Rugby Borough Council

Air Quality Action Plan

In fulfilment of Part IV of the Environment Act 1995 (as amended 2021)

Local Air Quality Management

September 2024

Information	Rugby Borough Council Details
Local Authority Officer	Henry Biddington
Department	Environmental Health
Address	Rugby Borough Council Environment and Public Realm Commercial Regulation Team Town Hall Evreux Way Rugby CV12 2RR
Telephone	01788 533 607
E-mail	henry.biddington@rugby.gov.uk
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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 Rugby Borough Council (RBC) between 2024-2028.

This action plan replaces the previous action plan which ran from 2006-2011. Projects successfully delivered through the past action plan and subsequent updates, which have contributed to air quality improvements in the borough in that time, include:

- The development of an Air Quality and Planning Supplementary Planning Document to provide guidance to planners of what developments require Air Quality Assessment and what mitigation is suitable.
- Implementation of the Health Protection Strategy 2017-2021, alongside Coventry and Warwickshire Air Quality Alliance.
- Rugby Western Relief Road.
- Warwick Street Gyratory Improvements.
- Decriminalisation of Parking Enforcement within Rugby Borough (now referred to as Civil Parking Enforcement CPE) to reduce number of vehicles parked on streets and ease congestion.
- Variable Message Signing to reduce unnecessary distance travelled by vehicles looking for parking spaces.

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

equalities issues, because areas with poor air quality are also often the less affluent areas[1,2].

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion[3]. RBC is committed to reducing the exposure of people in Rugby Borough to poor air quality in order to improve health.

We have developed a list of 16 actions that can be considered under eight broad topics:

- Traffic Management;
- Transport Planning and Infrastructure;
- Promoting Travel Alternatives;
- Promoting Low Emission Transport;
- Policy Guidance and Development Control;
- Environmental Permits;
- Public Information; and
- 'Other'.

There is one AQMA in Rugby, which was declared for the NO_2 annual mean objective in 2004. As the Rugby AQMA has now been compliant since 2020, our priorities for this AQAP are:

1) To maintain compliance with the AQS objectives to ensure revocation of the AQMA in 2025[4];
2) Continue to implement AQAP measures in support of Priority 1, to improve air quality beyond statutory compliance; and

[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 Department for Environment, Food and Rural Affairs. Abatement cost guidance for valuing changes in air quality, May 2013

[4] Defra guidance on compliance in the context of COVID-19 affected years, FAQ 142, available at: https://laqm.defra.gov.uk/faqs/faq-142-three-or-more-years-of-compliance-with-air-quality-objectives/

3) If and when the AQMA is revoked, put in place a robust Air Quality Strategy for RBC.

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), but for which we may have useful evidence, and so we will continue to work with regional and central government on policies and issues beyond Rugby Borough Council's direct influence.

Responsibilities and Commitment

This AQAP was prepared by the Environmental Health Department of Rugby Borough Council with the support of AECOM Limited, and with the assistance and agreement of the following officers and departments:

RBC Greenspace and Biodiversity;

RBC Planning - Major Projects team;

Warwickshire County Council (WCC) transport data team; and

WCC transport planning.

This AQAP has been approved by:

David Burrows Chief Officer Regulation and Safety at Rugby Borough Council

This AQAP has been signed off by a Director of Public Health.

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

If you have any comments on this AQAP, please send them to Henry Biddington at:

Environmental Health & Community Safety Manager
Regulatory Services
Regulation and Safety
Rugby Borough Council
Tel: 01788 533607
Mail: Henry.Biddington@rugby.gov.uk

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1. Introduction

This Draft Air Quality Action Plan (AQAP) outlines the actions that Rugby Borough Council (RBC) 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 Rugby.

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 in 2021[5], and relevant regulations made under that part, and to meet the requirements of the Local Air Quality Management (LAQM) statutory process.

The previous AQAP covered the years 2006-2011. This Plan has been updated to both build on those measures that were successfully implemented within the previous AQAP, and add a new focus and refinement to air quality policy now that compliance has been achieved. 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 RBC's ASR.

A steering group was formed to develop this AQAP, full details of which are provided in Section 4.2, with guidance provided by Rugby Borough Council's contracted consultants, AECOM. It is intended that this group will continue to meet through the implementation of the AQAP to ensure the measures are being enacted, and where barriers arise, that these are addressed where possible.

The Draft Plan is now subject to formal consultation and has been submitted to the statutory consultees, as well as relevant internal parties, for comment. Once consultation comments have been received, these will be addressed as relevant and a Final AQAP adopted by September 2024.

[5] HM Stationary Office 2021 Environment Act 2021, Available at: https://www.legislation.gov.uk/ukpga/2021/30/enacted

2. Summary of Current Air Quality in Rugby Borough Council

RBC's ASR provides a detailed account of air quality within the borough. ASRs are available to all on the Council's website[6].

The main pollutants of concern in Rugby, as in most areas of the UK, are associated with road traffic, in particular nitrogen dioxide (NO_2) and particulate matter (PM) at locations close to busy, congested roads where people may live, work or shop.

Monitoring data in the borough indicates an overall downward trend in NO_2 concentrations in RBC observed over the past five years. There were no exceedances of the AQS objective for NO_2 (40 µg/m^3) recorded in the latest complete year of monitoring data (2022) available.

2.1 Air Quality Management Areas

The borough of Rugby currently has one AQMA which covers the whole urban area of Rugby bounded by the A5, M6 and M45 as well as minor roads to the west of Long Lawford. The AQMA was declared as of December 2004 for exceedances of the annual NO_2 mean AQS objective, which a Detailed Assessment predicted future exceedances were likely on a number of major roads in the centre of Rugby town and in Dunchurch. The extent of the AQMA is shown in Figure 2-1.

As per section 2.22 of LAQM.TG(22)[7], AQAPs should also, where possible, include the population for the AQMA area. Based on the 2021 census[8], the town of Rugby's population is 78,117, so it can be estimated that approximately this number of people currently reside within the AQMA.

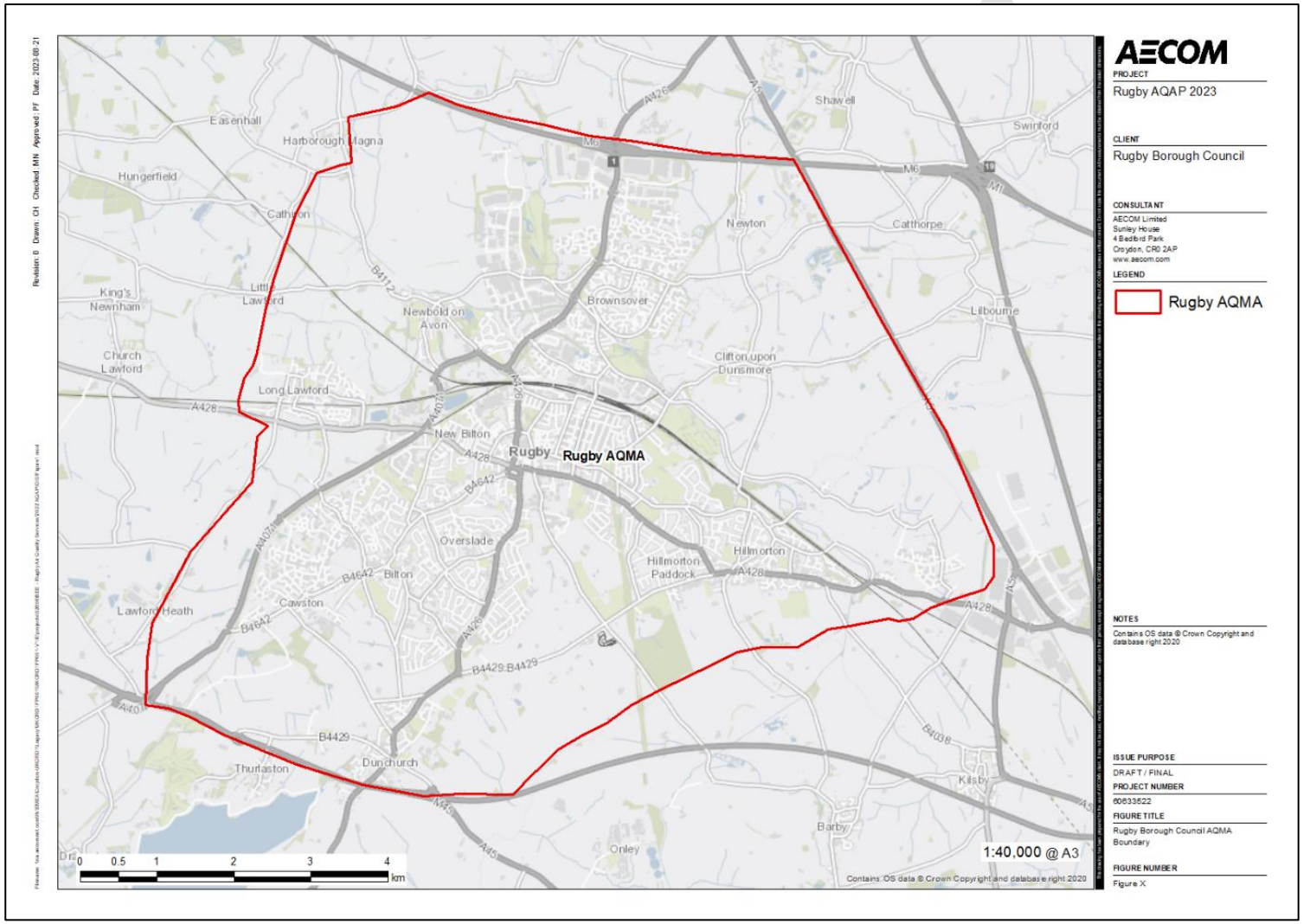
[6] Rugby Borough Council, Air Quality Annual Status Report (ASR), 2023. Available at : https://www.rugby.gov.uk/w/air-quality-monitoring-reports

[7] Department for Environment, Food and Rural Affairs (2022). Local Air Quality Management. Technical Guidance (TG22). August 2022. Available at: https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf

[8] Office for National Statistics (2021) Available at: https://www.ons.gov.uk/census

The level of exceedance at declaration in 2004 was 59.2 µg/m^3. Rugby AQMA has been compliant with national objectives for three years. The highest concentration monitored in 2022 was 32.4 µg/m^3. Defra recommends that AQMAs with three or more years compliance should be considered for revocation. However, if compliance began in 2020 then years of compliance affected by the COVID-19 pandemic should be discounted[4]. As 2020 was the first year of compliance for Rugby AQMA, 2020 and 2021 have been discounted as relevant years of compliance. If the monitoring continues to report concentrations below the national objective in 2023 (still to be confirmed at the time of writing) and 2024, Rugby AQMA will be considered for revocation in 2025. In the instance of revocation, this AQAP will be used to form the basis of an Air Quality Strategy instead, so that air quality remains a priority in the borough, and as required in the 2021 update to the Environment Act[5].

Figure 2-1 - Rugby AQMA Boundary



2.2 Summary of Monitoring Undertaken

2.2.1 Nitrogen Dioxide (NO_2)

RBC does not undertake automatic (continuous) monitoring. The Council undertook non-automatic (passive) monitoring of NO_2 at 53 sites for 2023, 42 of which are located within the Rugby AQMA. The annual mean NO_2 concentrations (2018-2023) at diffusion tube sites are shown in Table 2-1. No exceedances of the AQS objective value (40 µg/m^3) have been recorded in the borough since 2019. An overall downward trend can be seen in annual concentrations between 2018 and 2023. The highest concentration recorded in 2023 was 34.2 µg/m^3, recorded at S2.

Table 2-1 Annual Mean NO_2 Monitoring Results 2018 – 2023 (µg/m^3)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	2018	2019	2020	2021	2022	2023
S1	449000	277178	Kerbside	17.6	16.2	13.5	15.6	15.3	13.4
S2	440416	284401	Roadside	**46.1**	**45.5**	33.5	33.7	31.4	34.2
S3	447316	276162	Urban Background	14.2	13.1	9.5	9.3	9.5	8.9
S4	441131	275648	Urban Background	12.1	10.4	8.2	8.9	8.3	7.6
S5	438642	274418	Kerbside	24.0	23.5	16.4	17.7	17.6	16.9
S6	449671	274795	Urban Background	14.9	13.6	10.4	11.5	10.7	9.8
S7	448863	272786	Urban Background	11.6	11.7	8.6	9.0	8.1	7.8
S8	450138	275557	Kerbside	30.0	28.0	26.9	24.3	25.9	24.1
S9	451187	275334	Roadside	15.8	16.3	11.8	12.3	12.0	11.1

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	2018	2019	2020	2021	2022	2023
S10	450069	275040	Roadside	30.8	35.7	25.7	26.4	26.1	27.2
S11	449787	275224	Roadside	21.8	22.6	16.2	17.4	16.3	16.9
S12	451445	277245	Urban Background	19.6	20.9	14.3	13.3	13.4	13.0
S13	450088	276229	Roadside	34.8	33.5	26.7	26.5	26.6	27.2
S14	439450	277523	Urban Background	15.1	16.8	10.9	10.7	11.1	9.5
S15	449168	275411	Kerbside	26.9	25.1	22.1	20.7	26.7	24.9
S16	436867	275275	Roadside	19.6	18.8	13.5	14.6	14.1	13.3
S17, S18, S19	431271	266404	Roadside	18.4	17.4	12.7	13.2	12.6	12.2
S20	450137	275849	Roadside	27.8	26.0	19.5	20.2	17.6	18.0
S21	451698	273273	Roadside	22.5	22.2	15.5	15.8	17.2	16.1
S22	452403	273567	Roadside	21.3	20.7	15.1	16.1	15.7	14.5
S23	452672	273633	Roadside	21.0	21.8	14.4	17.1	16.8	16.1
S24	448496	271244	Kerbside	**43.3**	38.5	27.3	28.3	27.0	28.2
S25	448414	271175	Roadside	29.3	25.4	19.0	20.7	18.8	17.8
S26	448999	275505	Roadside	19.1	18.7	14.5	14.9	14.6	13.1
S27	449435	275543	Roadside	18.2	21.2	14.4	14.9	13.3	13.1
S28	449011	276329	Roadside	17.2	16.7	11.7	11.1	11.6	10.6
S29	449575	276540	Urban Background	19.8	21.0	16.3	18.4	15.7	13.9
S30	451107	275838	Kerbside	34.5	33.0	20.8	25.9	28.6	26.8

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	2018	2019	2020	2021	2022	2023
S31	450848	275849	Roadside	27.3	24.7	21.3	20.8	21.1	16.3
S32	450750	275547	Roadside	29.3	27.4	21.1	21.2	20.9	20.4
S33	450510	275355	Roadside	22.4	22.2	15.7	16.6	16.4	14.3
S34	450405	275329	Roadside	24.8	23.1	15.2	17.1	17.1	16.5
S35	450444	275236	Roadside	31.7	31.0	19.9	22.0	23.7	23.4
S36	450870	275043	Roadside	28.9	29.8	24.2	26.8	23.8	23.0
S37	450897	275059	Roadside	23.9	25.2	20.7	22.7	21.5	19.7
S38	451868	275501	Kerbside	26.5	25.1	17.1	19.5	18.9	16.5
S39	450852	275116	Roadside	27.9	26.2	19.6	21.0	20.8	20.6
S40	450181	275029	Roadside	26.5	28.3	22.1	23.9	23.6	21.5
S41	450010	274998	Roadside	25.7	24.8	17.8	20.4	20.2	17.2
S42	448855	274352	Roadside	22.8	21.2	15.5	17.6	16.9	15.2
S43	450162	274898	Roadside	25.9	26.3	19.1	20.0	21.7	18.8
S44	453394	273633	Roadside	27.4	23.6	17.5	19.8	20.4	19.7
S45	442963	277071	Roadside	22.5	23.8	16.3	13.5	17.2	15.1
S46	437555	274561	Kerbside	36.7	35.3	26.3	29.9	27.0	25.4
S47	450445	275495	Kerbside	32.6	29.5	20.2	22.6	23.0	21.2
S48	450304	275314	Roadside	31.0	34.1	23.1	22.3	24.5	23.2
S49	450864	274896	Roadside	34.0	30.0	20.6	23.2	24.7	21.5
S50	448169	273625	Roadside	22.9	21.3	16.8	18.6	18.1	14.9
S51	443433	279208	Roadside	29.4	28.1	19.0	20.6	19.8	21.1

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	2018	2019	2020	2021	2022	2023
S52	448537	271195	Roadside	20.8	20.9	14.1	15.6	14.9	12.7
S53	448361	271334	Roadside	21.8	21.8	13.7	15.0	15.2	15.0
S54	450269	274998	Roadside	38.7	**41.6**	28.5	31.8	32.4	29.1
S55	445004	281330	Roadside	20.8	21.4	13.5	14.4	15.6	12.0

Note: Values in **bold** are above the AQS objective value (40 µg/m^3).

2.2.1 Particulate Matter (PM_{10})

RBC ceased PM_{10} (particulate matter with an aerodynamic diameter of 10µm or less) monitoring in December 2017. Monitoring at the Parkfield Road location was originally commenced to investigate particulate matter concentrations at sensitive receptors near to the Cemex Climafuel facility, but there were no monitored exceedances of the PM_{10} annual mean or short-term mean AQS objectives after several years of monitoring.

2.2.2 Particulate Matter ($PM_{2.5}$)

RBC ceased $PM_{2.5}$ monitoring at the Parkfield Road location in December 2017, as there were no monitored exceedances of the $PM_{2.5}$ annual mean target value after several years of monitoring.

As no $PM_{2.5}$ monitoring is undertaken, $PM_{2.5}$ background concentrations from Defra Background Maps[9] were reviewed. The highest background $PM_{2.5}$ concentration within the Rugby AQMA was 10.23 µg/m^3 in 2022. Outside the AQMA the highest $PM_{2.5}$ concentration was 9.35 µg/m^3 in 2022. Both maximum concentrations are significantly below the current air quality standard of 20 µg/m^3, and already close to the new target of 10 µg/m^3, to be achieved by 2040.

[9] Department for Environment, Food and Rural Affairs, Background Mapping Data for Local Authorities – 2018. Available at: https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018

3. Rugby Borough Council's Air Quality Priorities

3.1 Public Health Context

Local Air Quality represents a significant concern for public health. Defra estimates the mortality burden of the air pollution mixture (based on both particulate matter ($PM_{2.5}$) and nitrogen dioxide (NO_2)) in the UK, is equivalent to 29,000 to 43,000 deaths at typical ages, with a total estimated healthcare cost to the NHS and social care of £157 million in 2017. Defra estimated that in 2012, poor air quality cost the economy £2.7 billion through its impact on productivity[10].

Epidemiological studies have demonstrated that long-term exposure to air pollution can reduce life expectancy, mainly due to cardiovascular diseases, respiratory conditions and lung cancer. In addition, short-term exposure (over hours or days) to elevated levels of air pollution can also cause health impacts, such as reduced lung function, exacerbation of asthma, increases in respiratory and cardiovascular hospital admissions and mortality.

The Chief Medical Officers Annual Report (2022)[11] discusses evidence for the short- and long-term health effects of the main outdoor air pollutants, including particulate matter (PM) especially fine particulate matter ($PM_{2.5}$), nitrogen dioxide (NO_2), ozone (O_3) sulphur dioxide (SO_2) and others along with additional indoor air pollutants such as volatile organic compounds (VOCs). The report highlights that air pollution does not affect everyone equally. Air pollution can affect social groups differently, by factors such as age, socio-economic gradient and ethnicity. These disparities are both by air pollution exposure and by vulnerability – for example pregnant women,

[10] Public Health England (2018)Health matters: air pollution available at: Health matters: air pollution - GOV.UK (www.gov.uk)

[11] Department of Health and Social Care (2022). Chief Medical Officer's Annual Report. 2022: Air Pollution. Available at: https://www.gov.uk/government/publications/chief-medical-officers-annual-report-2022-air-pollution

children and those with health conditions are more vulnerable to harm, even if their exposure is the same as other population groups.

Recent evidence has indicated that health effects are possible from lower levels of exposure to pollutants, with no clear lower thresholds detected for the effects for air pollution at a population level. The updated World Health Organisation (WHO) Global Air Quality Guidelines[12] published in 2021 reflect this. In WHO's annual average air quality guidelines, the recommended air quality guideline levels were reduced from 10 to 5 µg/m^3 for fine particulate matter ($PM_{2.5}$) and 40 to 10 µg/m^3 for NO_2. This evidence helps to support need for the second priority of this AQAP.

Whilst a great deal of focus is places on NO_2 within LAQM, particulate matter is also acknowledged to be linked with health effects. Modelling estimates suggest that a reduction of one µg/m^3 of $PM_{2.5}$ in 2017 in England could prevent 50,900 cases of coronary heart disease, 16,500 strokes, 4,200 lung cancers and 9,300 cases of asthma in people aged over 18 years by 2035.

To encourage health and active travel in RBC, there are a number of dedicated cycling routes. The National Cycle Network also passes through Rugby. The Walking for Health programme organises free walks weekly at locations across the borough.

Rugby Borough Council continues to work with the County Council to develop and implement the Warwickshire Health and Wellbeing Strategy 2021 – 2026[13]. This is a high-level plan for improving health and wellbeing and reducing inequalities in health within Warwickshire. The Health and Wellbeing Strategy is owned by Warwickshire's Health and Wellbeing Board, a collaborative partnership bringing together senior leaders from the county, borough and district councils. The key priorities for Warwickshire identified in the Health and Wellbeing Strategy 2021 – 2026 are:

- Help our children and young people have the best start in life;

[12] World Health Organisation (2021). WHO global air quality guidelines. Available at: https://www.who.int/publications/i/item/9789240034228

[13] Warwickshire County Council (2021) Warwickshire Health and Wellbeing Strategy 2021 – 2026, Available at; https://www.warwickshire.gov.uk/healthandwellbeingstrategy

- Help people improve their mental health and wellbeing, particularly around prevention and early intervention in our communities; and
- Reduce inequalities in health outcomes and the wider determinants of health.

Rugby participates in the Air Quality Alliance. The Coventry and Warwickshire Air Quality Alliance meet on a quarterly basis. Public Health Warwickshire work in partnership with Coventry City Council, Solihull Metropolitan Borough Council, UK Health Security Agency (UKHSA) and the district and borough councils in Warwickshire. The Alliance service to be a multi-profession partnership forum for the sharing of ideas and evidence-based practice to agree on overarching areas for action, and co-ordinate collective action to address air quality.

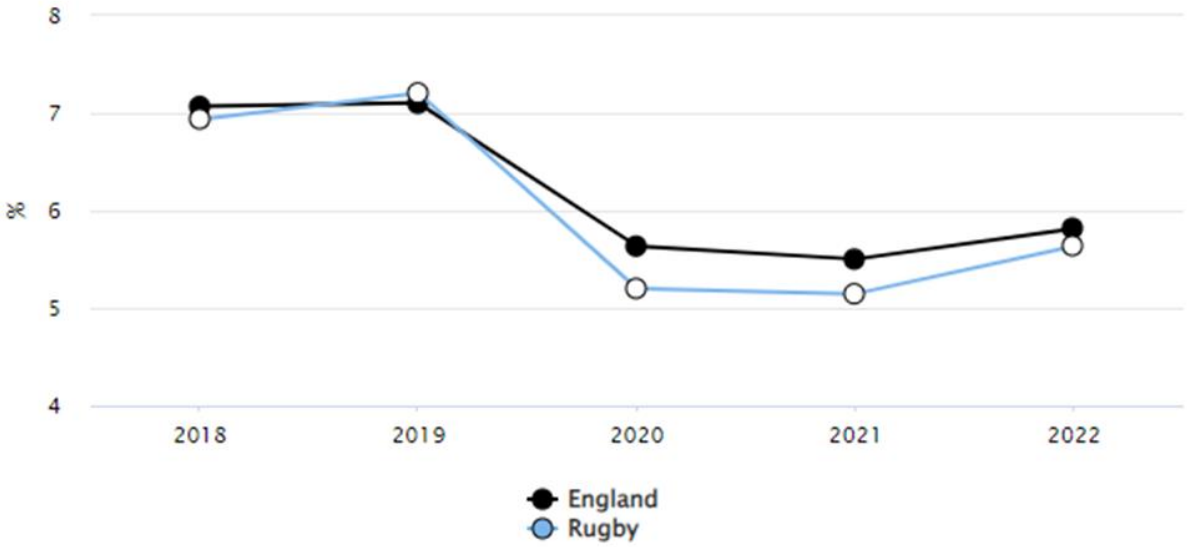
3.1.1 Public Health Outcomes Framework (PHOF)

The Public Health Outcomes Framework[14] includes an indicator relating to the fraction of mortality attributable to particulate pollution. This indicator enables Directors of Public Health to prioritise action on air quality in their local area to help reduce the health burden from air pollution. Indicator D01 'Fraction of mortality attributable to particulate air pollution' addresses the fraction of mortality attributable to particulate air pollution (specifically, $PM_{2.5}$ only), a value for which is presented for each local authority. In Rugby the PHOF D01 indicator estimates the fraction of mortality attributable to particulate air pollution is 5.6% for 2022. This is slightly below the percentage mortality attributable to the West Midlands Region and for England, at 5.7% and 5.8% respectively. The trend in PHOF D01 indicator is shown in Figure 3-1

Particulate matter can have a significant effect on public health. Modelling estimates suggest that a reduction of one µg/m_3 of $PM_{2.5}$ in 2017 in England could prevent 50,900 cases of coronary heart disease, 16,500 strokes, 4,200 lung cancers and 9,300 cases of asthma in people aged over 18 years by 2035.

[14] Office for Health Improvement & Disparities. Public Health Outcomes Framework. Available at: https://fingertips.phe.org.uk/profile/public-health-outcomes-framework

Figure 3-1 - Public Health Outcomes Framework D01 indicator for Rugby Borough Council and England



3.2 Planning and Policy Context

The AQAP has been developed with due consideration of existing strategy, policy and corporate priorities.

3.2.1 National Scale

Of relevance to this AQAP are the following:

- Clean Air Strategy 2019[15] - this strategy sets out central government plans for dealing with all sources of air pollution, the measures within which are aligned to this AQAP.
- Environment Act 2021[5] - provides the statutory drivers for this document, and sets the direction of future travel for air quality improvements to be continued beyond compliance.
- UK Air Quality Strategy 2023[16] - sets out the strategic framework for local authorities to follow in implementing air quality actions, which have been considered in the preparation of this AQAP (particularly section 4.3).

3.2.2 Local Scale

- Rugby Borough Local Plan 2011-3[17] - contains specific policies related to air quality to ensure this remains at the forefront of development decisions in the borough. Specifically, policies ED2 and HS5 are of relevance and limit the impact of development on air quality.

[15] Department for Environment, Food and Rural Affairs (2019). UK Clean Air Strategy 2019. Available at: https://www.gov.uk/government/publications/clean-air-strategy-2019

[16] Department for Environment, Food and Rural Affairs. Air quality strategy: framework for local authority delivery. Updated 25 August 2023. Available at: https://www.gov.uk/government/publications/the-air-quality-strategy-for-england/air-quality-strategy-framework-for-local-authority-delivery

[17] Rugby Borough Council (2019). Local Plan 2011-2031. Available at: https://www.rugby.gov.uk/w/local-plan-2011-2031

- Air Quality and Planning Supplementary Planning Document (SPD) 2021[18] - Related to Local Plan policy HS5, the SPD sets guidance for developers and their consultants to follow when assessing air quality impacts in the borough such that consistency can be applied by decision makers, and cumulative impacts reduced. This guidance was developed in co-operation between Coventry City Council, Coventry & Warwickshire Public Health, Nuneaton and Bedworth Borough Council, Rugby, Stratford District Council and Warwick District Council.
- South-West Rugby Masterplan Supplementary Planning Document[19] - focuses on a significant allocation and proportion of the proposed development growth in Rugby (approximately 5,000 dwellings), reiterating the air quality policy HS5 from the Local Plan.
- Corporate Strategy 2021-202420 - shapes local public services, with one of the main outcomes (climate) inclusive of policies and a strategic direction that is overall beneficial to air quality.

[18] Rugby Borough Council. Air Quality Supplementary Planning Document. Available at: https://www.rugby.gov.uk/w/air-quality-supplementary-planning-document-spd-

[19] Rugby Borough Council. South-West Rugby Masterplan Supplementary Planning Document (SPD). Available at: https://www.rugby.gov.uk/w/south-west-rugby-masterplan-supplementary-planning-document-spd-

[20] Rugby Borough Council. Corporate Strategy 2021-24. Available at: https://www.rugby.gov.uk/w/corporate-strategy-2021-24

3.3 Source Apportionment

The AQAP measures presented in this report are intended to be targeted towards the predominant sources of emissions within RBC's area. A source apportionment exercise was carried out by RBC in 2023, based on 2022 data[21]. This identified percentage road NOx contributions from the main roads of interest within the AQMA, shown in Table 3-1. An average profile is also shown both in Table 3-1 and Figure 3-2. The unweighted average does not take account of the number of vehicles in the area, but does serve to homogenise trends over the various discrete locations considered, to give a more general overview.

At most locations, diesel cars represent the highest contribution to road NOx, with the second highest being diesel LGVs.

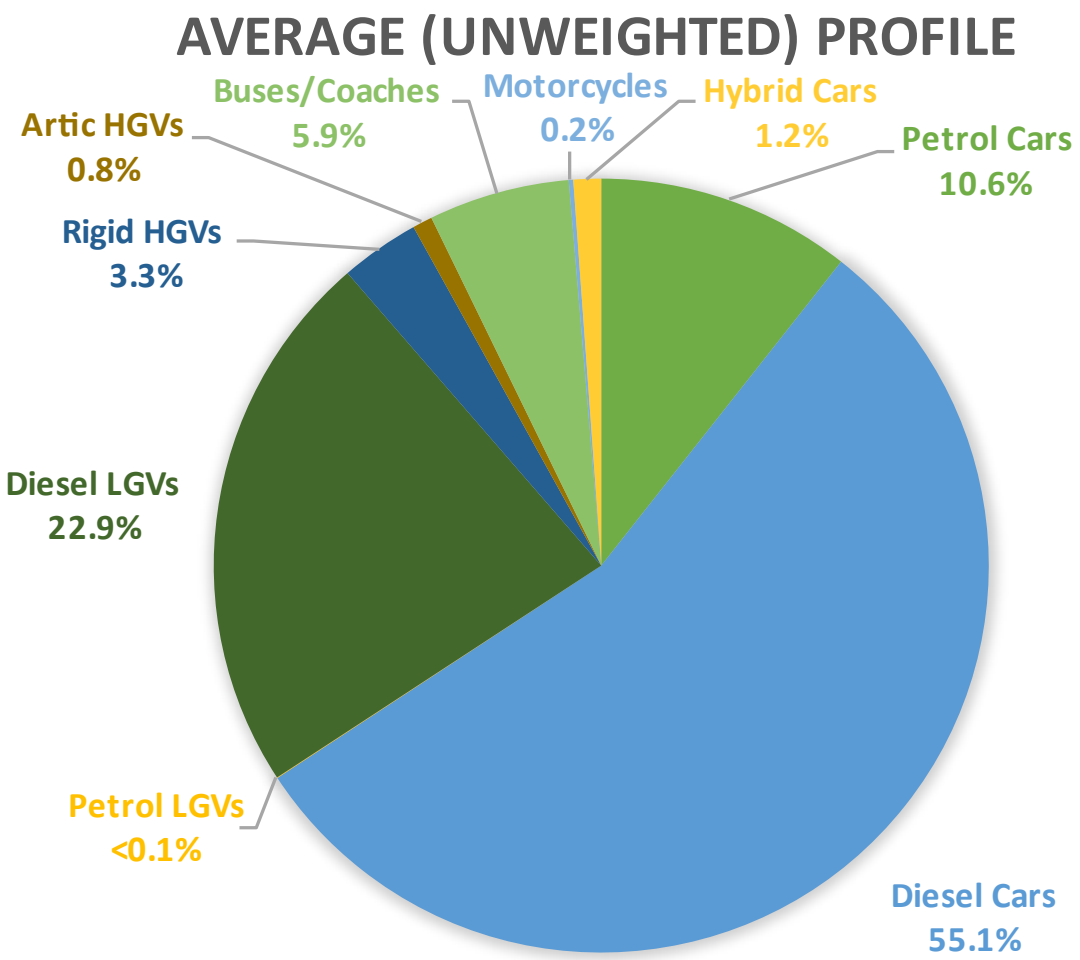
Buses are low contributors on the whole, with the exception of Newton Manor and Clifton Road. Leicester Road (M6 - Colton Park) is an atypical profile relative to the other locations. Here, diesel cars represent a much lower proportion of emissions, with diesel LGVs comprising the largest contribution of the emissions profile. Leicester Road and the A4071 is a designated major road and is more frequently used by heavier classes of vehicles relative to roads within the centre of Rugby, many of which are height restricted or inaccessible.

[21] This was done using version 11 of the EFT, prior to the release of version 12.

Table 3-1 - Road NO_x Emissions Percentage Breakdown

%s	A428 Hillmorton Road Rugby (near Bowen Road)	A428 Coventry Road, Long Lawford	D3114 Butlers Leap, Rugby	A428 Hillmorton Road, Rugby	D3061 Newton Manor Lane, Rugby	A426 Leicester Rd (M6 - Coton Park) Rugby	A426 Corporation Street, Rugby	B5414 Clifton Road, Rugby	A426 Gyratory, Rugby	Average (unweighted) Profile
Petrol Cars	12.8	12.2	11.7	12.4	7.6	4.2	12.5	10.3	12.1	10.6
Diesel Cars	67.6	60.3	59.5	65.7	37.7	22.7	64.0	56.6	62.0	55.1
Petrol LGVs	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1
Diesel LGVs	13.1	21.0	22.0	13.7	22.4	61.1	15.5	17.7	19.2	22.9
Rigid HGVs	1.5	1.7	2.1	1.7	7.7	6.7	2.5	3.6	2.2	3.3
Artic HGVs	0.2	0.0	0.5	0.2	0.5	4.3	0.9	0.3	0.5	0.8
Buses/Coaches	3.3	3.1	2.4	4.9	23.1	0.3	3.1	10.2	2.6	5.9
Motorcycles	0.1	0.2	0.5	0.2	0.1	0.1	0.3	0.1	0.1	0.2
Hybrid Cars	1.4	1.4	1.2	1.3	0.9	0.5	1.3	1.1	1.3	1.2

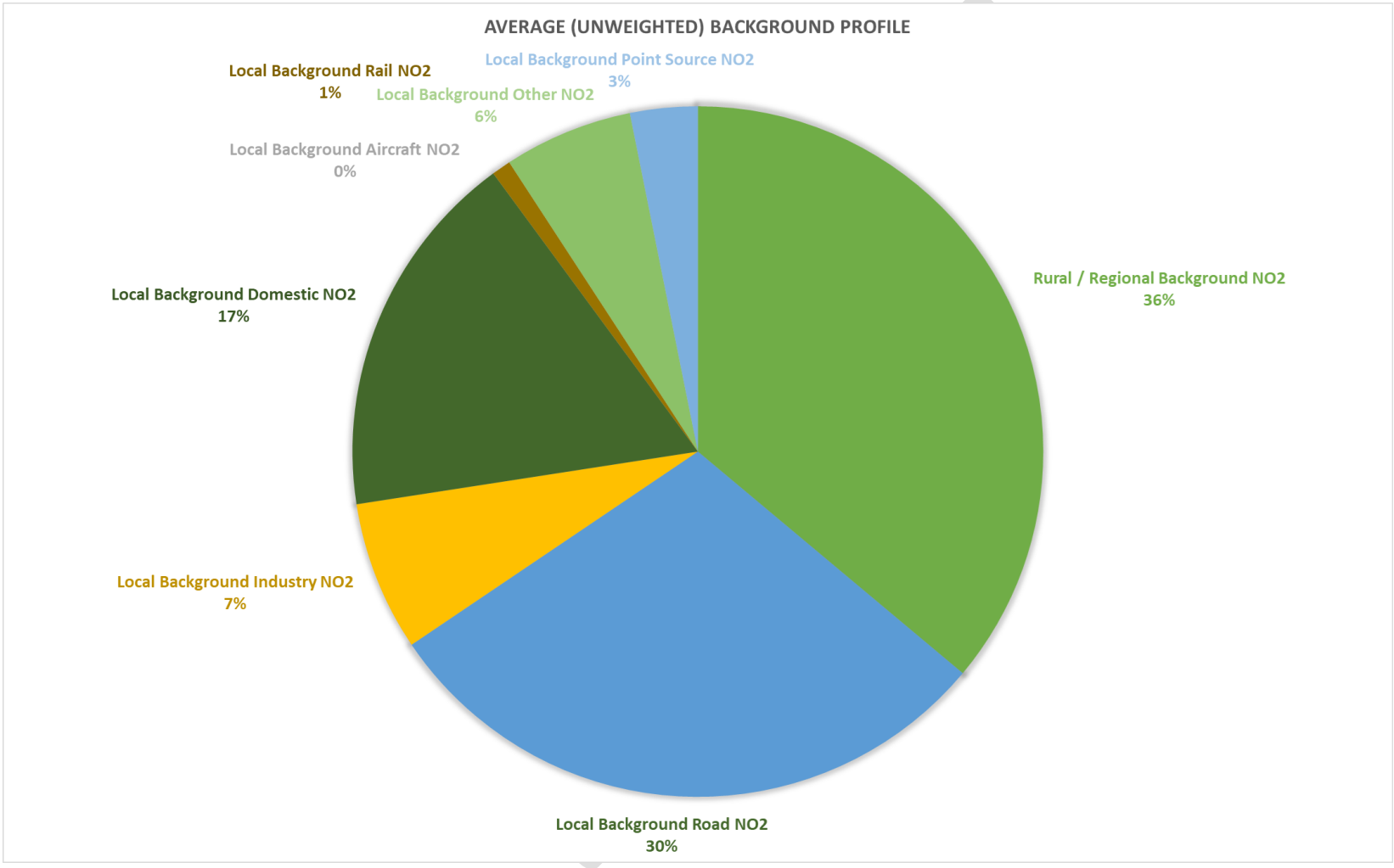
Figure 3-2 - Average (Unweighted) Road NOx Emissions Profile



Total NO_2 has also been summarised in Table 3-2 for roads where 2022 diffusion tube monitoring data was available. Backgrounds are also included, to provide a more wholistic view of the contributors to ambient concentrations beyond road source emissions. Regional Backgrounds represent sources from outside RBC and Local Backgrounds represent emissions from sources within the Council borders, but that have had the chance to disperse by the time they have reached the locations referenced.

Figure 3-3 presents an unweighted average of background NO_2 profile. It can be seen beyond road traffic sources from within the Council borders, a significant component of background NO_2 concentrations are domestic sources, followed by industrial sources.

Figure 3-3 - Average (Unweighted) Background NO_2 Profile



The results indicate road sources represent approximately half to the total NO_2 at each site. Although all monitored NO_2 concentrations in the borough are currently compliant with air quality objectives, this suggests that RBC can still affect further improvement, since local sources are key contributors to ambient concentrations.

Table 3-2 - Contribution to Annual Average NO_2 Emissions

Category		Metric (Left figure µg/m^3; right figure %)				
		A428 Hillmorton Road	B4429 Ashlawn Road	A426 Corporation Street	B5414 Clifton Road	A426 Gyratory
Regional Background		4.35 (17.6)	4.45 (25.9)	4.12 (15.8)	4.12 (17.4)	4.33 (20)
Local Background		5.66 (22.9)	3 (17.5)	11.51 (44.1)	11.51 (48.6)	6.14 (28.3)
Road NO_2	Total	14.74 (59.6)	9.74 (56.7)	10.44 (40)	8.07 (34)	11.19 (51.7)
	Petrol Cars	1.82 (7.4)	1.36 (7.9)	1.3 (5)	0.83 (3.5)	1.35 (6.2)
	Diesel Cars	9.69 (39.1)	6.73 (39.2)	6.67 (25.6)	4.57 (19.3)	6.94 (32)
	Diesel LGVs	2.01 (8.1)	1.27 (7.4)	1.62 (6.2)	1.42 (6)	2.15 (9.9)
	Rigid HGVs	0.25 (1)	0.16 (0.9)	0.26 (1)	0.29 (1.2)	0.25 (1.2)
	Artic HGVs	0.02 (0.1)	0.02 (0.1)	0.09 (0.4)	0.03 (0.1)	0.06 (0.3)
	Buses/Coaches	0.72 (2.9)	0.02 (0.1)	0.32 (1.2)	0.83 (3.5)	0.29 (1.3)
	Motorcycles	0.02 (0.1)	0.02 (0.1)	0.03 (0.1)	0.01 (0)	0.02 (0.1)
	Hybrid Cars	0.19 (0.8)	0.16 (0.9)	0.14 (0.5)	0.09 (0.4)	0.14 (0.7)

Figure 3-4 shows a visual representation of the emissions percentage breakdowns when converted to NO_2, including background concentrations.

Figure 3-5 shows a visual representation of the percentage breakdown of vehicle emissions out of road traffic emissions only (i.e. not including backgrounds) when converted to NO_2.

Figure 3-4 - NO_2 Emissions Percentage Breakdown

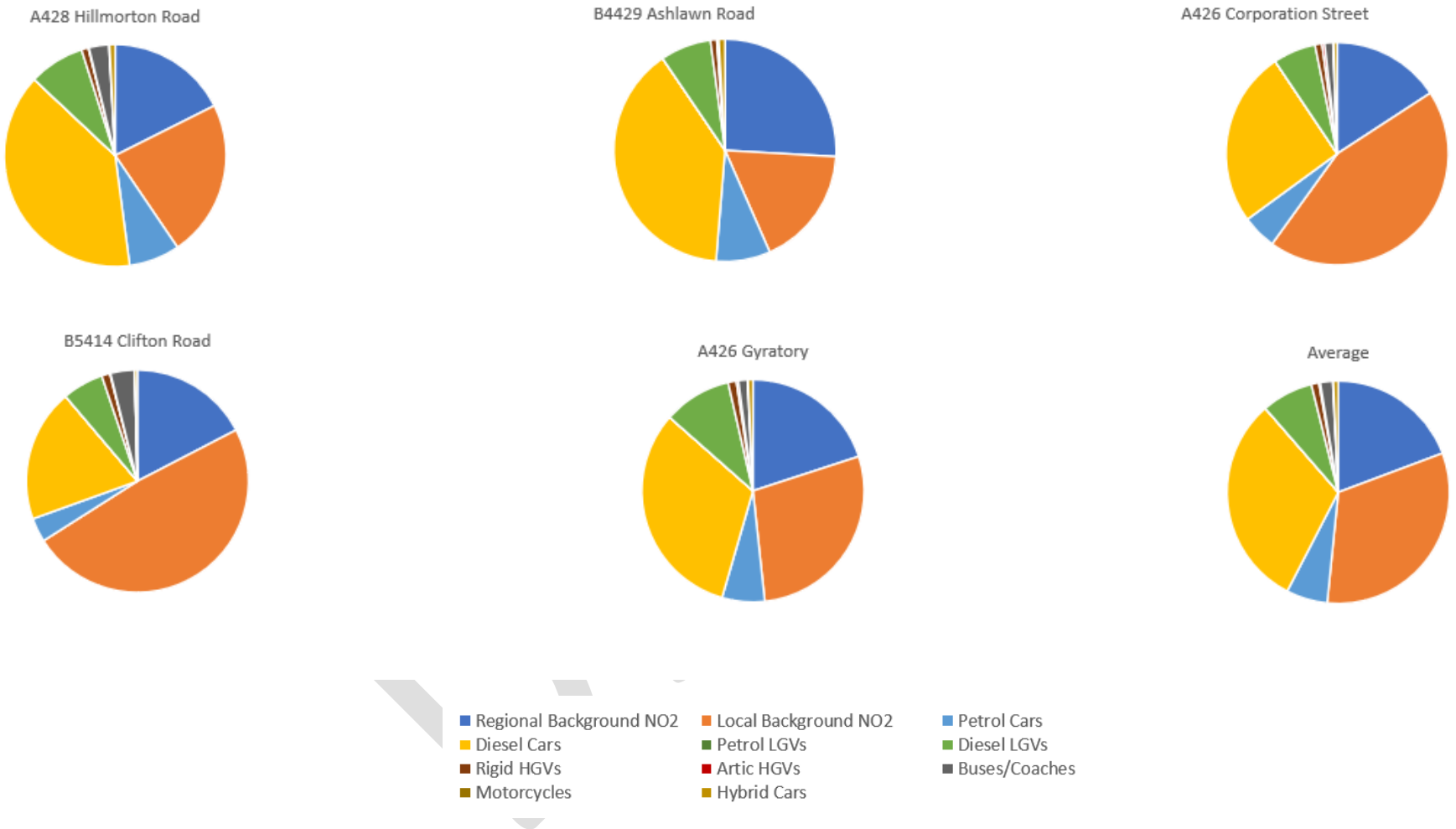
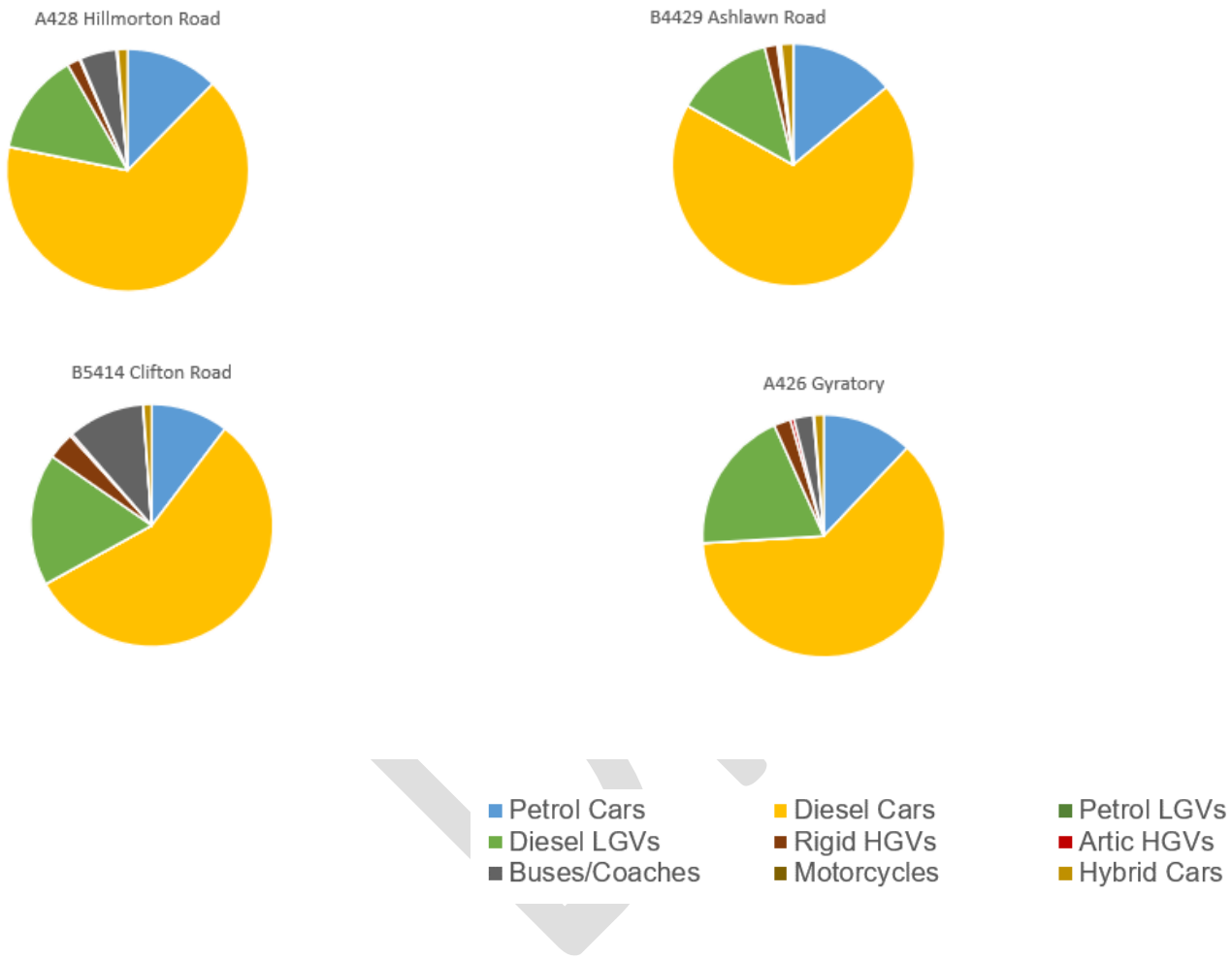


Figure 3-5 - Road NO_2 Emissions Percentage Breakdown



3.4 Required Reduction in Emissions

Of the monitoring sites within Rugby AQMA, one site recorded an exceedance of the national AQS objective in 2019 (the most recent year of exceedance). The location of Diffusion Tube site S54 is shown in Figure 3-6. The site is located on Lawrence Sheriff Street in central Rugby. 2019 data was used as a reference as it is the last year of exceedance and because 2019 represents the latest available data not affected by the COVID-19 pandemic.

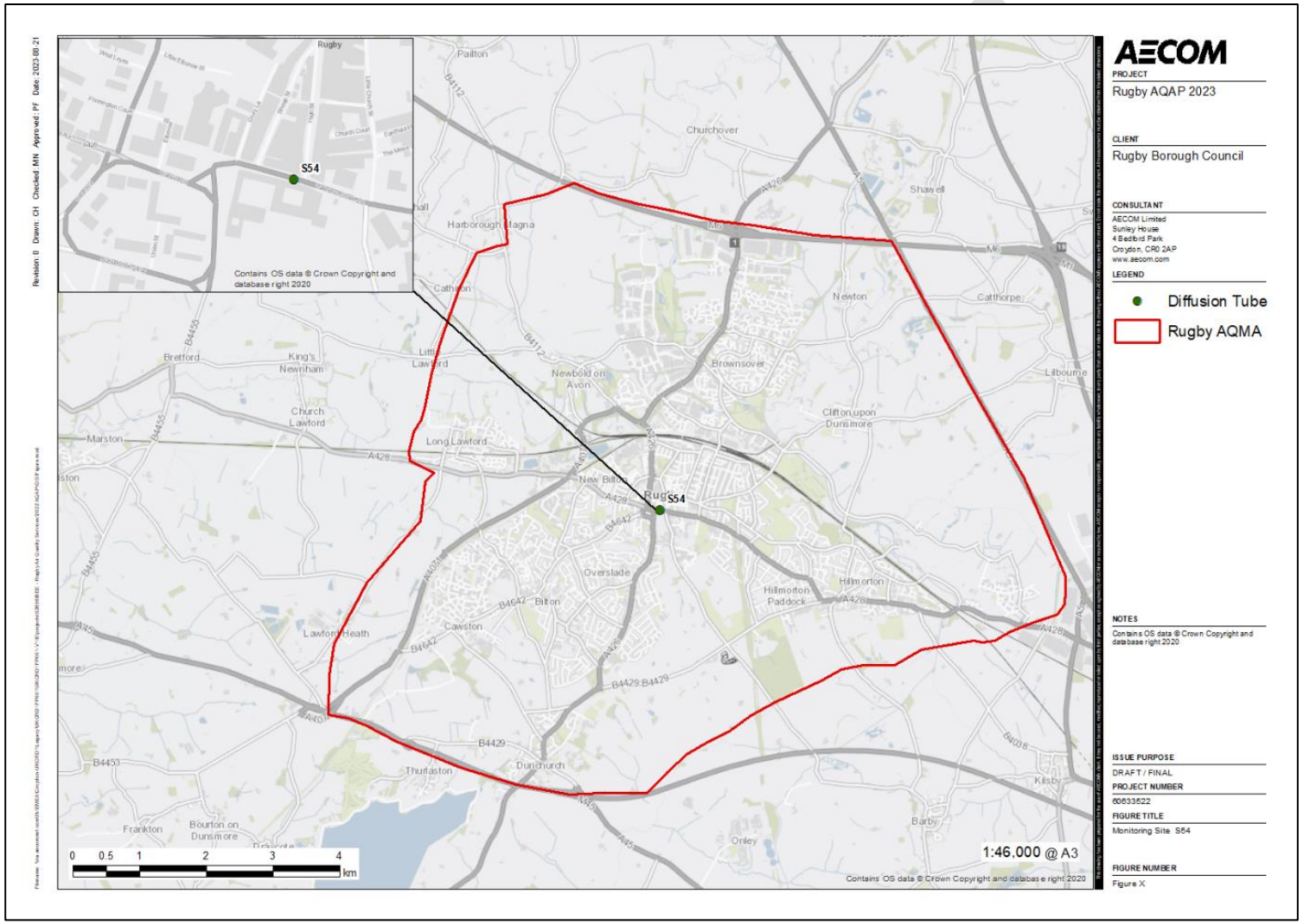
The required reduction in NO_2 and NOx for compliance of Rugby is shown Table 3-3, based on the recorded concentration at site S54 in 2019. A percentage decrease in NOx of 6.1% was at that time required for Rugby AQMA to achieve compliance with the air quality objective value (40 µg/m^3).

It should be noted, however, that this represents a worst-case consideration, as NO_2 concentrations have decreased since this time. The reality is that at the time of writing, no further reductions are required to meet statutory compliance for the AQS objective, but that does not diminish RBC's commitment to continual air quality improvement beyond compliance over the course of this AQAP.

Table 3-3 - Reduction in NOx (µg/m^3) required for compliance of Rugby AQMA

AQMA	Site	2019 Concentration (µg/m^3)	Required reduction in NO_2 for compliance (40 µg/m^3)	Required reduction in NOx for compliance (40 µg/m^3)	Percentage decrease in NOx (%)
Rugby AQMA	S54	41.6	1.6	3.75	6.1

Figure 3-6 - Monitoring site exceeding AQS objective in 2019.



3.5 Key Priorities

Having given due consideration to the information collected in preparation of this AQAP, RBC consider the following to be the key priorities for Air Quality in Rugby over the course of the AQAP's intended duration:

- Priority 1 – Maintain compliance with the AQS objectives to ensure revocation of the AQMA in 2025.
- Priority 2 – Continue to implement AQAP measures in support of Priority 1, and to improve air quality beyond statutory compliance.
- Priority 3 – If and when the AQMA is revoked, put in place a robust Air Quality Strategy for RBC.

4.4. Development and Implementation of Rugby Borough Council 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 1995, as amended 2021[5], requires local authorities to consult the bodies listed in Table 4-1. In addition, we have undertaken the relevant internal and external stakeholder engagement in preparation of this Draft, and are conducting further consultation that will feed into the Final AQAP.

The response to our consultation stakeholder engagement will be given in Appendix A: Response to Consultation once completed within the Final AQAP, inclusive of signposts within the document where action has been taken to address comments, where relevant.

Table 4-1 - Consultation Undertaken

Consultee	Consultation Undertaken
The Secretary of State	Yes
The Environment Agency	Yes
The highways authority	Yes
All neighbouring local authorities	Yes
Other public authorities as appropriate, such as Public Health officials	Yes
Bodies representing local business interests and other organisations as appropriate	Yes

4.2 Steering Group

An air quality steering group was set up to develop this Air Quality Action Plan. The steering group is comprised of the following members:

- Henry Biddington: Rugby Borough Council, Environmental Health and Community safety Manager.
- Michael Warren: Rugby Borough Council, Environmental Health Officer.
- John Howes: Rugby Borough Council, Greenspace and Biodiversity Manager.
- Max Nancarrow: AECOM, Principal Air Quality Consultant.
- Nicholas Dauncey: Warwickshire County Council, Transport Planner.
- Moises Muguerza: Warwickshire County Council, Transport Planner.
- Luca Mitchell: Warwickshire County Council, Transport Planner.
- Tim Snazell: Warwickshire County Council, Senior Transport Planner.
- Chris Whatcott: Warwickshire County Council, Data Manager, Traffic Survey Team.
- Ella Casey: Warwickshire County Council, Senior Planner, Major Projects Team.
- Stuart Bird: Warwickshire County Council Public Health

The purpose of the Steering Group was to set priorities to progress the AQAP and review ongoing work throughout the process.

Further meetings were used to identify what schemes are currently in place and how they could feed into the new AQAP along with assess relevant data and assessment methodology.

Air Quality consultants AECOM were engaged primarily to assist with the source apportionment, advisement on measures and quantitative assessment of three measures, but have also drafted the main content of this document with RBC's steer.

The dates of the main steering group meetings are summarised below. Not all meetings required all attendees, specifically around measure quantification:

Table 4-2 - The date, purpose and outcome of current and proposed steering group meetings

Event	Date	Purpose	Outcome
AQAP Review Meeting	15/02/2023	Discuss future Source Apportionment Work	Data sources provided for AECOM to process.
AQAP Review Meeting	18/05/2023	Air Quality Action Plan Review and review of Source Apportionment Study.	Outcomes of SA disseminated. Action plan measures discussed.
AQAP Review Meeting	17/08/2023	Air Quality Action Plan Measures	Measures to be determined from long list and discussed
AQAP Review Meeting	15/09/2023	Air Quality Action Plan Measures	Measures agreed as no further input from stakeholders received, and measures to be quantified determined.
AQAP Review Meeting	29/01/24	Present Draft AQAP	Present Draft for comment prior to consultation.
AQAP Review via email	16/09/24	Present Final AQAP	Address consultation comments and agree final version.

It is RBC's intention that the Steering Group continue to meet periodically, and at least annually, through the implementation phase of the AQAP, to ensure progress against the measures' KPIs are reported, and any changes to the overall Plan that are required can be considered as necessary.

The Steering Group will continue to meet to ensure compliance with air quality standards and objectives will be maintained. RBC will continue monitoring local air quality and report this within ASRs to track continued compliance. If 2023 and 2024

monitoring data demonstrate continue compliance and are below 36 µg/m^3 (below 10% of the AQS Objective), it would be considered the Rugby AQMA has achieved five consecutive years of compliance and RBC will begin the process of revocation of the Rugby AQMA in 2025. In the instance of revocation, this AQAP will be used to form the basis of an Air Quality Strategy instead, so that air quality remains a priority in the borough, and as required in the 2021 update to the Environment Act[5]. RBC confirm that monitoring will continue beyond the potential revocation of the Rugby AQMA, and the Air Quality Strategy will be reviewed regularly and updated where necessary.

5.5. AQAP Measures

Monitored concentrations in RBC have showed consistent compliance with national air quality objectives since 2020. However, RBC aims to ensure this is maintained such that the AQMA can be revoked in 2025, and for continual improvement in pollutant concentrations beyond compliance in the meantime. Measures have accordingly been to chosen to target locations and activities in the borough that can be most cost effectively improved in terms of their NOx emissions, but many are also expected to improve particulate emissions too.

The Source Apportionment study allowed for prioritisation of certain vehicles in reducing emissions and influenced the prioritisation of certain measures. The source apportionment highlighted that diesel cars and LGVs represent the highest contribution to road NOx in most cases. The most effective measure to target diesel vehicles is the implementation of a Clean Air Zone (CAZ). However, a CAZ would not be appropriate in the RBC AQMA, so this was not taken forward. Measures targeting traffic emissions more generally were therefore considered. Particular focus was put on measures encouraging Electric Vehicle (EV) uptake, along with encouraging active travel. Petrol cars are the next largest source of emissions after diesel vehicles, which can also be targeted through this type of measure. As buses represented a small contribution to overall emissions, measures targeting buses were not prioritised.

Some measures are joint efforts with Warwickshire County Council (WCC) and others are specifically to be run by RBC.

Table 5-2 shows the RBC AQAP measures, organised in order of priority. 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; and

- how progress will be monitored.

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

A summary of each measure is provided below, including a cost-benefit analysis. As many of the measures are conceptual at this stage, this is largely qualitative, but can help interpret the efficiency of each measure and highlight high priority measures. describes the levels at which Air Quality Benefit (AQ), External Benefit (Ex) and Estimated Cost (£) are assessed.

To calculate the cost benefit analysis the following calculation is therefore used:

AQ x Ex - £ = Rating

Ratings are categorised as follows:

- -3 - -1 = Undesirable Measure
- 0 – 2 = Low Priority Measure
- 3 - 5 = Medium Priority Measure
- 6 - 9 = High Priority Measure

Table 5-1 - Measure Cost benefit Analysis (CBA)

Level	Air Quality Benefit (AQ)	External Benefit (Ex)	Estimated Cost (£)
0	No discernible direct benefit to NO_2	No discernible benefit to other priority areas, climate and transport.	Zero cost, or part of existing spend.
1	Low (1 µg/m^3 reduction) benefit to NO_2.	Low benefits to other priority areas, climate and transport.	Low (<£10,000) cost
2	Medium (1 - 5 µg/m^3 reduction) benefit to NO_2.	Medium benefits to other priority areas, climate and transport.	Medium (£10,000-£100,000) cost
3	High (>5 µg/m^3 reduction) benefit to NO_2.	High benefits to other priority areas, climate and transport.	High (>£100,000) cost

Measure 1: Rugby Parkway Station at Houlton, close to M1 J18.

A new Park and Ride has been proposed for Houlton. The plans for this measure were introduced in January 2023, with the application (RBC/23CC003) submitted later in the year.

The aim of Park and Ride is to ease congestion on the road network around Rugby Town Station by providing a second access into Rugby town centre relative to the local and national rail network for residents and business in Rugby. The scheme will support a shift from private car use to rail for all or part of a journey.

The primary operator will be the Stagecoach bus operator in Rugby. The park and Ride will have the capacity for 2,000 passengers a day. The Park and Ride will also be connected to existing cycle ways and walking routes, to encourage active travel. The station site layout will integrate access for sustainable modes of travel into and around the site.

RBC are working with Avanti West Coast for the interchange and general access requirements. It is anticipated that construction would begin in 2025, subject to funding and necessary consents being secured. On this assumption, it is expected that construction would be complete by 2030. WCC would work with the Department for Transport and Network Rail to implement this measure and funding would be provided by WCC and national government.

An air quality assessment was carried out as part of the planning application for the Rugby Parkway Train station itself. Annual mean NO_2 concentrations were predicted at the existing sensitive receptor locations for a future year of 2031 for 'Without Development' and 'With Development' scenarios. There was a reduction in concentration at two sensitive receptors (Between -0.5 µg/m^3 and -0.6 µg/m^3) in the with development scenario, as a result of a reduction in traffic flows associated with the Proposed Development. All estimated changes in concentrations were negligible in terms of their impact significance.

***CBA (M1)**: 3 (AQ) x 3 (Ex) – 3 (£) = 6 (High Priority)*

Measure 2: Homestead Link

The proposed Homestead Link will connect the A426 (Rugby Road) with a new roundabout which will then be linked to Alywn Road and Cawston Lane. From there it will run south over Northampton Lane byway to join the B4429 (Coventry Road) west of Durchurch.

The scheme is intended to divert traffic from congested areas within the AQMA, specifically Dunchurch Crossroads, and through this lower NO_2 concentrations.

Initial modelling demonstrates a 30-35% reduction in peak traffic, which indicates this measure could produce significant air quality benefits. This measure is still in the planning phase, with consultation having taken place in 2021.

This measure is expected to reduce NO_2 concentrations at this location. Modelling undertaken as part of the scheme indicated that concentration could decrease between -0.6 µg/m^3 and -1.8 µg/m^3. At the majority of receptors, estimated changes in NO_2 were of negligible significance. However, slight beneficial and moderate beneficial changes were estimated at some receptors.

***CBA (M2)**: 3 (AQ) x 3 (Ex) – 3 (£) = 6 (High Priority)*

Measure 3: Potsford Dam Link

This measure involves the reconfiguration of Coventry Road to join the new Potsford Dam link. The alignment of the road will be altered to join directly into the existing Potsford Dam roundabout on the Rugby link road. The aim of this measure is to redirect traffic from areas of elevated pollution in Rugby AQMA and it is expected that the reconfiguration would relieve some of the congestion from the gyratory. This measure is to be completed in partnership with WCC, with an estimated completion year of 2028. The performance of this measure can be judged on queue lengths and junction waiting times, in addition to NO_2 concentrations.

***CBA (M3)**: 3 (AQ) x 3 (Ex) – 3 (£) = 6 (High Priority)*

Measure 4: Installation of EV Charging Points

WCC have received funding through the Local Electric Vehicle Infrastructure (LEVI) Fund of £3.2m to install around 500-800 EV charging points across Warwickshire. A portion of these will be installed in Rugby. RBC currently has approximately 85 charging points installed and it has been assumed that 100 further are planned for installation. The installation of additional charging points in RBC is intended to encourage the use of EVs by improving the accessibility of charging stations. This measure is at the planning stage but is estimated to be completed by 2028.

A quantitative assessment of this measure was carried out. Defra's Emissions Factor Toolkit (EFT) v.12[22] was used to determine the impact of increased EV update of emissions from road traffic in RBC. Details of this assessment are given in Appendix C. The assessment estimated that an uptake of EV vehicles proportionate to the increase in the number of charging stations in the borough, relative to the current infrastructure, could reduce traffic related NO_x emissions by between 1 – 4%.

***CBA (M4)**: 2 (AQ) x 3 (Ex) – 2 (£) = 4 (Medium Priority)*

Measure 5: Improvements to the A426 Avon Mill Roundabout and the junction of Hunters Lane with Newbold Road.

Traffic Modelling has indicated that improvements can be made to the A426 Avon Mill Roundabout and the junction of Hunters Lane with Newbold Road. Altering these junctions is likely to reduce existing traffic queuing which is expected to lower emissions at this locality.

The improvements include enlarging the roundabout and the exits. A new pedestrian and cycle path will be also linked to existing routes on the northeast side of the roads and junctions. Some additional land will be required for these works. A scrap business is located at Avon Mill, so LGV emissions will also be targeted at this

[22] Defra Emissions Factors Toolkit. EFT v12 November 2023. Available at: https://laqm.defra.gov.uk/air-quality/air-quality-assessment/emissions-factors-toolkit/

location. Initial modelling has indicated these works will allow for queue reductions at Avon Mill.

The strategic outline for this project has been sent to Department for Transport. This is expected to be a relatively high cost measure. Construction is expected to begin in March 2025 and the scheme is expected to open in 2026-2027.

The performance will be measured by the queue lengths at the junction.

***CBA (M5)**: 3 (AQ) x 2 (Ex) – 3 (£) = 3 (Medium Priority)*

Measure 6: Licensing Policy Taxi replaced to low emission vehicles.

From 1 January 2022, all new and existing private hire vehicles must have at least Euro 4 petrol or Euro 6 diesel engines. These vehicles are capable of being licensed for 10 years, however once the vehicle is over six years old, the licence must be renewed every six months. From 1 March 2024, all existing or replacement saloon hackney carriage vehicles must be new, white in colour, and must be new ultra-low emission or zero emission capable.

***CBA (M6)**: 2 (AQ) x 2 (Ex) – 1 (£) = 3 (Medium Priority)*

Measure 7: Air Quality Supplementary Guidance.

The Air Quality Supplementary Guidance was adopted in July 2021. The measure is classified as air quality planning and policy guidance. The aim of this guidance is to improve the quality impacts associated with new developments and facilitate a consistent and transparent approach to decision making. This guidance has been developed in co-operation with Coventry City Council, Coventry & Warwickshire Public Health, Nuneaton and Bedworth Borough Council, Stratford District Council and Warwick District Council.

***CBA (M7)**: 2 (AQ) x 2 (Ex) – 1 (£) = 3 (Medium Priority)*

Measure 8: Expansion of Traffic Monitoring and Survey Capabilities

WCC intends to expand its traffic monitoring and survey capabilities. As traffic is the primary source of NO_2 in the county, increased understanding of traffic flow in the County can guide measures and identify areas of potentially higher NO_2 concentrations. In 2023, WCC intended to introduce a new rapid roadside screening tool for air quality modelling to screen the impact of measures. This tool is expected to be fully integrated into practice in 2024, and will allow the speedy appraisal of proposed measures' air quality impact, improving the decision making process. This is expected to be a relatively low cost measure. Should this tool bring about further opportunity for quantification of AQAP measures, these possibilities will be explored and added to the AQAP if viable.

***CBA (M8)**: 2 (AQ) x 2 (Ex) – 2 (£) = 2 (Low Priority)*

Measure 9: The Safe and Active Schools Programme

The Safe and Active Schools Programme aims to provide road safety education and promote active travel. This measure is already ongoing, is funded by WCC and was introduced in 2022. As part of this measure an additional pilot project is planned to close a street leading to a school in Rugby to encourage active travel and reduce congestion around this school, to include monitoring of pollution at the school during this trial. The performance of this measure can be tracked by the uptake rates and by recorded pollutant concentrations at schools.

***CBA (M9)**: 2 (AQ) x 2 (Ex) – 2 (£) = 2 (Low Priority)*

Measure 10: The Safe and Active Workplace

The safe and active workplace project aims to promote travel alternatives for those commuting to work. This project was introduced in 2022 and has an estimated completion date of 2028. The workplace plan will be promoted to workplaces across Rugby, and performance of this measure can be estimated by uptake rates. This is expected to be a relatively low cost measure.

***CBA (M10)**: 2 (AQ) x 2 (Ex) – 2 (£) = 2 (Low Priority)*

Measure 11: Increased Connectivity to Green Spaces

RBC has coordinated several projects to increase the connectivity of green spaces in the borough. The aim of this measure is to increase public access to green space and encourage active travel through parks. This measure involves the creation of a new entrance to Caldecot Park to increase non-vehicle traffic in the town centre, discouraging the public from travelling into town by vehicle. This is turn should lower NOx emissions.

A number of new stretches of pathway have already been completed as part of this measure:

- 2020/2021: 2,000 metres of pathway installed at New Bilton's Freemantle Open Space, Brownsover's Sorrel Drive and Brooklime Drive.
- 2021/2022: 340 metres of pathways created at Rokeby. 1,278.5 metres of pathways installed at Whinfield Recreation ground and Whinfield Woods.
- 2022/2023: Approximately 1.5km of pathways was installed between Whitehall (855m), Newbold Quarry (135m) and Freemantle and Cornwallis (560m).
- 2023/2024: Approximately 330 metres of pathways completed at Apple Grove.

This project is managed by RBC, with advice from WCC highways.

***CBA (M11)**: 2 (AQ) x 2 (Ex) – 2 (£) = 2 (Low Priority)*

Measure 12: Neighbourhood Car Share Scheme

RBCs Neighbourhood Car Share Scheme aims to reduce the number of cars journeys in RBC by encouraging the public to carpool when travelling. Similar schemes are currently operational across Coventry and Warwickshire. Promotion of the scheme is undertaken externally via the RBC website and social media platforms. RBC are aiming to include RBC staff in the scheme. This is a relatively low cost measure.

***CBA (M12)**: 2 (AQ) x 2 (Ex) – 2 (£) = 2 (Low Priority)*

Measure 13: Control of Industrial Emissions

This measure relates to reducing pollution through Integrated Pollution Prevention and Control (IPPC) Permits, going beyond Best Available Technique (BAT) appraisal. The key performance indicator of this measure is to complete 100% of inspections and record the levels of compliance. This measure is an ongoing measure funded by RBC.

***CBA (M13)**: 2 (AQ) x 2 (Ex) – 2 (£) = 2 (Low Priority)*

Measure 14: Control of Domestic Combustion.

This measure relates to the maintenance of the designated smoke control area. The smoke control area aims to regulate primarily particulate emissions from chimneys. Where issues are identified, section 79 of the EPA 1990 would be actively implemented (Gov 1990)[23]. The success of this measure can be monitored through the reduction of complaints. However, there are a low number of these type of complaints in RBC.

***CBA (M14)**: 2 (AQ) x 2 (Ex) – 2 (£) = 2 (Low Priority)*

Measure 15: Air Quality Monitoring

This measure relates to the maintenance of the existing Council LAQM monitoring regime, along with making additional monitoring efforts where required or the opportunity arises. For example, five schools have been looked at with the intention of setting up internal and external monitoring of NOx, and PM. This monitoring will hopefully identify any issues that require further work. This measure is funded by RBC and was introduced in 2023, although LAQM monitoring has been ongoing for

[23] Environmental Protection Act 1990. Section 79- Statutory nuisances and inspections, Available at: https://www.legislation.gov.uk/ukpga/1990/43/section/79

some time. The success of this measure will be assessed through monitoring the trends in pollutants.

***CBA (M15)**: 1 (AQ) x 3 (Ex) – 1 (£) = 2 (Low Priority)*

Measure 16: Warwickshire Local Cycling and Walking Infrastructure Plan (LCWIP)

The Warwickshire LCWIP[24] was created to manage and promote the network of cycle routes in Warwickshire. This plan was initially implemented in 2022 and is funded by WCC. This measure will involve holding events to promote the use of cycle routes. Events include the Warwickshire Cycle Buddies, Cycle September and other planned walks. Public opinion of the plan was sought in 2022, through in person sessions and an online webinar and survey.

Over 1,000 people completed the survey and the comments are being utilised to create an updated version of the plan. The progress of this measure can be determined by the number of bike journeys undertaken using the cycle network.

***CBA (M16)**: 2 (AQ) x 2 (Ex) – 3 (£) = 1 (Low Priority)*

[24] Warwickshire's Local Cycling and Walking Infrastructure Plan (LCWIP). Available at: https://www.warwickshire.gov.uk/cycling/developing-warwickshires-cycle-network/3

Table 5-2 - 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
1	Proposed Rugby Parkway station at Houlton, close to M1 J18	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	2023	2030	WCC, DFT, Network Rail,	County, National Govt.	NO	Not Funded	> £10 million	Planning	-0.5 µg/m^3 at two locations where traffic is reduced. <0.1 µg/m^3 adverse impacts elsewhere	Passenger usage (expected ~2,000 passengers a day) CBA = 6	Plans introduced in Jan 2023, application submitted later in 2023 (RBC/23CC003). Air Quality assessment carried out indicated with development some small decreases in concentrations are estimated.	New strategic park and ride for Houlton. Should ease congestion on the road network around Rugby Town Station by providing a second access to the local and national rail network for residents and businesses in Rugby. Construction of the station is anticipated to begin in 2025 subject to funding and necessary consents being secured.
2	Homestead Link	Transport Planning and Infrastructure	Other	2023	2026	WCC	S106	NO	Not Funded	£1 million - £10 million	Planning	Modelling indicated a reduction in NO_2 between -0.6 µg/m^3 and -1.8 µg/m^3. Negligible, slight beneficial and Moderate beneficial impacts.	Traffic volumes, Queue lengths and junction waiting times. CBA = 6	Consultation in 2021. Still at planning stage, live at present (2023) .	Intended to take traffic away from areas of elevated pollution within the AQMA. Due to connect onto the A426 (Rugby Road) with a new roundabout, before heading west to connect with Alwyn Road and Cawston Lane. It will then turn south, crossing over the Northampton Lane byway, to join the B4429 (Coventry Road) to the west of Dunchurch. Initial modelling results show 30-35% reduction in peak traffic so could have significant benefits.
3	Potsford Dam Link	Transport Planning and Infrastructure	Other	2023	2028	WCC	S106	NO	Not Funded	£1 million - £10 million	Planning	Reduced emissions of NO_2 from traffic.	Traffic volumes, Queue lengths and junction waiting times CBA = 6	Consultation at Planning stage	Reconfiguration of Coventry Road onto the new Potsford Dam link, alignment altered to tie directly into existing Potsford Dam roundabout on the Rugby link road. Intended to take traffic away from areas of elevated pollution within the AQMA. Compulsory land purchases likely to delay scheme.

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
4	Installation of EV Charging points in RBC Carpark	Promoting Low Emission Transport	Other	2023	2028	RBC	Local	NO	Funded	£50k - £100k	Planning	1-4% Road NOx emissions reductions.	Number of active charging points CBA = 4	14 on street charging in 3 locations in Town Centre. 85 overall across the borough currently	WCC have received LEVI funding to install a significant number of Charging points across Rugby. RBC planning to install EV charging in a Town Centre carpark. 100 additonal chargers have been assumed, overall.
5	Improvements to the A426 Avon Mill roundabout and the junction of Hunter's Lane with Newbold Road	Transport Planning and Infrastructure	Other	2023	2026	WCC	County	NO	Funded	£1 million - £10 million	Planning	Reduced emissions of NO_2 from traffic.	Queue lengths and junction waiting times. CBA = 3	Cabinet gave approval for officers to produce an OBC in 2023. No air quality specific assessment of scheme yet, appointment pending. March 2025 construction has to start, 2026-2027 to open.	Traffic modelling shows substantial queue reductions on gyratory which is expected to improve local air quality. New pedestrian and cycle path with bridge on North (east)side of roads and junctions, to be linked to existing routes. Should target LGV emissions from source apportionment, as scrap businesses in Avon Mill.
6	Licensing Policy Taxi replaced to low emission vehicles	Promoting Low Emission Transport	Taxi Licensing conditions	2020	2028	RBC	Local	NO	Funded	< £10k	Implement ation	Reduced emissions of NO_2 from traffic.	Number of taxis meeting licensing conditions (key metrics newer fleet vehicles) CBA = 3	Ongoing progress	From 1 January 2022 all new and existing private hire vehicles with Euro 4 petrol or Euro 6 diesel engines. These vehicles are capable of being licensed for 10 years, however once the vehicle is over six years old, the licence must be renewed every six months. From 1 March 2024, all existing or replacement saloon hackney carriage vehicles must be new, white in colour, and must be new ultra-low emission or zero emission capable.
7	Air Quality Supplementary Planning Document	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2021	2028	RBC	Local	NO	Funded	< £10k	Implement ation	Not quantifiable	Number of applications in which it is applied CBA = 3	Guidance adopted July 2021	The overall aim is to improve the quality of new development and facilitate a consistent and transparent approach to decision making. This guidance has been developed in co-

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
															operation between Coventry City Council, Coventry & Warwickshire Public Health, Nuneaton and Bedworth Borough Council, Rugby, Stratford District Council and Warwick District Council.
8	Warwickshire County Council (WCC) to expand its traffic monitoring and surveying capabilities and support evidence-based decision making in the County's approach to tackling climate impacts and air quality management.	Traffic Management	Other	2023	2024	WCC	County	NO	Funded	£10k - 50k	Planning	Not quantifiable	Traffic Counts undertaken annually. CBA = 2	No progress update	During 2023 WCC intended to bring a new rapid roadside screening tool for air quality modelling in house, which can help to screen the impact of measures. ANPR data also to be available for more detailed modelling should this be required.
9	Safe and Active Schools (road safety education and active travel). The Safe and Active Schools programme	Promoting Travel Alternatives	School Travel Plans	2022	2028	WCC	County	NO	Funded	£10k - 50k	Implement ation	Not quantifiable	Schools' Plan Uptake Rates CBA = 2	In place since March 24	Also a pilot project plan to close a street leading to school in Rugby to encourage active travel and reduce congestion around school, which will include monitoring
10	The Safe and Active Workplace	Promoting Travel Alternatives	Workplace Travel Planning	2022	2028	WCC	County	NO	Funded	£10k - 50k	Implement ation	Not quantifiable	Workplaces' Plan Uptake Rates CBA = 2	Ongoing work	
11	Increased connectivity to green spaces	Other	Other	2023	2023	RBC / WCC	UKSPF	NO	Funded	£10k - 50k	Implement ation	Not quantifiable	Parking / traffic numbers in town centre CBA = 2	RBC involved with input from WCC Highways	Creation of new entrance to Caldecott Park to increase non-vehicle traffic in town centre, discouraging vehicular journeys
12	Neighbourhood Car Share Scheme	Promoting Travel Alternatives	Personalised Travel Planning	2021	2028	RBC/WCC	RBC/W CC	NO	Funded	£10k - 50k	Implement ation	Not quantifiable	Reduction in the number of car-based journeys being made within the borough CBA = 2	There is car share scheme operating across Coventry and Warwickshire.	RBC looking at options for staff to join the scheme as an organisation with internal promotion though emails and updates. Promotion of the scheme externally via the website and Social Media platforms.

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
13	Control Of Industrial Emissions	Environmental Permits	Measures to reduce pollution through IPPC Permits going beyond BAT	2023	2028	RBC	Local	NO	Funded	£10k - 50k	Implementation	Not quantifiable	100% compliance with permits allocated CBA = 2	42 Permitted Industrial Pollution Process (100% inspections completed) achieved 100% compliance improvements.	Ongoing implementation of Council's permitting requirements
14	Control Of Domestic Combustion	Policy Guidance and Development Control	Other policy	2023	2028	RBC	Local	NO	Funded	£10k - 50k	Implementation	Not quantifiable	Reduction in complaints CBA = 2	Designated smoke Control Area (chimneys) and section 79 of the EPA 1990 actively implemented where problems are identified. Section 79 of the EPA 1990 actively implemented where problems are identified.	Relatively low priority. Low number of complaints.
15	Air Quality Monitoring	Public Information	Other	2023	2028	RBC	Local	NO	Funded	£10k - 50k	Implementation	Not quantifiable	Trends in pollutants and number of monitoring sites CBA = 2	In addition to Council's core LAQM monitoring regime, applied for Defra funding for particulate monitoring, but rejected. Also looking to set up 5 schools in Rugby to have internal and external monitoring, to include NOx and PM. This will help identify if PM is an issue that needs further work.	Used to track compliance and impacts of measures.
16	Warwickshire Local Cycling and Walking Infrastructure Plan (LCWIP)	Transport Planning and Infrastructure	Cycle network	2022	2024	WCC	County	NO	Funded	£100k - £500k	Planning	Not quantifiable	Bike journeys undertaken CBA = 1	Between 17 June and 14 August 2022, WCC asked local people for their thoughts on the draft Plan.	Periodic events to promote adoption, such as Warwickshire Cycle Buddies, Cycle September, and planned walks

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
														This included drop-in sessions, an online webinar and online survey, which was completed by over 1,000 people. All comments and suggestions are now being reviewed and are being used in an updated version of the LCWIP.	

Appendix A: Response to Consultation

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

Consultee	Category	Response
Secretary of State (Defra)	Consultation comments on Draft (responses highlighted as red text)	1. *"The public health context has been outlined, but detail relative to the public health concerns within RBC are required. Further detail should be provided in the final AQAP to outline key areas of concern and to make use of the public health outcomes framework where appropriate."* Populated in 3.1. Public health has been discussed within the AQAP, with specific reference to the Public Health Outcomes Framework indicator D01 'Fraction of mortality attributable to particulate air pollution' provided for RBC. Specific local public health context has also been added as requested. 2. *"The AQAP measures are well presented and discussed in some detail."* Duly noted, measures retained. 3. *"The current concentrations within the AQMA are well detailed, but it would be useful to also include the level of exceedance of the objective at the time of declaration and the original cause for declaration."* Added in 1.

Consultee	Category	Response
		4. *"A source apportionment exercise has been undertaken. Consideration has been made to regional and local background sources. A simple source apportionment exercise has been undertaken utilising the Emissions Factors Toolkit. Whilst a new update of the Emissions Factors Toolkit has been published (v12), the current presented approach is accepted. There are some discrepancies between the reported average data in Figures 3-2 and 3-3 within this assessment. A discussion of other sources not considered within the source apportionment exercise would be helpful."* Wider discussion of other sources beyond roads based on Defra Background maps added to section 3.3, and figures checked and updated. 5. *"Relevant policies, plans and strategies are outlined within the AQAP; however it would be useful to specify further any relevant links in which the AQAP will be influenced by or influence and these policies."* No further links were considered necessary to add. 6. *"It is stated "Schedule 11 of the Environment Act 1995 requires local authorities to consult the bodies listed in Table 5.1". It is however not clear*

Consultee	Category	Response
		how these bodies have been consulted or if any response has been received. This should be included clearly within the final AQAP." Summarised within 4.1. 7. *"A summary of responses received from consultation need to be included within Appendix A within the final version of the AQAP."* Summarised within this Appendix. 8. *"It is noted that latest air quality levels within the AQMA are compliant with the objectives. However, it would be useful to present a quantitative assessment of the impact of some of the measures on air quality concentrations at worst case receptors if feasible."* Any further quantitative assessment of the impact of measures on air quality concentrations is not considered feasible. Those which can be quantified already have been, for example Measure 8, the methodology for which is illustrated in Appendix C: Assessment of Measure 8. Whilst not directly quantified by RBC, Measure 3 (Proposed Rugby Parkway station at Houlton, close to M1 J18) and Measure 6 (Homestead Link) had air quality assessments carried out as part of the planning application, which modelled the estimated reduction in NO_2 concentrations at relevant sensitive receptors. The remaining high priority (Measure 7 Potsford Dam

Consultee	Category	Response
		Link) has not been directly modelled. Detailed modelling of this measure is not considered commensurate to existing concentrations given the AQMA has been compliance for three consecutive years. Remaining measures either do not lend themselves easily to a quantitative assessment (e.g. Measure 10 Air Quality SPD) or are a lower priority for RBC. 9. *"The measures set out should be ordered by priority. A cost-benefit analysis has been completed for each measure which allows these to be ordered. It is expected that Table 5-5 inclusive of the proposed measures would align with the cost benefit analysis with those measures which are cheapest with the greatest effect being prioritised."* Re-ordered according to priority in 5. AQAP Measures. 10. *"Describe how it will be ensured that air quality standards and objectives are maintained with the implementation of the AQAP. If compliance is determined to be achieved consistently in the 2023 and 2024 monitoring data, a clear plan should be provided on steps to the revocation of the AQMA."* Added in 4.2.

Consultee	Category	Response
		11. *"The AQAP should be signed off by a Director of Public Health."* Added to Executive Summary. 12. While there are some formatting anomalies and grammatical errors, it is acknowledged that the document is still in draft. Amended where pertinent.

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)
Freight and Delivery Servicing	Procuring cargo bikes to utilise for deliveries in the borough.	Funding is not currently available to progress this measure.

Appendix C: Assessment of Measure 8.

It is proposed that the number of EV charging stations in Rugby be increased from 85 to 185 using the LEVI funding. A quantitative assessment of this measure was carried out using Defra's Emissions Factor Toolkit (EFT) v12.0, published in November 2023[22], utilising the new traffic format which allows battery electric vehicles to be considered. For measure 8, the percentage of EV vehicles was increased at the same ratio as the increase in charging stations relative to the baseline, and the percentage of conventional petrol and diesel cars reduced by the same amount. The estimated fleet emissions from the two scenarios were then compared. The results indicated that an uptake of EV vehicles proportionate to the increase in the number of charging stations in the borough could reduce traffic related NO_x emissions by around 1 – 3.5%. The percentage reduction estimated at each road link are shown in Table C-1.

Table C-1: Change in NOx Concentration (µg/m^3) predicted at modelled Road links as a result of EV uptake.

Road ID	Pollutant	Reduction in Concentration (µg/m^3)
4281	NOx	2.7%
4289	NOx	3.0%
D3114	NOx	2.6%
50020	NOx	2.9%
100046	NOx	1.5%
102487	NOx	3.1%
102612	NOx	1.0%
A426018060	NOx	2.8%
A26019640	NOx	2.5%
A426021550	NOx	2.7%
35	NOx	3.5%

Glossary of Terms

Abbreviation	Description
ANPR	Automatic Number Plate Recognition
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
BAT	Best Available Technique
CAZ	Clean Air Zone
CBA	Cost Benefit Analysis
CPE	Civil Parking Enforcement
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
EFT	Emissions Factor Toolkit
EPA	Environmental Protection Act
EU	European Union

Abbreviation	Description
EV	Electric Vehicle
HGV	Heavy Goods Vehicle
IPPC	Integrated Pollution Prevention and Control
KPI	Key Performance Indicator
LAQM	Local Air Quality Management
LCWIP	Local Cycling and Walking Infrastructure Plan
LEVI	Local Electric Vehicle Infrastructure
LGV	Light Goods Vehicle
NAEI	The National Atmospheric Emissions Inventory
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
O_3	Ozone
OBC	Outline Business Case
PHOF	Public Health Outcomes Framework
PM	Particulate matter
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
RBC	Rugby Borough Council

Abbreviation	Description
SO_2	Sulphur dioxide
SPD	Supplementary Planning Document
VOC	Volatile organic compound
WCC	Warwickshire County Council
WHO	World Health Organisation

References

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

Defra Emissions Factors Toolkit. EFT v12 November 2023. Available at: https://laqm.defra.gov.uk/air-quality/air-quality-assessment/emissions-factors-toolkit/

Defra guidance on compliance in the context of COVID-19 affected years, FAQ 142, available at: https://laqm.defra.gov.uk/faqs/faq-142-three-or-more-years-of-compliance-with-air-quality-objectives/

Department for Environment, Food and Rural Affairs (2019). UK Clean Air Strategy 2019. Available at: https://www.gov.uk/government/publications/clean-air-strategy-2019

Department for Environment, Food and Rural Affairs (2022). Local Air Quality Management. Technical Guidance (TG22). August 2022. Available at: https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf

Department for Environment, Food and Rural Affairs, Background Mapping Data for Local Authorities – 2018. Available at: https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018

Department for Environment, Food and Rural Affairs. Abatement cost guidance for valuing changes in air quality, May 2013

Department for Environment, Food and Rural Affairs. Air quality strategy: framework for local authority delivery. Updated 25 August 2023. Available at: https://www.gov.uk/government/publications/the-air-quality-strategy-for-england/air-quality-strategy-framework-for-local-authority-delivery

Department of Health and Social Care (2022). Chief Medical Officer's Annual Report. 2022: Air Pollution. Available at: https://www.gov.uk/government/publications/chief-medical-officers-annual-report-2022-air-pollution

Environmental equity, air quality, socioeconomic status and respiratory health, 2010

Rugby Borough Council Air Quality Action Plan – 2024-28

Environmental Protection Act 1990. Section 79- Statutory nuisances and inspections therefor. Available at: https://www.legislation.gov.uk/ukpga/1990/43/section/79

HM Stationary Office 2021 Environment Act 2021, Available at: https://www.legislation.gov.uk/ukpga/2021/30/enacted

Office for Health Improvement & Disparities. Public Health Outcomes Framework. Available at: https://fingertips.phe.org.uk/profile/public-health-outcomes-framework

Office for National Statistics (2021) Available at: https://www.ons.gov.uk/census

Public Health England (2018) Health matters: air pollution available at: https://www.gov.uk/government/publications/health-matters-air-pollution/health-matters-air-pollution

Rugby Borough Council (2019). Local Plan 2011-2031. Available at: https://www.rugby.gov.uk/w/local-plan-2011-2031

Rugby Borough Council, Air Quality Annual Status Report (ASR), 2023. Available at : https://www.rugby.gov.uk/w/air-quality-monitoring-reports

Rugby Borough Council. Air Quality Supplementary Planning Document. Available at: https://www.rugby.gov.uk/w/air-quality-supplementary-planning-document-spd-

Rugby Borough Council. Corporate Strategy 2021-24. Available at: https://www.rugby.gov.uk/w/corporate-strategy-2021-24

Warwickshire County Council (2021) Warwickshire Health and Wellbeing Strategy 2021 – 2026, Available at; https://www.warwickshire.gov.uk/healthandwellbeingstrategy

Warwickshire's Local Cycling and Walking Infrastructure Plan (LCWIP). Available at: https://www.warwickshire.gov.uk/cycling/developing-warwickshires-cycle-network/3

World Health Organisation (2021). WHO global air quality guidelines. Available at: https://www.who.int/publications/i/item/9789240034228