Broxbourne Borough Council
Air Quality Action Plan - 2024

Bureau Veritas

February 2024

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Document Control Sheet

Identification	
Client	Broxbourne Borough Council
Document Title	Air Quality Action Plan - 2024
Bureau Veritas Ref No.	AIR11527338

Contact Details		
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Configuration				
Version	**Date**	**Author**	**Reason for Issue/Summary of Changes**	**Status**
v1.0	07/02/2024	M Fernandez Zoppi	Draft for comment	Draft
v1.1	16/02/2024	M Fernandez Zoppi	Draft incorporating BBC comments	Draft

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Broxbourne Borough Council

Air Quality Action Plan

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

February 2024

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Date	February 2024

Executive Summary

This Air Quality Action Plan (AQAP) has been produced as part of our statutory duties required by the Local Air Quality Management framework. It outlines the action we will take to improve air quality in Broxbourne Borough Council (BBC) between 2023 and 2028.

Where an exceedance of the Air Quality objective is recorded, local authorities are required to declare an Air Quality Management Area (AQMA) to focus efforts into reducing pollutant concentrations. This action plan is for the existing AQMAs as detailed below:

- **AQMA No. 1** – Arlington Crescent to Abbey Road, Waltham Cross. Declared for exceedances of the annual mean air quality objective for Nitrogen Dioxide (NO_2);
- **AQMA No. 4** - Eleanor Cross Road / Monarchs Way Roundabout, Waltham Cross. Declared for exceedances of the annual mean air quality objective for NO_2;
- **AQMA No.6** – Great Cambridge Road (A10), Cheshunt, including the A10 near Theobalds Lane junction up to the Brookfield Centre (B156 Flyover and B156/A10 Slip Road). Declared for exceedances of the annual mean and 1-hour mean air quality objectives for NO_2.

This action plan replaces the previous action plan which was implemented in 2004. To support this action plan, a detailed modelling assessment, considering 2018 as a base year, has been carried out for all of the declared AQMAs.

Projects delivered through the past action plan include:

- Requiring developers to undertake an air quality assessment for planning applications associated with increased transport, and provided and air pollution mitigation plan where necessary;
- Implementation of Hertfordshire and Bedfordshire Air Pollution Alert System;
- Promotion of cycling, with maps and routes being periodically produced/updated by Sustrans as required;

- The replacement of petrol/diesel council pool cars with EV cars;
- The installation of EV charging points within council owned car parks. Three charging points have been installed at 5 locations across Broxbourne with a further additional three charging points planned within 4 other council carparks;
- Developing a service level agreement between BBC and Yorkshire Energy Services for determining resident's eligibility for grants for insulation and heating; and
- Launching an annual anti-idling campaign with involvement from local schools.

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equality 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]. Broxbourne District Council is committed to reducing the exposure of people in Broxbourne to poor air quality in order to improve health.

We have developed actions that can be considered under seven broad topics:

- Alternatives to private vehicle use;
- Policy guidance and development control;
- Promoting low emission transport;
- Promoting travel alternatives;

[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

- Public information;
- Transport planning and infrastructure; and
- Traffic management.

Our priorities are public health and wellbeing, transport, planning and infrastructure and policy guidance and so we will facilitate and encourage behavioural changes by developing infrastructure, providing accurate air quality information and setting examples. We will also facilitate the use of low/zero emission vehicles by changing the composition of our fleet, review taxi licenses and increasing the electric vehicles charging points. We will ensure that new developments do not exasperate any areas of existing poor air quality and provide appropriate mitigation measures where this is unavoidable. All this while applying the current policies that are already in place within the Council and introducing new measures that share benefits with other policies and strategies as key mechanisms to reduce emissions from road transport.

In this AQAP we outline how we plan to effectively tackle air quality issues within our control. However, we recognise that there are a large number of air quality policy areas that are outside of our influence (such as vehicle emissions standards agreed in Europe, the influence of the M25 which borders the borough), but for which we may have useful evidence, and so we will continue to work with National Highways, regional and central government on policies and issues beyond Broxbourne Borough Council's direct influence.

Responsibilities and Commitment

This AQAP was prepared by Bureau Veritas on behalf of the Environmental Health Department of Broxbourne Borough Council with the support and agreement of the following officers and departments:

Rebecca Broadbelt Head of Environmental Health and Licensing

This AQAP has been approved by:

This AQAP has not been signed off by a Director of Public Health.

This AQAP will be subject to an annual review to consider the progress. Progress each year will be reported in the Annual Status Reports (ASRs) produced by Broxbourne Council, as part of our statutory Local Air Quality Management duties.

If you have any comments on this AQAP please send them to Environmental Health at:

Broxbourne Borough Council,

Bishops' College,

Churchgate,

Cheshunt

EN8 9XQ

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1 Introduction

This report outlines the actions that Broxbourne Borough Council will deliver between 2024-2028 in order to reduce concentrations of air pollutants and exposure to air pollution; thereby positively impacting on the health and quality of life of residents and visitors to the Borough of Broxbourne.

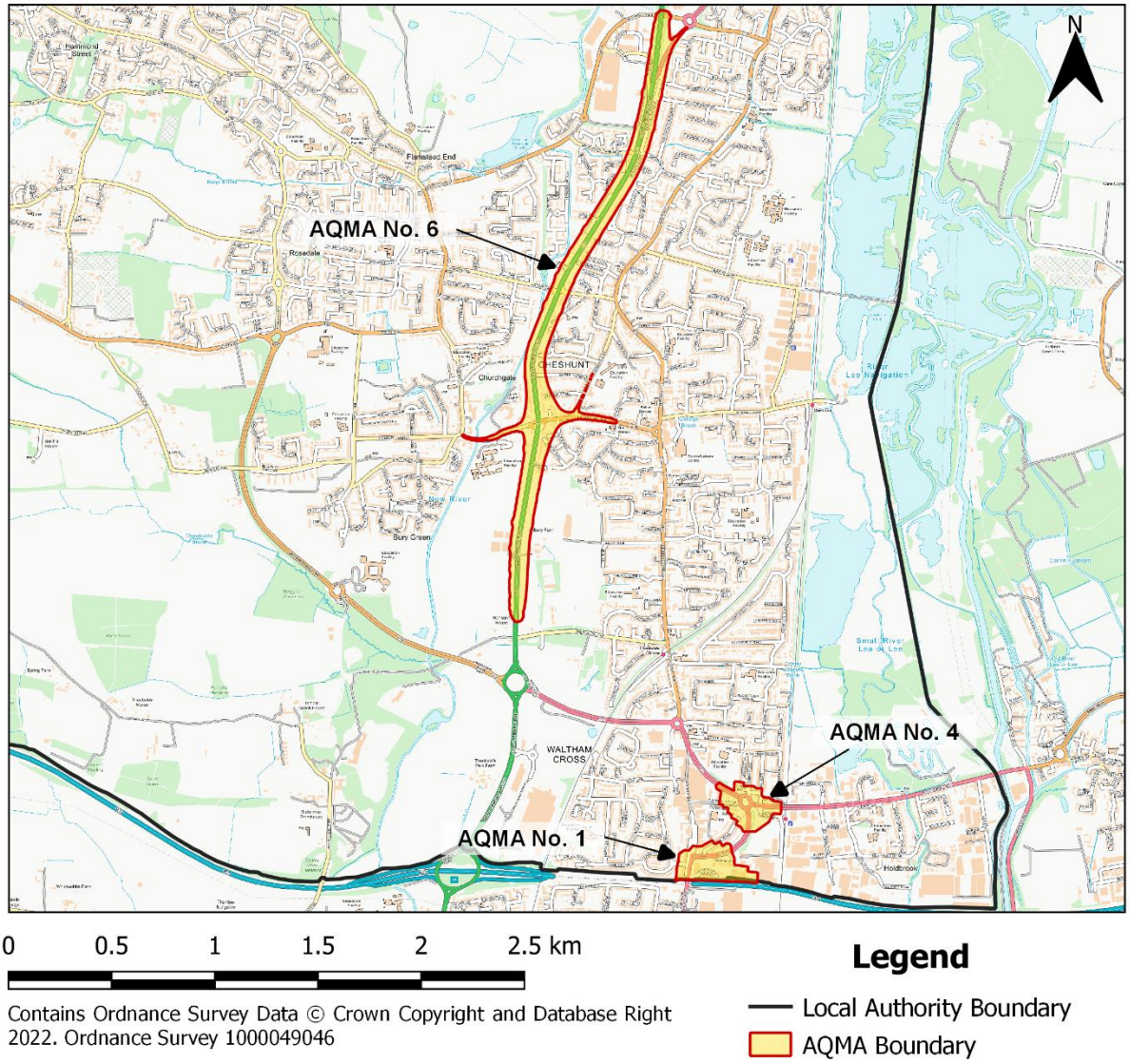
It has been developed in recognition of the legal requirement on the local authority to work towards Air Quality Strategy (AQS) objectives under Part IV of the Environment Act 1995 (as Amended 2021) and relevant regulations made under that part and to meet the requirements of the Local Air Quality Management (LAQM) statutory process.

This Plan will be reviewed every five years at the latest and progress on measures set out within this Plan will be reported on annually within Broxbourne Borough Council's air quality annual status report (ASR).

This action plan focuses on actions to improve air quality across the entire borough, with a specific focus on the three AQMAs currently declared by Broxbourne Borough Council. The AQMAs are presented in Figure 1.1, and are as follows:

- **AQMA No.1** – Arlington Crescent to Abbey Road, Waltham Cross. Declared for exceedances of the annual mean air quality objective for Nitrogen Dioxide (NO_2);
- **AQMA No.4** - Eleanor Cross Road / Monarchs Way Roundabout, Waltham Cross. Declared for exceedances of the annual mean air quality objective for NO_2;
- **AQMA No.6** – Great Cambridge Road (A10), Cheshunt, including the A10 near Theobalds Lane junction up to the Brookfield Centre (B156 Flyover and B156/A10 Slip Road). Declared for exceedances of the annual mean and 1-hour mean air quality objectives for NO_2.

Figure 1.1 – Broxbourne Borough Council Declared AQMAs



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2 Summary of Current Air Quality in Broxbourne Borough Council

2.1 Review of Air Quality Monitoring

The main air pollutant of concern within the Borough is Nitrogen Dioxide (NO_2), which largely originates from vehicular emissions. There are two major road links located within the borough which carry large numbers of vehicles through the local authority area on a daily basis, and therefore are considered to be the major source of NO_2 within the borough. The A10 runs north to south through the borough, and the M25 runs along the southern boundary from east to west. The A10 and M25 intersect at junction 25 of the M25 and is a main route in and out of Central London for both commuters and freight. Broxbourne is the Borough's principal town and is the central area for employment and transport.

Broxbourne Borough Council have little influence on the management of the stretch of M25 that borders the borough as this is owned by National Highways. Broxbourne Borough Council have worked with National Highways in the past to improve junctions and traffic flow in order to minimise local impacts within Broxbourne. National Highways have funded the M25 J25 capacity improvement scheme that finished in late 2022; this work is expected to reduce congestion and delays at this junction for both vehicles entering and exiting the M25. This will likely have impacts on the flow of traffic along the A10 and in turn tangible effects on the Borough.

Air quality monitoring is carried out within the Borough via a network of diffusion tubes which measure the concentrations of NO_2 in a variety of locations (kerbside, roadside, and background). During 2022, Broxbourne Borough Council undertook passive monitoring (non-automatic monitoring) for nitrogen dioxide (NO_2) at 44 sites across the district. No automatic monitoring was carried out. Due to the impact of the COVID-19 pandemic and the associated restrictions on traffic volumes, there is uncertainty with regard to whether 2020 and 2021 monitoring data will be considered an outlier when compared to the normal pollution trends. Further study into the long-term impacts are required to fully determine the influence of the Covid-19 pandemic

on air quality. Therefore, monitoring data for the past 5 years is presented so that the trends and the frequency of any exceedances can be considered.

Additionally, an assessment of air quality has been undertaken through the use of mathematical models to predict the levels of NO_2 within the AQMAs declared by Broxbourne Borough Council considering 2018 as a base year. Dispersion modelling provides a means by which predictions on the levels of NO_2 can be made and then verified against the monitored levels to provide an assessment of uncertainty in predictions. It should be noted that as the base year of the model is 2018, it does not consider the impacts the pandemic had on road traffic and the air quality within Broxbourne.

A detailed model was developed as part of the Local NO_2 Plan work which has taken place within Broxbourne. This was in response to the UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations (Detailed Plan)[4] and Ministerial Direction issued to the Council in 2018. The Local NO_2 Plan investigated options to bring forward compliance with the annual mean AQS limit value of 40µg/m^3 along the A10, which was identified in the Pollution Climate Model (PCM) as an area of continued exceedance, without worsening air quality elsewhere. This work was finalised in 2021 and concluded that no single or group of non-displacing measures, which would be eligible for HM Treasury funding, would bring forwards compliance by more than 12 months from the year of natural compliance. The model developed for the Local NO_2 plan has however been utilised to further assess the air quality within each AQMA, and the non-displacing measures proposed have been included for consideration within this AQAP.

[4] Department for Environment, Food and Rural Affairs, Department for Transport (2017), UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations (Detailed Plan)

2.2 Air Quality Management Areas

2.2.1 AQMA No.1 Arlington Crescent to Abbey Road, Waltham Cross

AQMA No.1 was originally declared in 2001 at a number of residential properties close to the M25 along Arlington Crescent, Parkside and the High Street in Waltham Cross for exceedances of both the NO_2 annual mean and PM_{10} 24-hour mean Air Quality Strategy (AQS) objectives. This was further amended in 2004 and 2016 to revoke the PM_{10} 24-hour AQS objective, and for the extension of the AQMA boundary to cover the area up to and including Abbey Road in Waltham Cross.

The AQMA is therefore currently declared for exceedances of the annual mean NO_2 AQS objective of 40µg/m^3, with the current boundary covering the area surrounding the Monarch Way A1010 and High Street Roundabout adjacent to the M25, including Arlington Crescent and sections of Abbey Road in Waltham Cross.

As of 2022, there are currently 3 diffusion tube monitoring sites located within the boundary of AQMA No.1. The annual mean NO_2 concentrations reported at all sites within this AQMA over the past 5 years is presented in Table 2-1. BB52 was deployed as a replacement to BB05 in 2021, at a location nearer to relevant exposure. All monitoring locations deployed over the past 5 years are shown in Figure 2.1.

Monitored exceedances of the annual mean NO_2 AQS objective (40µg/m^3) have been reported from 2018 to 2020 at BB05 and for 2018 and 2019 at BB11. As the sites are not at a location of relevant exposure (e.g. installed on the façade of a residential property) a fall off with distance correction was applied. Considering the concentration at relevant exposure, exceedances of the annual mean NO_2 AQS objective at a location of relevant exposure have been reported at BB05 in 2018 (45.1µg/m^3) and 2019 (43.5µg/m^3) and concentrations within 10% of the objective (36µg/m^3) have been recorded at BB11 in 2018 (37.3µg/m^3). Additionally, at site BB52, installed on the façade of a residential property, a concentration between 10% of the AQA objective was recorded in 2022.

According to the LAQM TG(22)[5], an AQMA is compliant when the annual mean NO_2 concentrations are lower than 36µg/m^3 (i.e. within 10% of the annual mean NO_2 objective, when NO_2 monitoring is completed using diffusion tubes) for three consecutive representative years. Compliance being reached in 2020 may not be representative of long-term trends in pollutant concentrations due to the change in activity observed across the UK as a result of COVID-19 and associated lock down measures. As in 2019 there has been exceedances, the years 2020 and 2021 cannot be considered representative. AQMA No.1 is not compliant as there has not been three consecutive representative years of compliance.

Table 2-1 – AQMA No.1 Annual Mean NO_2 Concentrations (µg/m^3)

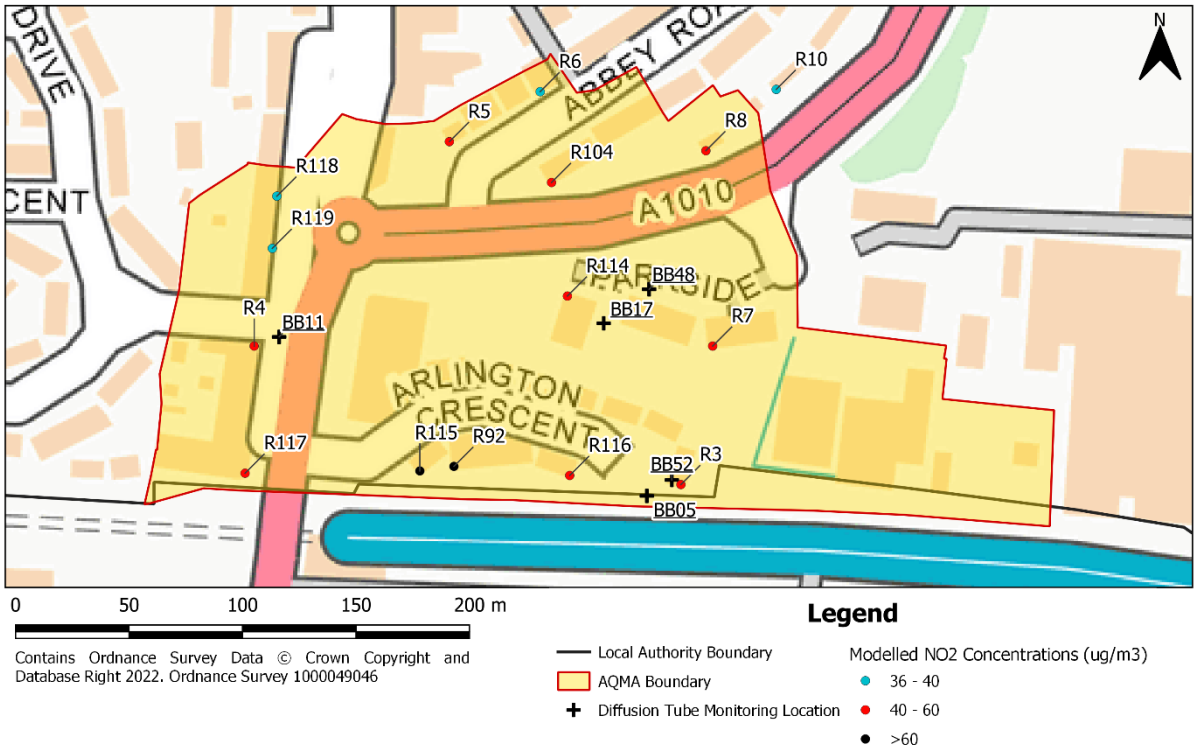
Site ID	X OS Grid Ref.	Y OS Grid Ref.	Site Type	Distance to Relevant Exposure (m)	2018	2019	2020	2021	2022
BB05	536213	200020	Roadside	15.5	**58.9**	**57.0**	**45.4**	**-**	**-**
BB52	536224	200027	Roadside	0	-	-	-	20.2	*36.2*
BB11	536051	200090	Roadside	6.5	**47.4**	**43.8**	34.5	34.2	30.6
BB17	536194	200096	Urban Background	7.0	33.6	-	-	-	-
BB48	536214	200111	Urban Background	7.0	31.8	31.9	22.4	22.2	16.7

Note:
In *italics*, annual mean NO_2 concentration is within 10% of the AQS objective of 40µg/m3 (i.e. 36.0 - 40.0µg/m^3)
In **bold**, exceedance of the annual mean NO_2 AQS objective of 40µg/m^3.

Concentrations presented are not distance corrected

[5] Local Air Quality Management Technical Guidance (22). Defra. August 2022.

Figure 2.1 – Map of AQMA No.1, Monitoring Locations and Modelled Receptors with an Annual Mean NO_2 Concentration >36µg/m^3



Within the detailed modelling assessment, receptors were positioned at numerous existing residential receptor locations both within the AQMA and in the near vicinity. Figure 2.1 displays the modelled receptors where predicted annual mean NO_2 concentrations in 2018 were greater than 36µg/m^3. Exceedances of the annual mean NO_2 AQS objective were predicted throughout the AQMA, with the maximum concentrations being reported near to the M25, near to the location of monitoring locations BB05 and BB52. No exceedances were predicted to be outside of the AQMA boundary. Caution should be taken when reviewing the modelled results as the predicted annual mean concentrations for 2018 were prior to the Covid-19 pandemic which saw an overall reduction in traffic. The monitored concentrations have consistently decreased from 2018 and so it is likely the current concentrations at the modelled receptor locations will also be reduced.

2.2.2 AQMA No.4 Eleanor Cross Road / Monarchs Way Roundabout, Waltham Cross

AQMA No.4 was declared in 2016 for exceedances of the annual mean NO_2 Air Quality Strategy (AQS) objective of 40µg/m^3. The current boundary covers the area

surrounding the Eleanor Cross Road / Monarchs Way Roundabout in Waltham Cross, slightly northeast of AQMA No.1.

The annual mean NO_2 concentrations reported at all sites within this AQMA over the past 5 years are presented in Table 2-2. As of 2022, there are 4 diffusion tube monitoring sites located within the boundary of AQMA No.4. BB51 was deployed as a replacement to BB21 in 2020 following road works and the removal of the original monitoring location. All monitoring locations deployed over the past 5 years are shown in Figure 2.2.

Monitored exceedances of the annual mean NO_2 AQS objective have been reported at BB21 in 2018 and 2019, at BB51 from 2020 to 2022 and at BB54 in 2022. Neither of these sites are located at relevant exposure. When NO_2 fall-off with distance correction calculations are carried out, concentrations are still within 10% of the AQS objective, reporting 37.5 µg/m^3 at BB21 in 2018 and 36.8µg/m^3 at BB54 in 2022.

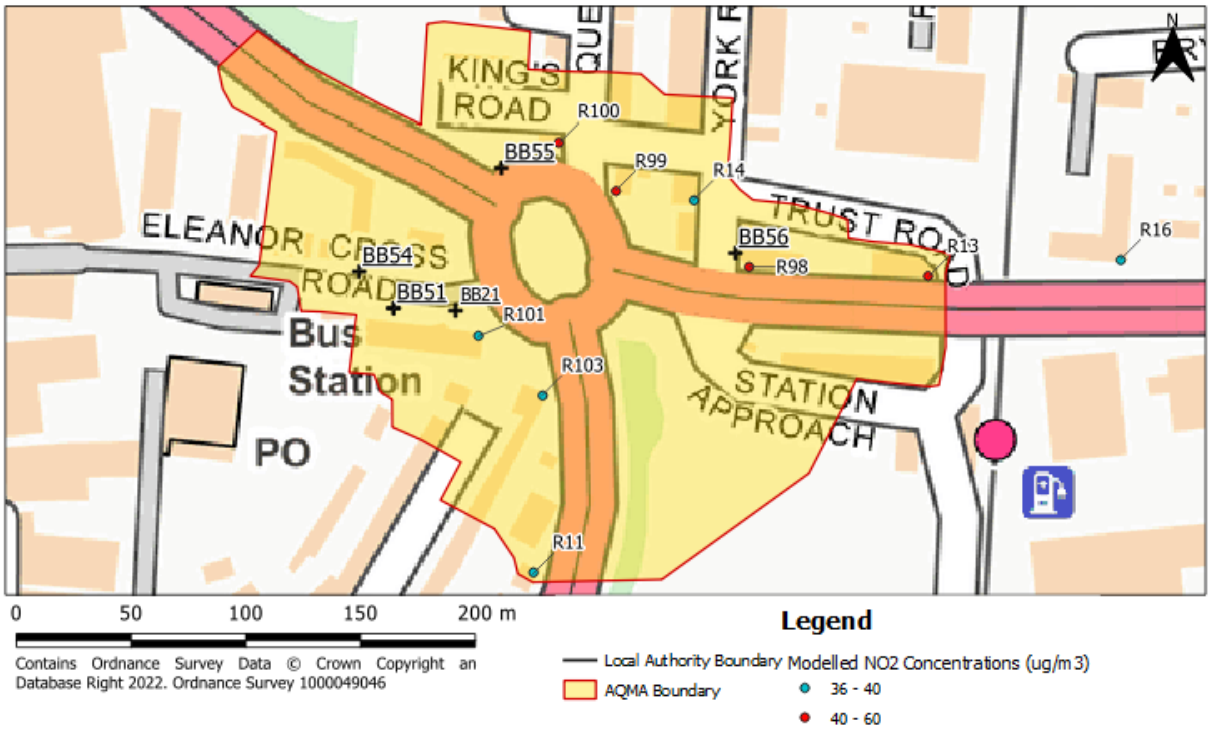
As a consequence, AQMA No.4 is still not compliant for the annual mean NO_2 AQS objective.

Table 2-2 – AQMA No.4 Annual Mean NO_2 Concentrations (µg/m^3)

Site ID	X OS Grid Ref.	Y OS Grid Ref.	Site Type	Distance to Relevant Exposure (m)	2018	2019	2020	2021	2022
BB21	536292	200374	Roadside	5	**44.0**	**44.1**	-	-	-
BB51	536265	200375	Kerbside	4.6	-	-	*39.4*	41.3	**41.4**
BB54	536250	200391		5	-	-	-	-	**43.5**
BB55	536312	200436		5	-	-	-	-	28.2
BB56	536414	200399		7	-	-	-	-	31.4

Note:
In *italics*, annual mean NO_2 concentration is within 10% of the AQS objective of 40µg/m3 (i.e. 36.0 - 40.0µg/m^3)
In **bold**, exceedance of the annual mean NO_2 AQS objective of 40µg/m^3.
Concentrations presented are not distance corrected

Figure 2.2 – Map of AQMA No.4, Monitoring Locations and Modelled Receptors with an Annual Mean NO_2 Concentration >36µg/m^3



Modelled receptors were positioned at existing residential receptor locations both within the AQMA and in the near vicinity. Figure 2.2 displays the modelled receptors where predicted annual mean NO_2 concentrations in 2018 were greater than 36µg/m^3. Exceedances of the annual mean NO_2 AQS objective were predicted within the AQMA along the northern edge of the roundabout and Eleanor Cross Road A121. No exceedances were predicted to be outside of the AQMA boundary. Caution should be taken when considering the modelled results as the predicted annual mean concentrations for 2018 are higher than the concentrations observed during the past three years within Broxbourne Borough Council. The monitored concentrations have consistently decreased from 2018 to present day. For example, at the new monitoring location BB55 a concentration of 28.1µg/m^3 was recorded in 2022, whereas the closest modelled receptor, R100 (44 µg/m^3), was predicted to have a concentration above the ASQ objective (40 µg/m^3) in 2018. Similarly, at the new monitoring site BB56 a concentration of 31.4 g/m^3 was recorded in 2022, in comparison to the closest modelled receptor, R98 (46.2 µg/m^3), which was predicted to have a concentration above the ASQ objective (40 µg/m^3) in 2018. The drop in

concentration is likely associated with the impacts of the Covid-19 pandemic and the reduction in traffic flows as a consequence.

2.2.3 AQMA No.6 Great Cambridge Road (A10)

AQMA No.6 was declared in 2017 for exceedances of both the annual mean NO_2 Air Quality Strategy (AQS) objective of 40µg/m^3 and the 1-hour mean NO_2 AQS objective, whereby there should not be more than 18 hourly periods in a year where concentrations are greater than 200µg/m^3. The current boundary is designated to incorporate the junction of Great Cambridge Road and College Road in Cheshunt, including the Great Cambridge Road (A10) near Theobalds Lane junction up to the Brookfield Centre (B156 flyover and B156/A10 slip road).

As of 2022, there are 8 diffusion tube monitoring sites located within the boundary of AQMA No.6. The annual mean NO_2 concentrations reported at all monitoring sites carried out within this AQMA over the past 5 years is presented in According to the LAQM TG(22)[5], exceedances of the NO_2 1-hour mean are unlikely to occur where the annual mean is below 60µg/m^3 at roadside and kerbside monitoring sites where road traffic is the primary source of emissions. During the past 5 years and considering the concentrations at relevant exposure, all the concentrations within the AQMA No.6 were below 60µg/m^3, with the highest recorded concentration being 45.0µg/m^3 at relevant exposure at BB28. This is in line with the modelling exercise carried out for the base year 2018 where all the NO_2 predicted concentrations at the receptors within and near the AQMA No.6 were below 60µg/m^3, with the highest predicted concentration being 49.75 µg/m^3 at receptor R34. As there has been five years of compliance of the 1-hour mean NO_2 AQS objective, revocation of the hourly objective to the AQMA should be made.

Table 2-3, with the relevant monitoring locations displayed in Figure 2.3.

Monitored exceedances of the annual mean NO_2 AQS objective have been reported over the past 5 years at BB28, and in 2018 and 2019 at BB09 and BB40. None of these sites are located at a site of relevant exposure. When NO_2 fall-off with distance correction calculations are carried out exceedances continue to be predicted at BB28 in 2018 (45.0µg/m^3) and 2019 (43.8 µg/m^3) and concentrations at BB40 were within 10% of the AQS objective in 2018 (38.4µg/m^3). When distance corrected,

concentrations at site BB28 fall below the 10% of the AQS objective from 2020 to 2022.

There has been compliance within AQMA No.6 for annual mean NO_2 for the past three years. Despite this, LAQM TG(22)[5] states that it is not advisable for the revocation of an AQMA to be based solely upon compliance in a year not representative of long-term trends. For example, compliance being reached in 2020 may not be representative of long-term trends in pollutant concentrations due to the change in activity observed across the UK as a result of COVID-19 and associated lock down measures. As compliance of AQMA No.6 was only achieved from 2020, more years of data are needed before considering AQMA revocation.

According to the LAQM TG(22)[5], exceedances of the NO_2 1-hour mean are unlikely to occur where the annual mean is below 60µg/m^3 at roadside and kerbside monitoring sites where road traffic is the primary source of emissions. During the past 5 years and considering the concentrations at relevant exposure, all the concentrations within the AQMA No.6 were below 60µg/m^3, with the highest recorded concentration being 45.0µg/m^3 at relevant exposure at BB28. This is in line with the modelling exercise carried out for the base year 2018 where all the NO_2 predicted concentrations at the receptors within and near the AQMA No.6 were below 60µg/m^3, with the highest predicted concentration being 49.75 µg/m^3 at receptor R34. As there has been five years of compliance of the 1-hour mean NO_2 AQS objective, revocation of the hourly objective to the AQMA should be made.

Table 2-3 – AQMA No.6 Annual Mean NO_2 Concentrations (µg/m^3)

Site ID	X OS Grid Ref.	Y OS Grid Ref.	Site Type	Distance to Relevant Exposure (m)	2018	2019	2020	2021	2022
BB09	535306	202351	Roadside	12.4	**47.4**	**43.8**	34.5	34.2	31.7
BB28	535459	202978	Roadside	11.5	**63.3**	**61.8**	**43.2**	**44.1**	**42.7**
BB34	535332	202039	Roadside	5.8	34.5	30.6	25.0	22.7	23.5
BB35	535571	202271	Roadside	10.0	33.4	31.9	23.5	23.6	22.3
BB39	535107	202160	Roadside	40.5	31.2	27.2	20.8	19.8	19.5
BB40	535314	202244	Roadside	6.5	**48.6**	**42.5**	33.7	35.1	32.4
BB41	535910	203822	Suburban	4.0	35.7	31.8	25.3	24.8	24.1

BB42	536265	200375	Kerbside	3.0	33.8	30.4	23.9	22.2	21.2

Note:
In *italics*, annual mean NO_2 concentration is within 10% of the AQS objective of 40µg/m^3 (i.e. 36.0 - 40.0µg/m^3)
In **bold**, exceedance of the annual mean NO_2 AQS objective of 40µg/m^3.
When **underlined**, NO_2 annual mean exceeds 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective
Concentrations presented are not distance corrected

Figure 2.3 – Map of AQMA No.6 and Monitoring Locations

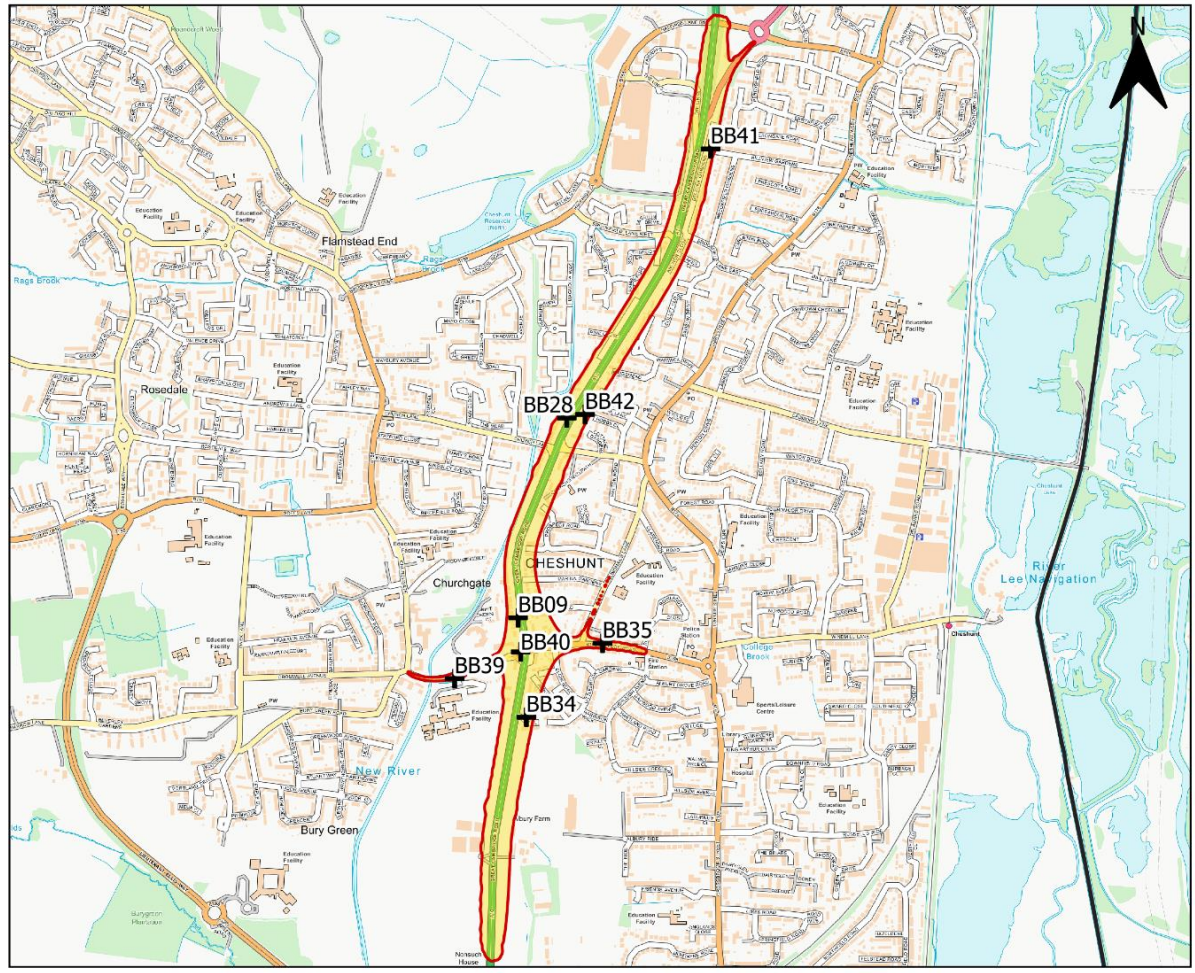
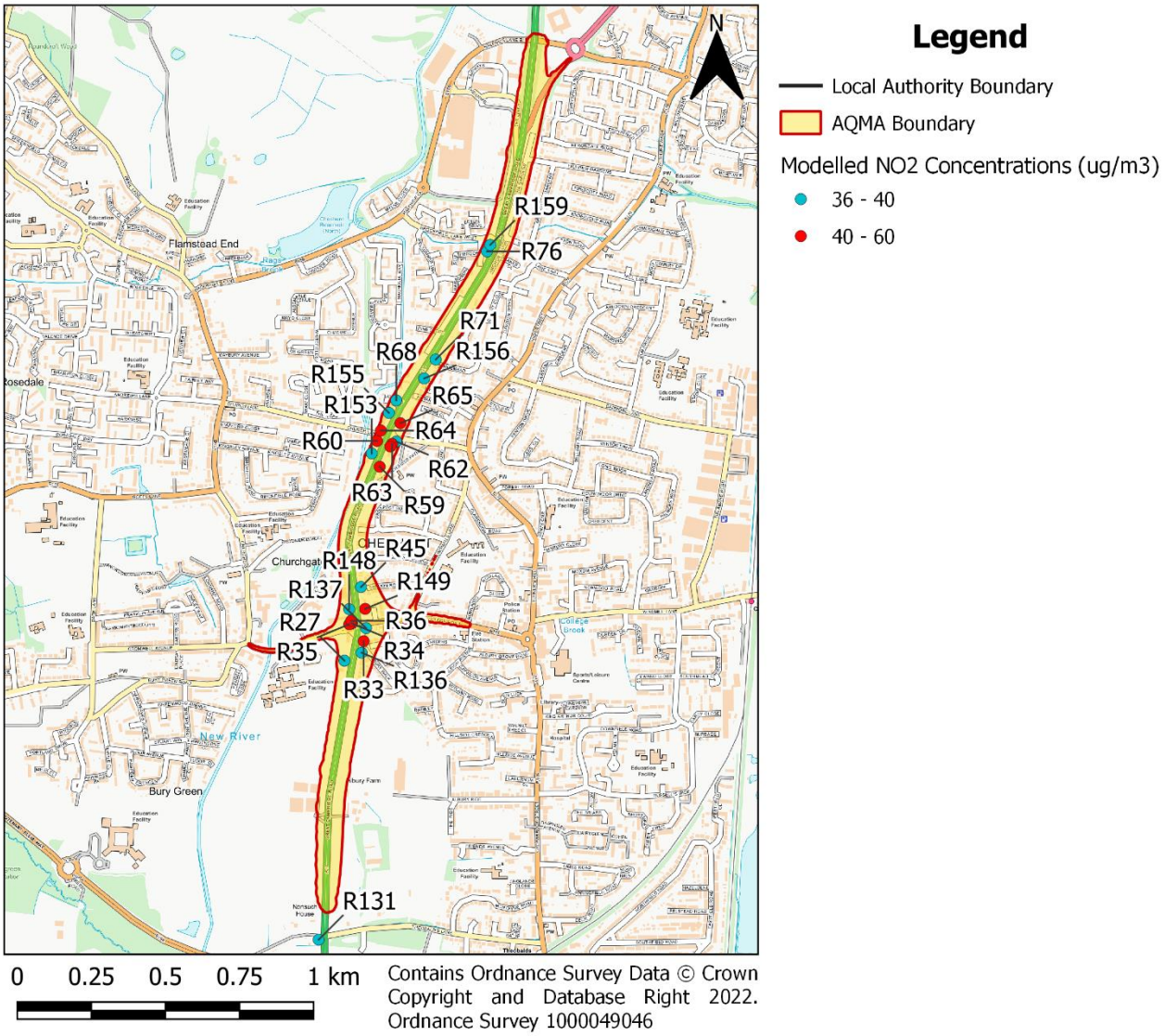


Figure 2.4 – Map of AQMA No.6 and Modelled Receptors with an Annual Mean NO_2 Concentration >36µg/m^3



Modelled receptors were positioned at existing residential receptor locations within the AQMA as well as outside the existing border. Figure 2.4 displays the modelled receptors where predicted annual mean NO_2 concentrations in 2018 were greater than 36µg/m^3. Exceedances of the annual mean NO_2 AQS objective were predicted within the AQMA around the junctions of College Road and Church Lane, where congestion is likely to occur. This is in line with what the monitoring network within this area has reported. No exceedances were predicted to be outside of the AQMA boundary. Caution should be taken when considering the modelled results as the predicted annual mean concentrations for 2018 are higher than the concentrations observed during the past three years within Broxbourne Borough Council. The

monitored concentrations have consistently decreased from 2018 to present day. For example, within AQMA No.6, receptor R34 has the highest predicted annual mean concentration (49.75µg/m^3). The closest monitoring site to R34 is BB40, which has a monitored concentration of 48.6µg/m^3 for 2018. This concentration has now decreased to 32.4µg/m^3 in 2022.

2.3 Public Exposure

The Borough of Broxbourne is situated to the north of Greater London, just outside the M25. There are approximately 99,000 residents currently residing within the Borough[6]. Based on the 2020 Lower Layer Super Output Area Population Estimates[7], there are 298 residents within AQMA No.1, 293 within AQMA No.4 and 1391 within AQMA No.6. Information from the Indices of Multiple Deprivation (IMD), which are based on deciles of multiple factors of deprivation, and the median age are also included in Table 2-4. The lower the score, the more deprived the area. The IMD varies from 1 to 10.

Table 2-4 Population Exposure within Broxbourne AQMAs

AQMA	Estimated Population	Average IMD	Median Age
AQMA No.1	298	4	35
AQMA No.4	293	4	35
AQMA No.6	1391	5	41

As indicated in the Table 2-4, AQMA No.6 has the greatest population of the three AQMAs within Broxbourne. The median age for Broxbourne is 41, which is similar to the median age for England which is reported as 42. AQMA No.1 and No.4 have a slightly younger population than the regional and national averages.

[6] Office for National Statistics: Census 2021 Estimates of the population for the UK, England, Wales, Scotland and Northern Ireland. Available at: <https://www.ons.gov.uk/>

[7] Office for National Statistics: Mid-2020 Population Estimates for Lower Layer Super Output Areas in England and Wales. Available at: <https://www.ons.gov.uk/>

3 Broxbourne Borough Council's Air Quality Priorities

This chapter presents the main drivers and the approach taken by Broxbourne Borough Council for the development and subsequent selection of measures that have been included within this AQAP. Included within this section of the AQAP are descriptions of the existing strategies and policies that relate to air quality within the Borough.

A source apportionment study has been completed across the Borough as part of the detailed assessment of the three AQMAs. The source apportionment study has allowed the most significant sources of oxides of Nitrogen (NO_x) vehicle contributors to be identified. NO_x are predominantly emitted into the atmosphere in the form of nitric oxide (NO) which is then converted to nitrogen dioxide (NO_2) through chemical processes in the atmosphere. Under most atmospheric conditions, the dominant pathway for NO_2 formation is via the reaction of NO with ozone (O_3).

In conjunction, with the strategies and policies that are currently in place, the conclusions of this apportionment exercise have been used to identify and prioritise the action measures presented within Section 5.

3.1 Public Health Context

There is increasing scientific evidence that poor ambient air quality has a significant negative impact on health. Research shows that the most common air pollutants of concern, NO_2, PM_{10} and $PM_{2.5}$ (particulate matter in the fractions of less than 10 microns and 2.5 microns in diameter), are linked to various health complications, primarily impacting the cardiovascular and respiratory systems, but also impacting other bodily organs. Short-term exposure to these pollutants can bring about symptoms such as nose and throat irritation, followed by bronchoconstriction and dyspnoea, alongside increasing reactivity to natural allergens, increasing the risk of

respiratory infections through the pollutants interaction with the immune system[8]. Long-term exposure may lead to reduced lung function, hampering development in children, alongside reducing life expectancy due to cardiovascular and respiratory diseases[9].

There is increasing interest and pressure from members of public for local authorities to actively tackle and reduce air pollution in their areas. Previously, there had been no deaths officially linked to air pollution, however in 2020 the first person in the UK had 'air pollution' listed as a cause of death. Although currently there are no legislative outcomes as a result of this, this further increases the pressure and duty of care that local authorities have in order to protect their residents.

Poor air quality is considered to be a significant contributory factor to the loss of life, shortening lives by an average of 5 months. In 2018, a report led by King's College London and published by the Department of Health's Committee on the Medical Effects of Air Pollutants (COMEAP) estimated that exposure to outdoor air pollution results between 28,000 to 36,000 deaths each year in the UK. The report also proposes that by reducing the amount of traffic pollutants in the air, approximately 1.6 million life years over the next 106 years would be saved in the UK, equivalent to an increase of life expectancy at birth of 8 days for each person[10]. A further study by the Royal College of Physicians reported in 2016 that outdoor air pollution in the UK contributed to the equivalent of 40,000 deaths in 2015[11]. Figures published by the European Environment Agency in 2021, using data provided by the UK Government, indicate that in 2019 there were approximately 33,100 premature deaths related to $PM_{2.5}$ exposure, and approximately 5,570 associated to NO_2 exposure[12]. This is

[8] Marilena Kampa and Elias Castanas, Human Health Effects of Air Pollution, June 2007

[9] Public Health England, Health Matters: Air Pollution, November 2018. Available online: <https://www.gov.uk/government/publications/health-matters-air-pollution/health-matters-air-pollution>

[10] Committee on the Medical Effects of Air Pollutants, Associations of Long-Term Average Concentrations of Nitrogen Dioxide with Mortality, August 2018. Available online: <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/734799/COMEAP_NO2_Report.pdf>

[11] Royal College of Physicians, Every Breath We Take: The Lifelong Impact of Air Pollution, February 2016. Available online: <https://www.rcplondon.ac.uk/projects/outputs/every-breath-we-take-lifelong-impact-air-pollution>

[12] European Environment Agency, Health Impacts of Air Pollution in Europe 2021, November 2021. Available online: <https://www.eea.europa.eu/publications/air-quality-in-europe-2021/health-impacts-of-air-pollution>

equivalent to 355,900 and 61,900 years of lost life respectively. Furthermore, it has been estimated that between 2017 and 2025, the total cost to the NHS and social care system as a result of air pollution will be £1.6 billion[13].

Local authorities have a range of powers which can effectively help to improve air quality. However, the involvement of public health officials is crucial in playing a role to assess the public health impacts and providing advice and guidance on taking appropriate action to reduce exposure and improve the health of everyone within Broxbourne Borough Council.

The Air Quality Indicator in the Public Health Outcomes Framework (England) provides further impetus to join up action between the various local authority departments which impact on the delivery of air quality improvements. The "Air Quality – A Briefing for Directors of Public Health" document published in March 2017 provides a one-stop guide to the latest evidence on air pollution, guiding local authorities to use existing tools to appraise the scale of the air pollution issue in its area[14]. It also advises local authorities how to appropriately prioritise air quality alongside other public health priorities to ensure it is on the local agenda.

The document comprises the following key guides:

- Getting to grips with air pollution – the latest evidence and techniques
- Understanding air pollution in your area
- Engaging local decision-makers about air pollution
- Communicating with the public during air pollution episodes
- Communicating with the public on the long-term impacts of air pollution
- Air Pollution: an emerging public health issue: Briefing for elected members

Besides NO_2, there is an increasing focus on fine particulate matter. $PM_{2.5}$ is a pollutant of concern meaning particulate matter which is 2.5 microns or less in

[13] UK Government, Office for Health Improvement & Disparities, Air Pollution: Applying All Our Health, February 2022. Available online: <https://www.gov.uk/government/publications/air-pollution-applying-all-our-health/air-pollution-applying-all-our-health>

[14] Local Government Association, Air Quality: A Briefing for Directors of Public Health, March 2017. Available online: <https://www.local.gov.uk/publications/air-quality-briefing-directors-public-health>

diameter. The Public Health Outcomes Framework data tool compiled by Public Health England quantifies the mortality burden of $PM_{2.5}$ within England on a county and local authority scale. The 2021 fraction of mortality attributable to $PM_{2.5}$ pollution in Broxbourne is 6.0%, which is above both the national and regional (East of England) averages of 5.5% and 5.5%. It should be noted that this figure only accounts for one pollutant ($PM_{2.5}$) for which stronger scientific evidence on links with mortality exist, and not NO_2, for which the AQMA is declared, so the true figure is possibly even higher.

With regards to health impacts as a result of air pollution within Broxbourne, this is predominantly associated to concentrations of NO_2 exceeding the annual mean AQS objectives, as well as the hourly-mean objective along the A10 Great Cambridge Road. It is expected that some of the measures implemented within this action plan for the achievement of reductions in NO_2 will have co-benefits in additionally reducing concentrations of PM_{10} and $PM_{2.5}$.

3.2 Planning and Policy Context

This Air Quality Action Plan outlines Broxbourne Borough Council's plan to effectively tackle air quality issues within its control. There are numerous existing and impending policies and strategies adopted at all levels (local, regional and national) that can exert significant effects, both positive and negative, on air quality across Broxbourne. It is important to identify and consider these plans and strategies at an early stage of the development of the plan, as these will aid the establishment of the context in which specific options for improving air quality can be implemented.

Whilst certain policies and / or strategies may be outside of the influence of Broxbourne Borough Council, there are a number of related policies and strategies at local and regional levels that can be tied directly with the aims of this AQAP. Some of these have a focus on air quality improvements within the Borough, whilst others relate to transportation issues and therefore have the added benefit of contributing to overall improvements in air quality across Broxbourne.

The review of these strategies and policies also assists in preventing duplication of work within the AQAP but can instead work in concordance for mutual benefit whilst also focusing on direct measures outside those considered within the already

developed strategies and policies. This section outlines the strategies and policies that have the most significant potential to impact on pollutant concentrations within the Borough of Broxbourne.

The most relevant policies and strategic documents are detailed below.

3.2.1 Clean Air Strategy 2019

The Clean Air Strategy[15] has been published to set out the case for action at a national level, identifying a number of sources of air pollution within the UK including road transportation (relevant in terms of the AQMAs currently declared by Broxbourne Borough Council) and sets out the actions required to reduce the impact upon air quality from these sources. It has been developed in conjunction with three other UK Government Strategies; the Industrial Strategy, the Clean Growth Strategy, and the 25 Year Environment Plan.

Key actions that are detailed within the strategy aimed at reducing emissions from transportation sources include the following:

- The publication of the Road to Zero strategy, which sets out plans to end the sale of new conventional petrol and diesel cars and vans by 2040;
- New legislation to compel vehicle manufacturers to recall vehicles and non-road mobile machinery for any failures in emission control systems, and to take effective action against tampering with vehicle emissions control systems;
- Develop new standards for tyres and brakes to reduce toxic non-exhaust particulate emissions from vehicles. This action would not necessarily target reductions in NO_2 for which the AQMAs within Broxbourne has been declared;
- The encouragement of the cleanest modes of transport for freight and passengers; and
- Permitting approaches for the reduction of emissions from non-road mobile machinery, especially in urban areas.

[15] Department for Environment, Food and Rural Affairs (2019), Clean Air Strategy

3.2.2 UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations

Published in July 2017, the UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations (Detailed Plan)[4] is the UK governments plan for bringing concentrations of NO_2 within statutory limits within the shortest possible time. It is identified that the most immediate air quality challenge within the UK is tackling the issue of NO_2 concentrations close to roads, especially within towns and cities. The plan identifies a number of local authorities that were required to complete feasibility studies to define NO_2 concentrations on road links identified by the national Pollutant Climate Mapping (PCM) model as being in exceedance of the NO_2 annual mean objective as set out within the Ambient Air Quality Directive 2008/50/EC.

The UK Plan provides a high level of detail on possible solutions, and their implementation, to reduce NO_x emissions from vehicles, and therefore lower NO_2 concentrations. The actions detailed within the UK Plan include the following:

- Implementation of Clean Air Zones (CAZs);
- New real world driving emissions requirements for light passenger and commercial vehicles;
- Additional funding to accelerate the uptake of low emissions buses and also for the retrofitting of older buses;
- Additional funding to accelerate the uptake of hydrogen vehicles and associated infrastructure;
- New mandatory emissions standards for non-road mobile machinery; and
- Local cycling and walking investment plans.

The Mayor of London launched an Ultra Low Emission Zone (ULEZ) in Greater London in April 2019. The ULEZ was first implemented in April 2019 in central London, later expanded to inner London in October 2021, and in August 2023 it was extended to cover every borough of London. Improvements in NO_2 concentrations are predicted outside the Greater London Authority boundary as a result of the ULEZ expansion to outer London, with the biggest reductions occurring close to roads due

to the scheme focus on reducing road traffic emissions[16]. As the ULEZ extends out to the M25, bordering with Broxbourne except for a small area near Bullsmore, it is expected to deliver a 2% reduction in NO_2 along key corridors within Broxbourne which will likely have an impact on the current AQMAs.

Whilst Broxbourne Borough Council was not one of the initial authorities identified, following Ministerial Direction in 2018 and a Targeted Feasibility Study, the Council were later instructed to develop a Local NO_2 Plan to bring forwards compliance within the shortest possible time. Extensive and detailed modelling was carried out as part of this; however it was determined that there was no singular or package of measures that would be supported under the UK plan which could bring forwards compliance, without leading to a worsening of air quality elsewhere within the region.

3.2.3 Broxbourne Borough Council Local Plan

The Broxbourne Borough Council Local Plan[17] was adopted in June 2020 and provides a framework for the future development of the Borough in a sustainable manner. The plan contains eight objectives, three of which are “Environment”, “Transport” and “Health and wellbeing”. There is a focus to protect and enhance the natural, historic and built environment, whilst encouraging as many journeys as possible by sustainable, safe and viable alternatives to driving. This in turn is strongly linked to improving the overall health of the residents, by encouraging active and healthy lifestyle choices.

In direct relation to air quality, the local plan states that

“28.6 Clean air is critical to our health. Road transport is the major source of air pollution, giving rise to nitrogen dioxide, ozone and small particulate matter which can cause respiratory illnesses and other adverse health effects. The nature of the Borough, with its historic pattern of ribbon development along major roads, and in

[16] Transport for London, 2022. Our proposals to help improve air quality, tackle the climate emergency, and reduce congestion by expanding the ULEZ London-wide and other measures. Available online at: https://haveyoursay.tfl.gov.uk/cleanair/widgets/44946/documents

[17] Broxbourne Borough Council, Local Plan 2018-2033, published June 2020. Available online at: <https://www.broxbourne.gov.uk/planning/local-plan-2018-2033/1>

close proximity to London, makes it particularly vulnerable to the adverse effects of road transport on air quality.

28.7 Every local authority has a statutory duty to work towards air quality targets set by Government. Where development is proposed in areas of poor or marginal air quality, the contribution that the development makes to air pollution requires careful consideration so as to avoid exacerbation of existing problems.

28.8 New development should consider design solutions to reduce poor air quality and mitigate the effect of transport related pollutants. The role of vegetation in the management of air quality is complex and needs to be carefully considered."

In addition, *Policy EQ2: Air Quality*, states that:

"I. Applicants should consider the impact of their proposals on air quality. Where it is likely that a decline in air quality will occur, applicants should provide details of how the adverse effects will be mitigated in order to comply with national air quality objectives. Where adequate mitigation cannot be provided, development will not normally be permitted.

II. Developments proposing housing, schools, and other uses vulnerable to the effects of poor air quality within AQMAs will be required to provide an air quality assessment which will detail options for the mitigation of poor air quality on users, particularly through development design. Where air quality exposure is not reduced to acceptable levels, development will not normally be permitted."

3.2.4 Broxbourne Borough Council Transport Strategy

The Broxbourne Transport Strategy[18] was adopted in September 2017 and has been developed to support the Local Plan. This establishes a strategic framework for investment in transport to support growth and achieve wider social, environmental and economic objectives. The strategy provides a sound and robust evidence base and details strategic and site specific interventions to accommodate growth. It identifies that there are pinch points on the transport network, which can lead to

[18] Broxbourne Borough Council, Broxbourne Transport Strategy, Published September 2017. Available online at: <https://www.broxbourne.gov.uk/downloads/file/1033/t2-broxbourne-transport-strategy-2017>

delays and congestion, and are associated with a worsening of air quality and subsequent impacts on health and well-being of local residents.

A number of schemes and interventions are proposed to be taken forwards within this Strategy which had a direct link to improving air quality. These include:

- Public Transport Schemes
    - Improving accessibility of stations on the main rail network into London to reduce reliance on cars; and
    - Creating a more attractive and accessible bus network to link large developments to provide a realistic alternative to car journeys.
- Walking and Cycling Schemes
    - Developing a comprehensive network of safe cycle routes to cater for both commuter and leisure orientated journeys; and
    - Improving pedestrian routes to increase accessibility to town centres, focusing on improving crossing points, wider foodways, and street furniture.
- Smarter Choices
    - Development of a series of workplace, school and station travel plans to raise awareness of travel choices and encourage alternatives to cars; and
    - Providing high quality, bespoke and accessible information on sustainable travel through personalised journey planning, real time information displays, and the use of smartphone based technology to enable individuals to make more informed travel choices.
- Highway Schemes
    - Enhancing junction capacity at key junctions to improve the flow of both north-south and east-west traffic movements; and
    - Replacing mini-roundabouts with signal controlled junctions to provide better management of conflicting traffic flows.

3.2.5 Local Cycling and Walking Infrastructure Plan

Broxbourne Borough Council's Local Cycling and Walking Infrastructure Plan (LCWIP)[19] was introduced in 2017, sitting alongside the Transport Strategy to support the Local Plan. The strategy combines an approach to providing new infrastructure and physical improvements with encouraging behavioural change to maximising the up-take of opportunities for active travel throughout the borough. The LCWIP sets out a number of objectives:

- Improve walkability at town centres and other focal points;
- Provide a network of priority cycle corridors to make cycling a safe and convenient alternative to the car for local trips to key destinations;
- Remove physical and behavioural obstacles to walking and cycling;
- Increase walking and cycling to stations, schools, and workplaces;
- Locate and plan new development to maximise walking and cycling;
- Improve awareness of the leisure opportunities afforded by walking and cycling across the borough.

Key measures proposed within the LCWIP with a direct link to air quality are as follows:

- Improvements to Hoddesdon, Waltham Cross and Cheshunt Old Pond town centres to make them more attractive and accessible to pedestrians and cyclists;
- Cycle corridors: Church Lane/Andrews Lane; Rags Brook; Cheshunt Reservoir; A1170/B176; the New River; Lee Valley Park, southern gateways;
- Creation of safer routes to school and safety zones around schools;
- Improved public realm and signposting and 'cycle hubs' at stations;

[19] Broxbourne Borough Council, Local Cycling and Walking Infrastructure Plan, published September 2017. Available online at: <https://www.broxbourne.gov.uk/downloads/file/1032/t5-draft-local-cycling-and-walking-infrastructure-plan-2017#:~:text=These%20schemes%20should%20be%20operating,A1010%20south%20of%20Waltham%20Cross>

- Area-Wide Travel plans at employment areas;
- Subway replacement at key locations;
- A borough-wide crossing points programme;
- Adjustable barriers to facilitate cycling on key routes;
- Improved signage and wayfinding;
- Improved street lighting;
- Promotion of new and existing walking and cycling opportunities;
- Preparation of a Public Realm Strategy for the borough; and
- Preparation of an Area Action Plan for Waltham Cross to maximise opportunities for walking and cycling as part of a sustainable transport strategy for the area.

3.2.6 Sustainability Strategy and Action Plan 2021 – 2025

The Broxbourne Borough Council Sustainability Strategy and Action Plan[20] sets out the Council's aims to achieve sustainability within the borough between 2021 and 2025. Whilst in part focusing on reducing carbon emissions, measures introduced to achieve this often have shared wins with improving air pollution. A number of measures directly related air quality and related to each of the three priorities set out within the plan are detailed below:

- A sustainable Council
    - Increase proportion of gas and electricity supply that are from sustainable sources;
    - Create Green Wall on the Monarchs Way external wall of the Pavilions Shopping Centre;

[20] Broxbourne Borough Council, Sustainability Strategy and Action Plan, published March 2021. Available online at: <https://www.broxbourne.gov.uk/downloads/file/1478/environmental-sustainability-strategy-2021-2025>

  - Develop and implement a staff travel plan to reduce car journeys by staff;
  - Increase proportion of Council fleet journeys, including pool cars, made in electric or hydrogen powered vehicles; and
  - Maximise fuel efficiency and minimise emissions from Council vehicles running on fossil fuels.

- A greener Broxbourne
  - Implement an Air Quality Management Plan for the Boroughs AQMAs;
  - Implement road junction improvements on the A10 as described in the Infrastructure Delivery Plan in the Local Plan;
  - Continue to monitor air pollution regularly and take appropriate action on the results in accordance with guidance from DEFRA; and
  - Ensure that up-to-date warnings about poor air quality are available to residents.

- Supporting action by business and residents
  - Implement the Broxbourne LWCIP;
  - Help create a network of rapid charging points for electric vehicles;
  - Promote walking and cycling to school;
  - Lobby to improve public transport in the borough and promote the use of low emission buses;
  - Participate in Clean Air Day, to promote awareness of air pollution and encourage residents to join the Council in taking action to reduce it;
  - Promote information on the Council's website to assist residents adopt a more sustainable lifestyle;
  - Organise an annual event on sustainability for local business;
  - Provide links to guidance for business on sustainability on the Council website; and
  - Encourage larger business in the borough to develop plans to reduce petrol and diesel vehicle use.

3.2.7 Hertfordshire County Council Air Quality Strategy and Implementation Plan

Hertfordshire County Council (HCC) developed an Air Quality Strategy in 2019[21]. This sets the County Council's position on air quality at a strategic level. The aim and objectives as declared in the strategy are:

OBJETIVES:

- To achieve clarity on the role of County Council in improving the quality of air within Hertfordshire and the surrounding areas
    - As air quality is an agenda that spreads across the functions of the County Council, we want to be able to offer our staff, our partners and the residents of Hertfordshire a clear understanding of how we, as a County Council, can use our Highways officers, Public Health Service and planners, amongst others, to improve Hertfordshire's air quality.
- To achieve a clear and consistent relationship with our partners in tackling this important agenda
    - The legal obligations and responsibilities around air quality primarily sit with lower tier authorities, however we will work to be a reliable and resourceful partner to our colleagues at the District and Borough councils when working towards cleaner air for Hertfordshire.
- To achieve an improvement in Hertfordshire's air quality through the work that we do. We want Hertfordshire to continue to be a county that our residents and visitors enjoy. We want everybody to feel safe in the knowledge that the air that they are breathing is clean.

AIMS:

- To gain a stronger understanding of the air quality issues within Hertfordshire.
- To ensure that air quality is an integral part of everything that we do

[21] Hertfordshire County Council, Air Quality Strategy, 2019. Available online: <https://www.hertfordshire.gov.uk/media-library/documents/about-the-council/data-and-information/public-health/air-quality-strategy.pdf>

- To develop a productive relationship with partners, in particular the District and Borough Councils, to achieve positive air quality outcomes.
- To create clear leadership on air quality
- To establish a coherent workstream on air quality, including clarification on roles and responsibilities

Fifteen “Quick Win” actions are included which demonstrate how the County Council will achieve their objectives. The associated Implementation Plan[22] sets out in greater detail how these will be reasonably achieved, including their requirements, costs, and expected timescales.

3.2.8 Hertfordshire County Council Local Transport Plan

Hertfordshire County Council’s Local Transport Plan (2018 – 2031)[23] sets out the strategic plan for delivering a positive future vision for Hertfordshire, whilst providing safe and efficient travel, meeting housing needs, improving public health and reducing environmental damage. A number of transport improvements proposed by Hertfordshire County Council are included, some of which are focused on the A10 which runs through Broxbourne, as well as identifying significant regional transport schemes which will impact the County as a whole. This also identifies key challenges that the County faces with regard to improving transport, and the future drivers of change which will interact to change the demands and capabilities of the transport network.

A number of policies and actions are detailed, some of which have a direct link to improving air quality, and the County Council will actively work with the district and borough councils to implement strategies relating to these.

[22] Hertfordshire County Council, Air Quality Strategy 2019, Implementation Plan, 2019. Available online: <https://www.hertfordshire.gov.uk/media-library/documents/about-the-council/data-and-information/public-health/air-quality-implementation-plan.pdf>

[23] Hertfordshire County Council, Local Transport Plan (2018 – 2031), 2017. Available online: <https://www.hertfordshire.gov.uk/services/recycling-waste-and-environment/planning-in-hertfordshire/transport-planning/local-transport-plan.aspx>

3.2.9 Hertfordshire County Council Active Travel Strategy

Hertfordshire County Council's current Active Travel Strategy was published in 2013[24], supplements the Local Transport Plan. This sets out how the County Council and its partners, including Broxbourne Borough Council, will identify, deliver and promote interventions to increase the number of people who use active modes of transport. Chapter 5 of this strategy specifically details how this will be delivered, including the implementation of measures and potential funding streams.

3.2.10 Hertfordshire County Council Sustainable Modes of Travel Strategy

Hertfordshire County Council's Sustainable Modes of Travel Strategy 2021[25] supplements the Local Travel Plan. This sets out the County Council's strategic vision to increase opportunities for children and young people specifically to travel to and from schools and colleges by sustainable means. This in part aims to improve child health through active travel and therefore reduce congestion and pollution around schools, and to improve the quality of the local environment around school sites. It provides a breakdown of existing school travel patterns and outlines the actions and processes that will be adopted to improve the viability of sustainable travel.

3.2.11 Healthy Streets design approach

The Healthy Streets Approach is a human-centred framework for embedding public health in transport, public realm and planning. The approach is based on 10 evidence-based Healthy Streets Indicators, each describing an aspect of the human experience of being on streets. These ten must be prioritised and balanced to improve social, economic and environmental sustainability through how streets are designed and managed. One of the ten indicators is clean air. BBC and HCC

[24] Hertfordshire County Council, Actie Travel Strategy, April 2013. Available online: <https://www.hertfordshire.gov.uk/media-library/documents/about-the-council/data-and-information/active-travel-strategy.pdf>

[25] Hertfordshire County Council, Sustainable Modes of Travel Strategy, August 2021. Available online: <https://www.hertfordshire.gov.uk/media-library/documents/environment-and-planning/planning/planning-in-hertfordshire/ltp-sustainable-travel-strategy-for-schools-2021.pdf>

promote a healthy streets approach. Through this, cleaner air will be promoted in its widest sense.

It is suggested that promoting a healthy streets approach through new infrastructure will be a requirement, with consideration of a standard minimum street score, and for the development to contribute to the existing environment and meet the needs for future site users by uplifting existing surrounding and connected streets where this is necessary.

3.3 Source Apportionment

The AQAP measures presented in this report are intended to be targeted towards the predominant sources of emissions within Broxbourne Borough Council's area.

A source apportionment exercise was carried out using ADMS-Roads air dispersion modelling to assess the overall emission profiles of the vehicles present within each AQMA. It should be noted that emission sources of NO_2 are dominated by a combination of direct NO_2 (f-NO_2) and oxides of nitrogen (NO_x), the latter of which is chemically unstable and rapidly oxidised upon release to form NO_2. Reducing levels of NO_x emissions therefore reduces levels of NO_2. As a consequence, the source apportionment study has considered the emissions of NO_x which are assumed to be representative of the main sources of NO_2.

The following sections describe the source apportionment results in each of the AQMAs. A breakdown of NO_x is given according to vehicle class within the AQMAs and based on the following criteria:

- Contributions based on average NO_x levels across all monitored locations;
- Contributions based on NO_x levels across all modelled locations where NO_2 concentrations exceed 40µg/m^3 (where applicable); and
- Contributions based on NO_x levels at the highest NO_2 concentration receptor in the AQMA.

3.3.1 AQMA No.1 Arlington Crescent to Abbey Road, Waltham Cross

Table 3-1 provides a breakdown in NO_x emissions according to vehicle class within AQMA No.1, and Figure 3.1 displays the average NO_x emissions across all modelled receptors within AQMA No.1 where the modelled annual mean NO_2 concentrations was greater than 40µg/m^3.

At modelled locations where the annual mean NO_2 concentration exceeds 40µg/m^3, the average NO_x emissions are predominantly associated with heavy goods vehicles (HGVs) which contribute 46.5% of the total road NO_x concentration. This is followed by diesel cars at 19.2%, and diesel light goods vehicles (LGVs) at 11.6%, with petrol cars contributing 3.8%. This is consistent with both the average across all modelled receptors and the worst-case receptor, located along Arlington Crescent adjacent to the M25.

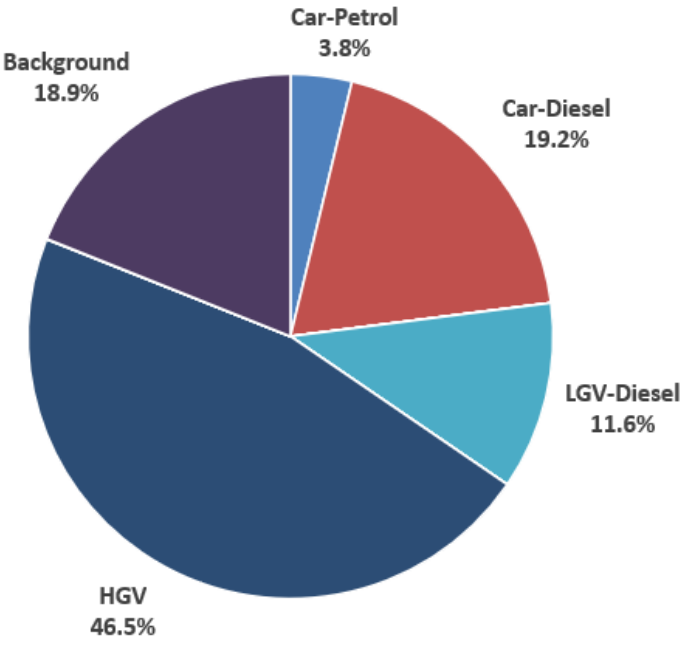
Whilst this indicates that HGVs have the most significant influence on emissions within this AQMA, it has been highlighted by National Highways that there are limited measures which could be easily implemented to improve emissions further. This is because new HGVs have been required to meet the Euro VI European Emissions Standards since 2013[26], therefore there is currently little additional regulation available to enforce further reduction in tailpipe emissions from HGVs. Furthermore, rerouting options for HGVs are not feasible due to the lack of nearby alternative routes. Measures focused on HGVs won't be disregarded, but measures focusing on reducing emissions from diesel cars and LGVs will also be considered as these are also shown to have a significant influence on NO_x emissions within this AQMA.

[26] European Union, Commission Regulation (EU) No 582/2011, May 2011. Available online: <https://eur-lex.europa.eu/eli/reg/2011/582/oj>

Table 3-1 – NO_x Source Apportionment Results: AQMA No.1

Results	All Vehicles	Petrol Car	Diesel Car	EV/LPG Car	Petrol LGV	Diesel LGV	EV/LPG LGV	HGV	Bus/ Coaches	Background
Average across all modelled receptors										
NO_x Concentration ($\mu g/m^3$)	76.7	3.6	18.3	0.0	0.0	11.0	0.0	43.8	0.0	19.1
Percentage of Total NO_x	80.1	3.8	19.1	0.0	0.0	11.5	0.0	45.7	0.0	19.9
Percentage Contribution to Road NO_x	100.0	4.7	23.8	0.0	0.0	14.4	0.0	57.0	0.0	-
Average Across All Receptors with NO_2 Concentration exceeding the AQS Annual Mean Objective										
NO_x Concentration ($\mu g/m^3$)	81.8	3.8	19.4	0.0	0.0	11.7	0.0	46.9	0.0	19.1
Percentage of Total NO_x	81.1	3.8	19.2	0.0	0.0	11.6	0.0	46.5	0.0	18.9
Percentage Contribution to Road NO_x	100.0	4.6	23.7	0.0	0.0	14.3	0.0	57.3	0.0	-
At the Receptor with the Maximum Road NO_x Concentration (ID R115)										
NO_x Concentration ($\mu g/m^3$)	131.9	5.4	28.5	0.0	0.0	16.2	0.0	81.8	0.0	19.1
Percentage of Total NO_x	87.3	3.6	18.9	0.0	0.0	10.7	0.0	54.1	0.0	12.7
Percentage Contribution to Road NO_x	100.0	4.1	21.6	0.0	0.0	12.3	0.0	62.0	0.0	-

Figure 3.1 – Average NO_x Contribution by Vehicle Class, where Modelled Annual NO_2 Concentrations are greater than 40µg/m3 within AQMA No.1



3.3.2 AQMA No.4 Eleanor Cross Road / Monarchs Way Roundabout, Waltham Cross

Table 3-2 provides a breakdown in NO_x emissions according to vehicle class within AQMA No.4 and Figure 3.2 displays the average NO_x emissions across all modelled receptors within AQMA No.4 where the modelled annual mean NO_2 concentrations was greater than 40µg/m^3.

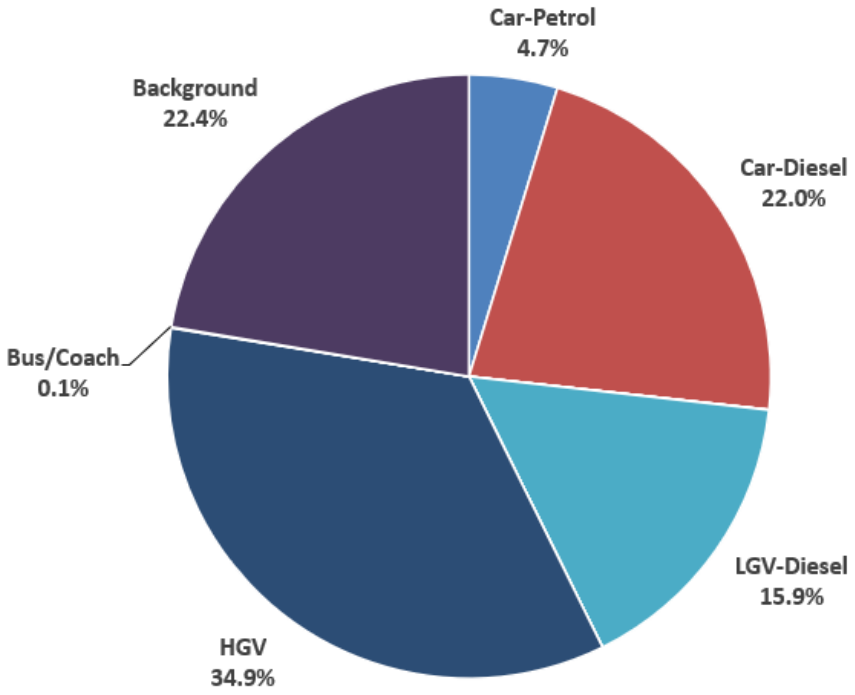
At locations where the annual average NO_2 AQS objective has been predicted to be in exceedance, the majority of road emissions are associated with HGVs (34.9%). This is followed by diesel cars and diesel LGVs (22.0% and 15.9% respectively).

This indicates that measures to reduce emissions in this AQMA should largely be focused on reducing emissions from diesel cars and LGVs, with some focus where possible on HGVs as per recommendation from National Highways.

Table 3-2 – NO_x Source Apportionment Results: AQMA No.4

Results	All Vehicles	Petrol Car	Diesel Car	EV/LPG Car	Petrol LGV	Diesel LGV	EV/LPG LGV	HGV	Bus/ Coaches	Background
Average across all modelled receptors										
NO_x Concentration (µg/m^3)	51.6	3.2	14.9	0.0	0.0	10.3	0.0	23.1	0.0	19.1
Percentage of Total NO_x	73.0	4.5	21.1	0.0	0.0	14.6	0.0	32.7	0.1	27.0
Percentage Contribution to Road NO_x	100.0	6.2	28.9	0.0	0.0	20.0	0.0	44.9	0.1	-
Average Across All Receptors with NO_2 Concentration exceeding the AQS Annual Mean Objective										
NO_x Concentration (µg/m^3)	66.3	4.0	18.8	0.0	0.0	13.6	0.0	29.8	0.0	19.1
Percentage of Total NO_x	77.6	4.7	22.0	0.0	0.0	15.9	0.0	34.9	0.1	22.4
Percentage Contribution to Road NO_x	100.0	6.1	28.4	0.0	0.0	20.5	0.0	44.9	0.1	-
At the Receptor with the Maximum Road NO_x Concentration (ID R115)										
NO_x Concentration (µg/m^3)	72.8	4.4	21.1	0.0	0.0	13.9	0.0	33.3	0.1	19.1
Percentage of Total NO_x	79.2	4.8	23.0	0.0	0.0	15.2	0.0	36.2	0.1	20.8
Percentage Contribution to Road NO_x	100.0	6.0	29.0	0.0	0.0	19.2	0.0	45.8	0.1	-

Figure 3.2 – Average NO_x Contribution by Vehicle Class, where Modelled Annual NO_2 Concentrations are greater than 40µg/m3 within AQMA No.4



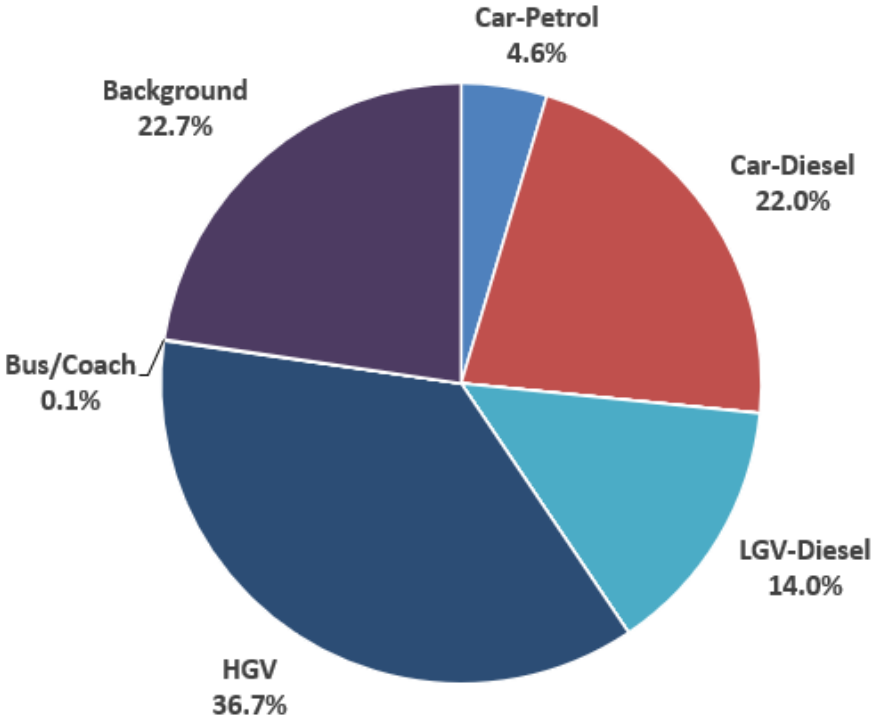
3.3.3 AQMA No.6 Great Cambridge Road (A10)

Table 3-3 provides a breakdown of NO_x emissions according to vehicle class within AQMA No.6 and Figure 3.3 displays the average NO_x emissions across all modelled receptors within the AQMA. The breakdown is similar to that of AQMA No.1 and No.4, whereby the majority of NO_x emissions are resulting from HGVs (36.7%), followed by diesel cars (22.0%) and diesel LGVs (14.0%). This continues to indicate that there should be focus on measures to reduce emissions from diesel cars and LGVs. Although HGVs are the biggest contributor it is a difficult vehicle type to target due to all new vehicles being required to meet Euro VI standards since 2013. There is therefore little that can be implemented by way of directly reducing tailpipe emissions.

Table 3-3 – NO_x Source Apportionment Results: AQMA No.6

Results	All Vehicles	Petrol Car	Diesel Car	EV/LPG Car	Petrol LGV	Diesel LGV	EV/LPG LGV	HGV	Bus/ Coaches	Background
Average across all modelled receptors										
NO_x Concentration ($\mu g/m^3$)	44.4	2.9	13.1	0.0	0.0	9.0	0.0	19.3	0.1	18.0
Percentage of Total NO_x	71.2	4.6	21.1	0.0	0.0	14.5	0.0	30.9	0.1	28.8
Percentage Contribution to Road NO_x	100.0	6.4	29.6	0.0	0.0	20.4	0.0	43.5	0.1	-
Average Across All Receptors with NO_2 Concentration exceeding the AQS Annual Mean Objective										
NO_x Concentration ($\mu g/m^3$)	63.2	3.8	17.9	0.0	0.0	11.4	0.0	30.0	0.1	18.5
Percentage of Total NO_x	77.3	4.6	22.0	0.0	0.0	14.0	0.0	36.7	0.1	22.7
Percentage Contribution to Road NO_x	100.0	6.0	28.4	0.0	0.0	18.1	0.0	47.4	0.1	-
At the Receptor with the Maximum Road NO_x Concentration (ID R115)										
NO_x Concentration ($\mu g/m^3$)	78.1	4.7	22.6	0.0	0.0	14.4	0.0	36.4	0.1	18.5
Percentage of Total NO_x	80.8	4.8	23.4	0.0	0.0	14.9	0.0	37.6	0.1	19.2
Percentage Contribution to Road NO_x	100.0	6.0	28.9	0.0	0.0	18.5	0.0	46.5	0.1	-

Figure 3.3 – Average NO_x Contribution by Vehicle Class, where Modelled Annual NO_2 Concentrations are greater than 40µg/m3 within AQMA No.6



3.4 Required Reduction in Emissions

In line with the methodology presented in Box 7.6 of LAQM.TG(22), calculations have been carried out to determine the necessary reduction in road NO_x required to bring AQMA No.1, No.4 and No.6 to compliance. The reduction required at the worst-case location within each AQMA is presented, under the assumption that an equal reduction across the entirety of the AQMAs would ensure that all receptors are compliant. In addition, the average reduction required at all receptors predicted to be exceeding within each AQMA is also presented.

It is important to understand that although reducing NO_x emissions from vehicles will in turn reduce NO_2 concentrations, there is a non-linear relationship between NO_x and NO_2 concentrations and therefore a greater relative reduction in NO_x may be required.

3.4.1 AQMA No.1 Arlington Crescent to Abbey Road, Waltham Cross

Across all modelled receptors where an annual average NO_2 concentration of 40µg/m^3 or greater was reported, a reduction of **34.7%** NO_x is required, which would lead to general improvements overall throughout the AQMA but it will not achieve compliance at the worst-case location.

The worst-case receptor within AQMA No.1 is located along Arlington Crescent in Waltham Cross, at a residential property adjacent to the M25. The reduction in NO_x required to achieve compliance with the annual mean NO_2 objective of 40µg/m^3 at this location is **59.5%**.

This therefore suggests that a target NO_x reduction of between 35% and 60% will have significant improvements on NO_2 concentrations throughout this AQMA.

3.4.2 AQMA No.4 Eleanor Cross Road / Monarchs Way Roundabout, Waltham Cross

Across all modelled receptors where an annual average NO_2 concentration of 40µg/m^3 or greater was reported, a reduction of **19.5%** NO_x is required, which would lead to general improvements overall throughout the AQMA but it will not achieve compliance at the worst-case location.

The worst-case receptor within AQMA No.4 is located along the northern edge of the Eleanor Cross Road / Monarchs Way roundabout in Waltham Cross. The reduction in NO_x required to achieve compliance with the annual mean NO_2 objective of 40µg/m^3 at this location is **26.6%**.

This therefore suggests that a target NO_x reduction of between 20% and 27% will have significant improvements on NO_2 concentrations throughout this AQMA.

1.1.1 AQMA No.6 Great Cambridge Road (A10)

Across all modelled receptors where an annual average NO_2 concentration of 40µg/m^3 or greater was reported, a reduction of **15.5%** NO_x is required, which would lead to general improvements overall throughout the AQMA but it will not achieve compliance at the worst-case location.

The worst-case receptor within AQMA No.6 is located at the junction of College Road and Great Cambridge Road. The reduction in NO_x required to achieve compliance with the annual mean NO_2 objective of 40µg/m^3 at this location is **31.6%**.

This therefore suggests that a target NO_x reduction of between 16% and 32% will have significant improvements on NO_2 concentrations throughout this AQMA.

3.5 Key Priorities

- **Priority 1 – Public Health and Wellbeing** (Behaviour change/modal shift, Health Promotion)
    - Air pollution has a significant impact on public health and is therefore a major reason why the Council wishes to improve air quality. The Council has a strong role in facilitating and encouraging behavioural changes by setting examples and developing infrastructure to support this.
    - By providing accurate air quality information with clear linkages to the health impacts associated with poor air quality alongside clear guidance on how residents can take action to improve this, the Council and encourage residents to change their travel patterns and use low/zero emission modes of transport.
    - We will seek to promote the health benefits associated with ‘greener travel’ and will develop policies to remove perceived barriers.
- **Priority 2 - Transport** (Licensing, Parking, Public Transport, Procurement)
    - Road traffic and transport is the major contributor for emissions within the district. The Council therefore wishes to control these via measures presented within this AQAP as a priority.
    - The Council is able to influence this via areas of direct control, such as taxi licensing, the composition of its own fleet, encouraging the use of, and facilitating the use of low/zero emissions transport.
    - The Council will work with its wider strategic partners, such as National Highways, neighbouring local authorities and Hertfordshire County Council, on matters of traffic management and public transport that extend beyond the Broxbourne Borough Council’s direct control. This

will help mitigate existing areas of traffic and transport issues, whilst also allowing us to seek opportunities for alternatives and improvements. This will also help encourage a unified approach to improving air quality beyond Broxbourne Borough Council's own area of control.

- The Council will lead by example by continuing to improve its own vehicle fleet and operations in order to reduce harmful emissions whilst increasing efficiency.
- We will look to reduce the need to travel by supporting sustainable development and initiatives that help support the local economy, services and facilities. Additionally, where travelling is required, we will encourage the uptake of alternatives to private and single occupancy vehicles. There will be a focus on active travel, but also supporting sustainable multi-occupancy modes of travel and encouraging the uptake of electric vehicles. This is of particular importance along Great Cambridge Road (A10) as this is a main arterial route that leads into London.

- **Priority 3 - Planning and Infrastructure**
  - As the local planning authority our objectives are:
    - To strengthen and broaden the local economy;
    - To provide sufficient housing to meet local housing need and support economic growth;
    - To protect the built and natural environment; and
    - To develop sustainable communities, and seek to ensure adapt community facilities are provided
  - We believe that applicants should be aware of the air quality impacts of their development and that they consider appropriate mitigation as part of the design process. This will help ensure that the local air quality is not worsened whilst developing Broxbourne Borough Council.
  - We will ensure that new developments do not exasperate any areas of existing poor air quality and provide appropriate mitigation measures where this is unavoidable.

- **Priority 4 - Policy Guidance**
    - A number of relevant and related policy documents are already in place within the Council. It is therefore considered a priority to utilise these and introduce measures that share benefits with other policies and strategies as key mechanisms to reduce emissions from road transport.

4 Development and Implementation of Broxbourne Borough Council's AQAP

4.1 Consultation and Stakeholder Engagement

In developing/updating this AQAP, we have worked with other local authorities, agencies, businesses and the local community to improve local air quality. Schedule 11 of the Environment Act 2021 requires local authorities to consult the bodies listed in Table 5-1. In addition, we will undertake the following stakeholder engagement:

- Website

4.2 The response to our consultation stakeholder engagement will be given in Timescales of the AQAP Measures

Twenty-four of the measures set out in Table 6-1 have already commenced. For example, Measure 1a, where the council are committed to maintaining the existing 27 EV charging points. While four of the measures set out in Table 6-1 are expected to commence in 2025 and are in the planning stage. These measures are in their infancy and, while there is every ambition to implement these to achieve reductions in pollutant concentrations within Broxbourne, they will require investigation and planning before a realistic timescale can be set.

4.3 Air Quality Partners

Our key partner for Air Quality is Hertfordshire County Council and there is good collaborative working across Broxbourne Council and HCC to ensure that we have a joined up approach to deal effectively with the challenges of Air Quality.

4.4 Measures to Maintain Safe Air Quality

It is recognised that improving air quality is an ongoing challenge which must be weighed against business interest and political will. There are a number of measures

within this AQAP which look to make behavioural changes by improving active travel and moving away from single occupancy vehicles. With these measures, the Council look to make sustainable, long-term changes in patterns of behaviour which will aid in reducing pollution in years and decades to come.

5 Quantification of Measures

5.1 Assumptions and Quantification

Many of the measures set out in Table 6-1 are very difficult to quantify. As a result, no detailed studies have been able to be completed to reliably inform the likely effect in terms of change in traffic or fleet composition as a result of the measures. However, some measures do allow for a high-level analysis of reductions in emissions. A summary consideration of the measures and whether they can be quantified is contained in Table 7-1 below. The table also details the AQMA most affected by the measure.

Table 7-1 Assumptions around Quantification of Measures

Measure no.	Measure	Assumptions for Quantification	Assumed Reduction in AQMA		
			AQMA No.1	AQMA No.4	AQMA No.6
1a	The Council will continue to provide EV charging points that are accessible and efficient.	Additional 27 EV charging points at Broxbourne Borough Council. Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards normalising EV use. The aim is to reduce the number of diesel and petrol cars within the AQMAs as they contribute around 20% of the NO_x emissions within the AQMAs.	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
1b	The Council fully consider Air quality as part of planning procedures and policy.	Insufficient detail to quantify this measure. Reduction based on professional judgement.	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
2a	Improved traffic signal control for smoother traffic movement, e.g. install Smart Traffic Lights at the Church Lane and College Road Junctions	It is anticipated that a detailed Air Quality assessment will be completed for this scheme, which will set out the expected changes in pollutant concentrations. However, no assessment is yet available. Insufficient detail to quantify this measure. Reduction based on professional judgement considering that congestion is a primary factor contributing to the elevated NO_2 pollutant concentrations within the AQMAs according to the Source Apportionment.			1-2µg/m³
2b	At grade improvements at College Road/A10 junction, providing additional northbound and southbound lanes at the junction and increased length of northbound left filter into College Road, and banning all right turns. The outline design for the scheme can be found as part of the Broxbourne Transport Strategy.	It is anticipated that a detailed Air Quality assessment will be completed for this scheme, which will set out the expected changes in pollutant concentrations. However, no assessment is yet available. Insufficient detail to quantify this measure. Reduction based on professional judgement.			<0.5µg/m³
3a	The Council will encourage sustainable methods of travel by engaging with the workforce	See section 7.1.1 below. The aim is to reduce the number of diesel and petrol cars within the AQMAs as they contribute around 20% of the NO_x emissions within the AQMAs as per the Source Apportionment.			< 0.5µg/m³

Measure no.	Measure	Assumptions for Quantification	Assumed Reduction in AQMA		
			AQMA No.1	AQMA No.4	AQMA No.6
3b	The Council also consider the provision for signage and ability to park bicycles across the Borough.	Effectiveness of measure in isolation is likely to be negligible, but it will help to push the drive towards active and sustainable travel. Reduction based on professional judgement.	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
3c	The Council have considered new cycle routes alongside major developments.	In planning stage, insufficient detail to attempt quantification. Reduction based on professional judgement.	0.5-1µg/m³	0.5-1µg/m³	0.5-1µg/m³
4a	The Council will strive to provide clear communication around travel.	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards active and sustainable travel. Reduction based on professional judgement	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
4b	The Council will actively engage with residents on Social media to encourage behaviour change to help Air	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards active and sustainable travel. Reduction based on professional judgement	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
4c	The Council are encouraging remote/flexible working to reduce car usage.	See section 7.1.1 below.			< 0.5µg/m³
4d	The Council are committed to raising the profile with our businesses of how they can improve Air Quality.	Insufficient detail to quantify this measure. Reduction based on professional judgement	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
4e	The Council will engage with National campaigns, where appropriate to do so, such as Clean Air day	Unknown effectiveness at this stage. Reduction based on professional judgement	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
4f	The Council will conduct anti-idle interventions around Educational establishments e.g. Schools	Not possible to quantify given the existing amount of idling is not known for comparison. Reduction based on conservative professional judgement	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
4g	The Council are committed to reduce anti-idling at taxi ranks	Not possible to quantify given the existing amount of idling is not known for comparison. Reduction based on conservative professional judgement	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
5a	The Council will review taxi licensing fees to consider sustainability.	Insufficient detail to quantify this measure. Reduction based on professional judgement	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³

Measure no.	Measure	Assumptions for Quantification	Assumed Reduction in AQMA		
			AQMA No.1	AQMA No.4	AQMA No.6
5b	Collaborating with bus operators to introduce ultra-low emission vehicles into the bus fleet (new or retrofit). Target use of ULEV into the problem areas.	According to the source apportionment, the impact of buses within the AQMAs is minimal. Even though, the measure will have a wider impact within the BBC, the impact within the AQMA will be minimal.	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
5c	The Council are committed to procure low emission vehicles (3EV) for use by staff.	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards normalising EV use.	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
5d	Alternative fuel (EV) infrastructure development	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards normalising EV use.	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
5e	Install rapid EV charging points within all Council-owned Car Parks	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards normalising EV use. Insufficient detail to quantify this measure. Reduction based on professional judgement	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
6a	City link shuttle service to key towns, e.g. various proposals from the Broxbourne Transport Strategy (High Leigh, Brookfield/Cheshunt Lakeside, Park Plaza enhancements), Broxbourne borough – Enfield cross-boundary services; extending one or more TfL services to Park Plaza; extending the Brookfield service down into Enfield.	Insufficient detail to quantify this measure. Reduction based on conservative professional judgement	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
6b	Council funding to provide free buses for all schools	Insufficient detail to quantify this measure. Reduction based on conservative professional judgement	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
6c	Public transport infrastructure improvements, e.g. - Enhanced bus shelters - Accurate electronic timetables - m-tickets / contactless payment options	Insufficient detail to quantify this measure. Reduction based on conservative professional judgement	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³

Measure no.	Measure	Assumptions for Quantification	Assumed Reduction in AQMA		
			AQMA No.1	AQMA No.4	AQMA No.6
6d	Incentivise public transport usage, e.g. - Provision of information about existing services - Campaigns - Season ticket loan/discounts - Subsidised tickets	Insufficient detail to quantify this measure. Reduction based on conservative professional judgement	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
7a	The Council will consider the availability of charging points across the Borough	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards normalising EV use. Insufficient detail to quantify this measure. Reduction based on conservative professional judgement.	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
7b	The Council actively encourage staff to car share to reduce the number of cars on the road	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards active and sustainable travel.			< 0.5µg/m³
7c	The Council actively encourage different modes of transport for staff to get to and from work	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards active and sustainable travel.			< 0.5µg/m³
8	Air quality alerts to promote information to the most vulnerable.	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards active and sustainable travel.	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
9	Consider new technologies and their application to improve air quality in AQMAs	Insufficient detail to quantify this measure. Reduction based on conservative professional judgement.	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³

5.1.1 Measure Quantification – Measure 3.a, 4.c, 7.b and 7.c

Measure 3.a: The Council will encourage sustainable methods of travel by engaging with the Council workforce.

Measure 4.c: The Council are encouraging remote/flexible working within its workforce to reduce car usage.

Measure 7.b: The Council actively encourage Council staff to car share to reduce the number of cars on the road

Measure 7.c: The Council actively encourage different modes of transport for Council staff to get to and from work

The council currently has 366 employees. These measures have the potential to impact 100% of the Council workforce, however a study for British workplace travel plans made in 2002, observed a reduction of 16% of car use at a Government Office for the East Midlands that implemented travel plans. As the Council offices are located on Bishops College, Churchgate, Cheshunt, which is near the AQMA 6. It is estimated that these measures will impact AQMA 6 only. The Emissions Factors Toolkit (EFT) has been used to reduce the AADT on Great College Road and Great Cambridge Road by 366 cars (100%) and by 59 cars (16% of 366) representing the full potential and the expected impact.

A NO_x emission-based assessment was carried out for these set of measures. The inputs for the EFT are described below:

EFT inputs without measures:

- Year: 2022
- Road Type: Urban (not London)
- Traffic Flow through AQMA No.6: 42319 AADT at Great College Road and 42750 AADT at Great Cambridge Road.
- Cars travelling through AQMA No.6: 30962 AADT at Great College Road and 31964 AADT at Great Cambridge Road.
- Average speed in AQMA No.6: 64kph (40mph)

- Total link length within the AQMA No.6: 0.9km of Great College Road and 2.1km of Great Cambridge Road.

EFT inputs with measures implemented and reaching 100% of the Council workforce:

- Year, Road Type, Average Speed and Total link length remain the same.
- Traffic Flow through AQMA No.6: 41953 AADT at Great College Road and 42384 AADT at Great Cambridge Road.
- Cars travelling through AQMA No.6: 30596 AADT at Great College Road and 31598 AADT at Great Cambridge Road.

EFT inputs with measures implemented and reaching 16% of the Council workforce:

- Year, Road Type, Average Speed and Total link length remain the same.
- Traffic Flow through AQMA No.6: 42260 AADT at Great College Road and 42691 AADT at Great Cambridge Road.
- Cars travelling through AQMA No.6: 30903 AADT at Great College Road and 31905 AADT at Great Cambridge Road.

Table 7-2 shows the calculations undertaken and potential NO_x emission reductions if all the Council workforce is impacted by the measure and Table 7-3 shows the calculations and potential reductions if 16% of the workforce is impacted. There is an estimated reduction of 0.6% on NO_X Annual Emissions from road traffic if these set of measures impact 100% of the Council workforce and an estimated reduction of 0.1% on NO_X Annual Emissions from road traffic if these set of measures impact 16% of the Council workforce.

Table 7-2 Emissions-Based Assessment

	AQMA No.6
Average Annual NOx Emissions without measure (kg/year)	6,531
Average Annual NOx Emissions - with measure at full potential (kg/year)	6,495
Average NOx Emission Reduction (%)	0.6

Table 7-3 Emissions-Based Assessment

	AQMA No.6
Average Annual NOx Emissions without measure (kg/year)	6,531
Average Annual NOx Emissions - with measure. Switch from 0.2% petrol car AADT to Battery EV cars (kg/year)	6,525
Average NOx Emission Reduction (%)	0.1

5.2 Cost Benefit Analysis of Measures

5.2.1 Methodology

Using the above assumptions around the quantitative pollution reduction and assumed costs, each measure was given a score as set out below.

Table 7-4 - Cost Score

Estimated Cost of Measure	Score
< £10k	1
£10k - £50k	2
£50k - £100k	3
£100k - £500k	4
£500k - £1m	5
£1m - £10m	6
> £10m	7

Table 7-5 - Benefit Score

Estimated Reduction in Pollutant Concentrations	Score
>0.5µg/m³	1
0.5-1 µg/m³	2
1-2 µg/m³	3
2-3 µg/m³	4
3-4 µg/m³	5
4-5 µg/m³	6
>5 µg/m³	7

Using the scores above, the below matrix was implemented to work out the cost-benefit. Higher scores are awarded for those measures which are cheapest with the

greatest effect, with the lowest scores awarded for those which will be costly with limited reduction in pollution.

Table 7-6 - Cost Benefit Scoring Matrix

		Estimated Reduction in Pollutant Concentrations						
		>0.5µg/m³	0.5-1 µg/m³	1-2 µg/m³	1-2 µg/m³	2-3 µg/m³	3-4 µg/m³	>4 µg/m³
Cost of Measure	< £10k	6	8	10	12	14	16	18
	£10k - £50k	5	6	8	10	12	14	16
	£50k - £100k	4	5	6	8	10	12	14
	£100k - £500k	3	4	5	6	8	10	12
	£500k - £1m	2	3	4	5	6	8	10
	£1m - £10m	1	2	3	4	5	6	8
	> £10m	0	1	2	3	4	5	6

The analysis also accounts for the feasibility of implementing the measures, with those likely to progress given a higher priority than those which are acknowledged to be a challenge to implement. The feasibility score factors in local influences such as political backing, accessibility to funding options and resources available. As such, each measure was assigned a 'Feasibility score based on the table below. The score from the matrix was multiplied by this score.

Table 7-7 - Feasibility Scores

Feasibility Score	Score
Measure has already been started and just requires progressing	7
Very easy to implement, and political good will towards this, sufficient resources	6
Easy to implement, general political goodwill and available resources	5
Possible to implement but may require some learning/campaigning, moderately time intensive	4
Possible to implement but not straightforward and will require some learning/campaigning, moderately time intensive	3
Challenging to implement, would require some campaigning, time intensive	2
Very Difficult to implement, no political appetite, time and resource intensive	1

5.2.2 Cost-Benefit Analysis

Following the above assessment, it has been possible to rank the measures by cost, benefit and feasibility, this is shown in Following a cost-benefit analysis, one of the measures analysed obtained the highest overall score followed by nine measures which obtained the same overall score. The measure that scored the highest is considering air quality as part of the planning procedures and policy (Measure 1b) which has a broad impact on the air quality within the AQMAs. The following nine measures scored the same. Measure 2a, improve traffic signal control for smoother

traffic movement, aims to reduce the congestion near junctions. According to the Source Apportionment, congestion is a primary factor contributing to the elevated NO2 pollutant concentrations within the AQMAs. Measure 5d, alternative fuel (EV) infrastructure development, aims to reduce the proportion of petrol and diesel cars by increasing the proportion of EV cars. Petrol and diesel cars contribute to around 20% of NOx emissions within the AQMAs according to the Source Apportionment. The remaining seven high scoring measures are indirect interventions that focus on individual / group behavioural change and do not involve measures that directly impact infrastructure with physical changes. These measures (3a, 4a, 4b, 4c, 4d, 7b and 7c) aid behavioural shifts within the council staff, wider population and businesses to promote more sustainable and less polluting methods of transport. They are easy to implement at a low cost. Their aim is to promote better practices and behaviours across wider areas specially reducing the use of private cars.

The measure that scored the lowest is 2b which aims to deliver grade improvements at College Road/A10 junction, providing additional northbound and southbound lanes at the junction and increased length of northbound left filter into College Road, and banning all right turns. This measure scored the lowest as it is costly, very difficult to implement and time and resource intensive.

Table 7-8 below. With the feasibility weighting meaning that measures which are the easiest to progress are scored higher, these are prioritised.

Following a cost-benefit analysis, one of the measures analysed obtained the highest overall score followed by nine measures which obtained the same overall score. The measure that scored the highest is considering air quality as part of the planning procedures and policy (Measure 1b) which has a broad impact on the air quality within the AQMAs. The following nine measures scored the same. Measure 2a, improve traffic signal control for smoother traffic movement, aims to reduce the congestion near junctions. According to the Source Apportionment, congestion is a primary factor contributing to the elevated NO_2 pollutant concentrations within the AQMAs. Measure 5d, alternative fuel (EV) infrastructure development, aims to reduce the proportion of petrol and diesel cars by increasing the proportion of EV cars. Petrol and diesel cars contribute to around 20% of NO_x emissions within the AQMAs according to the Source Apportionment. The remaining seven high scoring measures are indirect interventions that focus on individual / group behavioural change and do not involve measures that directly impact infrastructure with physical changes. These measures (3a, 4a, 4b, 4c, 4d, 7b and 7c) aid behavioural shifts within the council staff, wider population and businesses to promote more sustainable and less polluting methods of transport. They are easy to implement at a low cost. Their aim is to promote better practices and behaviours across wider areas specially reducing the use of private cars.

The measure that scored the lowest is 2b which aims to deliver grade improvements at College Road/A10 junction, providing additional northbound and southbound lanes at the junction and increased length of northbound left filter into College Road, and banning all right turns. This measure scored the lowest as it is costly, very difficult to implement and time and resource intensive.

Table 7-8 - Cost Benefit Analysis of Measures

Measure No.	Measure	Cost Score	Air Quality Effect Score	Feasibility Score	Overall Score
1b	The Council fully consider Air quality as part of planning procedures and policy.	7	1	7	42
2a	Improved traffic signal control for smoother traffic movement, e.g. install Smart Traffic Lights at the Church Lane and College Road Junctions	5	3	6	36
5d	Alternative fuel (EV) infrastructure development	7	1	6	36
4d	The Council are committed to raising the profile with our businesses of how they can improve Air Quality.	7	1	6	36
4a	The Council will strive to provide clear communication around travel.	7	1	6	36
4b	The Council will actively engage with residents on Social media to encourage behaviour change to help Air Quality.	7	1	6	36
3a	The Council will encourage sustainable methods of travel by engaging with the workforce	6	1	6	36
7b	The Council actively encourage staff to car share to reduce the number of cars on the road	7	1	6	36
7c	The Council actively encourage different modes of transport for staff to get to and from work	7	1	6	36
4c	The Council are encouraging remote/flexible working to reduce car usage.	7	1	6	36
4f	The Council will conduct anti-idle interventions around Educational establishments e.g. Schools	7	1	5	30
4g	The Council are committed to reduce anti-idling at taxi ranks	7	1	5	30
4e	The Council will engage with National campaigns, where appropriate to do so, such as Clean Air day	7	1	5	30
5c	The Council are committed to procure low emission vehicles for use by staff.	7	1	5	30
7a	The Council will consider the availability of charging points across the Borough	7	1	5	30
5e	Install rapid EV charging points within all Council-owned Car Parks	7	1	5	30
8	Air quality alerts to promote information to the most vulnerable.	7	1	5	30
9	Consider new technologies and their application to improve air quality in AQMAs	7	1	5	30
3b	The Council also consider the provision for signage and ability to park bicycles across the Borough.	7	1	4	24
5b	Collaborating with bus operators to introduce ultra-low emission vehicles into the bus fleet (new or retrofit). Target use of ULEV into the problem areas.	5	1	5	20
6b	Council funding to provide free buses for all schools	5	1	5	20
6a	City link shuttle service to key towns, e.g. various proposals from the Broxbourne Transport Strategy (High Leigh, Brookfield/Cheshunt Lakeside, Park Plaza enhancements), Broxbourne borough – Enfield cross-boundary services; extending one or more TfL services to Park Plaza; extending the Brookfield service down into Enfield.	5	1	5	20
3c	The Council have considered new cycle routes alongside major developments.	5	2	4	20

Measure No.	Measure	Cost Score	Air Quality Effect Score	Feasibility Score	Overall Score
1a	The Council will continue to provide EV charging points that are accessible and efficient.	5	1	5	20
5a	The Council will review taxi licensing fees to consider sustainability.	7	1	3	18
6d	Incentivise public transport usage, e.g. - Provision of information about existing services - Campaigns - Season ticket loan/discounts - Subsidised tickets	5	1	4	16
6c	Public transport infrastructure improvements, e.g. - Enhanced bus shelters - Accurate electronic timetables - m-tickets / contactless payment options	5	1	4	16
2b	At grade improvements at College Road/A10 junction, providing additional northbound and southbound lanes at the junction and increased length of northbound left filter into College Road, and banning all right turns. The outline design for the scheme can be found as part of the Broxbourne Transport Strategy.	5	1	2	8

Appendix A: Response to Consultation. The consultation section will be completed within the Final AQAP, as consultation will take place in tandem with the Draft AQAP being submitted for Defra consultation and appraisal.

Table 5-1 – Consultation Undertaken

Consultee	Consultation Undertaken
The Secretary of State	<Yes/No>
The Environment Agency	<Yes/No>
The highways authority	<Yes/No>
All neighbouring local authorities	<Yes/No>
Other public authorities as appropriate, such as Public Health officials	<Yes/No>
Bodies representing local business interests and other organisations as appropriate	<Yes/No>

5.3 Steering Group

A steering group was established at the start of the update process to drive forward the development of the new AQAP. The core aim of the steering group was to identify measures for inclusion within the AQAP that would be effective both in terms of reducing NO_2 concentrations and also feasible in terms of implementation and delivery.

Broxbourne Borough Council set up a steering group in June 2022, chaired by BV. Membership of the group included representatives from: Broxbourne Borough Council Environmental Health Department, Hertfordshire County Council Environment and Transport Department, National Highways. This group met once on July 21st, 2022, to discuss the consolidated measures.

Including members from various areas and departments in the steering group enables a collaborative strategy for enhancing air quality and expands the potential for implementing a wider array of measures.

BBC maintains virtual communication with the involved parties, mostly via e-mail correspondence, to clarify points for the consolidated measures. It's essential to communicate progress on individual initiatives related to AQAP measures, analyse valuable lessons learned from the continuous implementation, and persist in discussing innovative concepts for future measures and actions within the borough.

6 AQAP Measures

Table 6-1 shows the Broxbourne Borough Council AQAP measures. It contains:

- a list of the actions that form part of the plan
- the responsible individual and departments/organisations who will deliver this action
- estimated cost of implementing each action (overall cost and cost to the local authority)
- expected benefit in terms of pollutant emission and/or concentration reduction
- the timescale for implementation
- how progress will be monitored

NB: Please see future ASRs for regular annual updates on implementation of these measures

Table 6-1 – Air Quality Action Plan Measures

Measure No.	Measure	Category	Classification	Estimated Year Measure to be Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Target Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Potential Barriers to Implementation
1a	The Council will continue to provide EV charging points that are accessible and efficient.	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, gas fuel recharge	Ongoing /review	2027	Parking Services Manager	TBC	TBC	TBC	£50k - £100k	Implementation	< 0.5µg/m³	No. charge points and uptake in EVs, in total and per population.		The Council are committed to maintaining the existing 27 EV charging points.
1b	The Council fully consider Air quality as part of planning procedures and policy.	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Ongoing /review	2027	Planning Team (Local Plan)	TBC	TBC	TBC	< £10k	Implementation	< 0.5µg/m³	No. of implemented policies and planning procedures.		The Planning team have incorporated Air Quality into the Local plan.
2a	Improved traffic signal control for smoother traffic movement, e.g. install Smart Traffic Lights at the Church Lane and College Road Junctions	Traffic Management	UTC, Congestion Management, traffic reduction	2025 (subject to funding)	2025	HCC Network and infrastructure team leader	TBC	TBC	TBC	£50k - £100k	Planning	1 - 2 µg/m³	Percentage of reduction of NO_2 concentrations.		These improvements are subject to funding. If the funding is received from the Government, this can be implemented and this is likely to commence in 2025.
2b	At grade improvements at College Road/A10 junction, providing additional northbound and southbound lanes at the junction and increased length of	Traffic Management	UTC, Congestion Management, traffic reduction	2025 (subject to funding)	2025	HCC Network and infrastructure team leader	TBC	TBC	TBC	£50k - £100k	Planning	< 0.5 µg/m³	Percentage of reduction of NO_2 concentrations.		These improvements are pending funding from the Government (as outlined above).

Measure No.	Measure	Category	Classification	Estimated Year Measure to be Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Target Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Potential Barriers to Implementation
	northbound left filter into College Road, and banning all right turns. The outline design for the scheme can be found as part of the Broxbourne Transport Strategy.														
3a	The Council will encourage sustainable methods of travel by engaging with the workforce	Promoting Travel Alternatives	Workplace Travel Planning	Ongoing	2025	Sustainability Officer	TBC	TBC	TBC	< £10k	Implementation	< 0.5µg/m³	Workforce engaged with sustainability methods. In total and percentage.		A staff survey was sent out to all staff to gather information re.modes of travel.
3b	The Council also consider the provision for signage and ability to park bicycles across the Borough.	Promoting Travel Alternatives	Promotion of cycling	Jan-25	2025	Planning Policy Officer	TBC	TBC	TBC	< £10k	Planning	< 0.5µg/m³	No. of bicycles parking spaces. Bicycles AADT within the AQMAs.		The Planning team consider this factor for all new developments.
3c	The Council have considered new cycle routes alongside major developments.	Promoting Travel Alternatives	Promotion of cycling	Jan-25	2025	Director of Place/Planning Officers	TBC	TBC	TBC	£50k - £100k	Planning	0.5-1 µg/m³	Bicycles AADT within the AQMAs.		Scheme A has commenced and it is hoped this will be completed in 23/24. Scheme C will take longer and it is hoped to be completed 26/27.
4a	The Council will strive to provide clear	Public Information	Other	Apr-23	2024	Communications Team	TBC	TBC	TBC	< £10k	Implementation	< 0.5µg/m³	Uptake of sustainable		The Communications team

Measure No.	Measure	Category	Classification	Estimated Year Measure to be Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Target Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Potential Barriers to Implementation
	communication around travel.												travel methods.		provide regular/relevant information for our residents.
4b	The Council will actively engage with residents on Social media to encourage behaviour change to help Air Quality.	Public Information	Via the internet	Apr-23	2024	Communications Team	TBC	TBC	TBC	< £10k	Implementation	< 0.5µg/m³	Uptake of sustainable travel methods.		The Communications team have put information onto Social media around Air Quality.
4c	The Council are encouraging remote/flexible working to reduce car usage.	Promoting Travel Alternatives	Encourage / Facilitate home-working	Apr-23	2024	Head of Environmental Health & Licensing	TBC	TBC	TBC	< £10k	Implementation	< 0.5µg/m³	No. of AADT from cars reduced and No. of remote work days		This is subject to HR Policy and strives to improve Air Quality with less traffic.
4d	The Council are committed to raising the profile with our businesses of how they can improve Air Quality.	Public Information	Other	Jun-23	2024	Sustainability Officer	TBC	TBC	TBC	< £10k	Implementation	< 0.5µg/m³	Sustainable Business.		The sustainability officer continues to engage with our Customers to improve AQ.
4e	The Council will engage with National campaigns, where appropriate to do so, such as Clean Air day	Other	Other	Mar-23	2024	Head of Environmental Health & Licensing	TBC	TBC	TBC	< £10k	Implementation	< 0.5µg/m³	No. of successful bids		Several successful interventions have already taken place/raising the profile of AQ.
4f	The Council will conduct anti-idle interventions around Educational	Public Information	Other	Mar-23	2024	Head of Environmental Health & Licensing	TBC	TBC	TBC	< £10k	Implementation	< 0.5µg/m³	Percentage of reduction of NO_2 concentrations.		The Council have worked with local schools in the Borough to raise the

Measure No.	Measure	Category	Classification	Estimated Year Measure to be Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Target Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Potential Barriers to Implementation
	establishments e.g. Schools														profile of poor Air Quality and respiratory health impacts.
4g	The Council are committed to reduce anti-idling at taxi ranks	Traffic Management	Anti-idiling enforcement	Jul-23	2024	Head of Environmental Health & Licensing	TBC	TBC	TBC	< £10k	Implementation	< 0.5µg/m³	Percentage of reduction of NO_2 concentrations.		The taxi ranks are regularly inspected and a newsletter goes out to remind the trade.
5a	The Council will review taxi licensing fees to consider sustainability.	Traffic Management	Testing vehicles emissions	Apr-23	2024/25	Licensing officer	TBC	TBC	TBC	< £10k	Implementation	< 0.5µg/m³	Percentage of electric taxi		The Council taxi policy has been reviewed to consider environmental impacts.
5b	Collaborating with bus operators to introduce ultra-low emission vehicles into the bus fleet (new or retrofit). Target use of ULEV into the problem areas.	Promoting Low Emission Transport	Other	Apr-23	2025	HCC/Transport Policy Team	TBC	TBC	TBC	£50k - £100k	Implementation	< 0.5µg/m³	No. of zero emission buses Percentage of fleet that reach Euro V Percentage of fleet that reach VI standard		The Council works in partnership to support HCC with public transport options via the introduction of 27 zero emission buses and increasing the proportion of the fleet reaching Euro V and Euro VI standards.
5c	The Council are committed to procure low emission	Promoting Low Emission Transport	Company vehicle procurement – Prioritising uptake of low	Feb-23	2025	Treasury Insurance Risk Manager	TBC	TBC	TBC	< £10k	Implementation	< 0.5µg/m³	No. of EV provided for use by staff		EV contracts are reviewed regularly to ensure they are sustainable.

Measure No.	Measure	Category	Classification	Estimated Year Measure to be Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Target Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Potential Barriers to Implementation
	vehicles for use by staff.		emission vehicles												The council provides 3 electric vehicles to the staff.
5d	Alternative fuel (EV) infrastructure development	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, gas fuel recharge	Ongoing	2025	Sustainability Officer	TBC	TBC	TBC	< £10k	Implementation	< 0.5µg/m³	No. EV charge points		This is considered as part of our Environmental Strategy.
5e	Install rapid EV charging points within all Council-owned Car Parks	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, gas fuel recharge	Ongoing	2025	Parking Services Manager	TBC	TBC	TBC	< £10k	Implementation	< 0.5µg/m³	Percentage EV charge points in Council car parks		Parking Services are currently reviewing Eleanor cross car park for improvements.
6a	City link shuttle service to key towns, e.g. various proposals from the Broxbourne Transport Strategy (High Leigh, Brookfield/Cheshunt Lakeside, Park Plaza enhancements), Broxbourne borough – Enfield cross-boundary	Transport Planning and Infrastructure	Bus route improvements	Apr-23	2025	Local Comms/HCC Comms cell	TBC	TBC	TBC	£50k - £100k	Implementation	< 0.5µg/m³	No. of new services provided. No. of public transport users.		HCC comms use Social media to get AQ messages out to the Public.

Measure No.	Measure	Category	Classification	Estimated Year Measure to be Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Target Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Potential Barriers to Implementation
	services; extending one or more TfL services to Park Plaza; extending the Brookfield service down into Enfield.														
6b	Council funding to provide free buses for all schools	Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services	Pending	2025	HCC/Transport Policy Team	TBC	TBC	TBC	£50k - £100k	Planning	< 0.5µg/m³	No. and percentage of schools with free buses provided		HCC
6c	Public transport infrastructure improvements, e.g. - Enhanced bus shelters - Accurate electronic timetables - m-tickets / contactless payment options	Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services	Ongoing	2026	HCC/Transport Policy Team	TBC	TBC	TBC	£50k - £100k	Implementation	< 0.5µg/m³	No. of public transport users.		Awaiting confirmation of whether the funding has been successful to implement this measure
6d	Incentivise public transport usage, e.g. - Provision of information about existing services - Campaigns - Season ticket loan/discounts - Subsidised tickets	Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services	Ongoing	2026	HCC/Transport Policy Team	TBC	TBC	TBC	£50k - £100k	Implementation	< 0.5µg/m³	No. of public transport users.		To provide the public with clear information so that informed choices can be made.

Measure No.	Measure	Category	Classification	Estimated Year Measure to be Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Target Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Potential Barriers to Implementation
7a	The Council will consider the availability of charging points across the Borough	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, gas fuel recharge	Ongoing.	2026	Parking Services Manager	TBC	TBC	TBC	< £10k	Implementation	< 0.5µg/m³	No. of EV charging points and No. of EV		The Council have reviewed the current amount and will keep under review.
7b	The Council actively encourage staff to car share to reduce the number of cars on the road	Alternatives to private vehicle use	Car &lift sharing schemes	Ongoing.	2024	Communication Team	TBC	TBC	TBC	< £10k	Implementation	< 0.5µg/m³	No. of workforce engaged with the measure and AADT reduced for cars		Regular messaging takes place to encourage staff to consider their behaviour.
7c	The Council actively encourage different modes of transport for staff to get to and from work	Promoting Travel Alternatives	Promotion of cycling	Apr-23	2024	Communication Team	TBC	TBC	TBC	< £10k	Implementation	< 0.5µg/m³	No. of workforce engaged with the measure and AADT reduced for cars		The Council held a recent 'ride your bike' to work day to encourage staff to cycle.
8	Air quality alerts to promote information to the most vulnerable.	Public Information	Other	Ongoing	2024	Communication Team / HCC	HCC	TBC	TBC	< £10k	Implementation	< 0.5µg/m³	No. of subscriptions to the air quality alert system.		
9	Consider new technologies and their application to improve air quality in AQMAs	Other	Other	Ongoing	2024		TBC	TBC	TBC	< £10k	Implementation	< 0.5µg/m³			

6.1 Timescales of the AQAP Measures

Twenty-four of the measures set out in Table 6-1 have already commenced. For example, Measure 1a, where the council are committed to maintaining the existing 27 EV charging points. While four of the measures set out in Table 6-1 are expected to commence in 2025 and are in the planning stage. These measures are in their infancy and, while there is every ambition to implement these to achieve reductions in pollutant concentrations within Broxbourne, they will require investigation and planning before a realistic timescale can be set.

6.2 Air Quality Partners

Our key partner for Air Quality is Hertfordshire County Council and there is good collaborative working across Broxbourne Council and HCC to ensure that we have a joined up approach to deal effectively with the challenges of Air Quality.

6.3 Measures to Maintain Safe Air Quality

It is recognised that improving air quality is an ongoing challenge which must be weighed against business interest and political will. There are a number of measures within this AQAP which look to make behavioural changes by improving active travel and moving away from single occupancy vehicles. With these measures, the Council look to make sustainable, long-term changes in patterns of behaviour which will aid in reducing pollution in years and decades to come.

7 Quantification of Measures

7.1 Assumptions and Quantification

Many of the measures set out in Table 6-1 are very difficult to quantify. As a result, no detailed studies have been able to be completed to reliably inform the likely effect in terms of change in traffic or fleet composition as a result of the measures. However, some measures do allow for a high-level analysis of reductions in emissions. A summary consideration of the measures and whether they can be quantified is contained in Table 7-1 below. The table also details the AQMA most affected by the measure.

Table 7-1 Assumptions around Quantification of Measures

Measure no.	Measure	Assumptions for Quantification	Assumed Reduction in AQMA		
			AQMA No.1	AQMA No.4	AQMA No.6
1a	The Council will continue to provide EV charging points that are accessible and efficient.	Additional 27 EV charging points at Broxbourne Borough Council. Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards normalising EV use. The aim is to reduce the number of diesel and petrol cars within the AQMAs as they contribute around 20% of the NO_x emissions within the AQMAs.	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
1b	The Council fully consider Air quality as part of planning procedures and policy.	Insufficient detail to quantify this measure. Reduction based on professional judgement.	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
2a	Improved traffic signal control for smoother traffic movement, e.g. install Smart Traffic Lights at the Church Lane and College Road Junctions	It is anticipated that a detailed Air Quality assessment will be completed for this scheme, which will set out the expected changes in pollutant concentrations. However, no assessment is yet available. Insufficient detail to quantify this measure. Reduction based on professional judgement considering that congestion is a primary factor contributing to the elevated NO_2 pollutant concentrations within the AQMAs according to the Source Apportionment.			1-2µg/m³
2b	At grade improvements at College Road/A10 junction, providing additional northbound and southbound lanes at the junction and increased length of northbound left filter into College Road, and banning all right turns. The outline design for the scheme can be found as part of the Broxbourne Transport Strategy.	It is anticipated that a detailed Air Quality assessment will be completed for this scheme, which will set out the expected changes in pollutant concentrations. However, no assessment is yet available. Insufficient detail to quantify this measure. Reduction based on professional judgement.			<0.5µg/m³
3a	The Council will encourage sustainable methods of travel by engaging with the workforce	See section 7.1.1 below. The aim is to reduce the number of diesel and petrol cars within the AQMAs as they contribute around 20% of the NO_x emissions within the AQMAs as per the Source Apportionment.			< 0.5µg/m³

Measure no.	Measure	Assumptions for Quantification	Assumed Reduction in AQMA		
			AQMA No.1	AQMA No.4	AQMA No.6
3b	The Council also consider the provision for signage and ability to park bicycles across the Borough.	Effectiveness of measure in isolation is likely to be negligible, but it will help to push the drive towards active and sustainable travel. Reduction based on professional judgement.	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
3c	The Council have considered new cycle routes alongside major developments.	In planning stage, insufficient detail to attempt quantification. Reduction based on professional judgement.	0.5-1µg/m³	0.5-1µg/m³	0.5-1µg/m³
4a	The Council will strive to provide clear communication around travel.	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards active and sustainable travel. Reduction based on professional judgement	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
4b	The Council will actively engage with residents on Social media to encourage behaviour change to help Air	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards active and sustainable travel. Reduction based on professional judgement	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
4c	The Council are encouraging remote/flexible working to reduce car usage.	See section 7.1.1 below.			< 0.5µg/m³
4d	The Council are committed to raising the profile with our businesses of how they can improve Air Quality.	Insufficient detail to quantify this measure. Reduction based on professional judgement	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
4e	The Council will engage with National campaigns, where appropriate to do so, such as Clean Air day	Unknown effectiveness at this stage. Reduction based on professional judgement	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
4f	The Council will conduct anti-idle interventions around Educational establishments e.g. Schools	Not possible to quantify given the existing amount of idling is not known for comparison. Reduction based on conservative professional judgement	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
4g	The Council are committed to reduce anti-idling at taxi ranks	Not possible to quantify given the existing amount of idling is not known for comparison. Reduction based on conservative professional judgement	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
5a	The Council will review taxi licensing fees to consider sustainability.	Insufficient detail to quantify this measure. Reduction based on professional judgement	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³

Measure no.	Measure	Assumptions for Quantification	Assumed Reduction in AQMA		
			AQMA No.1	AQMA No.4	AQMA No.6
5b	Collaborating with bus operators to introduce ultra-low emission vehicles into the bus fleet (new or retrofit). Target use of ULEV into the problem areas.	According to the source apportionment, the impact of buses within the AQMAs is minimal. Even though, the measure will have a wider impact within the BBC, the impact within the AQMA will be minimal.	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
5c	The Council are committed to procure low emission vehicles (3EV) for use by staff.	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards normalising EV use.	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
5d	Alternative fuel (EV) infrastructure development	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards normalising EV use.	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
5e	Install rapid EV charging points within all Council-owned Car Parks	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards normalising EV use. Insufficient detail to quantify this measure. Reduction based on professional judgement	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
6a	City link shuttle service to key towns, e.g. various proposals from the Broxbourne Transport Strategy (High Leigh, Brookfield/Cheshunt Lakeside, Park Plaza enhancements), Broxbourne borough – Enfield cross-boundary services; extending one or more TfL services to Park Plaza; extending the Brookfield service down into Enfield.	Insufficient detail to quantify this measure. Reduction based on conservative professional judgement	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
6b	Council funding to provide free buses for all schools	Insufficient detail to quantify this measure. Reduction based on conservative professional judgement	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
6c	Public transport infrastructure improvements, e.g. - Enhanced bus shelters - Accurate electronic timetables - m-tickets / contactless payment options	Insufficient detail to quantify this measure. Reduction based on conservative professional judgement	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³

Measure no.	Measure	Assumptions for Quantification	Assumed Reduction in AQMA		
			AQMA No.1	AQMA No.4	AQMA No.6
6d	Incentivise public transport usage, e.g. - Provision of information about existing services - Campaigns - Season ticket loan/discounts - Subsidised tickets	Insufficient detail to quantify this measure. Reduction based on conservative professional judgement	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
7a	The Council will consider the availability of charging points across the Borough	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards normalising EV use. Insufficient detail to quantify this measure. Reduction based on conservative professional judgement.	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
7b	The Council actively encourage staff to car share to reduce the number of cars on the road	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards active and sustainable travel.			< 0.5µg/m³
7c	The Council actively encourage different modes of transport for staff to get to and from work	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards active and sustainable travel.			< 0.5µg/m³
8	Air quality alerts to promote information to the most vulnerable.	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards active and sustainable travel.	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³
9	Consider new technologies and their application to improve air quality in AQMAs	Insufficient detail to quantify this measure. Reduction based on conservative professional judgement.	< 0.5µg/m³	< 0.5µg/m³	< 0.5µg/m³

7.1.1 Measure Quantification – Measure 3.a, 4.c, 7.b and 7.c

Measure 3.a: The Council will encourage sustainable methods of travel by engaging with the Council workforce.

Measure 4.c: The Council are encouraging remote/flexible working within its workforce to reduce car usage.

Measure 7.b: The Council actively encourage Council staff to car share to reduce the number of cars on the road

Measure 7.c: The Council actively encourage different modes of transport for Council staff to get to and from work

The council currently has 366 employees. These measures have the potential to impact 100% of the Council workforce, however a study for British workplace travel plans made in 2002[27], observed a reduction of 16% of car use at a Government Office for the East Midlands that implemented travel plans. As the Council offices are located on Bishops College, Churchgate, Cheshunt, which is near the AQMA 6. It is estimated that these measures will impact AQMA 6 only. The Emissions Factors Toolkit (EFT) has been used to reduce the AADT on Great College Road and Great Cambridge Road by 366 cars (100%) and by 59 cars (16% of 366) representing the full potential and the expected impact.

A NO_x emission-based assessment was carried out for these set of measures. The inputs for the EFT are described below:

EFT inputs without measures:

- Year: 2022
- Road Type: Urban (not London)

[27] Cairns S et al. (2004). *'Smarter Choices – Changing the Way We Travel'.* Reproduced from Newson, C., Cairns, S. & Davis, A. (2002). Making travel plans work: Lessons from UK case studies.

- Traffic Flow through AQMA No.6: 42319 AADT at Great College Road and 42750 AADT at Great Cambridge Road.
- Cars travelling through AQMA No.6: 30962 AADT at Great College Road and 31964 AADT at Great Cambridge Road.
- Average speed in AQMA No.6: 64kph (40mph)
- Total link length within the AQMA No.6: 0.9km of Great College Road and 2.1km of Great Cambridge Road.

EFT inputs with measures implemented and reaching 100% of the Council workforce:

- Year, Road Type, Average Speed and Total link length remain the same.
- Traffic Flow through AQMA No.6: 41953 AADT at Great College Road and 42384 AADT at Great Cambridge Road.
- Cars travelling through AQMA No.6: 30596 AADT at Great College Road and 31598 AADT at Great Cambridge Road.

EFT inputs with measures implemented and reaching 16% of the Council workforce:

- Year, Road Type, Average Speed and Total link length remain the same.
- Traffic Flow through AQMA No.6: 42260 AADT at Great College Road and 42691 AADT at Great Cambridge Road.
- Cars travelling through AQMA No.6: 30903 AADT at Great College Road and 31905 AADT at Great Cambridge Road.

Table 7-2 shows the calculations undertaken and potential NO_x emission reductions if all the Council workforce is impacted by the measure and Table 7-3 shows the calculations and potential reductions if 16% of the workforce is impacted. There is an estimated reduction of 0.6% on NO_X Annual Emissions from road traffic if these set of measures impact 100% of the Council workforce and an estimated reduction of 0.1% on NO_X Annual Emissions from road traffic if these set of measures impact 16% of the Council workforce.

Table 7-2 Emissions-Based Assessment

	AQMA No.6
Average Annual NOx Emissions without measure (kg/year)	6,531
Average Annual NOx Emissions - with measure at full potential (kg/year)	6,495
Average NOx Emission Reduction (%)	0.6

Table 7-3 Emissions-Based Assessment

	AQMA No.6
Average Annual NOx Emissions without measure (kg/year)	6,531
Average Annual NOx Emissions - with measure. Switch from 0.2% petrol car AADT to Battery EV cars (kg/year)	6,525
Average NOx Emission Reduction (%)	0.1

7.2 Cost Benefit Analysis of Measures

7.2.1 Methodology

Using the above assumptions around the quantitative pollution reduction and assumed costs, each measure was given a score as set out below.

Table 7-4 - Cost Score

Estimated Cost of Measure	Score
< £10k	1
£10k - £50k	2
£50k - £100k	3
£100k - £500k	4
£500k - £1m	5
£1m - £10m	6
> £10m	7

Table 7-5 - Benefit Score

Estimated Reduction in Pollutant Concentrations	Score
>0.5µg/m³	1
0.5-1 µg/m³	2
1-2 µg/m³	3
2-3 µg/m³	4
3-4 µg/m³	5
4-5 µg/m³	6
>5 µg/m³	7

Using the scores above, the below matrix was implemented to work out the cost-benefit. Higher scores are awarded for those measures which are cheapest with the

greatest effect, with the lowest scores awarded for those which will be costly with limited reduction in pollution.

Table 7-6 - Cost Benefit Scoring Matrix

		Estimated Reduction in Pollutant Concentrations						
		>0.5µg/m³	0.5-1 µg/m³	1-2 µg/m³	1-2 µg/m³	2-3 µg/m³	3-4 µg/m³	>4 µg/m³
Cost of Measure	< £10k	6	8	10	12	14	16	18
	£10k - £50k	5	6	8	10	12	14	16
	£50k - £100k	4	5	6	8	10	12	14
	£100k - £500k	3	4	5	6	8	10	12
	£500k - £1m	2	3	4	5	6	8	10
	£1m - £10m	1	2	3	4	5	6	8
	> £10m	0	1	2	3	4	5	6

The analysis also accounts for the feasibility of implementing the measures, with those likely to progress given a higher priority than those which are acknowledged to be a challenge to implement. The feasibility score factors in local influences such as political backing, accessibility to funding options and resources available. As such, each measure was assigned a 'Feasibility score based on the table below. The score from the matrix was multiplied by this score.

Table 7-7 - Feasibility Scores

Feasibility Score	Score
Measure has already been started and just requires progressing	7
Very easy to implement, and political good will towards this, sufficient resources	6
Easy to implement, general political goodwill and available resources	5
Possible to implement but may require some learning/campaigning, moderately time intensive	4
Possible to implement but not straightforward and will require some learning/campaigning, moderately time intensive	3
Challenging to implement, would require some campaigning, time intensive	2
Very Difficult to implement, no political appetite, time and resource intensive	1

7.2.2 Cost-Benefit Analysis

Following the above assessment, it has been possible to rank the measures by cost, benefit and feasibility, this is shown in Following a cost-benefit analysis, one of the measures analysed obtained the highest overall score followed by nine measures which obtained the same overall score. The measure that scored the highest is considering air quality as part of the planning procedures and policy (Measure 1b) which has a broad impact on the air quality within the AQMAs. The following nine measures scored the same. Measure 2a, improve traffic signal control for smoother

traffic movement, aims to reduce the congestion near junctions. According to the Source Apportionment, congestion is a primary factor contributing to the elevated NO2 pollutant concentrations within the AQMAs. Measure 5d, alternative fuel (EV) infrastructure development, aims to reduce the proportion of petrol and diesel cars by increasing the proportion of EV cars. Petrol and diesel cars contribute to around 20% of NOx emissions within the AQMAs according to the Source Apportionment. The remaining seven high scoring measures are indirect interventions that focus on individual / group behavioural change and do not involve measures that directly impact infrastructure with physical changes. These measures (3a, 4a, 4b, 4c, 4d, 7b and 7c) aid behavioural shifts within the council staff, wider population and businesses to promote more sustainable and less polluting methods of transport. They are easy to implement at a low cost. Their aim is to promote better practices and behaviours across wider areas specially reducing the use of private cars.

The measure that scored the lowest is 2b which aims to deliver grade improvements at College Road/A10 junction, providing additional northbound and southbound lanes at the junction and increased length of northbound left filter into College Road, and banning all right turns. This measure scored the lowest as it is costly, very difficult to implement and time and resource intensive.

Table 7-8 below. With the feasibility weighting meaning that measures which are the easiest to progress are scored higher, these are prioritised.

Following a cost-benefit analysis, one of the measures analysed obtained the highest overall score followed by nine measures which obtained the same overall score. The measure that scored the highest is considering air quality as part of the planning procedures and policy (Measure 1b) which has a broad impact on the air quality within the AQMAs. The following nine measures scored the same. Measure 2a, improve traffic signal control for smoother traffic movement, aims to reduce the congestion near junctions. According to the Source Apportionment, congestion is a primary factor contributing to the elevated NO_2 pollutant concentrations within the AQMAs. Measure 5d, alternative fuel (EV) infrastructure development, aims to reduce the proportion of petrol and diesel cars by increasing the proportion of EV cars. Petrol and diesel cars contribute to around 20% of NO_x emissions within the AQMAs according to the Source Apportionment. The remaining seven high scoring measures are indirect interventions that focus on individual / group behavioural change and do not involve measures that directly impact infrastructure with physical changes. These measures (3a, 4a, 4b, 4c, 4d, 7b and 7c) aid behavioural shifts within the council staff, wider population and businesses to promote more sustainable and less polluting methods of transport. They are easy to implement at a low cost. Their aim is to promote better practices and behaviours across wider areas specially reducing the use of private cars.

The measure that scored the lowest is 2b which aims to deliver grade improvements at College Road/A10 junction, providing additional northbound and southbound lanes at the junction and increased length of northbound left filter into College Road, and banning all right turns. This measure scored the lowest as it is costly, very difficult to implement and time and resource intensive.

Table 7-8 - Cost Benefit Analysis of Measures

Measure No.	Measure	Cost Score	Air Quality Effect Score	Feasibility Score	Overall Score
1b	The Council fully consider Air quality as part of planning procedures and policy.	7	1	7	42
2a	Improved traffic signal control for smoother traffic movement, e.g. install Smart Traffic Lights at the Church Lane and College Road Junctions	5	3	6	36
5d	Alternative fuel (EV) infrastructure development	7	1	6	36
4d	The Council are committed to raising the profile with our businesses of how they can improve Air Quality.	7	1	6	36
4a	The Council will strive to provide clear communication around travel.	7	1	6	36
4b	The Council will actively engage with residents on Social media to encourage behaviour change to help Air Quality.	7	1	6	36
3a	The Council will encourage sustainable methods of travel by engaging with the workforce	6	1	6	36
7b	The Council actively encourage staff to car share to reduce the number of cars on the road	7	1	6	36
7c	The Council actively encourage different modes of transport for staff to get to and from work	7	1	6	36
4c	The Council are encouraging remote/flexible working to reduce car usage.	7	1	6	36
4f	The Council will conduct anti-idle interventions around Educational establishments e.g. Schools	7	1	5	30
4g	The Council are committed to reduce anti-idling at taxi ranks	7	1	5	30
4e	The Council will engage with National campaigns, where appropriate to do so, such as Clean Air day	7	1	5	30
5c	The Council are committed to procure low emission vehicles for use by staff.	7	1	5	30
7a	The Council will consider the availability of charging points across the Borough	7	1	5	30
5e	Install rapid EV charging points within all Council-owned Car Parks	7	1	5	30
8	Air quality alerts to promote information to the most vulnerable.	7	1	5	30
9	Consider new technologies and their application to improve air quality in AQMAs	7	1	5	30
3b	The Council also consider the provision for signage and ability to park bicycles across the Borough.	7	1	4	24
5b	Collaborating with bus operators to introduce ultra-low emission vehicles into the bus fleet (new or retrofit). Target use of ULEV into the problem areas.	5	1	5	20
6b	Council funding to provide free buses for all schools	5	1	5	20
6a	City link shuttle service to key towns, e.g. various proposals from the Broxbourne Transport Strategy (High Leigh, Brookfield/Cheshunt Lakeside, Park Plaza enhancements), Broxbourne borough – Enfield cross-boundary services; extending one or more TfL services to Park Plaza; extending the Brookfield service down into Enfield.	5	1	5	20
3c	The Council have considered new cycle routes alongside major developments.	5	2	4	20

Measure No.	Measure	Cost Score	Air Quality Effect Score	Feasibility Score	Overall Score
1a	The Council will continue to provide EV charging points that are accessible and efficient.	5	1	5	20
5a	The Council will review taxi licensing fees to consider sustainability.	7	1	3	18
6d	Incentivise public transport usage, e.g. - Provision of information about existing services - Campaigns - Season ticket loan/discounts - Subsidised tickets	5	1	4	16
6c	Public transport infrastructure improvements, e.g. - Enhanced bus shelters - Accurate electronic timetables - m-tickets / contactless payment options	5	1	4	16
2b	At grade improvements at College Road/A10 junction, providing additional northbound and southbound lanes at the junction and increased length of northbound left filter into College Road, and banning all right turns. The outline design for the scheme can be found as part of the Broxbourne Transport Strategy.	5	1	2	8

8 Appendix A: Response to Consultation

Table A.1 – Summary of Responses to Consultation and Stakeholder Engagement on the AQAP

Consultee	Category	Response
<Insert consultee e.g. Chamber of Commerce>	<Insert category e.g. Business>	<Insert text e.g. Disagree with plan to remove parking on High Street in favour of buses and cycles; consider it will harm business of members>

9 Appendix B: Reasons for Not Pursuing Action Plan Measures

Table B.1 – Action Plan Measures Not Pursued and the Reasons for that Decision

Action category	Action description	Reason action is not being pursued (including Stakeholder views)
<Select from the categories in the blue instruction box above>	<Insert description of measure>	<Insert text here>

10 <Appendix C: Add Additional Appendices as Required>

11 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
AQS	Air Quality Strategy
ASR	Air quality Annual Status Report
BBC	Broxbourne Borough Council
CAZ	Clean Air Zones
COMEAP	Committee on the Medical Effects of Air Pollutants
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
EU	European Union
HCC	Hertfordshire County Council
HGV	Heavy Goods Vehicles
IMD	Indices of Multiple Deprivation
JAQU	Joint Air Quality Unit
LAQM	Local Air Quality Management
LCWIP	Local Cycling and Walking Infrastructure Plan
LGV	Light Goods Vehicles
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less

Abbreviation	Description
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
ULEZ	Ultra Low Emission Zone

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