2019 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 2019

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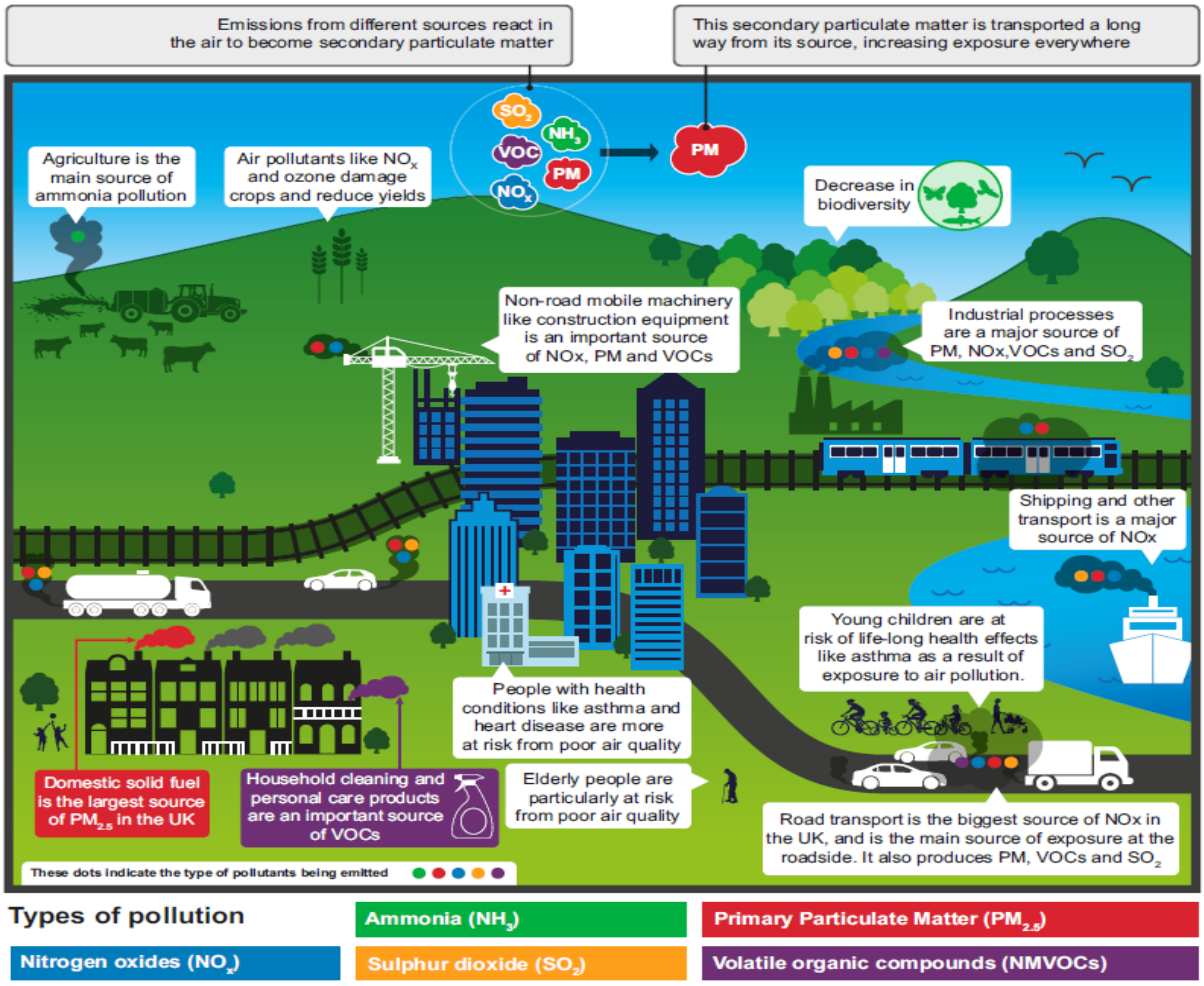
Executive Summary: Air Quality in Our Area

What is Air Pollution and where does it come from?

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

The sources of air pollutants and their effects.



Source – Clean Air Strategy 2019, DEFRA
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/clean-air-strategy-2019.pdf

Poor air quality can affect people's health on a daily basis and can result in premature death. Therefore, it is imperative that poor air quality is recognised as a public health issue and that continual measures are taken to improve the air quality even if the air quality objectives in the UK are being met.

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

What is Nitrogen Dioxide?

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

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

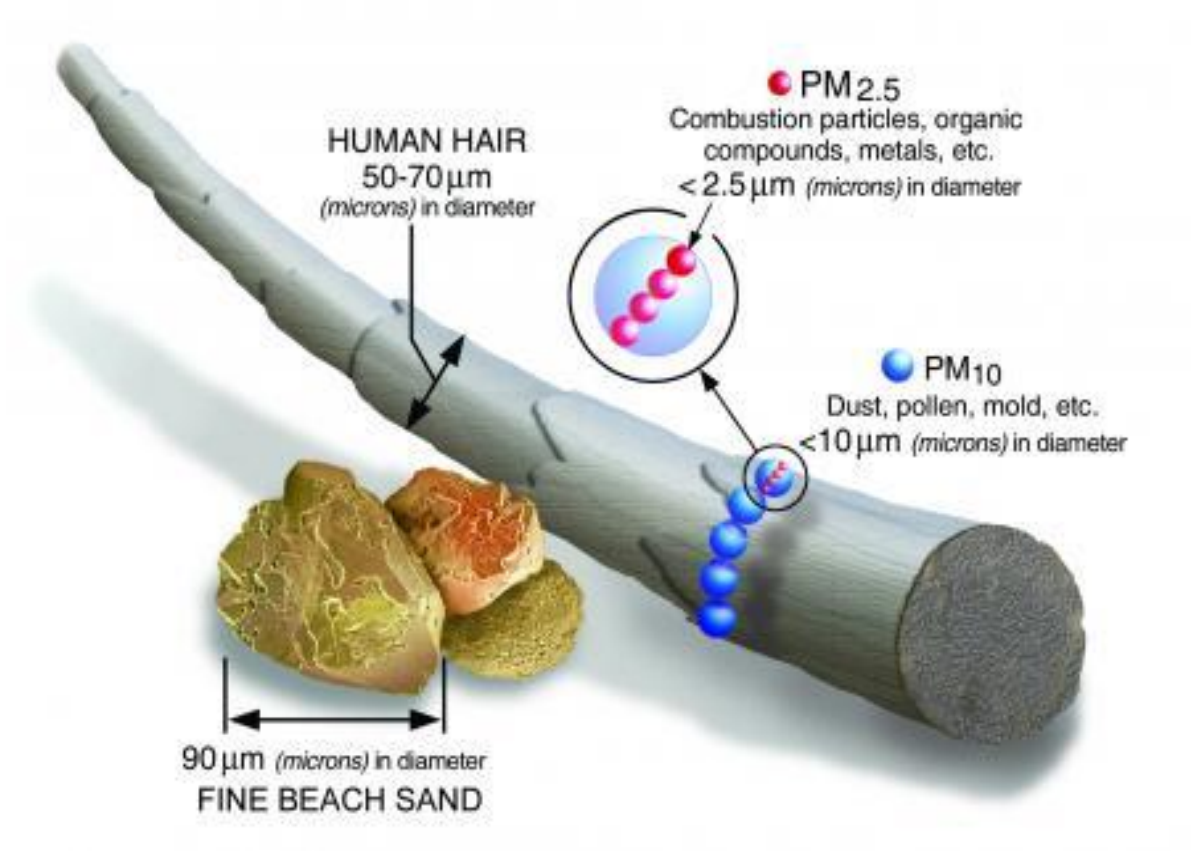
Some sources of NOx release NOx in the form of NO_2 into the atmosphere, these are known as primary sources of NO_2, which are mainly emitted from vehicle exhausts. It was previously believed that it was petrol vehicles that were the main source of NO_2 however the use of diesel particulate filters within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

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

What is Particulate Matter?

Particulate matter is the term used for a mixture of solid particles and/or liquid droplets within the air. Particulate matter varies in size with some particles being easily visible to humans e.g. dust, soot, smoke and vapour from domestic boiler flues. However, some particles are so small that they cannot be seen with the naked eye and it is these particles that are easily absorbed deep into the lungs and cannot be expelled when they are breathed in.

Size of Particulate Matter



Source: USEPA - https://www3.epa.gov/pm/basic.html

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 K for the Air Quality Objectives for the UK).

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

- Vehicle exhausts
- The wearing of brake pads, tyres and asphalt
- Rust from vehicles
- Poor fuel combustion
- Dust from demolition and building sites
- Bonfires and inefficient burning of solid fuel e.g. wood.

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

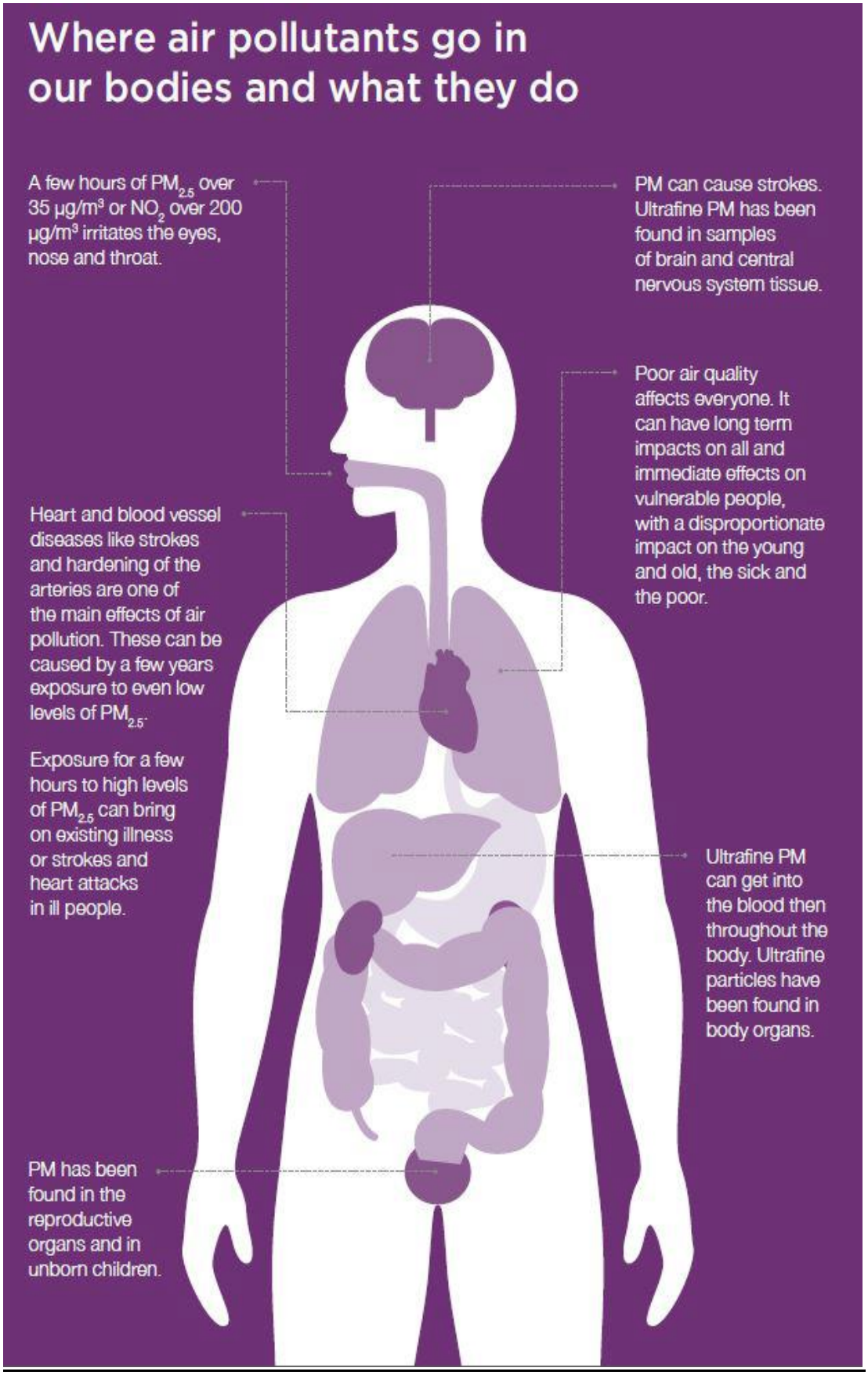
What are the Health Effects of Poor Air Quality?

Air pollution is associated with a number of adverse health impacts both short term and long term. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas[1,2].

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

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

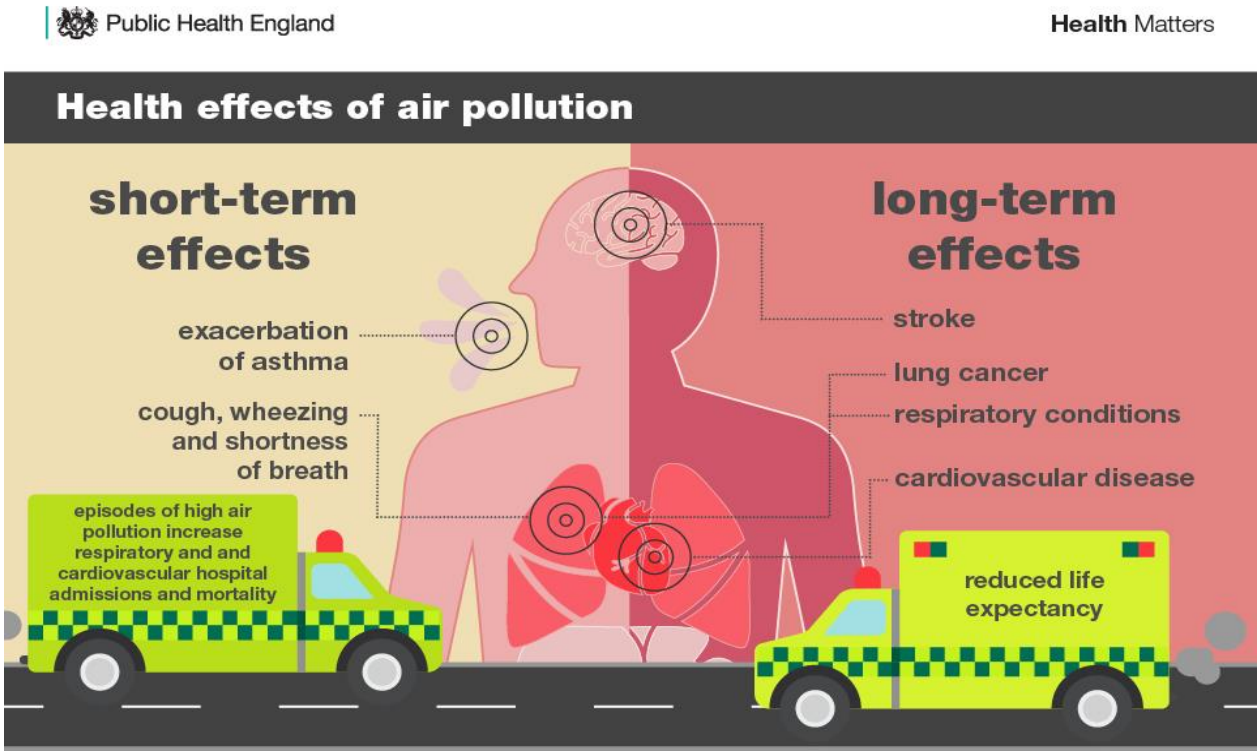
[1] Environmental equity, air quality, socioeconomic status and respiratory health, 2010
[2] Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006
[3] Defra. Abatement cost guidance for valuing changes in air quality, May 2013



Source - Air Quality: A Briefing for Directors of Public Health, March 2017
https://laqm.defra.gov.uk/assets/63091defraairqualityguide9web.pdf

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

The short and long-term effects of air pollution



Source – Health Matters 2018, Public Health England

Health Effects of Nitrogen Dioxide

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

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

Table i – Estimated Attributable Deaths in 2018 due to NO_2 and Particulate Matter based on 36,000.

Area	Attributable deaths Age 25+ due to NO_2 and PM based on 36,000	Associated Life-years Lost based on 36,000
East Midlands	3,115	29,813
Nottinghamshire County Council	567	5,430
Nottingham City	181	1,734
Ashfield	94	913
Gedling	87	866
Newark and Sherwood	87	863
Bassetlaw	84	855
Broxtowe Borough Council	86	844
Mansfield	79	819
Rushcliffe	77	728

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 844 life years lost, 86 of these are attributable to NO_2 and Particulate Matter. However, the data also identifies that Broxtowe does not have the highest number of deaths that are attributable to air quality in comparison to other District and Borough authorities in Nottinghamshire

Health Effects of Particulate Matter

The health effects associated with short term and long-term exposure to particulate matter are; exacerbation of asthma, effects on lung function, increases in hospital admissions for respiratory and cardiovascular conditions, and also increases in mortality[4]. Public Health England (PHE) has produced estimates of the risk of mortality from particulates for all local authorities in the United Kingdom. The estimates are based on the researched evidence of mortality risk combined with modelled levels of background air pollution to which populations are exposed to at each local authority. Table ii provides the results for Nottingham City and Broxtowe Borough Council.

Table ii – Estimated Effects of Annual Mortality in 2017 of human-made $PM_{2.5}$ Air Pollution.

Area	Attributable fraction	Attributable * Deaths aged 30 and over	Associated life-years lost
Nottingham City	5.6	130	1,397
Broxtowe Borough Council	5.5	62	612

Source: Estimating Local Mortality Burdens associated with particulate air pollution, PHE, 2017.

*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.

Although the figures in Table i show that in Broxtowe Borough Council there are believed to be 62 deaths attributable to human-made air pollution, this figure needs to be put into context as deaths that are attributable to smoking and alcohol

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

consumption are far higher. For example Nottingham City had 183 deaths attributable to human-made air pollution, but there are 1408 deaths attributable to smoking[5] and 153 deaths related to alcohol consumption[6].

However, as previously mentioned in this report it must be noted that research has shown that there is significant harm to health at concentrations of Particulate Matter well below the current EU and UK limit values.

Air Quality in the Borough of Broxtowe

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

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

Broxtowe Borough Council participates in the United Kingdom Nitrogen Dioxide diffusion tube network and has 43 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 Chapter 2.1 of this report.

The 2018 nitrogen dioxide results show that the air quality levels are below the objective of 40µg/m^3 for all of the monitoring locations throughout the Borough. The results are discussed in greater detail in Chapter 3.2.1 of this report.

[5] Tobacco Control Profiles 2015-2017, Public Health England. http://fingertipsreports.phe.org.uk/health-profiles/2017/e06000018.pdf
[6] Local Alcohol Profiles for England, 2017. https://fingertips.phe.org.uk/profile/local-alcohol-profiles/data#page/4/gid/1938132832/pat/6/par/E12000004/ati/102/are/E06000018/iid/91382/age/1/sex/4

Since January 2013, there are only thirteen NO_2 monitoring sites that have continued to be used for the past six years. Therefore, it is important to identify any trends in these sites. Out of the thirteen sites, ten of the sites are showing a downward trend since 2013, the three remaining sites are showing an overall downward trend since 2013 but have increased in 2018 by 1µg/m^3. The trends are discussed in greater detail in Chapter 3.2.1 of this report and Appendix C contains the trend graphs for the thirteen sites.

In respect of particualtes, the modelled background level provided by Defra for the Borough of Broxtowe is predicted to be between 8µg/m^3 and 11µg/m^3 for 2018, with the annual mean for 2018 being 10µg/m^3. The World Health Organisation (WHO) guideline level for $PM_{2.5}$ is 10µg/m^3.

Broxtowe Borough Council has a close working relationship with Highways England and Nottinghamshire County Council Highways Department. Highways England manages the M1 Motorway and the A52, which run through the Borough. Nottinghamshire County Council Highways Department manage the remaining roads that run through the Borough; this includes the A610/B600 Nuthall Roundabout.

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

The Environmental Health team at Broxtowe Borough Council also works closely with the Environment Agency who attends the Nottinghamshire Environmental Protection Working Group meetings and colleagues in the Planning department at the Council. This ensures that air quality issues are raised and considered throughout the planning process.

Actions to improve Air Quality

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

- Changes in Taxi Licensing Conditions at Broxtowe Borough Council - From the 13th June 2018, all petrol vehicles are required to meet Euro 5 standards, all new diesel vehicles are required to meet Euro 6 emissions. Hybrid and Electric Vehicles will be licensed as "Taxi's" by quoting minimum 70kW and reducing boot space requirement to allow for battery storage.
- Low Emission Fleet Vehicles – Broxtowe Borough Council have purchased three new Euro 6 vehicles to replace three older more polluting vehicles.
- 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; as well as marketing materials and campaigns developed in partnership with stakeholders such as passenger transport operators
- Go-Ultra Low programme – the County Council, in partnership with Nottingham and Derby City Councils, successfully secured £6.1m of funding to deliver the Go-Ultra Low programme between 2016 and 2021. The programme includes the development and delivery of an area-wide electric vehicle charging infrastructure network; and during 2017, the partnership procured a preferred delivery partner of the charging infrastructure. Work is now underway to identify a feasible network across the Derbyshire/Nottinghamshire area. To date 38 publicly available charge points have been installed across the Borough, 28 of these are in Broxtowe Borough Councils owned car parks in Beeston, Eastwood, Kimberley and Stapleford.
- Retrofitting of buses – In February 2018 it was announced that the County Council (and Nottingham City Council) had successfully secured funding from the Green Technology Fund to retrofit some of the most polluting buses in the County – including a number of buses that travel in the Borough. Work is now underway to retrofit the identified vehicles and will continue in to 2019/20.

- Electric Buses - Introduction of two electric buses (and their associated infrastructure) on route 510, serving communities in Beeston and Stapleford.
- Traffic signal improvements – All traffic signalling equipment at A610 Nuthall Island was replaced during 2017/18; with the installation of additional traffic monitoring cameras and advanced remote control systems to enable reactive and pro-active interventions to improve traffic flows. A review of the signal timings and linking at the signal junction was also undertaken.
- Personal travel planning with Beeston residents- which resulted in a 5% reduction of journeys to work by car amongst participants
- Effective Network Management – the County Council continues to work with stakeholders to effectively manage its highway network. Along with the co-ordination of works, contingency planning, and effective event and incident planning , the County Council has purchased an additional camera enforcement car to effectively enforce parking violations.
- Workplace Travel Plans – Broxtowe Borough Council and Nottinghamshire County Council have completed a council travel plan to determine which modes of transport are suitable. Travel Plans are also developed with businesses through the development control process.
- Joint Strategic Needs Assessment - Air Quality is now a chapter in the Joint Strategic Needs Assessment and it is part of the Health and Wellbeing Board Considerations.

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 2018 nitrogen dioxide results show that the air quality levels are below the objective of 40µg/m^3 for all of the monitoring locations throughout the Borough including the AQMA. Although the objectives are being met it is very important to continue to improve air quality within the UK as poor air quality is a public health concern.

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

- Review the NO_2 diffusion tubes network annually, discontinue sites where the annual air quality levels are comfortably below the objective, and relocate them to new sites within the Borough. Extensive monitoring will allow Broxtowe Borough Council to identify and focus on 'problem' areas.
- Continue to reduce the levels of NO_2 in the Borough by working with Highways England and Nottinghamshire County Council.
- Continue to be a member of the East Midlands Air Quality Network (EMAQN), to liaise with colleagues in Public Health and other local authorities.
- Continue to promote the final version of the "EMAQN Air Quality and Emissions Mitigation: guidance for developers" document.
- Continue to be a member of the Nottinghamshire Environmental Protection Working Group, and to liaise with colleagues in Public Health and the Health and Wellbeing Boards (Nottingham City and Nottinghamshire County) to ensure that Air Quality continues to be included in the Joint Strategic Needs Assessment for the County and any future work that involves air quality issues.
- Engage with the public about air quality and raise awareness of the health effects of air quality.
- Continue to provide the public, companies and businesses within the Borough with methods that they can use to improve air quality for themselves and also the health of their employees.
- Continue to provide information on green travel e.g. walking, cycling by providing leaflets.
- Continue to support bus companies and taxis that operate within the Borough to reduce emissions.
- Continue to review suitable research methods for reducing air quality levels for both NO_2 and particulate matter.
- Broxtowe Borough Council is an active member in the Air Quality Strategy Task Group.
- Ensure that the new Nottinghamshire Air Quality Strategy when completed is promoted and used once more as a valuable working document.

- Review Broxtowe Borough Councils Air Quality Action Plan and update the document to ensure that it is still relevant and that the measures are suitable to reduce air quality within the Borough.
- Pending a Planning Policy Review in 2019, Environmental Health is continuing to liaise with the Planning Department at Broxtowe Borough Council about the installation of Electric Vehicle Charging Points on future large commercial or large housing developments within the Borough. This is to promote sustainable travel.
- Continue to attend regional HS2 meetings to ensure that suitable mitigation measures are made during the construction phase and when HS2 is operational.

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

Apart from the M1 and the A52 all of the roads within the Borough are managed by Nottinghamshire County Council who manages 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 that the allocated County Council integrated transport funding has been reduced by approximately £3.5m from 2015/16 onwards. This significantly reduces the funding available for transport improvements that will deliver air quality improvements.

A lack of funding and resources is also a challenge that Broxtowe Borough Council face in trying to address the air quality in the Borough. The lack of resources/funding

does not allow the monitoring of PM_{10} and $PM_{2.5}$ within the Borough as the equipment is expensive to buy and also maintain. However although monitoring is not carried out, there are measures that are enforced in the Borough which would reduce airborne particulates, see Chapter 2.3 in this report for further information.

Local Engagement

Since the 2018 Annual Status Report (ASR) Broxtowe Borough Council (BBC) has continued to be in the East Midlands Air Quality Network (EMAQN), who review current air quality issues for the area. EMAQN is run by Public Health England. EMAQN has collectively produced a report to assist local authorities and developers when determining whether an air quality assessment is needed during the planning application process. The aim of EMAQN is to engage decision makers from different disciplines to assist in reducing AQ levels as a whole in the East Midlands. This also enables neighbouring counties to communicate more openly, which is vital for BBC 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 has been set up to update the Nottinghamshire Air Quality Strategy (NAQS). The aim is to get the NAQS endorsed by the County Health and Well-Being Board to ensure that delivery of the NAQS is aligned with the delivery of the Nottinghamshire Health and Wellbeing Strategy. An update on the progress of this group and the NAQS will be in the Annual Status Report in 2020.

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.

- 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 https://www.nottinghamshire.gov.uk/travelchoice/journey-planner and http://www.traveline.info/. Details on travelling on school buses to Nottinghamshire schools and assistance available to do so, can be found at http://www.nottinghamshire.gov.uk/education/travel-to-schools. The tram timetable is available at http://www.thetram.net/. The Big Wheel promotes sustainable travel within the Nottingham urban area (including parts of Broxtowe); it assists people and businesses with journey planning and advice. Further information can be found at http://www.thebigwheel.org.uk/ .
- Car sharing schemes - Nottinghamshire have a car share scheme which is available to anyone at https://liftshare.com/uk/community/nottinghamshare 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 http://www.nottinghamshire.gov.uk/transport/public-transport/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 http://www.nottinghamshire.gov.uk/planning-and-environment/walking-cycling-and-rights-of-way/walking and http://www.nottinghamcity.gov.uk/transport-parking-and-streets/rights-of-way-walking-and-cycling/walking-in-nottingham/ and a planning tool for deciding your route when walking can be found at http://walkit.com/.

- 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 http://www.nottinghamshire.gov.uk/education/travel-to-schools.

Cycling –

- Use the extensive cycle routes that are available throughout Nottinghamshire. Maps and cycling journey planners that cover all of Nottinghamshire, including the city and further afield are available at http://www.nottinghamshire.gov.uk/planning-and-environment/walking-cycling-and-rights-of-way/cycling. Maps of just the city cycle routes for Nottingham are available at http://www.nottinghamcity.gov.uk/cycling . There are also cycle centres within Nottinghamshire that are run by RideWise who are a Nottingham based charity. RideWise provide weekly advice, training, bike rides, free bike loans and information about routes and journey planning. Further information about RideWise can be found at http://www.ridewise.org.uk/ride/index.php Sustrans is also a charity that promotes sustainable travel and further information can be found at http://www.sustrans.org.uk/

- 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 http://www.energysavingtrust.org.uk/travel/driving-advice.

  - 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 http://goultralownottingham.org.uk/

- Smoke Control Area – Large parts of Nottinghamshire is a smoke control area, 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 https://smokecontrol.defra.gov.uk/index.php. 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.
- Bonfires – To not have bonfires at all and to compost all garden waste and recycle rubbish rather than burn it.
- 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.

Table of Contents

1 Local Air Quality Management

This report provides an overview of air quality in Broxtowe Borough Council during 2018. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Broxtowe Borough Council to improve air quality and any progress that has been made.

The Statutory Air Quality Objectives applicable to LAQM in England can be found in Table K.1 in Appendix K.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of the objectives.

Further information about the remaining AQMA declared by Broxtowe Borough Council can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at https://www.broxtowe.gov.uk/for-you/environmental-health-noise-and-pollution/air-quality/ Alternatively, see Appendix E: Maps of Monitoring Locations and Appendix F: Map of AQMA in Trowell, which provides a map of all the monitoring locations throughout the Borough and also a map of the AQMA in Trowell.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored concentration at a location of relevant exposure)		Action Plan (inc date of publication)
						At Declaration µg/m^3	Now µg/m^3	
AQMA 1 Trowell	1st February 2006	NO_2 annual mean	Trowell, Nottingham	AQMA 1 encompasses twenty properties on parts of Iona Drive and Tiree Close next to the M1 motorway in Trowell	Yes	45	32	Action Plan 2008.

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

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

- *The Nuthall AQMA has officially been revoked in 2017, and there is now one remaining AQMA in Trowell.*
- *There have been no exceedances of national air quality objectives in 2017, but site 19 in the Trowell AQMA still demonstrates concentrations within 20% of the annual mean objective concentration for NO_2.* **- BBC will continue to monitor at this location.**
- *The borough has stated that they will continue to monitor and keep the AQMA under review whilst the effects of the SMART motorway scheme are being determined, and until a significant decreasing trend can be demonstrated. This is supported, and it is suggested that the AQMA could be considered for revocation after demonstrating compliant NO_2 concentrations below 36 µg/m^3 for three consecutive years.* **– BBC will continue monitoring at this site and will consider revocation of the AQMA if it is consistently below the annual mean for five or more consecutive years. See Chapter 3.2.1 of this report for the results.**
- *There is an additional measured concentration within 20% of the annual mean objective concentration for NO_2 at site 48, which was newly introduced in 2018. The borough proposes to keep this under review in future years, which again, is supported* **- BBC will continue to monitor and report at this location.**
- *The Borough has made some good progress towards developing their AQAP and implementing AQAP measures in the last year, which is commended.*
- *The Borough may wish to consider developing some AQAP measures, which specifically target air quality improvements in the remaining AQMA. It would also be useful if the Borough could develop pollution reduction targets for their AQAP measures, and present these in a separate column from the KPIs, following the latest reporting template.* **– BBC will endeavour to do this.**

Broxtowe Borough Council (BBC) and Nottinghamshire County Council (NCC) have taken forward a number of measures during the current reporting year of 2018/2019 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2 More detail on these measures can be found in BBC Action Plan, the Nottinghamshire Local Transport Plan 2011-2026 (and its implementation plans) and Highways England Reports (Post opening project evaluation reports for the M1 Junction 25 to 28 widening and the A52 West of Nottingham Corridor Improvements).

Key completed measures are:

- A second camera enforcement vehicle was purchased by Nottinghamshire County Council - to enforce parking obstructions outside schools and in bus lanes. The purchase of a third vehicle was approved in April 2019.
- Changes in Taxi Licensing Conditions at Broxtowe Borough Council - From 13th June 2018, all petrol vehicles are required to meet Euro 5 standards, all new diesel vehicles are required to meet Euro 6 emissions. Hybrid and Electric Vehicles are to be licensed as “Taxi’s” by quoting minimum 70kW and reducing boot space requirement to allow for battery storage.
- Low Emission Fleet Vehicles – Broxtowe Borough Council have purchased three new Euro 6 vehicles to replace three older more polluting vehicles.
- 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; as well as marketing materials and campaigns developed in partnership with stakeholders such as passenger transport operators
- Go-Ultra Low programme – the County Council, in partnership with Nottingham and Derby City Councils, successfully secured £6.1m of funding to deliver the Go-Ultra Low programme between 2016 and 2021. The programme includes the development and delivery of an area-wide electric vehicle charging infrastructure network; and during 2017, the partnership procured a preferred delivery partner of the charging infrastructure. Work is

now underway to identify a feasible network across the Derbyshire/Nottinghamshire area.

- Electric Vehicle Charging Points - To date 38 publicly available charge points have been installed across the Borough, 28 of these are in Broxtowe Borough Councils owned car parks in Beeston, Eastwood, Kimberley and Stapleford.
- Retrofitting of buses – In February 2018 it was announced that the County Council (and Nottingham City Council) had successfully secured funding from the Green Technology Fund to retrofit some of the most polluting buses in the County – including a number of buses that travel in the Borough. Work is now underway to retrofit the identified vehicles and will continue in to 2019/20.
- Electric Buses - Introduction of two electric buses (and their associated infrastructure) on route 510, serving communities in Beeston and Stapleford.
- Traffic signal improvements – All traffic signalling equipment at A610 Nuthall Island was replaced during 2017/18; with the installation of additional traffic monitoring cameras and advanced remote control systems to enable reactive and pro-active interventions to improve traffic flows. A review of the signal timings and linking at the signal junction was also undertaken.
- Personal travel planning with Beeston residents- which resulted in a 5% reduction of journeys to work by car amongst participants
- Effective Network Management – the County Council continues to work with stakeholders to effectively manage its highway network. With 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 determine which modes of transport are suitable. Travel Plans are also developed with businesses through the development control process.
- Joint Strategic Needs Assessment - Air Quality is now a chapter in the Joint Strategic Needs Assessment and it is part of the Health and Wellbeing Board Considerations.

- Increase in the number of members registered in the car share scheme - to 3,351 members. As a result, there was a 1.69t reduction in NOx; and a 647kg reduction in CO_2 during 2018.
- Cycle Training - 7,544 people received cycle training during 2018/19.

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

- ❖ Cycling Networks - Completion of the improved cycle links between Beeston, the Enterprise Zone and the City.
- ❖ Local Cycling and Walking Infrastructure Plan (LCWIP) – Prioritised List of improvements to be included in the final LCWIP.
- ❖ Bus retrofitting programme - Collectively Nottingham County Council and Nottingham City Council secured £2.8 million from the Green Bus Technology Fund to retrofit older buses. This includes 6 different services that operate in the Borough of Broxtowe
- ❖ Nottinghamshire Air Quality Strategy (NAQS) - Completion of the revised NAQS, for it to be approved at the Nottinghamshire Health and Wellbeing Board and promoted within Nottinghamshire.
- ❖ Planning and Policy Guidance – the adoption of Broxtowe Borough Council's Local Plan including Policy 20 and 26 which are relevant to improving AQ within the Borough.
- ❖ Additional CCTV Enforcement Vehicle - Purchase of the third CCTV vehicle.
- ❖ Cycling Maps – To be reviewed and updated.
- ❖ Off-Street Parking Order – All of Broxtowe Borough Councils Off-street Parking orders are to be consolidated into one order and approved by the BBC's cabinet.
- ❖ Electric Fleet Vans – Two more electric fleet vans will be procured by Broxtowe Borough Council.

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:

- 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
- Parking enforcement on County Council managed roads to ensure that the traffic keeps moving
- Measures to reduce the need to travel at peak times such as the provision and encouragement of flexible working arrangements
- The facilitation of smarter travel behaviour such as the provision of a car sharing scheme and integrated and concessionary ticketing schemes
- The encouragement of smarter travel behaviour such as the marketing and promotion of passenger transport, walking and cycling, provision of cycling and walking route maps, cycle training programmes, and web-based journey planners
- The encouragement of the uptake of low-emission vehicles through the delivery of the Nottingham Go Ultra Low City bid funding, 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

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

- Ensuring funding is available 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 – Other cycling improvements are developed and delivered as part of the annual integrated transport programme but the schemes are dependant on funding being made available for such improvements.
- Public Cycle Hire Scheme – The scheme is dependent upon commercial cycle hire scheme providers committing to and delivering a scheme.

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

At the time of writing this report there is a currently a consultation underway regarding the potential changing of the HS2 route through the Trowell area, which may effect the AQMA in the future. The outcome of this consultation will be reported in the 2020 Air Quality Annual Status Report.

Table 2.2 - Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisation involved and funding source	Planning Phase	Implementation Phase	Key Performance Indicator and reduction in pollutant	Progress to Date, comments / barriers of implementation	Estimated Completion Date
1	**Light rail tram infra-structure**	Transport Planning and Infrastructure	Public transport improvements -interchanges stations and services	NCiC/NCC; DfT/WPL funding	Pre - 2012	2013-2016	Increased passenger transport patronage	•NET Phase 2 (with route through Broxtowe) opened 2015 •No further schemes other than a possible extension to the HS2 Terminus in Toton.	**Complete**
2	**Car sharing scheme**	Alternatives to private vehicle use	Car & lift sharing schemes	NCC	Pre-2006	On-going	In 2018: 1.69 tonnes reduction in NOx; 647.13kg reduction in CO2	•3,351 current members.210 members in 2018	On-going
3	**Introduction of car club**	Alternatives to private vehicle use	Car Clubs	NCC/NCiC	2014-2017	Dependent on success of Nottingham city scheme	Restrain average journey times in the morning peak to a 1% increase per year	•Nottm city scheme introduced in 2014. •Provider reviewed in 2018. Expansion of scheme into county dependent on its success which is still unclear •Funding for implementation to be determined	On-going
4	**Nottingham Go-Ultra Low programme - introduction of areawide EV charging network**	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	NCiC/NCC/ BBC; OLEV funding	2015/16	2016-2021	On-going take-up of cleaner vehicles	•£6.1m funding secured for 2016-2021 • Site investigation to determine feasibility and installation of infrastructure underway. • To date 38 publicly-available charge points have been installed across the Borough. 28 are installed in BBC car parks in Beeston, Eastwood, Kimberley and Stapleford. • Grants also available to help businesses install charging infrastructure	2021

Measure No.	Measure	EU Category	EU Classification	Organisation involved and funding source	Planning Phase	Implementation Phase	Key Performance Indicator and reduction in pollutant	Progress to Date, comments / barriers of implementation	Estimated Completion Date
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	NCiC/NCC; OLEV funding	2015/16	2016-2021	On-going take-up of cleaner vehicles	•£6.1m funding secured for 2016-2021 •Preferred partner to deliver EV charging infrastructure procured during 2018 •Promotion events held for public, businesses and fleet operators including loans of LEVs for trial use in 2018	2021
6	**Nottingham City Clean Air Zone**	Promoting Low Emission Transport	Low Emission Zone (LEZ) or Clean Air Zones (CAZ)	NCiC; DfT funding	2016-2019	2019/20	Reduced Emissions	•Nottingham City Council 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.	2020
7	**Joint Strategic Needs Assessment**	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	NCC/NCiC/ Borough and District councils	N/A	2017	Raising awareness and reduced emissions	•Air Quality is now a chapter in the Joint Strategic Needs Assessment and part of the Health and wellbeing Board considerations. •Currently being reviewed and updated in 2019.	On-going
8	**Nottinghamshire Air Quality Strategy**	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	NCC/NCiC/ Borough and District councils	2018	2019 onwards	Improving Air Quality, reduced Emissions and Raising awareness.	•Strategy reviewed and rewritten. •Due to be approved at Nottinghamshire Health & Wellbeing Board in June 2019	2019

Measure No.	Measure	EU Category	EU Classification	Organisation involved and funding source	Planning Phase	Implementation Phase	Key Performance Indicator and reduction in pollutant	Progress to Date, comments / barriers of implementation	Estimated Completion Date
9	**Planning and Policy Guidance**	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	BBC	2015-2016	2016	Reduced Emissions	• Review of the Broxtowe Local Plan to ensure 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. • Update – Policy 20 is due to be adopted in September 2019.	2019
10	**Developer requirements to provide of EV charging points at new development**	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	BBC	2015-2016	2016	Reduced Emissions	• Review of the Broxtowe Local plan includes Policy 26 that would require a Travel Plan to be submitted with any planning application for 10 or more dwellings or 1,000 square metres or more floorspace. This policy is due to be adopted in September 2019.	2019
11	**Inspection of Permitted Processes**	Environmental Permits	Introduction/increase of environment charges through permit systems and economic instruments	BBC	N/A	On-going	Reduced Emissions	• Annual inspections of permitted processes were undertaken; all permitted processes were risk rated with the higher risk processes incurring a higher annual subscription fee. The risk rating did not change in 2018, and all permitted processes were fully compliant.	On-going
12	**Encouragement of low-emission public transport fleets**	Vehicle Fleet Efficiency	Vehicle Retrofitting programmes	NCC/operators; NCC/OLEV - Green Bus Technology Fund	2017	2018-2020	Reduced Emissions and On-going take-up of cleaner vehicles	• NCC secured £1.3m; and NCiC secured £1.5m from the Green Bus Technology Fund in Feb 2018 to retrofit older buses • This includes 21, 34, 35, Indigo, Rainbow 1 and Rapid 1 services in the Borough.	2020

Measure No.	Measure	EU Category	EU Classification	Organisation involved and funding source	Planning Phase	Implementation Phase	Key Performance Indicator and reduction in pollutant	Progress to Date, comments / barriers of implementation	Estimated Completion Date
13	**Encouragement of low-emission public transport fleets**	Vehicle Fleet Efficiency	Promoting low emission public transport	NCC; NCC/OLEV - Green Bus Fund	2016	2017/18	On-going take-up of cleaner vehicles	•NCC secured £527,000 OLEV funding and will match fund the scheme with £410,000 from its transport budget. • Introduction of two electric buses (and their associated infrastructure) on route 510, serving communities in Beeston and Stapleford.	On-going **Complete**
14	**Encouragement of low-emission public transport fleets**	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	NCC/NCiC/ PT operators; NCT (operator) funding	N/A	On-going	Reduced Emissions	•The Statutory Quality Partnership Schemes (SQPSs), which includes fleet standards is in place affecting all buses travelling through AQMA.	On-going
15	**Review of on-street car parking in and around the AQMA**	Traffic Management	Workplace Parking Levy, Parking Enforcement on highway	NCC	N/A	On-going	Restrain average journey times in the morning peak to a 1% increase per year	• 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 trraffic flow	On-going Implemented and On-going
16	**Optimisation of traffic signals**	Traffic Management	UTC, Congestion management, traffic reduction	NCC/Via EM Ltd: NCC revenue funding	N/A	On-going	Restrain average journey times in the morning peak to a 1% increase per year	•All traffic signalling equipment at A610 Nuthall Island were replaced during 2017/18. •Also the introduction of additional traffic monitoring cameras and advanced remote control systems were also installed to enable reactive and pro-active interventions to improve traffic flow •A review of the signal timings and linking at the signal junction was also undertaken during 2017/18	**Complete** **Complete** **Complete**

Measure No.	Measure	EU Category	EU Classification	Organisation involved and funding source	Planning Phase	Implementation Phase	Key Performance Indicator and reduction in pollutant	Progress to Date, comments / barriers of implementation	Estimated Completion Date
17	**Traffic control and information**	Traffic Management	UTC, Congestion management, traffic reduction	Nottinghamshire County Council (NCC)/Via EM Ltd/Nottingham City Council (NCiC): NCC and NCiC revenue funding	N/A	On-going	Restrain average journey times in the morning peak to a 1% increase per year	• Traffic control centre that monitors traffic movement on the local highway network (not the trunk road/motorways) and provides real time traffic control over many traffic signal installations, including on A610 at Nuthall • Potential barrier: Lack of future revenue funding	On-going On-going
18	**Co-ordination of street works**	Traffic Management	UTC, Congestion management, traffic reduction	NCC/Via EM/NCiC: NCC and NCiC revenue funding	N/A	On-going	Restrain average journey times in the morning peak to a 1% increase per year	• Systems for notice management and coordination have been upgraded to enhance noticing handling, monitoring of works proposals, coordination of works and directing timing of works • Street designations/network hierarchy review is on-going to improve data quality for works promoters and network managers and to prioritise works management • Regular coordination meetings held between all works promoters and regional partners in additional to regular meetings between HE and regional partners to create a framework programme of planned works affecting strategic and local routes • Detailed journey time monitoring undertaken annually since 2005/06 • Implementation on-going	On-going On-going On-going On-going

Measure No.	Measure	EU Category	EU Classification	Organisation involved and funding source	Planning Phase	Implementation Phase	Key Performance Indicator and reduction in pollutant	Progress to Date, comments / barriers of implementation	Estimated Completion Date
19	**Real time travel information**	Public Information	Other	NCC/Via EM Ltd: NCC revenue funding	N/A	On-going	Restrain average journey times in the morning peak to a 1% increase per year	• Information conveyed by all forms of media (press, radio, website, social media etc.). • The Travelwise centre remains in operation 24hrs a day, every day. • Implementation on-going	On-going On-going
20	**Contingency planning, and effective event and incident management**	Traffic Management	UTC, congestion management, traffic reduction	NCC/Via EM/NCiC/Highways England (HE): NCC, NCiC, HE revenue funding	N/A	On-going	Restrain average journey times in the morning peak to a 1% increase per year	• The local operating agreement between the authority and HE has been comprehensively reviewed to identify the relevant parts of the network which have interaction on each authority and to put in place appropriate communication channels for management of incidents and dissemination of information • Key locations on the local network have been identified and associated diversion routes investigated in line with the developing network hierarchy • Incidents dealt with through agreed procedures and regular partnership meetings held. Working in close collaboration with the City and HE, tactical diversion routes have been developed for the emergency diversion of traffic from any part of the strategic road network, to reduce the delay in rerouting traffic to ease congestion at the time of incidents • Detailed journey time monitoring undertaken annually since 2005/06. • Implementation on-going	On-going On-going On-going On-going

Measure No.	Measure	EU Category	EU Classification	Organisation involved and funding source	Planning Phase	Implementation Phase	Key Performance Indicator and reduction in pollutant	Progress to Date, comments / barriers of implementation	Estimated Completion Date
21	**Bus service improve-ments**	Transport Planning and Infrastructure	Public transport improvements -interchanges stations and services	NCC/PT operators	N/A	On-going	Increased passenger transport patronage	• Review of all of the bus services in the county, including commercial, supported and specialist services. • The aim of this work is to review and design cost effective services that meet local needs.	On-going
22	**Bus infra-structure**	Transport Planning and Infrastructure	Public transport improvements -interchanges stations and services	BBC and NCC; integrated transport block funding	N/A	On-going	Increased bus patronage	• An annual programme of updates and maintenance of all stops including updating network maps to ensure all information is current and accurate is on-going. • Implementation on-going • BBC provides 50% of the funds for the installation of new bus shelters and real time bus information at bus stops.	On-going On-going
23	**Sustainable Travel information for the Public**	Public Information	Via leaflets, internet, other	BBC	N/A	On-going	Increased use of public transport	• BBC provide 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 Council owned buildings. All of the leaflets are also available on the internet. • Broxtowe Matters is a pamphlet that goes out to all households in the Borough and this has information in about sustainable travel and directs the public to further information. • Social media is used to message the public and provide them with information about events and sustainable travel methods. • Sustainable Travel is also promoted in the reception on the TV at the Council buildings to increase public awareness.	On-going for all

Measure No.	Measure	EU Category	EU Classification	Organisation involved and funding source	Planning Phase	Implementation Phase	Key Performance Indicator and reduction in pollutant	Progress to Date, comments / barriers of implementation	Estimated Completion Date
24	**Concession-ary fare schemes**	Transport Planning and Infrastructure	Other	NCC/PT operators	N/A	On-going	Increased passenger transport patronage	•Implementation on-going	On-going
25	**Nottingham city workplace parking levy (WPL)**	Traffic Management	Workplace Parking Levy, Parking Enforcement on highway	NCiC	Pre-2012	2012 and on-going	Restrain average journey times in the morning peak to a 1% increase per year	•NCiC introduced WPL within the city in 2012 and have used funding to make passenger transport improvements in the city	Introduced 2012 and on-going
26	**Public sector LEV procurement**	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	NCC/BBC	N/A	2015-2024	Reduction in vehicle emissions due to less polluting vehicles replacing older more polluting vehicles	•NCC upgraded its pool vehicles to lower emission diesel vehicles. All new fleet vehicles at BBC are Euro6 emissions complaint. There are 90+ fleet vehicles and they are on a 10 year replacing rolling programme •Dependant on whether funding from Central Government continues	2024
27	**Vehicle emissions testing**	Vehicle Fleet Efficiency	Testing Vehicle Emissions	BBC	N/A	On-going	Reduced emissions	•All BBC Fleet vehicles (98 road vehicles including 20 LGV's) are annually emission tested in house prior to MOT Emission testing. •BBC also undertakes additional emissions tests on all fleet vehicles if any new fuel or engine components have been changed. This is to ensure vehicle emission compliance.	On-going On-going

Measure No.	Measure	EU Category	EU Classification	Organisation involved and funding source	Planning Phase	Implementation Phase	Key Performance Indicator and reduction in pollutant	Progress to Date, comments / barriers of implementation	Estimated Completion Date
28	**Marketing and promotion of passenger transport**	Promoting Travel Alternatives	Other	NCC/NCiC/ PT operators	N/A	On-going	Increased passenger transport patronage	•Various marketing campaigns undertaken in partnership with operators and Nottingham City Council. •Co-ordinated through the Greater Nottingham Bus Quality Partnership. •Network maps produced to coincide with route/timetable changes	On-going **Complete**
29	**Taxi Licensing Conditions**	Promoting Low Emission Transport	Taxi Licensing Conditions	BBC	2016-2019	2011 2019	Reduced emissions	• No cars normally older than 8 years will be licensed as a taxi within the borough. • A review of the taxi licensing conditions will be undertaken to establish a common policy of conditions throughout the County. • From 13th June 2018, all petrol vehicles are required to meet Euro 5 standards, all new diesel vehicles are required to meet Euro 6 emissions. • Hybrid and Electric Vehicles to be licensed as “Taxi’s” by quoting minimum 70kW and reducing boot space requirement to allow for battery storage.	On-going On-going **Complete** **Complete**
30	**Civil Parking Enforcement**	Traffic Management	Workplace Parking Levy, Parking Enforcement on highway	NCC; NCC revenue funding	Pre-2008	On-going	Manage parking to improve journey time reliability.	•Introduced on County roads in May 2008 to help ensure parking does not interfere with the free flowing traffic. •Implemented and on-going	Implemented and On-going
31	**CCTV enforcement vehicle**	Traffic Management	Workplace Parking Levy, Parking Enforcement on highway	NCC; NCC revenue funding	N/A	On-going	Manage parking to improve journey time reliability	• ‘Camera car' to enforce school keep clear and bus stop clearway markings became fully operational during 2016 •A second CCTV vehicle was purchased in 2018. •Third CCTV vehicle planned to be purchased in 2019.	on-going **Complete** 2019.

Measure No.	Measure	EU Category	EU Classification	Organisation involved and funding source	Planning Phase	Implementation Phase	Key Performance Indicator and reduction in pollutant	Progress to Date, comments / barriers of implementation	Estimated Completion Date
32	**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	NCC/PT operators	N/A	On-going	Reduced Emissions and On-going take-up of cleaner vehicles	•On-going take-up of LEVs	On-going
33	**20mph speed limits outside schools**	Traffic Management	Reduction of speed limits, 20mph zones	NCC; integrated transport block funding	2012/13	2013-2017	Increased walking/cycling trips	•Advisory 20mph speed limits installed outside all feasible schools	**Complete**
34	**School travel plans**	Promoting Travel Alternatives	School Travel Plans	N/A	N/A	2000-2011	Restrain average journey times in the morning peak to a 1% increase per year	•STPs have been developed and approved at all but 3 schools in Broxtowe •Update - Funding withdrawn by DfT in 2010; no pro-active STP work undertaken since that date. NCC considering the development of online advice tool for schools.	**Complete** **Complete**
35	**Cycling networks - development of Local Cycling and Walking Infrastructure Plan (LCWIP)**	Transport Planning and Infrastructure	Cycle network	NCC/NCiC/DCC/DCiC/borough and district councils/Sustrans/other stakeholders; DfT funding	N/A	2018/19	Increased levels of cycling	•Funding secured to develop D2N2 wide LCWIP. Data collected, three stakeholder events held •Prioritised list of improvements to be included in final LCWIP	2019

Measure No.	Measure	EU Category	EU Classification	Organisation involved and funding source	Planning Phase	Implementation Phase	Key Performance Indicator and reduction in pollutant	Progress to Date, comments / barriers of implementation	Estimated Completion Date
36	**Cycling networks**	Transport Planning and Infrastructure	Cycle network	NCC/ViaEM/NCiC: LGF, s106 funding	2015/16-2016/17	2017/18-2018/19	Increased cycling trips	•Construction of improved cycle links between Beeston, Enterprise Zone and the City underway during 2018/19 •Other cycling improvements are developed and delivered as part of the annual integrated transport programme and through developer funded improvements	2018/19 Schemes dependent on funding being made available for such improvements
37	**Cycle hire scheme**	Transport Planning and Infrastructure	Public cycle hire scheme	NCiC/NCC; funding source to be determined	2017/18	Dependent on commercial cycle hire scheme providers	Increased cycling trips	•Hire schemes at the nearby University of Nottingham in place •Feasibility study undertaken on a city based hire scheme which potentially could include parts of the county such as Beeston •Scheme dependent on commercial cycle hire scheme providers committing to, and delivering a scheme	Not known - dependent on commercial cycle hire scheme providers
38	**Cycle training**	Promoting Travel Alternatives	Promotion of cycling	NCC; DfT funding/PH funding	N/A	On-going	Increased cycling trips	•7,544 people received cycle training in 2018/19. •Scheme dependent on DfT funding being made available for Bikeability •Implementation on-going	On-going
39	**Cycle parking facilities**	Transport Planning and Infrastructure	Cycle network	NCC/BBC; integrated transport block/ developer contributions	N/A	On-going	Increased cycling trips	•Cycle hub installed in 2015 to integrate with bus/rail services •Ad-hoc parking provided where required	Complete On-going

Measure No.	Measure	EU Category	EU Classification	Organisation involved and funding source	Planning Phase	Implementation Phase	Key Performance Indicator and reduction in pollutant	Progress to Date, comments / barriers of implementation	Estimated Completion Date
40	**Marketing of cycling**	Promoting Travel Alternatives	Promotion of cycling	NCC	N/A	On-going	Increased cycling trips	•Cycling in Nottinghamshire has increased by 10% between 2010 and 2017; and in Broxtowe district there has been a 12% increase in cycling between 2010 and 2017. •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'.	On-going On-going
41	**Cycle maps**	Promoting Travel Alternatives	Promotion of cycling	NCC; DfT funding	N/A	On-going	Increased cycling trips	•Greater Nottingham cycling maps reviewed during 2018, updated and available as a leaflet and online •Cycling maps to be reviewed again in 2019	**Complete** 2019 and on-going

Measure No.	Measure	EU Category	EU Classification	Organisation involved and funding source	Planning Phase	Implementation Phase	Key Performance Indicator and reduction in pollutant	Progress to Date, comments / barriers of implementation	Estimated Completion Date
42	**Marketing of cycling**	Promoting Travel Alternatives	Promotion of cycling	BBC	2012-2017	On-going.	In Broxtowe district there has been a 30% increase in cycling between 2010 and 2014	•Cycling in Broxtowe has increased by 12% between 2010 and 2017. •Review installing new cycle stands in Broxtowe with partners. Beeston Train station complete with the installation of cycle hub in the Council car park, trialled removable stands in Stapleford, new stands installed Eastwood/Beeston Town Centres, improved/more stands Kimberley Leisure Centre and Council Offices. •Develop and promote the Broxtowe Cycle Quest 2016 and 2017. BBC and Ridewise Ltd with funding from the Lifestyle fund in 2016 developed the scheme. The Quest includes 8 routes promoted on trails in Broxtowe/surrounding area with a quiz and prize draw. Promoted throughout Broxtowe and Ridewise networks in Greater Nottingham through social media/posters/email networks/Broxtowe Matters to every household in the borough. •As a follow on from the TravelRight project in Broxtowe two cycle centres will be kept open until September 2017 being run by Ridewise Ltd. External funding will be required to keep these open beyond September. These provide free cycle training for families, advice and led group rides weekly. •Hi Vis slap bands and rucksack covers have been given out at events.	On-going **Complete** **Complete** **Complete** **Complete 2017/18**

Measure No.	Measure	EU Category	EU Classification	Organisation involved and funding source	Planning Phase	Implementation Phase	Key Performance Indicator and reduction in pollutant	Progress to Date, comments / barriers of implementation	Estimated Completion Date
42	**Marketing of cycling Cont**	Promoting Travel Alternatives	Promotion of cycling	BBC	N/A	On-going	Increased cycling trips	•Cycle security events and locks have been given away at Beeston Train Station, Beeston Town Centre and at other events in partnership with the Police, BBC and the TravelRight project. Poster campaign promoting securing cycles properly to be completed 2017. •Promote safe cycling on tram lines at events/social media and leaflets. •Produce and promote Broxtowe Cycling Map. •Promotion to staff yearly about sustainable travel options. A number of sites have lockers/shower facilities/secure cycle parking for staff who commute to work other than by car and for leisure use encouraging healthy living.	**Complete** On-going **Complete**/ promotion on-going On-going
43	**Marketing of walking**	Promoting Travel Alternatives	Promotion of walking	NCC	N/A	On-going	Increased walking trips	• Marketing of walking is undertaken in a variety of formats for both commute and leisure trips. Various NCC campaigns have been undertaken including 'walk week', 'Notts Routes & Rides'.	On-going
44	**Marketing of walking**	Promoting Travel Alternatives	Promotion of walking	BBC	N/A	On-going	Increased walking trips	•Develop Broxtowe Country Trail and promote it. •BBC promote walking for health programmes •Promotion of Erewash Valley Trail and other local walks.	**Complete**/ promotion on-going
45	**Pedestrian infrastructure improvements**	Transport Planning and Infrastructure	Other	NCC/BBC	N/A	On-going	Increased walking trips	•Pedestrian improvements developed and delivered as part of the annual integrated transport programme. Funding also secured to deliver improvements through the planning process. •Potential barrier: Lack of future funding	On-going

Measure No.	Measure	EU Category	EU Classification	Organisation involved and funding source	Planning Phase	Implementation Phase	Key Performance Indicator and reduction in pollutant	Progress to Date, comments / barriers of implementation	Estimated Completion Date
46	**Review of off-street car parking charging**	Traffic Management	Workplace Parking Levy, Parking Enforcement on highway	BBC	N/A	On-going	Restrain average journey times in the morning peak to a 1% increase per year	• BBC is currently consolidating all of their Off-Street Parking Orders into one Order. Cabinet approval is required and the charges will also be reviewed as well. • Charges will also be reviewed on an adhoc basis	2019 On-going
47	**Flexible working arrange -ments**	Promoting Travel Alternatives	Encourage / Facilitate home-working	NCC/BBC	N/A	On-going	Restrain average journey times in the morning peak to a 1% increase per year	•NCC operates flexible working arrangements for all its staff •BBC New Ways of working being introduced. Increase in Home working expected.	On-going On-going
48	**Workplace travel plans**	Promoting Travel Alternatives	Workplace Travel Planning	BBC planning/ NCC	N/A	On-going	Restrain average journey times in the morning peak to a 1% increase per year	•Developed with businesses as part of planning conditions. •BBC and NCC have a travel plan •BBC has undertaken a review of the Councils travel plan by reviewing Lease cars, car allowances and work place parking. Produced a transport map specifying the modes of transport the organisation considers acceptable if other modes or transport are not suitable. Feasibility study of having bus card/Tickets for employee use.	On-going **Complete** **Complete**
49	**NCC car pool vehicles**	Alternatives to private vehicle use	Car Clubs	NCC	N/A	2016/17	Restrain average journey times in the morning peak to a 1% increase per year	•NCC upgraded its pool vehicles to lower emission diesel vehicles	**Complete**

Measure No.	Measure	EU Category	EU Classification	Organisation involved and funding source	Planning Phase	Implementation Phase	Key Performance Indicator and reduction in pollutant	Progress to Date, comments / barriers of implementation	Estimated Completion Date
50	**Low emission vehicle procurement**	Promoting Low emission transport	Company vehicle Procurement - prioritising uptake of low emission vehicles	BBC	2015	2015-2024	Reduced emissions	•All new fleet vehicles at BBC are Euro6 emissions complaint. There are 90+ fleet vehicles and they are on a 10 year replacing rolling programme. •BBC has purchased three new Euro 6 vehicles in 2017/2018 replacing three older vehicles. •Update – BBC will be procuring two electric vans in 2019 and subject to satisfactory trials another two vehicles will be purchased in 2020.	2024 **Complete** 2019 and 2020.
51	**Eco-driver training sessions**	Vehicle Fleet Efficiency	Driver training and ECO driving aids	NCC	2012	2012	Reduced emissions	•Eco-driving training sessions held for NCC staff	**Complete**
52	**Fleet vehicle tracking system**	Vehicle Fleet Efficiency	Driver Training and ECO driving aids	BBC/NCC	N/A	2015-2017	Reduced emissions	•All BBC and NCC fleet vehicles are fitted with a vehicle tracking system, which records vehicle speed and idling time. •A review of the journeys undertaken will ensure that if necessary measures can be implemented e.g. staff training, to improve fleet efficiency.	**Complete** **Complete**
53	**Zoning of refuse collections**	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	BBC	N/A	2016-2017	Reduced emissions	•A review of the refuse collection areas at BBC to enable the areas to be zoned to ensure that the collection rounds are within the designated zone, which reduces the amount of non-productive travelling time. •Update - The Refuse round restructure is now complete and we have reduced the fleet size by one vehicle.	**Complete**

Measure No.	Measure	EU Category	EU Classification	Organisation involved and funding source	Planning Phase	Implementation Phase	Key Performance Indicator and reduction in pollutant	Progress to Date, comments / barriers of implementation	Estimated Completion Date
54	**Integrated ticketing**	Transport Planning and Infrastructure	Other	NCC/NCiC/ PT operators	N/A	On-going	Increased passenger transport patronage	•Integrated ticketing strategy developed in 2014/15. •New smartcard platform introduced in 2014. Robin Hood card scheme introduced in 2015 •Further smartcard/contactless improvements being developed	On-going
55	**Personalised travel planning**	Promoting Travel Alternatives	Personalised Travel Planning	NCC/AECOM	2015/16	2016/17	Restrain average journey times in the morning peak to a 1% increase per year	•Personalised Travel Planning undertaken in Beeston during 2016/17 •No DfT funding currently available	**Complete** On-hold.
56	**Web based journey planners**	Public Information	Via the Internet	NCC	N/A	On-going	Increased walking/cycling/ passenger transport trips	•Nottinghamshire is part of the national, multi-modal Traveline journey planner Web links to the Traveline site are publicised and available from the County Council's website. •Implementation on-going	On-going
57	**Broxtowe Transport Sub Group**	Transport Planning and Infrastructure	Other	BBC	N/A	On-going	Reduced emissions	•BBC facilitates a transport sub group to bring together partners and stakeholders to discuss transport issues and share information in the Borough. Partners include NCC, NCT buses, Barton buses, PEDALS(local cycling pressure group) and Sustrans.	The group is no longer operating

BBC= Broxtowe Borough Council, **NCC**= Nottinghamshire County Council, **HE** = Highways England, **NCiC**= Nottingham City Council, **DfT** = Department for Transport

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

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

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

The nearest AURN site is in Nottingham City and for 2018 the annual mean concentration is 10.01µg/m^3. The modelled background level provided by Defra for the Borough of Broxtowe are predicted to be between 8µg/m^3 and 11µg/m^3 for 2018, with the annual mean for 2018 being 10µg/m^3. The modelled background concentrations are shown to be in the higher range along the M1 Motorway, The background maps are shown in Appendix G.

The Air Quality Objective (AQO) for $PM_{2.5}$ is an annual mean of 25µg/m^3. However, the World Health Organisation guideline value are more stringent for $PM_{2.5,}$ as it is currently 10µg/m^3 (although it is believed that the guideline value will be reviewed in the future) therefore the modelling results show that parts of the Borough are exceeding WHO guideline but meeting the AQO . Therefore, BBC are working towards reducing the $PM_{2.5}$ levels by taking the following measures:

- Ensuring that dust management plans are requested during the planning application stage for all sites that involve large scale demolition and building works.

- To ensure that best practicable means of dust control measures are being used regardless of how large the development is. These measures can include the use of bowsers, road sweepers and dust suppression to prevent 'trackout'. Also minimise dust generating activities on dry windy days and if there are stockpiles ensure they are covered to prevent wind-whipping.
- Ensuring that developers are carrying out dust suppression monitoring on site at large development sites.
- Ensuring that water suppressants are in use when Nibblers and mobile crushers are on site.
- Educating the public in matters that contribute to air quality e.g. not having bonfires.
- Educate and advise the public about using exempt appliances with the correct fuel for that appliance in BBCs smoke control areas.
- Enforcing the Clean Air Act 1993 and the Environmental Protection Act 1990 where necessary to minimise the risk of particulates becoming air borne.
- To continue to manage, advice and enforce the Pollution Prevention and Control Regulations 1999 and the Environmental Permitting (England and Wales) Regulations 2010 on permitted processes when necessary
- To encourage, support and promote sustainable travel within the Borough by working with a variety of organisations and neighbouring local authorities.
- To continue to promote green travel e.g. walking, cycling, low emissions/ electric vehicles and the tram network.
- To continue to support bus companies and taxis that operate within the Borough to reduce emissions.
- To continue to review suitable research methods for reducing air quality levels for particulate matter e.g. the use of vegetation.
- Promote and encourage the use of the final version of the "EMAQN Air Quality and Emissions Mitigation: guidance for developers" document.
- To assist and advice consultants working on the proposed HS2 project. This ensures that suitable dust control measures will be used throughout the project.

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

3.1 Summary of Monitoring Undertaken

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

3.1.1 Automatic Monitoring Sites

BBC does not currently utilise any automatic air quality monitoring within the Borough

3.1.2 Non-Automatic Monitoring Sites

BBC undertook non- automatic (passive) monitoring of NO_2 at 43 sites during 2018. Table A.1 in Appendix A shows the details of the sites.

Seven sites were discontinued at the end of 2017 for having consistently low NO_2 concentrations. Seven new sites were chosen for 2018, to have a greater understanding of what the levels of NO_2 are within the Borough.

Maps showing the location of the monitoring sites are provided in Appendix E. 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 D.

3.2 Individual Pollutants

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

3.2.1 Nitrogen Dioxide (NO_2)

Table A.2 in Appendix A compares the ratified and adjusted monitored Nitrogen Dioxide (NO_2) annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3.

For diffusion tubes, the full 2018 dataset of monthly mean values are provided in Table B.1 of Appendix B.

Nitrogen Dioxide Diffusion Tube Monitoring Results

The results from the bias corrected NO_2 diffusion tube monitoring have shown that there are no exceedences of the 40µg/m^3 air quality objective at any of the 43 monitoring locations within the Borough for 2018.

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

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

Revoked AQMA in Nuthall

There are three diffusion tube sites located on Nottingham Road in Nuthall that are located within the recently revoked AQMA in Nuthall. The results below show that since 2012 the levels of NO_2 are consistently below the objective of 40µg/m^3 for all three sites.

Table 3.1 – Results for the Revoked AQMA in Nuthall 2012 – 2018.

Site ID	NO_2 Annual Mean Concentration (µg/m^3)						
	2012	2013	2014	2015	2016	2017	2018
BX01 or 33	31	33	29	28	29	29	23
BX05 or 34	32	33	32	29	29	27	28
BX13 or 35	35	33	34	34	32	34	30

Monitoring will continue to be undertaken at these three sites and the results will be reported in the 2020 Air Quality Annual Status Report.

AQMA in Trowell

Since January 2016 there are now two monitoring sites within the AQMA in Trowell as opposed to just one site. They are situated between Junction 25 and 26 of the M1 and are monitoring NO_2 levels from the M1 Motorway. The tubes are sited on the façade of properties that are the closest to the M1.

The original monitoring site is on the façade of a property on Iona Drive, which has been there since 2011. The new monitoring site is on the façade of a property that is in Tiree Close (See Appendix F for the map of the AQMA and the tube locations). The diffusion tube monitoring results from 2012 to 2018 are shown below.

Table 3.2 – Results for AQMA in Trowell 2012 – 2018.

Site ID	NO_2 Annual Mean Concentration (µg/m^3)						
	2012	2013	2014	2015	2016	2017	2018
18	-	-	-	-	34	33	28
BX11 or 19	**42**	39	38	**42**	38	37	32

Although the 2016 and the 2017 NO_2 results for both sites in the AQMA are below the air quality objective, the 2015 data did show an increase in NO_2. 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 at the time of writing the 2016 report. Therefore it was considered that this may have caused congestion further South, which could have had an effect on increasing the air quality levels in 2015.

However, the results do show that there is a decreasing trend (if the 2015 data is seen as an anomaly due to the Smart Motorway Scheme), as the NO_2 levels have reduced by 5µg/m^3 from 2017 to 2018 for both sites. BBC will continue to monitor NO_2 levels in this area and work alongside Highways England to improve air quality levels.

A610/B600 Nuthall Island

Since 2016 there have been two new sites for monitoring the air quality levels on the Nuthall Island (Site's 36 and 37). The reason for changing the origional site (BX 22) was due to the diffusion tube being located less than 1m from Nottingham Road which was very near to the A610/B600 Nuthall Island but not near the residential properties. Therefore, the site was not a true representaion of the levels that receptors are receiving at their properties so the site was relocated to the façade of a residential property in January 2016 (See Appendix H for the Map of the roundabout and the current monitoring locations).

In January 2016 a second site was also chosen to determine what the NO_2 levels are on a residential property that is situated on the opposite side of the roundabout to Site 36 where the traffic is leaving Nottingham City and travelling into the Borough of Broxtowe. The results from 2012 to 2015 are shown for the 'old' site and the 2016 to 2018 results for the 'new' sites are shown below.

Table 3.3 – Results for Nuthall Island 2012 – 2018.

Site ID	NO_2 Annual Mean Concentration (µg/m^3)						
	2012	2013	2014	2015	2016	2017	2018
BX 22	42	41	39	41	-	-	-
36	-	-	-	-	35	35	33
37	-	-	-	-	32	30	29

The results above show that that the origional site did not provide a true representation of NO_2 levels at the façade of the properties. However, the two 'new' sites are showing that the levels are below the air quality objective by 7µg/m^3 for site 36 and 11µg/m^3 for site 37 in 2018 and are showing a decreasing trend.

BBC will continue to monitor NO_2 levels at these sites and provide an update in the 2020 ASR. BBC will continue to work alongside Nottinghamshire County Council to improve air quality levels.

Bramcote Island, Derby Road, Bramcote

Since January 2016, increased monitoring has been undertaken at this location due to the original site showing exceedances of the air quality objective of 40µg/m^3 . The original site (BX04) was discontinued and relocated in January 2016 to a neighbouring property at a more suitable height and nearer to Bramcote Island (Site 41). An additional site was also choosen to determine whether the concentration reduces further away from the roundabout (Site 40). Both sites are on the façade of properties on Derby Road. (See Appendix I for the Map of the roundabout and the monitoring locations).

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

Table 3.4 – Results for Bramcote Island 2012 – 2018.

Site ID	NO_2 Annual Mean Concentration (µg/m^3)						
	2012	2013	2014	2015	2016	2017	2018
BX 04	42	38	42	41	-	-	-
40	-	-	-	-	38	33	34
41	-	-	-	-	37	36	34

The table above shows that in 2018 Site 40 is 34µg/m^3, which is a slight increase of 1µg/m^3 and Site 41 is 34µg/m^3, which is a reduction of 2µg/m^3 in comparison to the 2017 results.

Although this is an overall downward trend for both sites from 2016 and they are below the objective level. There is a slight increase by 1µg/m^3 at Site 40. This could

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

Town Street, Bramcote.

In December 2016 a review was undertaken of the mornitoing network and as Town Street is often used as a 'rat run' in rush hour to avoid the A52 a decision was made to monitor at this location.

The new site started in January 2017 and the exact location was picked as the street is narrowed due to resdients parking outside their properties, which tends to cause a 'bottle neck' situation in rush hour (See Appendix J for the Map identifying the monitoring location). The siting of the tube has been choosen so that it is parallel with the façade of a nearby residential property as there were no suitable downpipes to attach it to the façade of the property.

Table 3.5 – Results for Town Street 2016 – 2018.

Site ID	NO_2 Annual Mean Concentration (µg/m^3)		
	2016	2017	2018
48	-	38	36
56	-	-	25

Above is the result for the sites for 2017 and 2018. The result for 2017 is 38µg/m^3. The result at site 48 for 2018 is 36µg/m^3 which is a reduction of 2µg/m^3 in comparison to the 2017 results, which shows a downward trend.

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

the site where there is a bottle neck. The results for Site 56 in 2018 are 25µg/m^3, which enforce the theory that the results are higher on site 48 due to the 'Bottle neck' situation.

BBC will continue to monitor NO_2 levels at these sites and provide an update in the 2020 ASR. BBC will continue to work alongside Nottinghamshire County Council to improve air quality levels.

The Results and Trends for the Thirteen Monitoring Sites 2013 - 2018.

As mentioned previously in Chaper 2.2 of this report. Defra requested that trend graphs and comparisons are made for the thirteen sites that have been continuously monitored since 2013. See Appendix C for the trend graph for all thirteen sites.

The trend graph in Appendix C shows that out of the thirteen sites, ten of the sites are showing a downward trend since 2013 (Sites 1, 5, 7, 19, 20, 22, 31, 33, 35, 38). The three remaining sites are showing an overall downward trend since 2013 but have increased in 2018 (Sites 34, 39 & 43) but the increase for all of them is by 1µg/m^3. These are discussed in greater detail below.

Site 34- 19a Nottingham Road, Nuthall.

Since 2013, Site 34 has shown a downward trend until 2018 when there has been a slight increase of 1µg/m^3 in comparision to 2017 result. Overall since 2013 there had been a decrease of 5µg/m^3 with the highest concentration being 32µg/m^3 it is currently 28 µg/m^3 , which is below the air quality objective of 40µg/m^3. The reason for the slight increase is unknown as this is a co-location study with Site 33 which has not shown an increase.

Site 39 – 9 Bembridge Court, Bramcote

Since 2013, Site 39 has shown a general downward trend until 2018 when there has been a slight increase of 1µg/m^3 in comparision to 2017 result. Overall since 2013

there had been a decrease of 6µg/m^3 with the highest concentration being 32µg/m^3 it is currently 27 µg/m^3 , which is below the air quality objective of 40µg/m^3. The reason for the slight increase may be due to an increase in traffic on the A52 due to roadworks and sporadic closures on the M1 Motorway.

Site 43- Broxtowe Borough Council Offices.

Since 2013, Site 43 has shown a downward trend until 2018 when there has been a slight increase of 1µg/m^3 in comparision to 2017 result. Overall since 2013 there had been a decrease of 5µg/m^3 with the highest concentration being 23µg/m^3 it is currently 19µg/m^3 , which is below the air quality objective of 40µg/m^3. This is one of the urban background sites. The other urban background site is Site 5 which has shown a decrease of 2µg/m^3 since last year, therefore this may be a localised increase in NO_2.

The breakdown of the annual figures for each year from 2013 to 2018 can be viewed in Appendix A, Table A.2 of this report.

3.2.2 Particulate Matter (PM_{10})

BBC does not currently monitor PM_{10} within the Borough. However, discussions are currently taking place with Nottinghamshire District and Borough Authorities and Nottinghamshire County Council, to collectively buy and maintain particulate monitors in the future. The outcome of this will be discussed in the air quality report for 2020.

3.2.3 Particulate Matter ($PM_{2.5}$)

BBC does not currently monitor $PM_{2.5}$ within the Borough. However, discussions are currently taking place with Nottinghamshire District and Borough Authorities and Nottinghamshire County Council, to collectively buy and maintain particulate monitors in the future. The outcome of this will be discussed in the air quality report for 2020.

3.2.4 Sulphur Dioxide (SO_2)

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

Appendix A: Monitoring Results

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

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m)) (2)	Tube co-located with a Continuous Analyser?	Height (m)
1	113 Wollaton Road, Beeston	R	452527	337313	NO_2	N	0	1^	N	1.9
50	309 Wollaton Road, Beeston	R	452114	338018	NO_2	N	0	16^	N	1.7
2	166 Derby Road, Beeston	R	452091	338122	NO_2	N	0	7^	N	1.8
3	8 Queens Road East, Beeston	R	453659	337412	NO_2	N	0	12^	N	1.8
4	226 Queens Road, Beeston	R	453361	336627	NO_2	N	0	6^	N	1.8
51	36 Meadows Road, Beeston	R	453537	336100	NO_2	N	0	4^	N	1.7

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m)) (2)	Tube co-located with a Continuous Analyser?	Height (m)
52	228 Station Road Beeston	R	453287	336349	NO_2	N	0	4^	N	1.7
5	Chilwell Olympia School, Beeston	UB	451782	335320	NO_2	N	0	104^	N	1.9
7	31 Hickton Drive, Chilwell	R	450756	334328	NO_2	N	0	10^	N	1.9
53	1 Calverton Close, Chilwell	R	450360	334982	NO_2	N	0	5^	N	1.7
8	The Manor Pub, 350 Nottingham Road, Toton	R	450422	334243	NO_2	N	0	5^	N	1.8
9	Toton branch Surgery, 2 Banks Road, Toton	R	449876	334804	NO_2	N	0	8^	N	1.8

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m)) (2)	Tube co-located with a Continuous Analyser?	Height (m)
10	1 Katherine Drive, Toton	R	449748	335472	NO_2	N	0	13^	N	1.7
11	269 Stapleford Lane, Toton	R	449694	335501	NO_2	N	0	7^	N	1.8
12	Lamppost, Stapleford Lane, Toton	R	449615	335664	NO_2	N	0	2^	N	1.9
45	209 Toton Lane, Stapleford	R	449467	336220	NO_2	N	0	16^	N	1.8
15	George Spencer Academy, Stapleford	R	449406	336135	NO_2	N	0	9^	N	1.9
13	George Spencer Lower School, Toton	R	449266	336075	NO_2	N	0	16^	N	1.8

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m)) (2)	Tube co-located with a Continuous Analyser?	Height (m)
16	24 Brampton Drive, Stapleford	R	449516	336216	NO_2	N	0	11^	N	1.7
54	195 Derby Road, Stapleford	R	448467	336591	NO_2	N	0	4^	N	1.8
17	Lamppost Church Street, Stapleford	R	448890	337190	NO_2	N	0	3^	N	1.8
55	12 Ilkeston Road, Stapleford	R	449814	338471	NO_2	N	0	11^	N	1.8
18	20 Tiree Close, Trowell	R	448560	338889	NO_2	Y	0	26	N	1.7
19	15 Iona Drive, Trowell	R	448586	339023	NO_2	Y	0	23	N	1.9
20	30 Derbyshire Avenue, Trowell	R	448652	339652	NO_2	N	0	39	N	1.9

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m)) (2)	Tube co-located with a Continuous Analyser?	Height (m)
22	81 Nottingham Road, Trowell	R	448832	340098	NO_2	N	0	33	N	1.8
44	32 Mansfield Road, Eastwood	R	446509	347091	NO_2	N	0	2^	N	1.8
27	Sun Inn Pub, 6 Derby Road, Eastwood	R	446465	346985	NO_2	N	0	6^	N	1.8
30	560 Nottingham Road, Giltbrook	R	448544	345241	NO_2	N	0	3^	N	1.9
31	15 Hayley Close, Kimberley	R	448826	344883	NO_2	N	0	11^	N	1.9
32	59b Main Street, Kimberley	R	450122	344658	NO_2	N	0	5^	N	1.8
33	19a Nottingham Road, Nuthall*	R	451631	344526	NO_2	Y	0	42	N	1.7

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m)) (2)	Tube co-located with a Continuous Analyser?	Height (m)
34	19a Nottingham Road, Nuthall*	R	451631	344526	NO_2	Y	0	42	N	1.7
35	20 Nottingham Road, Nuthall	R	451728	344440	NO_2	Y	0	32	N	1.9
36	113 Nottingham Road, Nuthall	R	452232	344033	NO_2	N	0	20^	N	1.7
37	114 Nottingham Road, Nuthall	R	452331	343910	NO_2	N	0	27^	N	1.7
38	Opp Sherwin Arms, Derby Road, Bramcote	R	450389	337866	NO_2	N	2	1^	N	1.8
39	9 Bembridge Court, Bramcote	R	450434	337781	NO_2	N	0	6^	N	1.6
56	10 Town Street, Bramcote	R	450570	337851	NO_2	N	0	10^	N	1.9

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m)) (2)	Tube co-located with a Continuous Analyser?	Height (m)
40	153 Derby Road, Bramcote	R	450632	337929	NO_2	N	0	14^	N	1.7
41	169 Derby Road, Bramcote	R	450555	337909	NO_2	N	0	11^	N	1.8
48	Near 73 Town Street, Bramcote	R	450817	337592	NO_2	N	0	2	N	1.8
43	Broxtowe Borough Council Offices	UB	452733	336962	NO_2	N	0	10^	N	1.8

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 to nearest road relate to the M1 which is the primary source of NO_2 throughout the borough unless indicated using the ^ symbol

(*) Co-located tubes

Table A.2 – Annual Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)					
					2013	2014	2015	2016	2017	2018
46	Roadside	Diffusion Tube	-	-	-	-	-	-	24	-
47	Roadside	Diffusion Tube	-	-	-	-	-	-	25	-
1	Roadside	Diffusion Tube	100	100	32	32	29	30	28	26
50	Roadside	Diffusion Tube	100	100	-	-	-	-	-	28
2	Roadside	Diffusion Tube	100	100	-	-	-	31	29	27
3	Roadside	Diffusion Tube	100	100	-	-	-	26	22	22
4	Roadside	Diffusion Tube	100	100	-	-	-	30	28	26
51	Roadside	Diffusion Tube	92	92	-	-	-	-	-	18

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2018 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]					
					2013	2014	2015	2016	2017	2018
52	Roadside	Diffusion Tube	100	100	-	-	-	-	-	23
5	Urban Background	Diffusion Tube	92	92	22	21	20	20	19	17
6	Roadside	Diffusion Tube	-	-	-	-	-	26	25	-
7	Roadside	Diffusion Tube	100	100	27	26	26	27	26	23
53	Roadside	Diffusion Tube	100	100	-	-	-	-	-	19
8	Roadside	Diffusion Tube	100	100	-	-	-	31	29	27
9	Roadside	Diffusion Tube	100	100	-	-	-	24	21	22
10	Roadside	Diffusion Tube	92	92	-	-	-	26	26	21
11	Roadside	Diffusion Tube	100	100	-	-	-	30	29	26

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2018 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]					
					2013	2014	2015	2016	2017	2018
12	Roadside	Diffusion Tube	100	100	-	-	-	29	25	24
13	Roadside	Diffusion Tube	100	100	-	-	-	31	34	26
45	Roadside	Diffusion Tube	100	100	-	-	-	28	29	26
15	Roadside	Diffusion Tube	92	92	-	-	-	36	26	28
16	Roadside	Diffusion Tube	100	100	-	-	-	28	26	26
54	Roadside	Diffusion Tube	100	100	-	-	-	-	-	30
17	Roadside	Diffusion Tube	100	100	-	-	-	37	35	33
55	Roadside	Diffusion Tube	100	100	-	-	-	-	-	25
18	Roadside	Diffusion Tube	100	100	-	-	-	34	33	28

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2018 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]					
					2013	2014	2015	2016	2017	2018
19	Roadside	Diffusion Tube	100	100	39	38	**42**	38	37	32
20	Roadside	Diffusion Tube	100	100	33	30	26	26	24	24
22	Roadside	Diffusion Tube	100	100	30	30	26	27	24	24
23	Roadside	Diffusion Tube	-	-	-	-	-	24	22	-
24	Roadside	Diffusion Tube	-	-	-	-	-	26	24	-
44	Roadside	Diffusion Tube	100	100	-	-	-	36	33	34
27	Roadside	Diffusion Tube	100	100	-	-	-	26	24	24
28	Roadside	Diffusion Tube	-	-	-	-	-	25	21	-
30	Roadside	Diffusion Tube	92	100	-	-	-	27	28	23

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2018 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]					
					2013	2014	2015	2016	2017	2018
31	Roadside	Diffusion Tube	92	92	30	32	30	30	32	26
32	Roadside	Diffusion Tube	100	100	-	-	-	30	29	29
33	Roadside	Diffusion Tube	83	83	33	29	28	29	29	23
34	Roadside	Diffusion Tube	100	100	32	32	29	29	27	28
35	Roadside	Diffusion Tube	100	100	33	34	34	32	34	30
36	Roadside	Diffusion Tube	100	100	-	-	-	35	35	33
37	Roadside	Diffusion Tube	100	100	-	-	-	32	30	29
38	Roadside	Diffusion Tube	100	100	22	34	31	34	30	30
39	Roadside	Diffusion Tube	100	100	32	32	28	31	26	27

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 Annual Mean Concentration (µg/m^3) (3)					
					2013	2014	2015	2016	2017	2018
56	Roadside	Diffusion Tube	100	100	-	-	-	-	-	25
40	Roadside	Diffusion Tube	100	100	-	-	-	38	33	34
41	Roadside	Diffusion Tube	100	100	-	-	-	37	36	34
48	Roadside	Diffusion Tube	100	100	-	-	-	-	38	36
49	Roadside	Diffusion Tube	-	-	-	-	-	-	24	-
43	Urban Background	Diffusion Tube	100	100	22	23	21	21	18	19

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

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

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

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

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

☒ **Diffusion tube data has been bias corrected**

☒ **Annualisation has been conducted where data capture is <75%**

☒ **If applicable, all data has been distance corrected for relevant exposure**

Appendix B: Full Monthly Diffusion Tube Results for 2018

Table B.1 – NO_2 Monthly Diffusion Tube Results - 2018

Site ID	NO_2 Mean Concentrations (µg/m^3)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (0.93) and Annualised (1)	Distance corrected to Nearest Exposure (2)
1	28	32	29	28	24	17	26	25	29	31	32	28	27	26	-
50	36	40	35	30	22	14	18	20	26	**43**	34	**46**	30	28	-
2	29	32	31	31	27	17	25	26	27	27	38	33	29	27	-
3	26	30	26	27	23	18	16	19	21	28	25	32	24	22	-
4	28	34	29	28	26	18	22	23	30	31	29	36	28	26	-
51	23	25	25	22	(a)	11	18	15	20	23	26	28	20	18	-
52	27	31	28	26	22	13	17	20	22	27	30	33	25	23	-
5	21	28	22	17	16	(b)	14	16	19	23	24	17	18	17	-
7	28	30	28	25	21	17	21	24	22	28	32	20	25	23	-
53	26	28	25	20	18	12	17	18	20	23	21	20	21	19	-
8	30	31	35	31	25	18	28	26	26	33	32	33	29	27	-
9	26	29	29	23	24	16	20	20	18	26	24	28	24	22	-

Site ID	NO_2 Mean Concentrations ($\mu g/m^3$)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (0.93) and Annualised (1)	Distance corrected to Nearest Exposure (2)
10	27	30	29	24	18	14	22	24	27	(a)	23	32	22	21	-
11	30	29	31	22	28	20	26	27	28	31	30	33	28	26	-
12	29	27	29	29	23	14	21	21	22	31	30	30	25	24	-
13	30	38	29	28	29	25	24	22	24	29	27	31	28	26	-
45	30	35	31	30	22	15	24	26	27	31	33	30	28	26	-
15	38	**41**	**41**	(a)	14	23	35	33	32	34	37	36	30	28	-
16	29	36	32	29	27	18	24	24	23	27	31	35	28	26	-
54	34	36	35	39	33	23	28	27	28	34	33	36	32	30	-
17	35	**43**	37	34	34	21	33	33	34	39	**41**	**41**	35	33	-
55	29	28	30	27	23	17	22	23	26	30	31	32	26	25	-
18	34	33	35	30	23	18	31	31	32	33	28	35	30	28	-
19	40	39	34	32	27	26	34	34	36	39	31	38	34	32	-
20	27	36	32	31	23	25	21	19	19	23	30	26	26	24	-
22	27	35	31	31	25	20	22	20	21	24	34	24	26	24	-
44	37	39	38	**41**	39	24	31	34	31	40	38	**42**	36	34	-

Site ID	NO_2 Mean Concentrations ($\mu g/m^3$)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (0.93) and Annualised (1)	Distance corrected to Nearest Exposure (2)
27	28	30	28	29	26	20	25	22	23	28	27	24	26	24	-
30	30	30	30	27	22	16	24	(a)	28	30	34	29	25	23	-
31	34	30	33	33	25	16	29	32	30	(a)	32	37	28	26	-
32	29	37	36	32	33	24	31	27	28	35	33	29	31	29	-
33	31	34	32	30	27	19	26	(b)	(b)	34	39	27	25	23	-
34	31	38	32	36	28	24	28	25	22	30	36	30	30	28	-
35	36	36	33	36	23	20	33	37	36	34	30	34	32	30	-
36	38	38	**41**	30	24	20	35	**41**	**44**	36	38	38	35	33	-
37	34	33	36	33	36	29	27	26	30	34	26	29	31	29	-
38	35	39	37	32	34	29	25	26	28	29	35	35	32	30	29
39	30	36	32	32	36	21	26	21	23	30	30	30	29	27	-
56	29	32	30	27	25	18	24	24	29	32	28	25	27	25	
40	38	37	**41**	35	**42**	31	35	32	37	39	37	34	37	34	-
41	**43**	**42**	**41**	38	36	24	37	36	39	38	36	31	37	34	-
48	**43**	38	40	36	36	25	40	39	**45**	**45**	36	27	38	36	-

Site ID	NO_2 Mean Concentrations ($\mu g/m^3$)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (0.93) and Annualised (1)	Distance corrected to Nearest Exposure (2)
43	25	27	26	18	17	13	13	15	17	23	23	24	20	19	-

Notes:

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

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

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

(2) Distance corrected to nearest relevant public exposure.

(a) Missing tubes

(b) Result not valid

☒ **Local bias adjustment factor used**

☒ **National bias adjustment factor used**

☒ **Annualisation has been conducted where data capture is <75%**

☒ **Where applicable, data has been distance corrected for relevant exposure**

Appendix C: A Trend Graph for 13 Continuous Monitoring Sites from 2013 to 2018

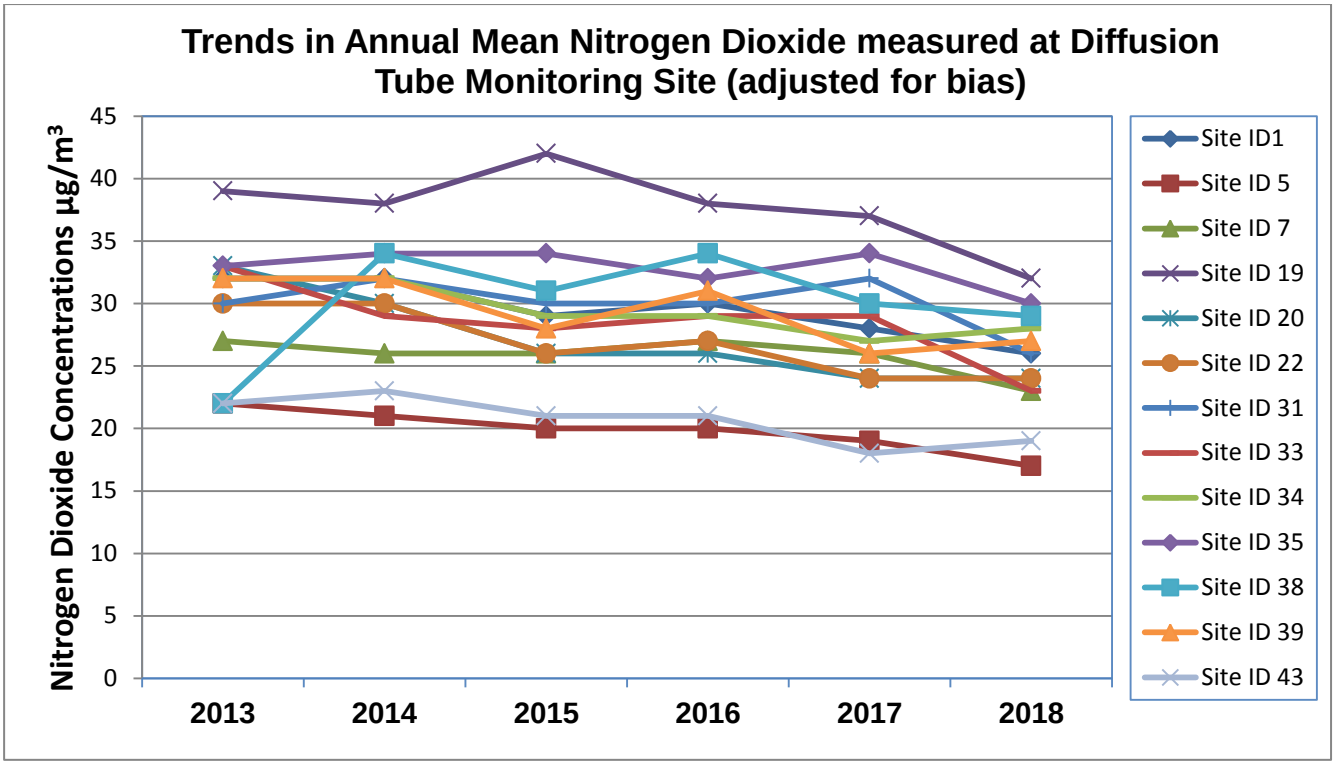


Figure C.1 – Trend Graph of 13 Sites 2013 to 2018.

Site ID 1 = 113 Wollaton Road, Beeston

Site ID 5 = Chilwell Olympia School, Beeston

Site ID 7 = 31 Hickton Drive, Chilwell

Site ID 19 = 15 Iona Drive, Trowell

Site ID 20 = 30 Derbyshire Avenue, Trowell

Site ID 22 = 81 Nottingham Road, Trowell

Site ID 31 = 15 Hayley Close, Kimberley

Site ID 33 = 19a Nottingham Road, Nuthall

Site ID 34 = 19a Nottingham Road, Nuthall

Site ID 35 = 20 Nottingham Road, Nuthall

Site ID 38 = Opposite Sherwin Arms, Derby Road, Bramcote

Site ID 39 = 9 Bembridge Court, Bramcote

Site ID 43 = Broxtowe Borough Council Offices

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

Nitrogen Dioxide Diffusion Tube Adjustment Information

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 Bias Adjustment Factors

The national bias adjustment factor was used to bias correct the data. The adjustment factor specific to each year is shown below.

2018 Figures

The Review and Assessment (R&A) Helpdesk Database 2018 bias adjustment factor for Gradko 20% TEA in water tubes = 0.93. This figure is the average of 30 studies and was taken from Spreadsheet Version Number: 03/19.

Diffusion tube precision was good for 28 of the 30 studies used to derive the national bias adjustment factor. Tube precision is categorised as “good” where the coefficient of variation (CV) of triplicate diffusion tubes for eight or more periods during the year is less than 20%, and the average CV of all monitoring periods is less than 10% (LAQM.TG(16)).

Annualisation

As the data capture was not below 75%, it was not necessary for the data to be annualised.

Distance Correction

One site (Site 38) has been distance corrected to the nearest public exposure using the NO2 fall-off with distance calculator available on the LAQM website http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html .

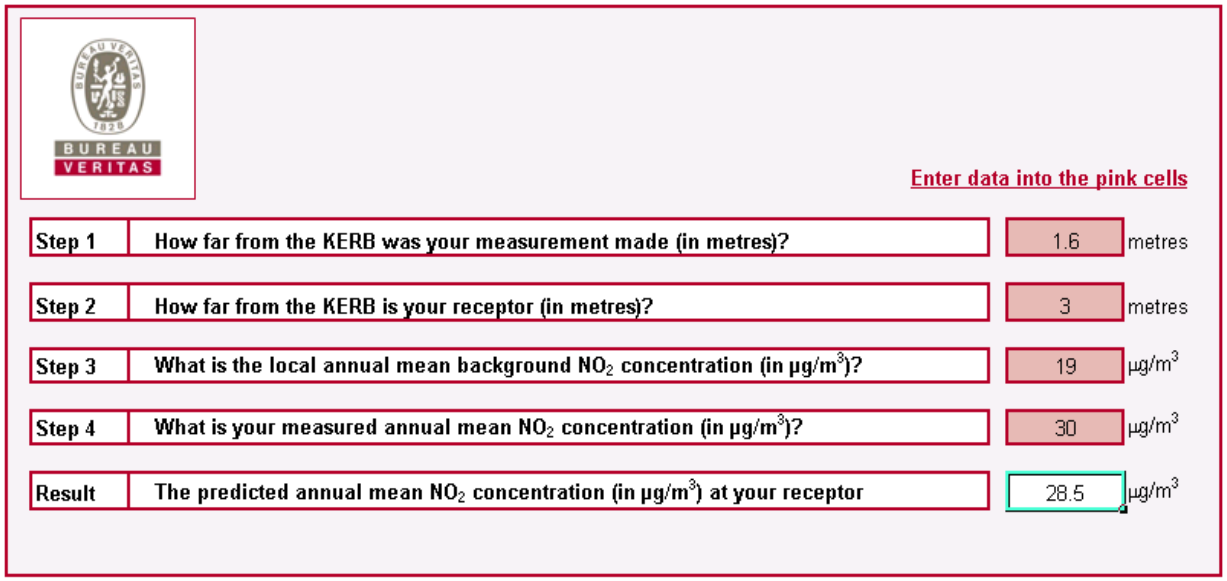


Figure D.1 - Road Calculation to nearest Receptor for Site 38.

QA/QC Data for Non-Automatic Sites

Broxtowe Borough Council

The QA/QC procedure's that are followed when deploying diffusion tubes are:

- The diffusion tubes on arrival are labelled (including the travel blank), put back in a sealed bag then stored in a fridge until they are deployed.
- The diffusion tubes (including the travel blank) are removed from the fridge 10 minutes before undertaking the changeover.
- All of the diffusion tubes are deployed vertically in a spacer at each location and the date and time of their removal is recorded. The travel blank is not exposed e.g. the end cap is not removed.
- After all of the diffusion tubes have been changed over, they are then put back into the fridge until they are sent to the laboratory.

- The paperwork is then filled in and the diffusion tubes and the associated paperwork are sent to the laboratory for analysis.

Gradko

Gradko International (diffusion tube supplier and analyst) is United Kingdom Accreditation Service (UKAS) accredited; it is assessed annually for compliance to ISO 17025 and participates in other proficiency schemes.

Gradko International confirms that:

- Their procedures have been amended to follow the guidance issued on behalf of Defra (AWA Energy & Environment, Feb 2008) relating to the preparation, extraction, analysis and calculation procedures for passive NO_2 diffusion tubes. And
- That most of these procedures were in force before the guidance was introduced and any amendments necessary in achieving compliance were minimal

Gradko International also participates in a number of QA/QC monitoring systems to demonstrate satisfactory performance:

- The Workplace Analysis Scheme for Proficiency (WASP) programme to ensure uniformity of data throughout the year. Only laboratories that are in the WASP scheme are used for analysing tubes from the National Nitrogen Dioxide Diffusion Tube Network.
- The monthly field inter-comparison exercise with other laboratories to enable assessment of bias and precision undertaken by AEA Energy & Environment

An external QC scheme to check solutions is run by AEA Energy & Environment

Appendix E: Map of All Monitoring Locations within the Borough of Broxtowe.

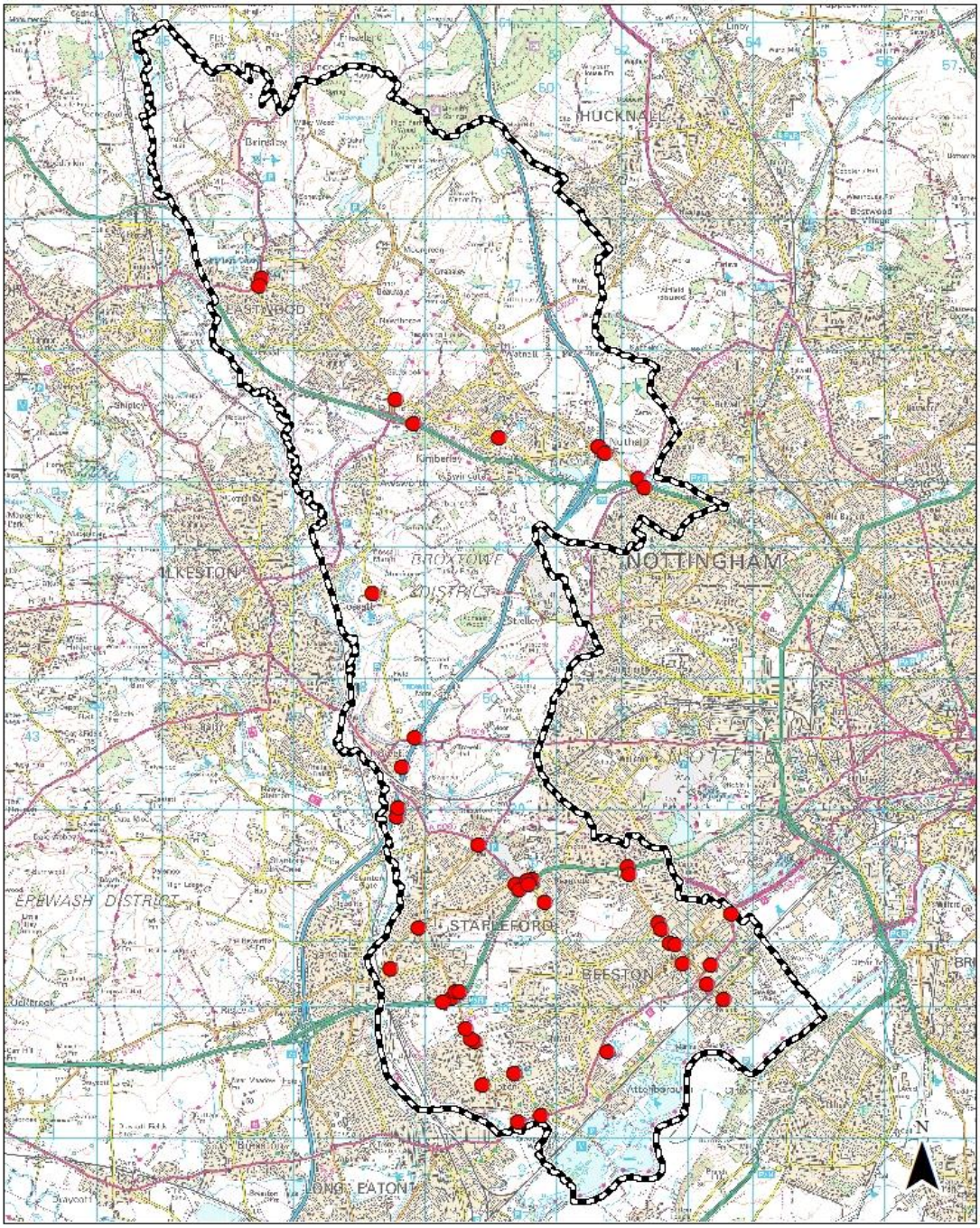


Figure E.1 – Diffusion Tube Locations

Appendix F: Map of AQMA in Trowell.

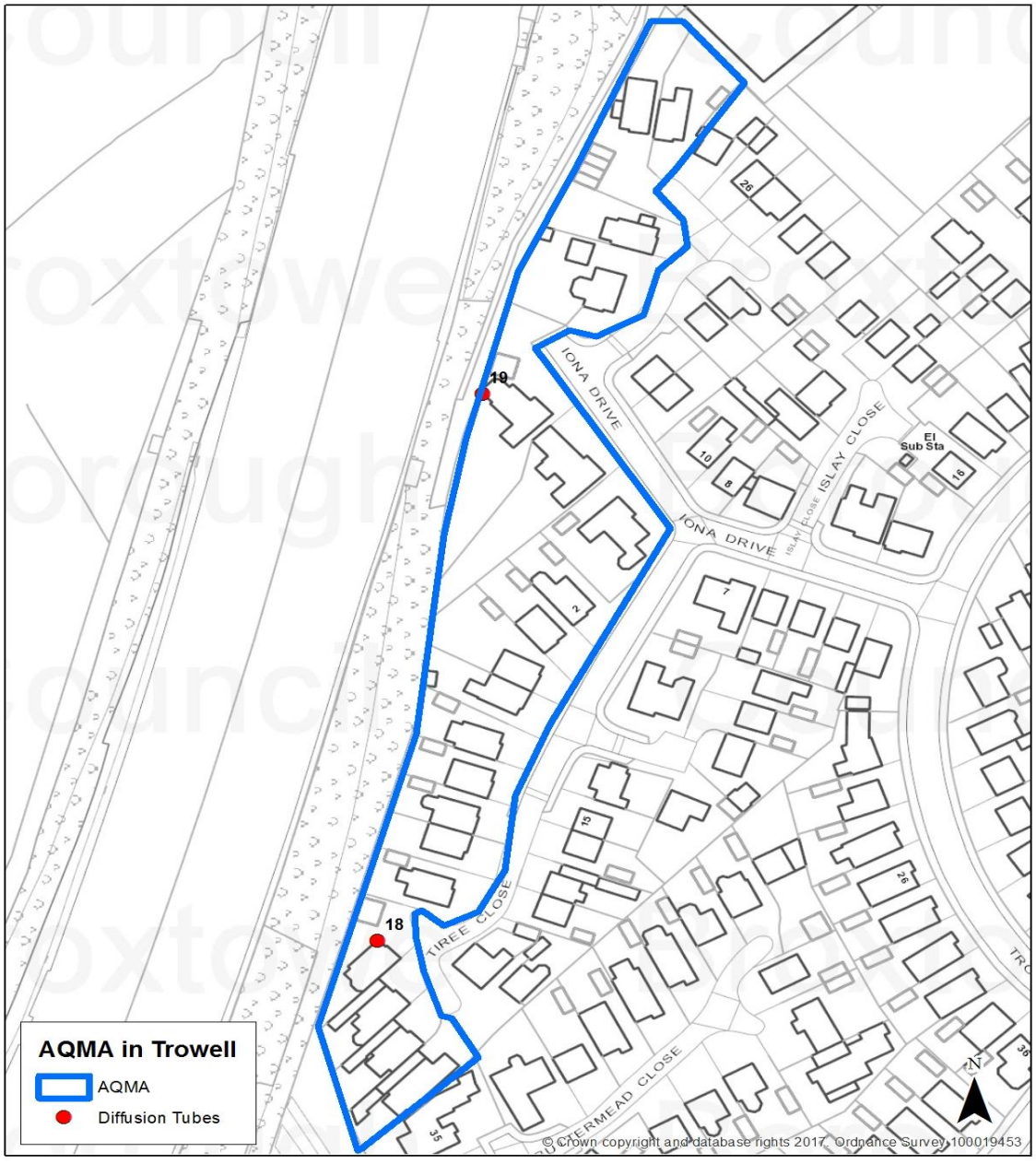


Figure F.1 - AQMA 1 encompassing twenty properties on parts of Iona Drive and Tiree Close next to the M1 motorway and the Trowell Park estate (boundary marked in blue).

Appendix G: Map of the Borough showing the 2018 modelled background levels of $PM_{2.5}$.

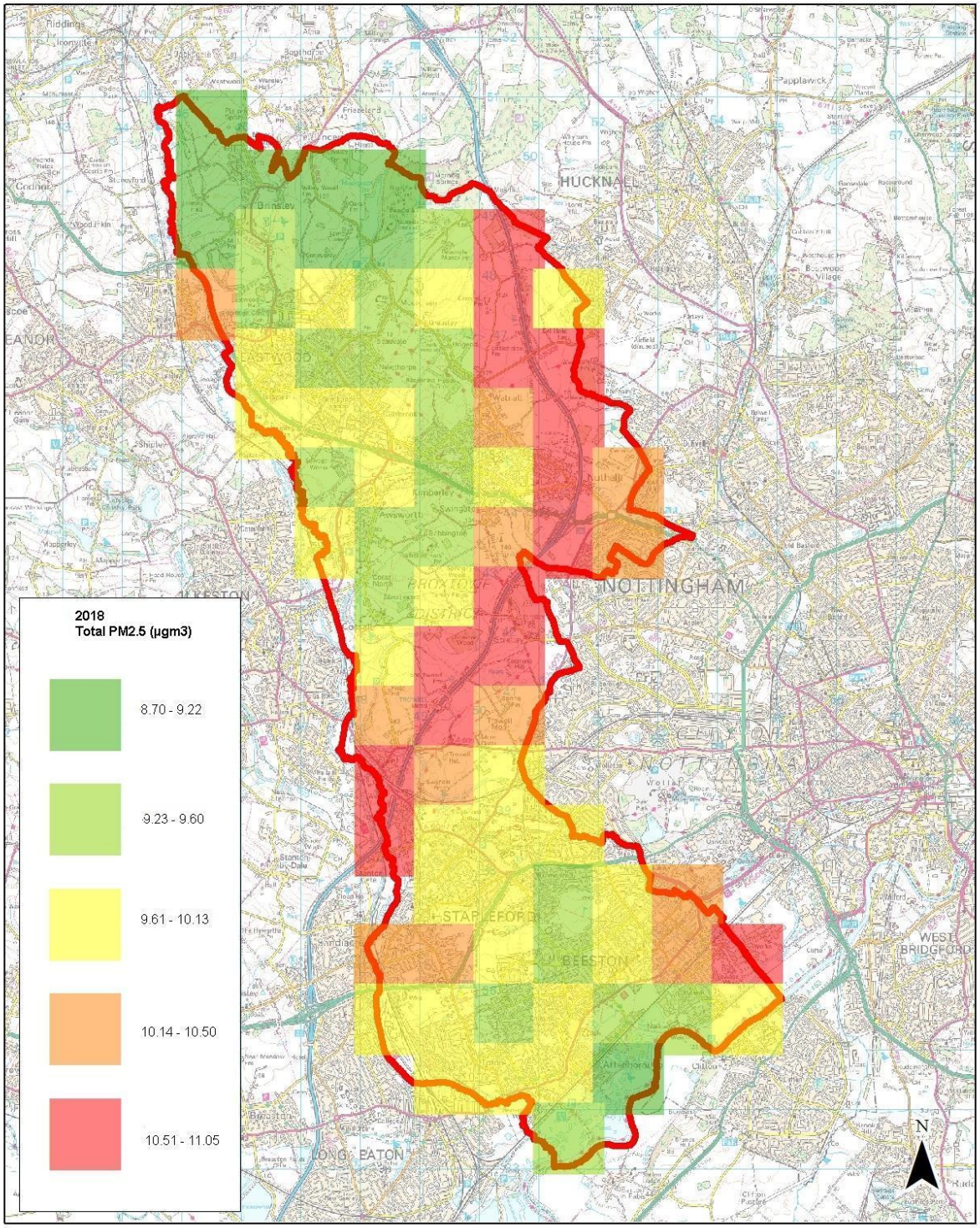


Figure G.1 - Map of the Borough showing the modelled background levels of $PM_{2.5}$.

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

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

Appendix I: Map of Bramcote Island, Derby Road, Bramcote showing the Monitoring Locations.

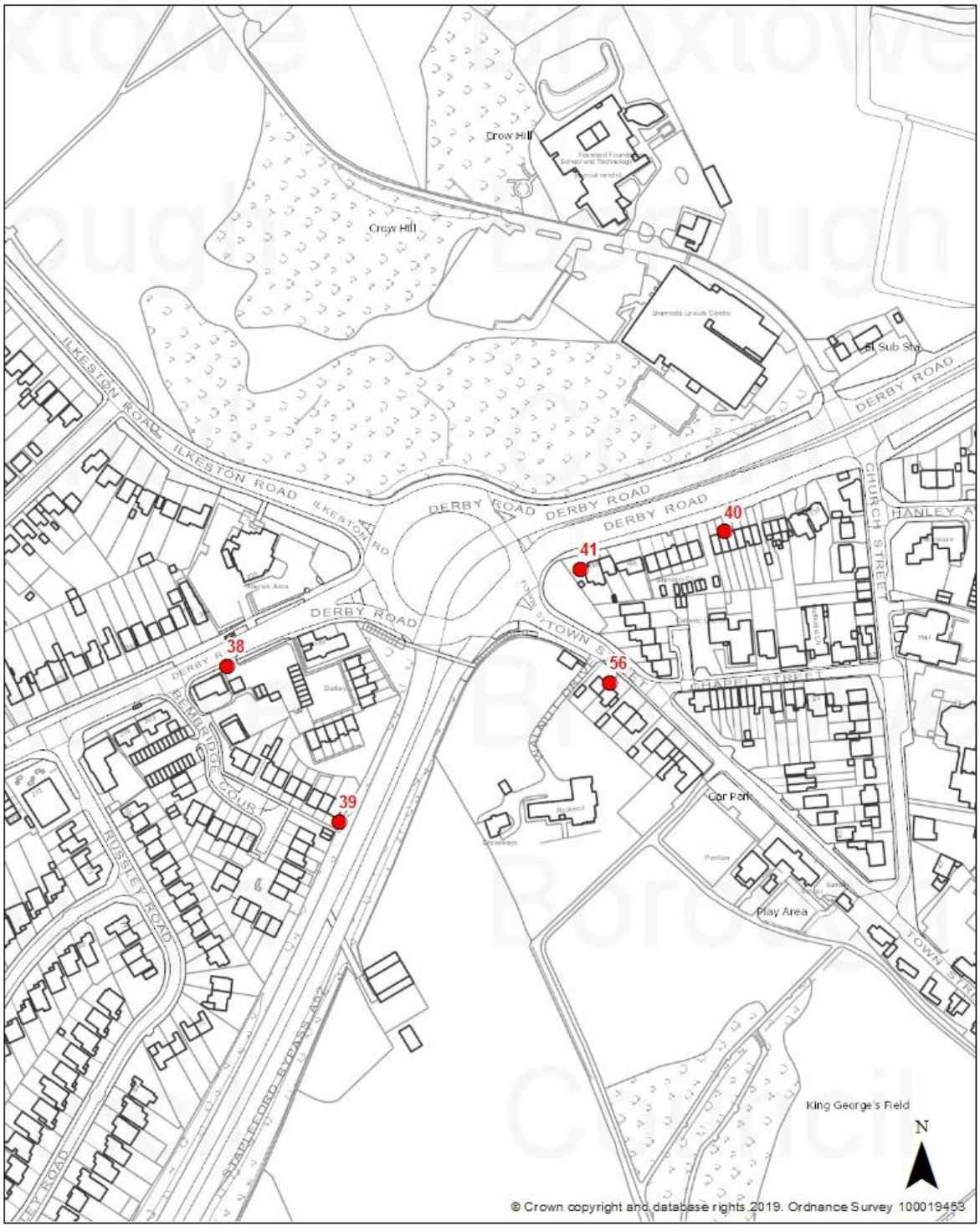


Figure I.1 – Bramcote Island and Diffusion Tube Location

Appendix J: Map of Town Street, Bramcote showing the Monitoring Location.

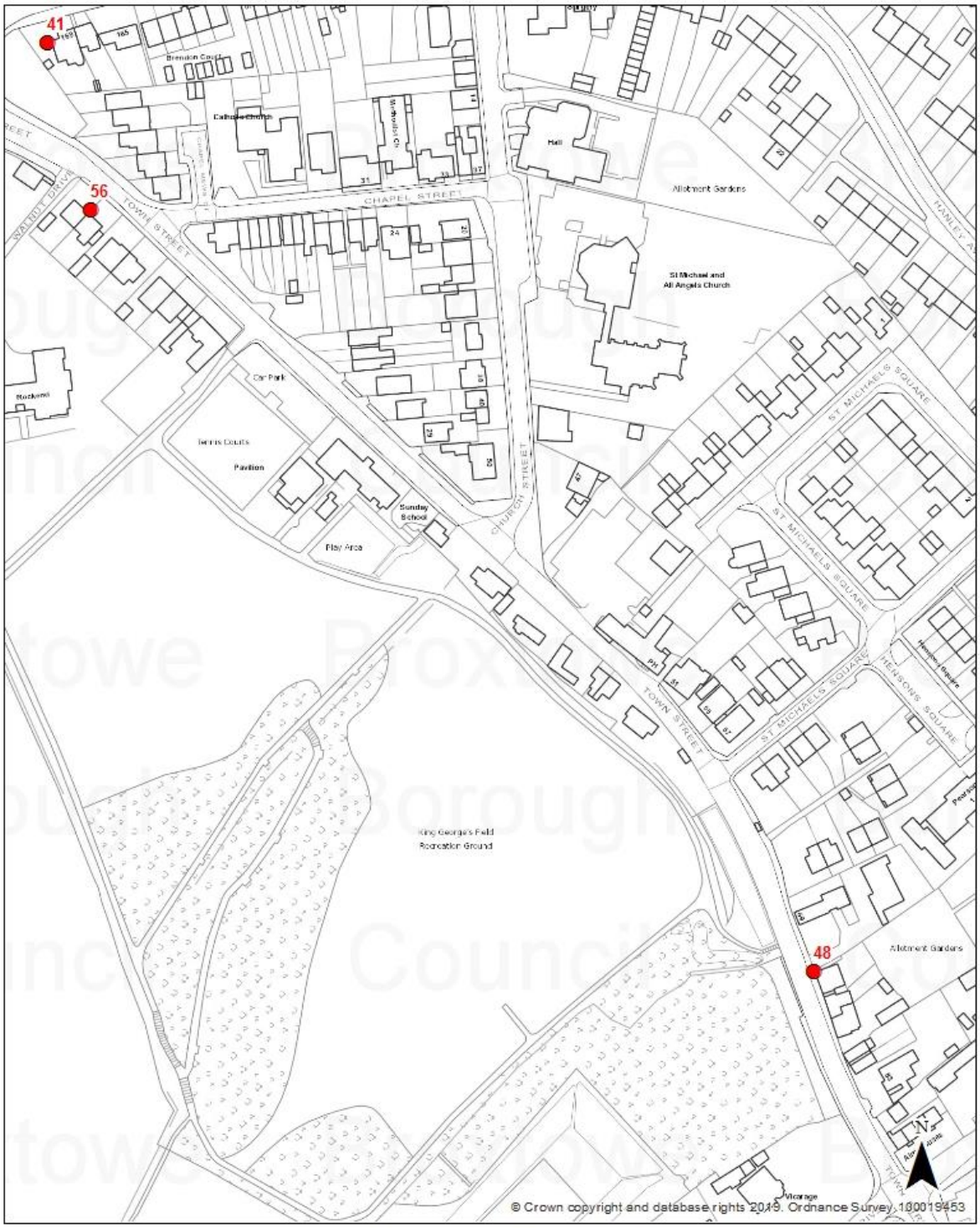


Figure J.1 – Map of Town Street, Bramcote and Diffusion Tube Location

Appendix K: Summary of Air Quality Objectives in England

Table K.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[7]	
	Concentration	Measured as
Nitrogen Dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m^3	Annual mean
Particulate Matter (PM_{10})	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m^3	Annual mean
Particulate Matter ($PM_{2.5}$)	Work towards reducing emissions/concentrations of fine particulate matter ($PM_{2.5}$)	Annual mean
Sulphur Dioxide (SO_2)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

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

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air Quality Annual Status Report
AURN	Automatic Urban and Rural Network
BBC	Broxtowe Borough Council
CAZ	Clean Air Zone
COMEAP	Committee on the Medical Effects of Air Pollution
CV	Coefficient of Variation
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
D2N2	Local Enterprise Partnership for Derby, Derbyshire, Nottingham and Nottinghamshire
EMAQN	East Midlands Air Quality Network
EU	European Union
HE	Highways England
HGV's	Heavy Goods Vehicles
HS2	High Speed Train 2
ITSO	Integrated Transport Smartcard Organisation
LAQM	Local Air Quality Management
LAQM.PG(16)	LAQM Policy Guidance 2016
LAQM.TG(16)	LAQM Technical Guidance 2016
LCWIP	Local Cycling and Walking Infrastructure Plan

LGA	Local Government Association
LSTF	Local Sustainable Transport Fund
µg/m^3	Microgrammes of pollutant per cubic metre of air
NEPWG	Nottinghamshire Environmental Protection Working Group
NET	Nottingham Express Transit
NCT	Nottingham City Transport
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
Notts CC	Nottingham City Council
NCC	Nottinghamshire County Council
O_3	Ozone
OLEV	Office for Low Emission Vehicles
PHE	Public Health England
PM	Particulate Matter
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
PTP	Personalised Travel Planning
QA/QC	Quality Assurance and Quality Control
R&A	Review and Assessment
SAFED	Safe And Fuel Efficient Driving
SO_2	Sulphur Dioxide
SQPS	Statutory Quality Partnership Schemes
TEA	Triethanolamine
UK	United Kingdom

ULEVs	Ultra Low Emission Vehicles
WASP	Workplace Analysis Scheme for Proficiency
WHO	World Health Organisation
WPL	Workplace Parking Levy

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