQO. Monitoring will continue to be undertaken at these three sites and the results will be reported in the 2024 Air Quality Annual Status Report.

AQMA in Trowell

Since 2011 there was only one monitoring site situated on the façade of a property on Iona Drive (Site ID 19). However, in January 2016 a second monitoring location was added (Site ID 18) in Tiree Close and since March 2020, two new monitoring locations were added in Tiree Close (Site ID 58 and 59), 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 NO₂ 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. In 2022, a Zephyr real time air quality monitor was installed in the AQMA on a street light in Iona Drive. A co-location study of triplicate tubes (Site ID 61, 62 and 63) were also sited next to the monitor to compare the accuracy between the two different types of monitoring methods. Therefore, as Site ID 61,62 and 63 are a triplicate site the annual data is provided for site 63 only.

The diffusion tube monitoring results from 2013 to 2022 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 2013 – 2022.

Site ID	NO ₂ Annual Mean Concentration (µg/m ³)									
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
18	-	-	-	34.3	32.9	28.2	28.4	17.9	22.3	21.5

Site ID	NO ₂ Annual Mean Concentration (µg/m ³)									
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
19	38.7	38.1	42.3	37.6	37.2	31.9	30.9	22.9	23.8	22.3
58	-	-	-	-	-	-	-	24.8	27.6	20.7
59	-	-	-	-	-	-	-	20.1	20.8	20.3
61, 62 &63	-	-	-	-	-	-	-	-	-	21.7

The data in Table 3.2 (excluding Site 58 and Site 59), shows that there has been a steady decrease year on year. However, the 2015 data did show an increase in NO₂ 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 and the 2020 data is discredited), as the NO₂ levels have reduced by 12.5µg/m³ from 2016 to 2022 for Site 18 and 15.3µg/m³ from 2016 to 2022 for Site 19. Site 18 in 2022 is 18.5µg/m³ below the AQO, Site 19 in 2022 is 17.7µg/m³ below the AQO, Site 58 in 2022 is 19.3µg/m³ below the AQO and Site 59 in 2022 is 19.7µg/m³ below the AQO. The three new sites (Site 61, 62 and 63) in 2022 when averaged (as they are co-location tubes) are below the AQO by 18.2µg/m³.

The results in Table 3.2 show that for seven consecutive years the AQO has been met within the remaining AQMA, and for five years the data has been below 36µg/m³ which is a 10% reduction of the 40µg/m³ AQO.

Although BBC will be revoking this remaining AQMA in 2023/2024, it will continue to monitor NO₂ levels in this area and work alongside National Highways to improve air quality levels. Please view Section 2.4 of this report on an Update on the Air Quality Action

Plan for this AQMA and the 2024 ASR will provide further information about the revocation of the AQMA in Trowell.

A610/B600 Nuthall Island

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

Therefore, the site was not a true representation of the levels that receptors are receiving at their properties, so the site was relocated to the façade of a residential property in January 2016 (See Appendix F for the Map of the roundabout and the current monitoring locations).

In January 2016 a second site was also chosen to determine what the NO₂ 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 2013 to 2015 are shown for the 'old' site and the 2016 to 2022 results for the 'new' sites are shown below.

Table 3.3 – Results for Nuthall Island 2013 – 2022.

Site ID	NO ₂ Annual Mean Concentration (µg/m ³)									
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
BX 22	41.1	39.2	41.1	-	-	-	-	-	-	-
36	-	-	-	35.2	35.2	32.8	31.7	24.9	26.0	25.4
37	-	-	-	32.2	29.5	28.9	26.4	19.3	23.5	21.1

The results above show that that the original site did not provide a true representation of NO₂ levels at the façade of the properties. However, the two 'new' sites are showing that the levels are below the air quality objective by 14.6µg/m³ for site 36 and 18.9µg/m³ for site 37 in 2022, and are showing an overall decreasing trend since 2016 (the 2020 data is considered an anomaly due to national and regional lockdowns). Therefore, BBC will

continue to monitor NO₂ levels at these sites and provide an update in the 2024 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/m³. The original site (BX04) was discontinued and relocated in January 2016 to a neighbouring property at a more suitable height and nearer to Bramcote Island (Site 41). An additional site was also chosen to determine whether the concentration reduces further away from the roundabout (Site 40). Both sites are on the façade of properties on Derby Road. (See Appendix G for the Map of the roundabout and the monitoring locations).

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

Table 3.4 – Results for Bramcote Island 2013 – 2022.

Site ID	NO ₂ Annual Mean Concentration (µg/m ³)									
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
BX 04	37.8	41.8	40.7	-	-	-	-	-	-	-
40	-	-	-	37.5	32.7	34.0	32.0	23.6	27.4	25.8
41	-	-	-	37.4	35.6	34.1	30.9	23.5	26.0	25.3

Table 3.4 shows that in 2022 the NO₂ concentrations for Site 40 is 25.8µg/m³ and Site 41 is 25.3µg/m³, this is a decrease of 1.6µg/m³ for site 40 and 0.7µg/m³ for site 41 in comparison to the 2021 data. Both sites are showing that the levels are below the air quality objective by 14.2µg/m³ for site 40 and 14.7µg/m³ for site 41 in 2022.

Although this is an overall downward trend for both sites from 2016, and they are below the objective level. There was a slight increase by $1.3\mu\text{g}/\text{m}^3$ at Site 40 in 2018. This was thought to be due to localised roadworks that were taking place on the A52, which has resulted in an increase in stationary traffic near to this site. However, since 2018 this site has shown a decrease in the levels, which further indicates that the slight increase was due to localised roadworks which were completed in 2018. Site 41 has continued to show a decreasing trend since 2016.

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

Town Street, Bramcote.

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

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

Table 3.5 – Results for Town Street 2017 – 2022.

Site ID	NO2 Annual Mean Concentration ($\mu\text{g}/\text{m}^3$)					
	2017	2018	2019	2020	2021	2022
48	37.5	35.7	30.4	25.4	27.8	28.4
56	-	25.1	23.4	18.7	19.6	19.8

Table 3.5 shows that in 2022 the NO₂ concentrations for Site 48 is 28.4µg/m³ and Site 56 is 19.8µg/m³. Although there is an overall downward trend from 2017 to 2020, the results show that since 2020 (which was lower due to national and regional lockdowns), there has been a slight increase since 2020. This is to be expected as there is an increase in people returning to offices and doing hybrid working rather than working from home full time. Although there has been a slight increase in 2022, both sites are still below the AQO, as site 48 is 11.6µg/m³ lower than the AQO and site 56 is 20.2µg/m³ lower than the AQO.

Table 3.5 also shows that the data for site 48 in comparison to site 56 does enforce the theory that the results are higher on site 48 due to the 'Bottle neck' situation. Therefore, BBC will continue to monitor NO₂ levels at these sites and provide an update in the 2024 ASR. BBC will continue to work alongside Nottinghamshire County Council to improve air quality levels.

The Results and Trends for all Monitoring Sites in 2022.

Defra requested that trend charts were provided for all monitoring sites to identify any trends in the annual mean concentrations. The trend charts are displayed in Figure A.1 in the Appendices for all of the sites in use since 2018 to 2022.

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 2018 – 2022 excluding the 2020 data, as the 2020 data has shown a decreasing trend at all sites, but this is to be expected due to the national and regional lockdowns.

Out of the 49 sites that are identified in the trend charts in Figure A.1 in the Appendices, Forty-two have been in use since 2018, in 2020 there were a further three additional sites added. In 2020, site 10 was discontinued due to the consistently low readings and the tube was moved to site 57. In 2022, a triplicate co location study was added next to the Zephyr Real Time Monitor in the Trowell AQMA, and there were also an additional three sites added in 2022, which were sited in or next to parks within the borough.

The trend charts have identified that out of the 49 sites, twenty-eight are showing a consistent downward trend year on year. Ten sites are showing an overall downward trend. Two sites have shown a slight increase since monitoring at the sites and then a downward trend in recent years and Four sites have shown an increase in the 2022 data in comparison to the 2021 data. Five of the sites will not have the data discussed as out of the five, four of the sites were started in 2022 (Sites 60, Site 61/62/63, site 64 and site 65) so a trend cannot be identified yet. However, with continuous yearly data being collected it is hoped that a clear trend can be identified in future years. The remaining site out of the five (site 10) was discontinued in 2020. Therefore, the remaining 44 sites and their trends will be discussed in greater detail below.

Twenty-eight of the forty-four sites are showing a consistent downward trend year on year, these sites are; site 2, site 4, site 5, site 8, site 9, site 12, site 13, site 16, site 17, site 18, site 19, site 20, site 27, site 30, site 32, site 35, site 36, site 37, site 38, site 39, site 40, site 41, site 43, site 44, site 54, site 57, site 58 and site 59.

Ten of the forty-four sites are showing an overall downward trend of the data these sites are; site 1, site 3, site 7, site 11, site 22, site 31, site 33/34, site 45, site 50 and site 53.

Two of the forty-four sites (Sites 51 and 52) have shown a slight increase since monitoring at the sites started and then a downward trend in recent years.

The remaining four sites showed an increase in the 2022 data in comparison to the 2021 data (2020 excluded as an anomaly). These sites were; site 15, site 48, site 55 and site 56. Therefore, these sites will be discussed in greater detail. Site 48 and site 56 results are discussed in greater detail earlier on this report, see Table 3.5. Site 15 and site 55 and are discussed in greater detail below.

Site 15 - George Spencer Academy, Stapleford

Table 3.6 below shows the results for George Spencer Academy in Stapleford for 2016 to 2022, the data shows that the highest concentration was in 2016 at $35.6\mu\text{g}/\text{m}^3$. In 2017 it had decreased greatly by $9.9\mu\text{g}/\text{m}^3$. In 2018 it increased by $2.5\mu\text{g}/\text{m}^3$ and an additional

0.4 $\mu\text{g}/\text{m}^3$ in 2019. The 2020 data is seen as an anomaly, but the 2021 data shows a decrease of 3.4 $\mu\text{g}/\text{m}^3$ in comparison to 2019 data. The reason for the slight increase in 2018 and 2019 is unknown. In 2022 the concentration has increased in comparison to 2021 by 3.1 $\mu\text{g}/\text{m}^3$. Although, the concentration is 0.3 $\mu\text{g}/\text{m}^3$ lower in 2022 in comparison to 2019, which was before the Covid pandemic in 2020.

Table 3.6 – Results for George Spencer Academy, Stapleford 2016 – 2022.

Site ID	NO ₂ Annual Mean Concentration ($\mu\text{g}/\text{m}^3$)						
	2016	2017	2018	2019	2020	2021	2022
15	35.6	25.7	28.2	28.6	24.4	25.2	28.3

The location of this site is closer to the A52 than the main academy buildings, this is to ensure that the monitoring data is consistently collected, as previously diffusion tubes have been removed. This location also allows BBC to determine the worst case scenario for the academy. Although the data is below the air quality objective of 40 $\mu\text{g}/\text{m}^3$, this site will be closely monitored and an update will be provided in the 2024 ASR.

Site 55 - 12 Ilkeston Road, Stapleford

Table 3.7 shows the results for 12 Ilkeston Road in Stapleford for 2018 to 2022. The data shows that the highest concentration was in 2018 when monitoring first started at the site the concentration was 24.6 $\mu\text{g}/\text{m}^3$. In 2019 it had decreased by 0.8 $\mu\text{g}/\text{m}^3$. The 2020 data is seen as an anomaly, but the 2021 data shows a decrease of 4.8 $\mu\text{g}/\text{m}^3$ in comparison to 2019 data, which was before the Covid pandemic in 2020. The 2022 data shows a slight increase of 0.4 $\mu\text{g}/\text{m}^3$ in comparison to the 2021 data and the slight increase is to be expected as more people are returning to work after the pandemic but the concentrations are not as high as they were in 2018/2019.

Table 3.7 – Results for 12 Ilkeston Road, Stapleford 2018 – 2022.

Site ID	NO ₂ Annual Mean Concentration ($\mu\text{g}/\text{m}^3$)						
	2016	2017	2018	2019	2020	2021	2022
48	-	-	24.6	23.8	17.9	19.0	19.4

The location of this site is on the façade of a property and is on Ilkeston Road which is a main route into Beeston and to Nottingham City. The property is situated near to a mini roundabout where it can become congested through rush hour. Although, this site has always been below the air quality objective of $40\mu\text{g}/\text{m}^3$, an update will be provided in the 2024 ASR.

3.2.2 Particulate Matter (PM₁₀)

BBC purchased a Zephyr real time monitor in late 2021, which was installed in 2022 to monitor PM₁₀, PM_{2.5} and NO₂ in the Trowell AQMA. There were a variety of issues with the monitor throughout 2022, and as a result BBC feel that the data was not reliable enough to report on. However, these issues were rectified and the 2023 data will be reported on in the 2024 ASR.

3.2.3 Particulate Matter (PM_{2.5})

BBC purchased a Zephyr real time monitor in late 2021, which was installed in 2022 to monitor PM₁₀, PM_{2.5} and NO₂ in the Trowell AQMA. There were a variety of issues with the monitor throughout 2022, and as a result BBC feel that the data was not reliable enough to report on. However, these issues were rectified and the 2023 data will be reported on in the 2024 ASR.

3.2.4 Sulphur Dioxide (SO₂)

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
7	31 Hickton Drive, Chilwell	Roadside	450756	334328	NO ₂	No	0	6	N	1.9
53	1 Calverton Close, Chilwell	Roadside	450360	334982	NO ₂	No	0	5	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)
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
12	Lamppost, Stapleford Lane, Toton	Roadside	449615	335664	NO ₂	No	0	1	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)
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
16	24 Brampton Drive, Stapleford	Roadside	449516	336216	NO ₂	No	0	7	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)
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
19	15 Iona Drive, Trowell	Roadside	448586	339023	NO ₂	Yes AQMA 1	0	18*	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)
20	30 Derbyshire Avenue, Trowell	Roadside	448652	339652	NO ₂	No	0	12*	N	1.9
22	81 Nottingham Road, Trowell	Roadside	448832	340098	NO ₂	No	0	18*	N	1.8
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
30	560 Nottingham Road, Giltbrook	Roadside	448544	345241	NO ₂	No	0	4	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)
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
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

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)
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
39	9 Bembridge Court, Bramcote	Roadside	450434	337781	NO ₂	No	0	14	N	1.6

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)
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
43	Broxtowe Borough Council Offices	Urban Background	452733	336962	NO ₂	No	0	8	N	1.8
48	Near 73 Town Street, Bramcote	Roadside	450817	337592	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)
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
60	Dovecote Lane Park, Beeston	Roadside	453075	336311	NO ₂	No	0	9	N	1.9
61, 62 and 63	Street Column Iona Drive, Trowell ^	Roadside	448607	339026	NO ₂	Yes AQMA 1	1	2*	Y	2.0
64	Smithurst Road Park, Giltbrook	Roadside	447720	345443	NO ₂	No	0	2	N	1.9
65	Hall Om Wong Park,	Roadside	449482	344888	NO ₂	No	0	19	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)
	Eastwood Road, Kimberley									

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/Triplicate Diffusion Tubes

Table A.2 – Annual Mean NO₂ Monitoring Results: Non-Automatic Monitoring (µg/m³)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
1	452527	337313	Roadside	100	100	25.6	26.8	19.0	21.0	20.8
50	452114	338018	Roadside	100	100	28.2	29.2	18.9	16.3	15.2
2	452091	338122	Roadside	100	100	26.6	26.5	18.9	20.8	20.1
3	453659	337412	Roadside	100	100	22.5	23.1	17.7	19.1	18.0
4	453361	336627	Roadside	100	100	26.0	25.8	19.1	20.2	19.2
51	453537	336100	Roadside	100	100	18.3	15.9	15.0	16.5	15.8
52	453287	336349	Roadside	100	100	22.9	24.5	18.0	19.0	17.5
5	451782	335320	Urban Background	100	100	16.7	15.7	13.2	13.5	13.2
7	450756	334328	Roadside	100	100	23.0	23.4	16.2	18.0	16.5
53	450360	334982	Roadside	100	100	19.3	19.9	13.9	14.7	13.9
8	450422	334243	Roadside	100	100	27.1	24.3	20.8	22.4	21.1

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
9	449876	334804	Roadside	92.3	92.3	21.9	21.5	16.2	18.0	16.9
10	449748	335472	Roadside	-	-	20.8	21.6	-	-	-
11	449694	335501	Roadside	90.4	90.4	26.1	27.6	20.8	23.0	22.5
12	449615	335664	Roadside	92.3	92.3	23.6	20.5	17.3	19.1	18.9
45	449467	336220	Roadside	100	100	25.9	26.7	20.1	20.8	20.6
15	449406	336135	Roadside	100	100	28.2	28.6	24.4	25.2	28.3
13	449266	336075	Roadside	100	100	26.0	24.9	18.1	20.4	18.8
16	449516	336216	Roadside	100	100	25.9	25.4	18.4	20.0	19.8
54	448467	336591	Roadside	100	100	29.8	29.9	21.9	23.6	22.0
17	448890	337190	Roadside	90.4	90.4	33.0	32.7	25.1	26.7	26.3
55	449814	338471	Roadside	100	100	24.6	23.8	17.9	19.0	19.4
18	448560	338889	Roadside	100	100	28.2	28.4	21.5	22.3	21.5

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
19	448586	339023	Roadside	100	100	31.9	30.9	22.9	23.8	22.3
20	448652	339652	Roadside	100	100	24.1	23.3	17.3	19.7	18.7
22	448832	340098	Roadside	82.7	82.7	24.2	24.2	18.7	19.7	19.8
44	446509	347091	Roadside	100	100	33.7	31.7	24.8	27.6	26.9
27	446465	346985	Roadside	100	100	24.1	20.4	17.8	18.9	18.0
30	448544	345241	Roadside	100	100	23.1	21.9	18.3	20.3	19.1
31	448826	344883	Roadside	90.4	90.4	25.7	28.8	21.2	22.8	21.7
32	450122	344658	Roadside	76.9	76.9	28.9	28.9	21.3	22.9	20.9
33 and 34	451631	344526	Roadside	100	100	25.5	25.9	18.7	20.7	19.6
35	451728	344440	Roadside	100	100	30.0	29.7	22.6	23.4	22.9
36	452232	344033	Roadside	100	100	32.8	31.7	24.9	26.0	25.4

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
37	452331	343910	Roadside	100	100	28.9	26.4	19.3	23.5	21.1
57	451413	341424	Roadside	100	100	-	-	15.2	16.0	14.7
38	450389	337866	Roadside	82.7	82.7	29.8	26.7	20.5	24.1	22.0
39	450434	337781	Roadside	100	100	26.7	25.5	18.6	21.1	20.5
56	450570	337851	Roadside	100	100	25.1	23.4	18.7	19.6	19.8
40	450632	337929	Roadside	100	100	34.0	32.0	23.6	27.4	25.8
41	450555	337909	Roadside	100	100	34.1	30.9	23.5	26.0	25.3
43	452733	336962	Urban Background	100	100	18.6	18.3	13.8	14.9	14.2
48	450817	337592	Roadside	100	100	35.7	30.4	25.4	27.8	28.4
58	448588	338940	Roadside	100	100	-	-	19.4	21.8	20.7
59	448602	338965	Roadside	100	100	-	-	19.1	21.0	20.3
60	453075	336311	Roadside	100	100	-	-	-	-	16.8

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
61, 62 and 63	448607	339026	Roadside	100	100	-	-	-	-	21.7
64	447720	345443	Roadside	92.3	92.3	-	-	-	-	14.2
65	449482	344888	Roadside	82.7	82.7	-	-	-	-	12.6

Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.

Diffusion tube data has been bias adjusted.

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

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

Exceedances of the NO₂ annual mean objective of $40\mu\text{g}/\text{m}^3$ are shown in **bold**.

NO₂ annual means exceeding $60\mu\text{g}/\text{m}^3$, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

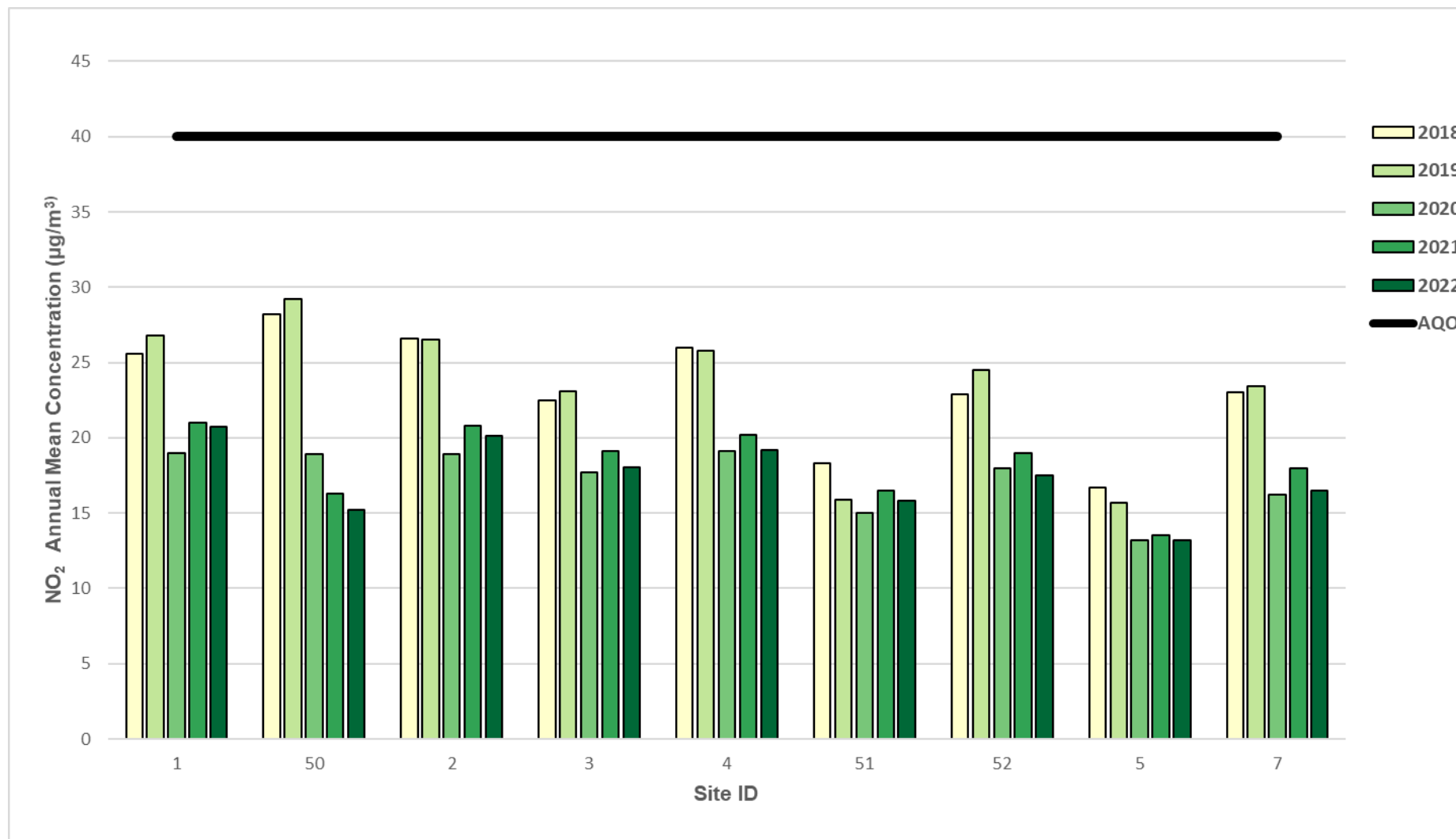
Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

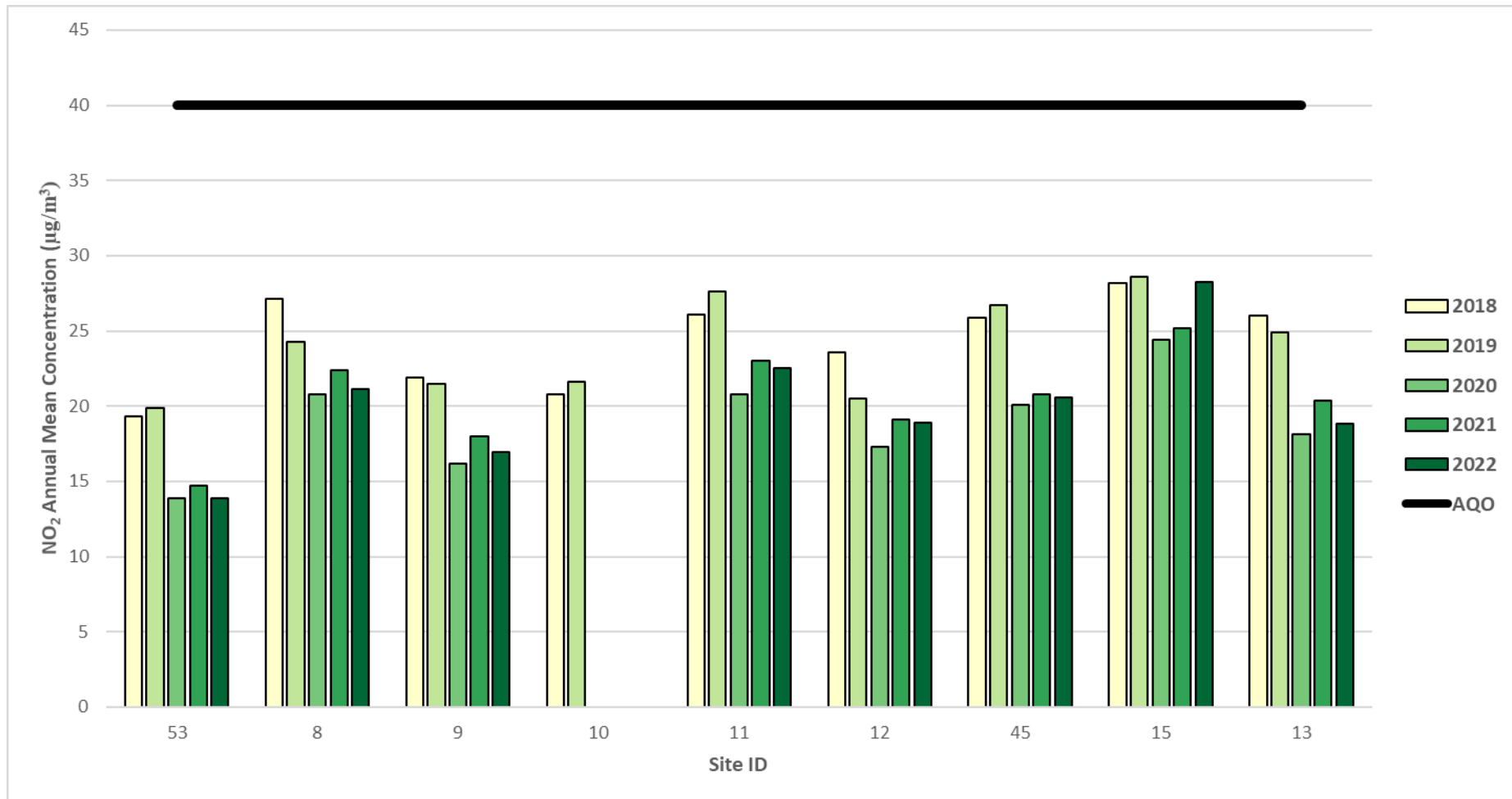
Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

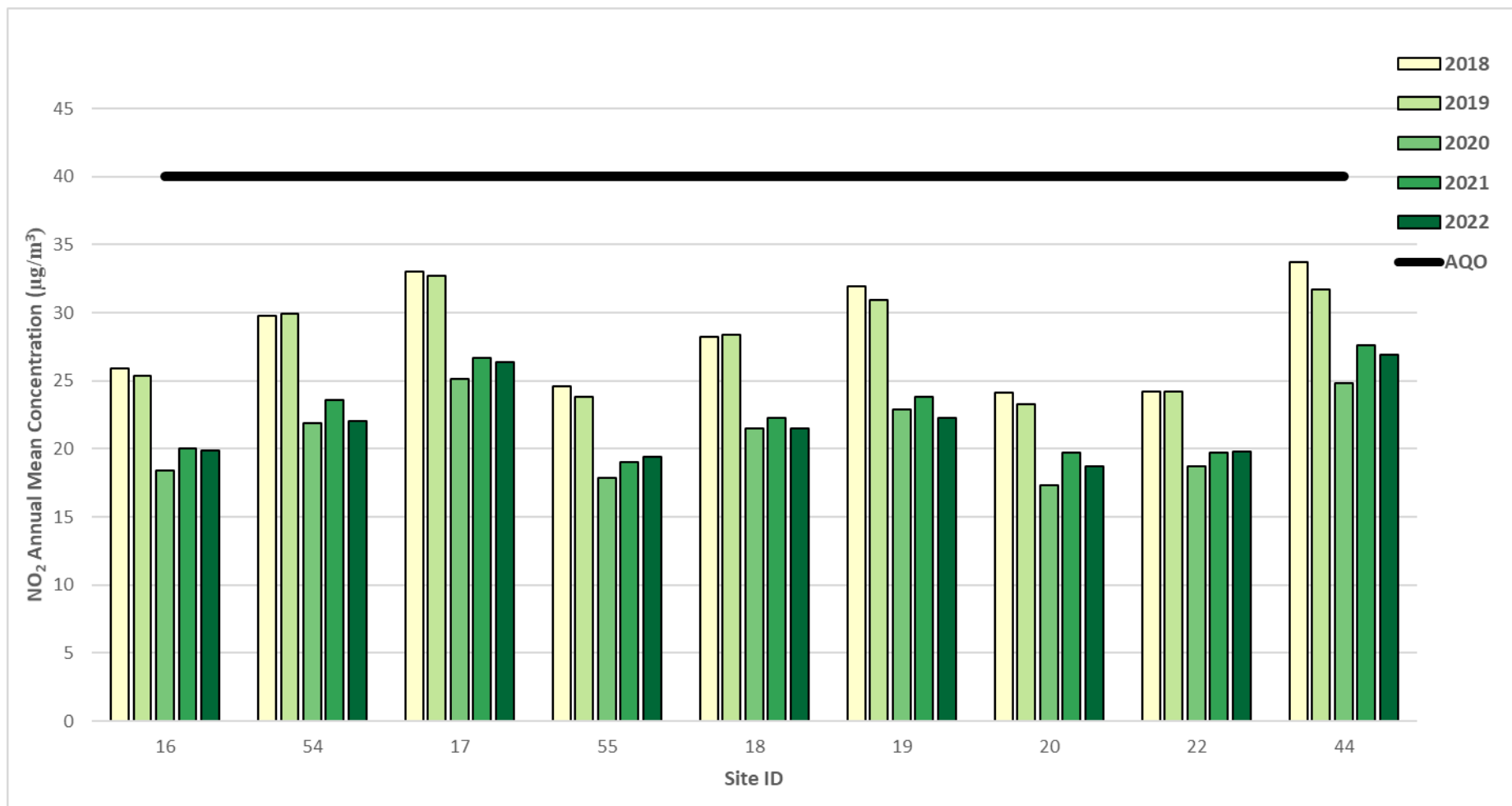
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

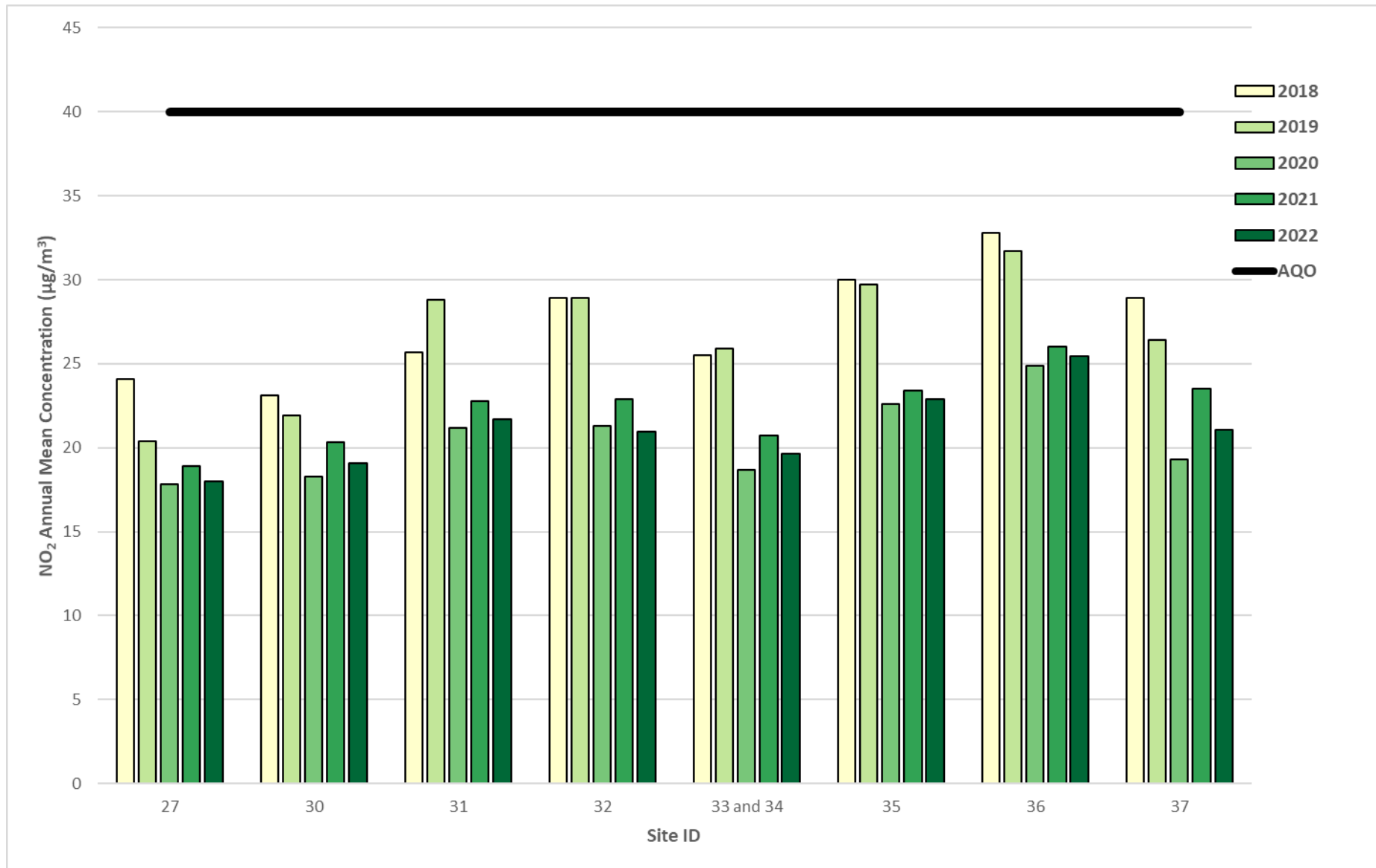
(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

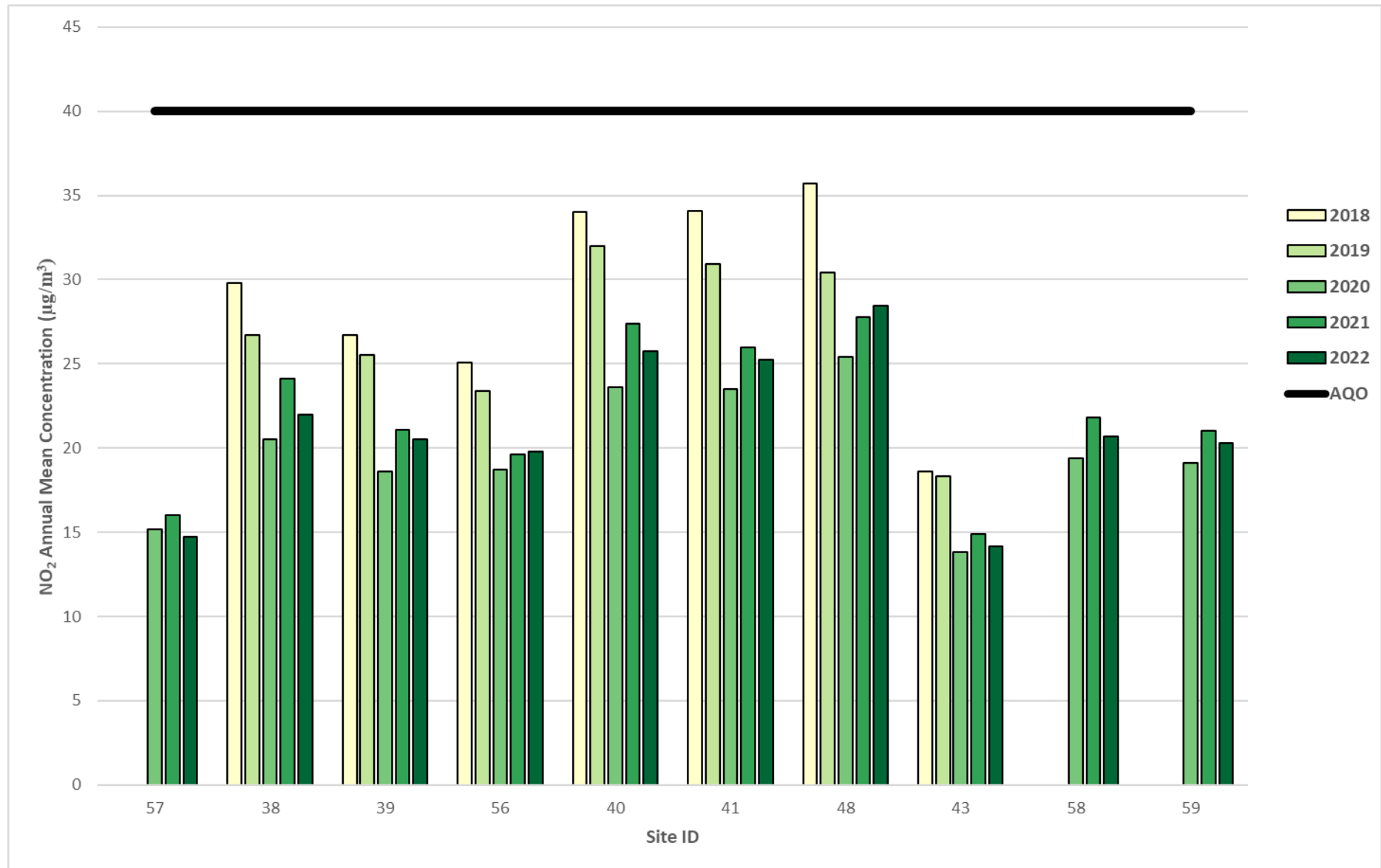
Figure A.1 – Trends in Annual Mean NO₂ Concentrations for all sites since 2018 to 2022.











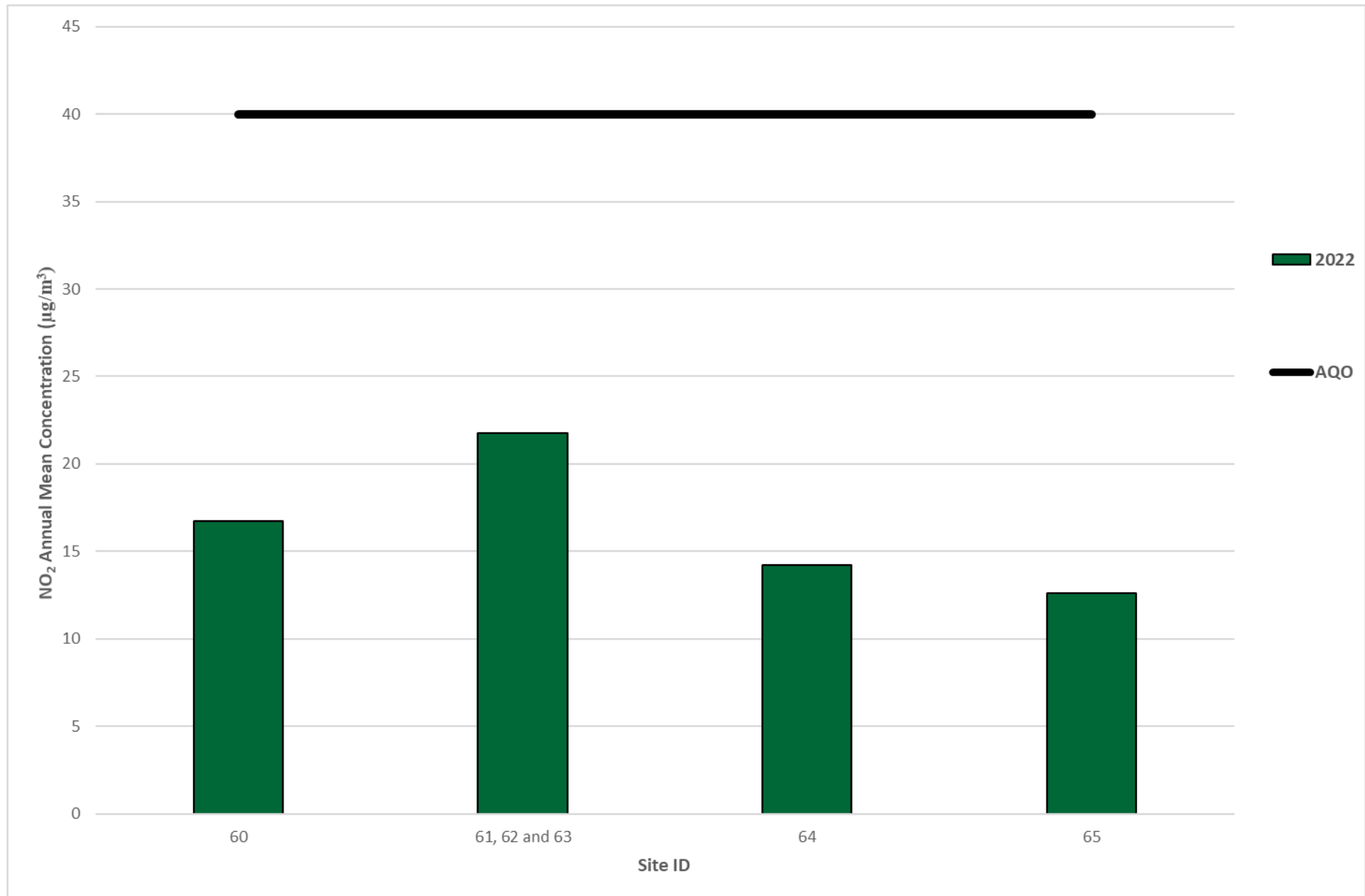
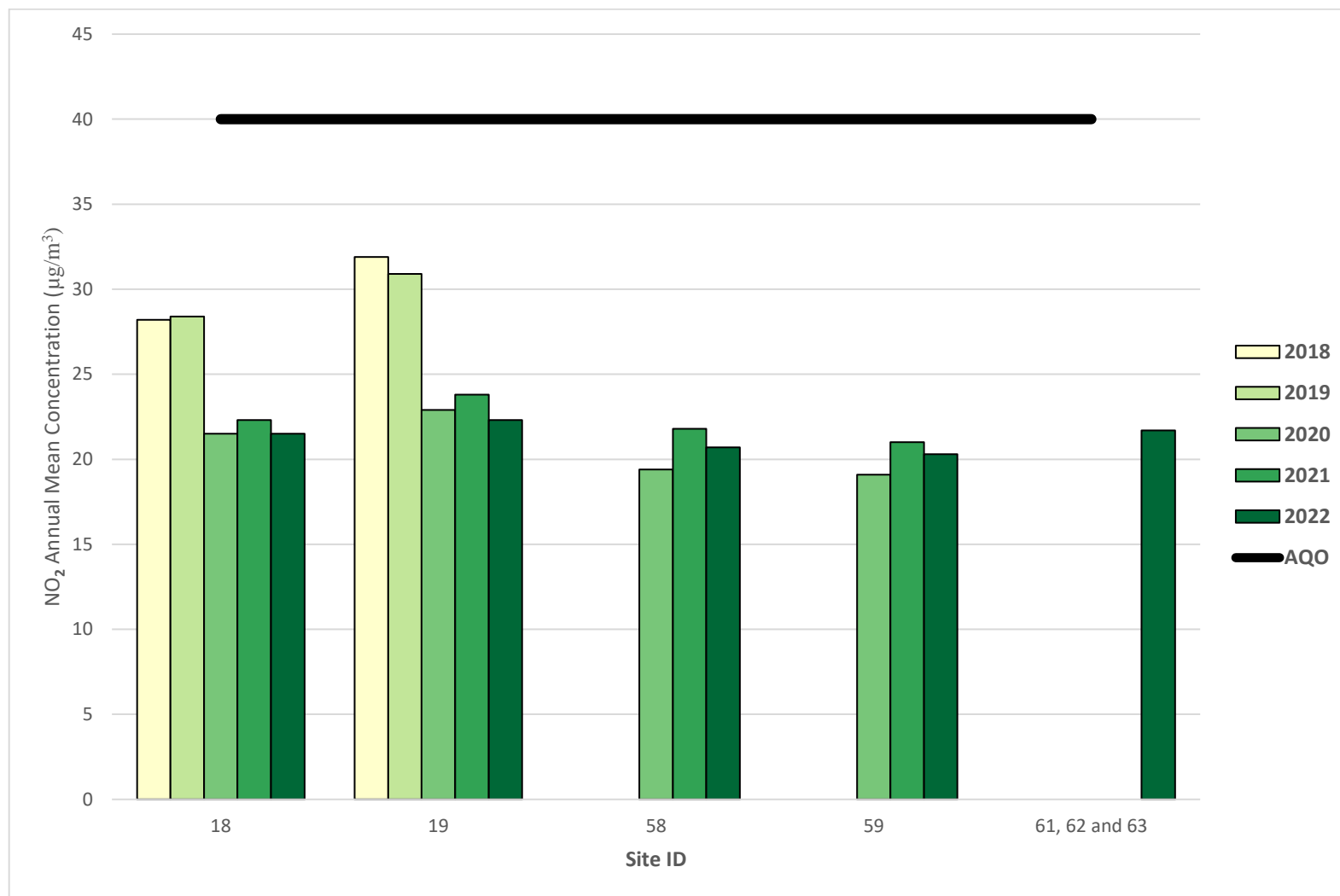


Figure A.2 – Trends in Annual Mean NO₂ Concentrations for the AQMA since 2018 to 2022



Appendix B: Full Monthly Diffusion Tube Results for 2022

Table B.1 – NO₂ 2022 Diffusion Tube Results (µg/m³)

DT ID	X OS Grid Ref (Eastin g)	Y OS Grid Ref (Eastin g)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.83)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
1	452527	337313	36.1	25.1	28.1	17.3	21.9	20.9	21.2	20.8	24.5	25.0	28.4	30.8	25.0	20.8	-	
50	452114	338018	27.5	18.1	23.1	16.3	12.5	11.6	13.4	14.7	19.5	17.9	19.3	26.3	18.3	15.2	-	
2	452091	338122	34.8	23.8	28.1	20.3	21.5	17.5	19.5	15.6	24.1	26.8	28.6	30.3	24.2	20.1	-	
3	453659	337412	31.1	22.2	27.4	19.3	15.3	14.8	15.9	18.0	20.5	21.1	24.8	30.6	21.7	18.0	-	
4	453361	336627	36.1	21.9	27.7	17.5	18.1	16.9	17.9	17.7	21.5	24.3	27.7	30.5	23.1	19.2	-	
51	453537	336100	25.2	17.3	24.3	15.5	14.3	14.0	15.3	15.7	18.3	19.1	21.8	27.7	19.0	15.8	-	
52	453287	336349	32.9	20.6	25.7	18.4	15.2	14.8	16.1	17.1	21.7	21.2	24.8	24.9	21.1	17.5	-	
5	451782	335320	27.3	15.3	17.5	13.1	11.6	10.2	10.5	11.5	15.0	15.5	16.8	25.9	15.9	13.2	-	
7	450756	334328	13.9	21.7	28.0	15.5	14.8	13.5	15.8	15.5	20.4	22.6	26.9	30.1	19.9	16.5	-	
53	450360	334982	25.9	16.9	20.0	15.3	13.1	11.7	12.6	13.1	17.2	14.8	17.3	23.1	16.8	13.9	-	
8	450422	334243	33.4	24.2	27.4	23.9	21.9	18.7	22.0	24.2	25.1	26.1	27.9	30.6	25.4	21.1	-	
9	449876	334804	28.7	18.6	24.9	18.6	15.2	14.4	16.4	19.5	20.2	21.1	26.8	20.4	20.4	16.9	-	
11	449694	335501	40.3	25.4	27.2	24.1	25.7	23.0	24.4	24.2	30.2	23.9	30.0		27.1	22.5	-	
12	449615	335664	32.7	20.0	30.7	19.0	16.2	15.0	16.7	24.3	19.7	24.8	31.1	22.7	22.7	18.9	-	
45	449467	336220	36.0	25.0	28.3	19.9	19.9	18.2	19.2	18.4	23.9	27.8	29.0	32.5	24.8	20.6	-	
15	449406	336135	42.8	34.5	37.0	27.8	30.5	27.7	30.8	28.4	32.4	37.3	40.5	38.8	34.1	28.3	-	
13	449266	336075	32.9	21.6	28.4	23.9	16.6	14.8	13.9	23.7	25.5	19.8	21.8	29.2	22.7	18.8	-	
16	449516	336216	31.4	23.6	29.1	19.9	19.9	17.4	19.5	20.5	22.9	25.3	28.0	29.4	23.9	19.8	-	
54	448467	336591	32.7	26.0	32.3	21.2	21.3	20.7	20.4	23.7	27.0	28.9	31.7	32.2	26.5	22.0	-	
17	448890	337190	44.3	33.1	34.1	24.4	28.8	27.6	27.3	27.2	28.5		36.9	37.0	31.7	26.3	-	

DT ID	X OS Grid Ref (Eastin g)	Y OS Grid Ref (Eastin g)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.83)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
55	449814	338471	31.9	23.7	28.0	19.2	18.5	17.8	18.4	19.8	22.8	22.9	28.0	29.7	23.4	19.4	-	
18	448560	338889	35.7	27.3	24.4	21.3	23.9	24.6	23.5	24.2	23.9	25.2	27.1	29.3	25.9	21.5	-	
19	448586	339023	35.7	32.7	23.2	21.1	25.6	23.8	22.8	23.7	23.4	28.0	30.9	31.1	26.8	22.3	-	
20	448652	339652	25.6	19.4	31.0	23.2	18.7	14.7	18.2	23.0	22.9	23.2	25.4	24.8	22.5	18.7	-	
22	448832	340098	23.5	23.4	30.7	18.9	20.5		18.3	20.5	22.8		32.3	27.8	23.9	19.8	-	
44	446509	347091	38.2	31.3	36.5	30.5	29.4	25.6	28.2	26.3	31.7	34.7	37.7	38.4	32.4	26.9	-	
27	446465	346985	27.0	19.5	28.2	20.5	17.9	16.7	17.3	21.0	21.4	21.1	22.6	27.0	21.7	18.0	-	
30	448544	345241	33.5	22.2	27.2	18.4	17.6	16.5	20.2	20.1	21.9	24.7	25.8	27.6	23.0	19.1	-	
31	448826	344883	35.6	31.4	28.0	18.8	26.3	26.3	23.2	22.2	24.9		20.2	30.8	26.2	21.7	-	
32	450122	344658	31.6			22.9	22.6	17.7	22.2		25.7	25.3	28.5	30.6	25.2	20.9	-	
33	451631	344526	27.8	22.9	29.1	19.2	20.2	18.7	17.5	19.7	22.4	26.0	30.9	27.1	-	-	-	Duplicate Site with 33 and 34 - Annual data provided for 34 only
34	451631	344526	27.2	23.3	30.5	19.3		18.3	19.4	20.2	22.9	27.3	28.6	28.4	23.6	19.6	-	Duplicate Site with 33 and 34 - Annual data provided for 34 only
35	451728	344440	35.9	34.3	24.3	15.7	28.0	27.5	26.0	23.0	25.7	28.8	31.4	30.4	27.6	22.9	-	
36	452232	344033	40.8	32.7	35.7	21.7	27.2	25.8	27.6	23.8	27.8	35.0	36.5	33.4	30.7	25.4	-	
37	452331	343910	34.1	21.7	29.8	21.7	23.8	20.2	20.5	29.1	28.1	20.3	24.2	31.0	25.4	21.1	-	
57	451413	341424	26.6	17.0	21.8	14.1	14.8	5.5	15.1	15.9	18.6	18.0	21.2	24.1	17.7	14.7	-	
38	450389	337866	36.2	26.3	37.8	27.8		18.4	20.1	25.4	27.6	11.6		33.3	26.5	22.0	-	
39	450434	337781	28.0	20.4	34.7	26.5	19.8	18.4	19.6	24.6	25.5	23.7	26.8	28.9	24.7	20.5	-	
56	450570	337851	33.9	24.1	27.4	21.3	20.6	18.8	18.8	19.3	23.1	23.3	25.9	29.1	23.8	19.8	-	
40	450632	337929	40.3	27.0	34.2	31.8	28.0	26.0	24.8	30.4	32.6	29.8	31.6	36.1	31.0	25.8	-	
41	450555	337909	36.4	29.1	31.3	33.6	27.8	26.4	25.6	27.2	28.7	32.5	31.8	34.7	30.4	25.3	-	
48	450817	337592	43.4	37.7	32.0	24.6	34.6	32.5	32.2	28.3	32.5	34.6	39.6	39.1	34.3	28.4	-	
43	452733	336962	27.7	16.8	24.8	13.6	11.0	11.1	11.2	12.2	15.2	16.1	20.1	25.1	17.1	14.2	-	
58	448588	338940	35.6	27.1	23.8	21.7	22.7	21.7	21.4	23.0	23.7	23.0	26.9	28.2	24.9	20.7	-	

DT ID	X OS Grid Ref (Eastin g)	Y OS Grid Ref (Eastin g)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.83)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
59	448602	338965	34.4	27.7	24.4	19.5	21.8	21.3	21.9	23.5	22.5	23.3	26.3	26.9	24.5	20.3	-	
60	453075	336311	28.8	15.3	29.7	18.7	16.7	12.8	15.1	17.2	19.5	18.2	21.9	28.3	20.2	16.8	-	
61	448607	339026	40.3	31.3	25.6	21.1	23.1	22.3	20.9	23.2	22.0	26.3	28.0	30.5	-	-	-	
62	448607	339026	40.4	25.8	27.1	21.5	23.1	22.8	22.4	22.3	20.1	26.7	29.5	30.1	-	-	-	
63	448607	339026	36.9	29.9	25.4	21.6		23.1	21.6	22.6	24.1	27.2	29.0	32.1	26.2	21.7	-	
64	447720	345443	24.2		20.8	11.6	11.1	10.4	12.7	12.3	14.2	19.8	24.2	27.2	17.1	14.2	-	
65	449482	344888	25.2		18.4	9.6		10.0	9.9	11.3	13.4	14.9	17.9	21.2	15.2	12.6	-	

- All erroneous data has been removed from the NO₂ diffusion tube dataset presented in Table B.1.
- Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.
- 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 2022 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

- (a) Missing tubes
- (b) Result not valid
- (C) Found on the Floor

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

New or Changed Sources Identified Within Broxtowe Borough Council During 2022

Broxtowe Borough Council has not identified any new sources relating to air quality within the reporting year of 2022.

Additional Air Quality Works Undertaken by Broxtowe Borough Council During 2022

Broxtowe Borough Council has not completed any additional works within the reporting year of 2022.

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% and above. 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 2023 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.TG22 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/NO₂ 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 0.83 to the 2022 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
2023	National	03/23	0.83
2021	National	03/22	0.84
2020	National	03/21	0.81
2019	National	03/20	0.93
2018	National	03/19	0.93

NO₂ Fall-off with Distance from the Road

No diffusion tube NO₂ monitoring locations within Broxtowe Borough Council required distance correction during 2022.

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

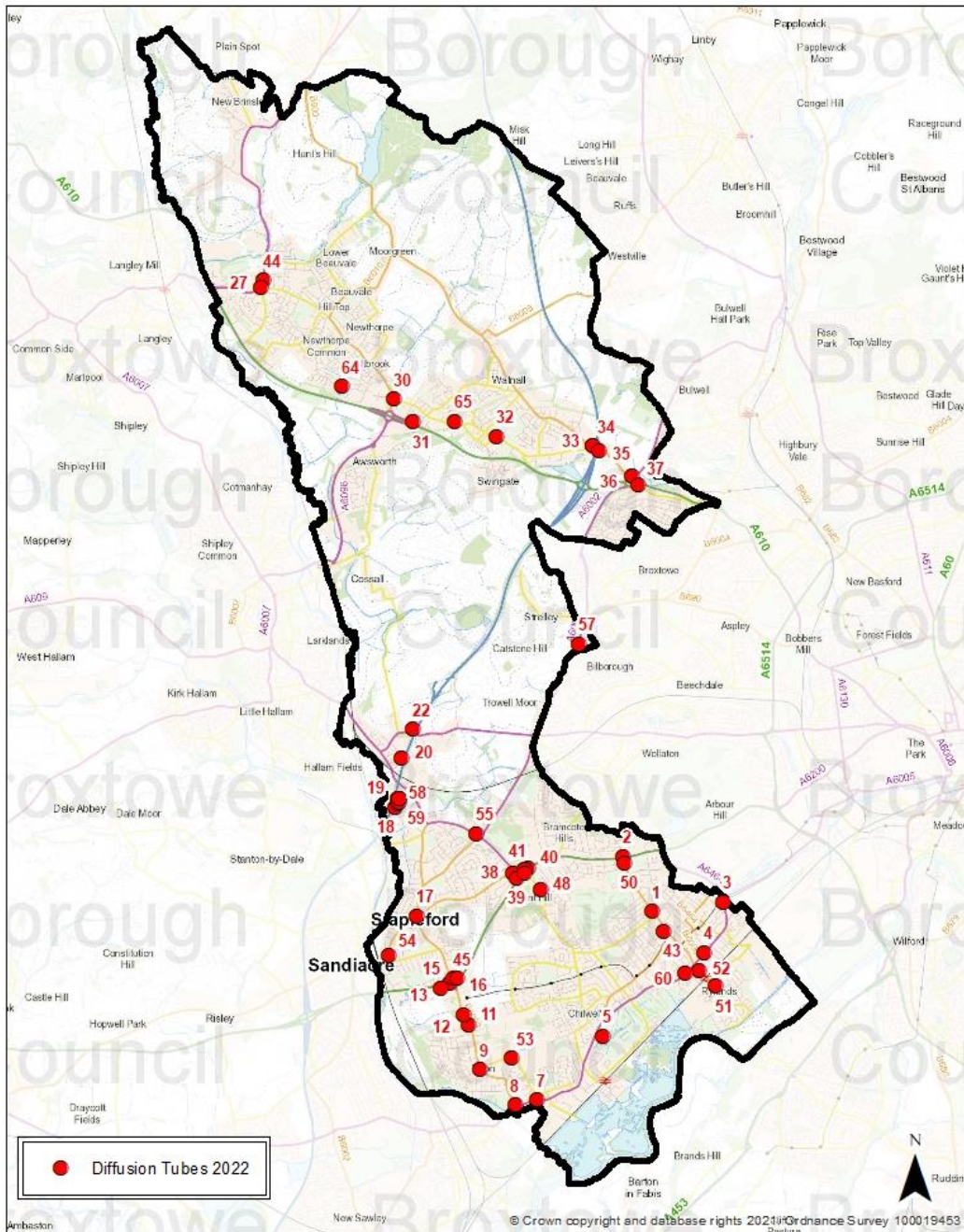


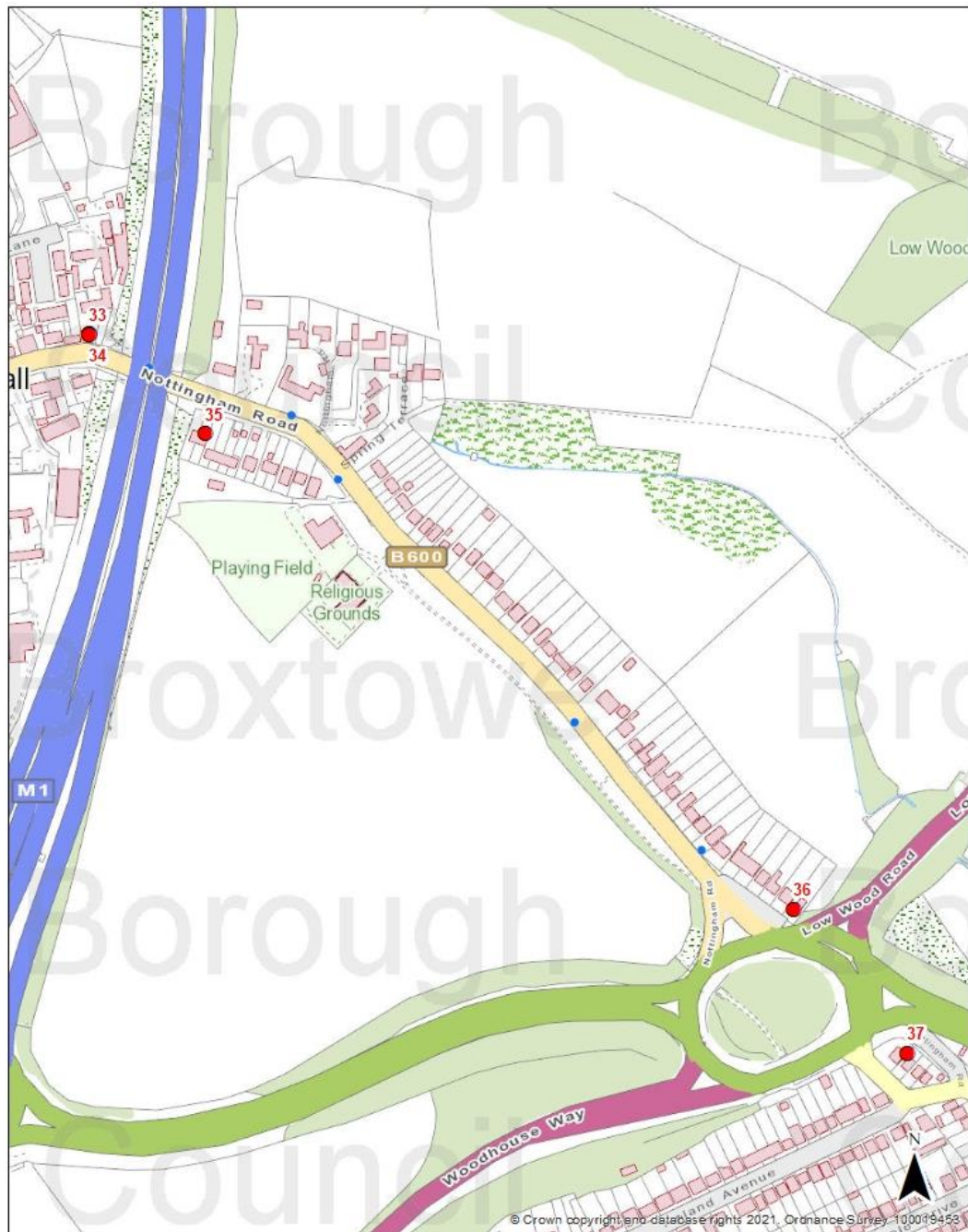
Figure D.1 – 2022 Diffusion Tube Locations.

Appendix E: Map of AQMA in Trowell.



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

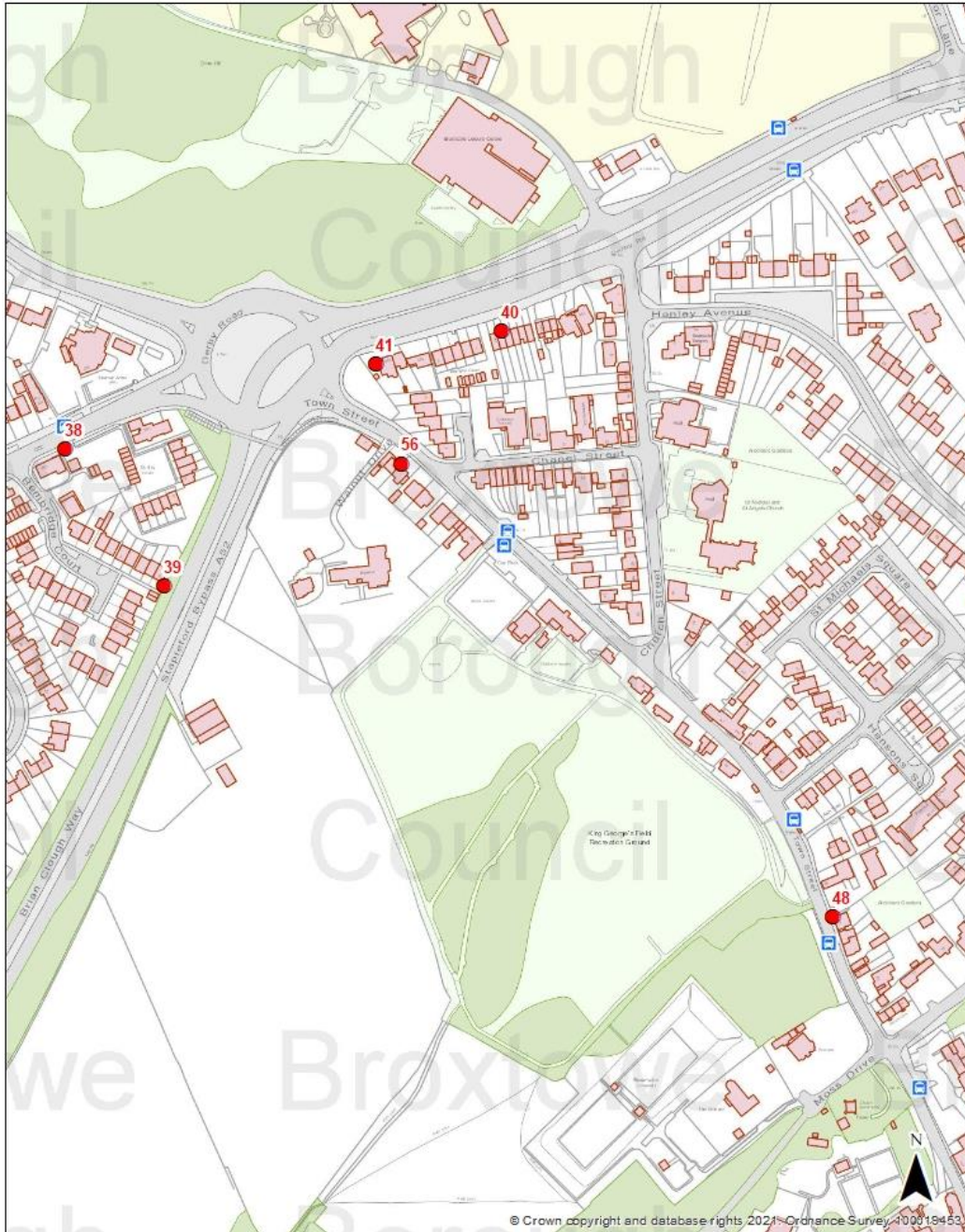
Appendix F: Map of A610/B600 Nuthall Island showing the Monitoring Locations.



© Crown copyright and database rights 2022. Ordnance Survey 100019453
You are not permitted to copy, sub-licence, distribute or sell any of this data to third parties in any form

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

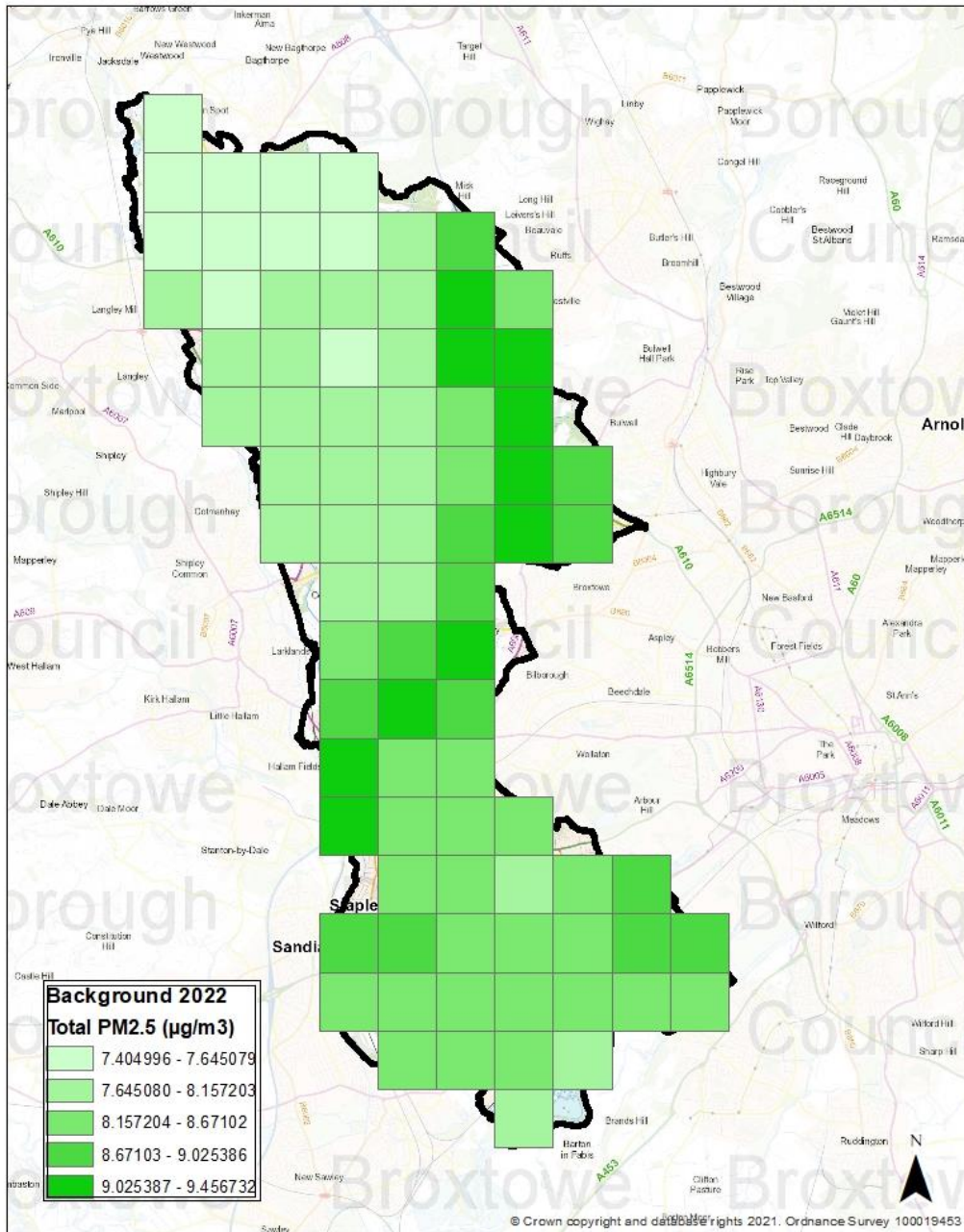
Appendix G: Map of Bramcote Island, Derby Road and Town Street showing the Monitoring Locations.



© Crown copyright and database rights 2022. Ordnance Survey 100019453
You are not permitted to copy, sub-licence, distribute or sell any of this data to third parties in any form

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

Appendix H: Map of the Borough showing the 2022 modelled background levels of PM_{2.5}.



© Crown copyright and database rights 2022. Ordnance Survey 100019453
 You are not permitted to copy, sub-licence, distribute or sell any of this data to third parties in any form

Figure H.1- Map of the Borough showing the 2022 modelled background levels of PM_{2.5}.

Appendix I: Summary of Air Quality Objectives in England

Table I.1 – Air Quality Objectives in England¹¹

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

¹¹ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air Quality Annual Status Report
ATF	Active Travel Fund
AURN	Automatic Urban and Rural Network
BBC	Broxtowe Borough Council
BSIP	Bus Service Improvement Plan
CAZ	Clean Air Zone
COMEAP	Committee on the Medical Effects of Air Pollution
CV	Coefficient of Variation
Defra	Department for Environment, Food and Rural Affairs
Derv	Diesel Engine Road Vehicle
DCC	Derbyshire County Council
DCiC	Derby City Council
DfT	Department for Transport
D2N2	Local Enterprise Partnership for Derby, Derbyshire, Nottingham and Nottinghamshire
EMAQN	East Midlands Air Quality Network
EU	European Union
EVCC	Electric Vehicle Cable Channels
FDMS	Filter Dynamics Measurement System
HGV's	Heavy Goods Vehicles

HS2	High Speed Train 2
HVO	Hydrotreated Vegetable Oil
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
LEV	Low Emission Vehicles
LGA	Local Government Association
LSTF	Local Sustainable Transport Fund
$\mu\text{g}/\text{m}^3$	Microgrammes of pollutant per cubic metre of air
MOT	Multi Operator Ticket in relation to travel on buses and trams
NEPWG	Nottinghamshire Environmental Protection Working Group
NET	Nottingham Express Transit
NCT	Nottingham City Transport
NH	National Highways
NHS	National Health Service
NO	Nitric Oxide
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
NCiC	Nottingham City Council
NCC	Nottinghamshire County Council
O ₃	Ozone
OHID	Office for Health Improvement & Disparities used to be Public Health England
OLEV	Office for Low Emission Vehicles
OZEV	Office of Zero Emission Vehicles
PHOF	Public Health Outcomes Framework

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
PT	Public Transport
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
- Defra, Abatement cost guidance for valuing changes in air quality, May 2022.
- Defra. Air quality appraisal: damage cost guidance, January 2023
- 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
- Defra, PHE and LGA, *Air Quality – A Briefing for Directors of Public Health 2017* Department for Environment Food and Rural Affairs, Office for Health Improvement & Disparities and Local Government Association Available at :
<https://laqm.defra.gov.uk/assets/63091defraairqualityguide9web.pdf>
- Defra, Environmental equity, air quality, socioeconomic status and respiratory health, 2010. Department for Environment Food and Rural Affairs.
- Defra. Environmental Improvement Plan 2023, January 2023 Available at:
<https://www.gov.uk/government/publications/environmental-improvement-plan>
- 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.html>
- Department for Transport, National statistics, Light rail and tram statistics, England: year ending March 2022, Available at:
<https://www.gov.uk/government/statistics/light-rail-and-tram-statistics-england-year-ending-march-2022/light-rail-and-tram-statistics-england-year-ending-march-2022#passenger-journeys>
- Department for Transport. *The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy*, July 2018

- Gowers, A.M. et al *Estimating Local Mortality Burdens associated with Particulate Air Pollution*, Office for Health Improvement & Disparities : 2014.
- Local Air Quality Management Technical Guidance LAQM.TG22. August 2022. 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.PG22. August 2022. 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.
- Office for Health Improvement & Disparities . Air Quality: A Briefing for Directors of Public Health, 2017
- Office for Health Improvement & Disparities. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018
- Office for Health Improvement & Disparities, *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/>
- 'Office for Health Improvement & Disparities. Public Health Outcomes Framework.
<https://fingertips.phe.org.uk/profile/public-health-outcomes-framework> © Crown copyright 2020.