

Borough Council of
**King's Lynn &
West Norfolk**



Borough Council of King's Lynn
and West Norfolk

Draft Air Quality Action Plan 2024-2029

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

Date: Sept 2024

Borough Council of King's Lynn and West Norfolk

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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 the Borough Council of King's Lynn and West Norfolk (BCKLWN) over the next 5-years (2024-2029) or until the Air Quality Management Areas (AQMAs) are revoked. It replaces the previous AQAP that was adopted in 2015¹.

Projects have been delivered through the previous action plan that have contributed towards improving air quality in King's Lynn. They include the following: -

- Improvements at the King's Lynn transport (bus-rail) interchange in the town centre that incentivises the use of public transport and active travel.
- Urban traffic control and selective vehicle detection systems being implemented to help reduce congestion and pollution levels in the town centre and where the AQMA's are located.
- Installed electric vehicle (EV) charging points within Council owned car parks across the district (18 double charging points installed to date and a further 8 to be commissioned) to help assist local residents with no off-street parking provision the opportunity to charge their electric vehicle overnight at one of the selected sites. Previously installed 50kW rapid EV charging points (4) have recently been replaced with newer units.

Air pollution affects us all. It is associated with impacts on lung development in children, heart disease, stroke, cancer, exacerbation of asthma and increased mortality, among other health effects². Critically, 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^{3,4}.

¹ Air Quality Action Plan, 2015; https://www.west-norfolk.gov.uk/downloads/download/346/air_quality_information_documents

² Chief Medical Officer, Air Pollution 2022; <https://www.gov.uk/government/publications/chief-medical-officers-annual-report-2022-air-pollution>

³ Environmental equity, air quality, socioeconomic status and respiratory health, 2010

⁴ Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006; https://uk-air.defra.gov.uk/assets/documents/reports/cat09/0701110944_AQinequalitiesFNL_AEAT_0506.pdf

The annual mortality of human-made air pollution in the UK is roughly equivalent to between 28,000 and 36,000 deaths every year at typical ages⁵. It is estimated that between 2017 and 2025 the total cost to the NHS and social care system of air pollutants (fine particulate matter and nitrogen dioxide), for which there is more robust evidence for an association, will be £1.6 billion^{5,6}.

The associated health costs associated with air pollution require a change with measures that not only tackle the pollution hot spots but more generally also focus on population-wide measures. This means at times going beyond existing air quality objectives which recognises the no observed safe level for some pollutants. As a consequence, this action plan includes a new measure to develop an air quality project for the area to help facilitate these wider health-based improvements.

Actions have been considered under the following short-listed topics identified from a long list of potential options. Those selected are considered as proportionate to levels of pollution being observed:

- Planning policy and development control interventions;
- Promoting travel alternatives and providing infrastructure improvements;
- Vehicle fleet efficiencies / improvements;
- Traffic management improvements;
- Public Information

Our priorities are set out below that focus on traffic reduction measures given this transport was the predominant source of the nitrogen dioxide (NO₂) in the AQMAs. This was identified through an earlier source apportionment study conducted by Bureau Veritas (2017¹⁹). The study and measures are described in more detail in Section 3. The AQAP measures are summarised within [Table 5.1](#) where costs and targets are also set out;

- **Priority-1: To increase active travel:** A modal shift to other, more sustainable forms of transport is considered a critical part of the plan, as it will lead to a reduction in private car use, improve air quality and also help to create a healthy community.

⁵ Defra. Air quality appraisal: damage cost guidance, July 2021

⁶ Office for Health Improvement and Disparities; <https://www.gov.uk/government/publications/air-pollution-applying-all-our-health/air-pollution-applying-all-our-health>

- **Priority-2: Public Transport (Bus) improvements:** Public transport (bus) service improvements comprise the next priority. A range of measures are identified within the Bus Service Improvement Plan (BSIP). We have also included a new measure to help the roll out of zero emission buses in King's Lynn.
- **Priority-3: Transport Management:** Prioritising transport management / infrastructure improvements for the centre of King's Lynn to help facilitate a modal shift to more active travel is also a priority. These transport schemes have been progressed to a high level as part of the King's Lynn Area Transport Strategy⁷. The work includes improvements to the town centre's gyratory system in favour of cycling/walking/public transport and also a regeneration of the South Gates area. Once detailed traffic data is available for these schemes they are to be reviewed for air quality.

Other complimentary transport management measures include the development of a comprehensive car-parking strategy, including measures to improve air quality.

- **Priority-4: Review new developments:** Minimising emissions from new developments through best practice principles is also an important aspect of the plan to prevent any deterioration in air quality.
- **Priority-5: Public Information;** A range of interventions are also necessary to better engage the public on air quality necessary to encourage behaviour change.
- **Priority-6: Air Quality Project:** The final element to this AQAP is to develop a local air quality project focussed on particulate matter of less than 10 & 2.5 microns (PM₁₀ & PM_{2.5}).

In terms of current status of air quality this is explained briefly in Section 2 but also in more detail within the council's latest Annual Status Report (ASR 2024). This shows that the Gaywood Clock AQMA no longer exceeds the annual mean objective for nitrogen dioxide (40µg/m³ NO₂). The concern had been the extent of traffic rebound

⁷ Norfolk County Council LTP4, 2021: <https://www.norfolk.gov.uk/what-we-do-and-how-we-work/policy-performance-and-partnerships/policies-and-strategies/roads-and-travel-policies/local-transport-plan>

following Covid, but pollution levels are observed as consistently below the objective level. As a consequence Gaywood Clock AQMA is to be put forward for revocation and to remove the associated action from the AQAP (Measure 3.4).

In terms of the Railway Road AQMA, a further detailed air quality review is needed once the options to the Southgates Masterplan and Gyrotory system have been completed and transport data made available. Once this review has been completed we can then determine if the Railway Rd AQMA should remain, be amended, or revoked.

We have considered comments from the public consultation that was undertaken earlier this year (between January – March 2024) within this final draft AQAP and which is to be put forward for adoption.

Responses from the public consultation were strongly supportive of the draft AQAP and its 16 measures. The details are set out in Section 4 with responses shown in Appendix A. Options have also been reviewed with input from Borough Council staff and Norfolk County Council Highways and Public Health departments.

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 the Borough Council of King's Lynn and West Norfolk's direct influence.

Responsibilities and Commitment

This Air Quality Action Plan (AQAP) was prepared by the Environmental Quality section of the Borough Council under the Directorship of Environment & Planning with the support and agreement of:

- Norfolk County Council's local highways and public health departments.

This AQAP will be subject to an annual review and appraisal of its progress as part of our statutory Local Air Quality Management review and assessment duties.

If you have any comments or suggestions on this AQAP, please send to:

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1 Introduction

This report outlines the actions that the Borough Council of King's Lynn and West Norfolk will deliver over the next 5-years (2024-29) 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 council's area.

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 and relevant regulations made under that part and to meet the requirements of the Local Air Quality Management (LAQM) statutory process^{8,9}.

It also considers the Environment Act 2021 and associated regulations in relation to PM_{2.5} which will be developed as part of the wider air quality project measure that sits within this plan.

This Plan will be reviewed every five years at the latest, or on revocation (whichever is the sooner). Progress on measures set out within this Plan will also be reported annually within this Council's Annual Status Report (ASR).

⁸ Defra, LAQM PG-22; <https://laqm.defra.gov.uk/air-quality/featured/england-exc-london-policy-guidance/>

⁹ Defra, LAQM TG-22; <https://laqm.defra.gov.uk/air-quality/featured/uk-regions-exc-london-technical-guidance/>

2 Summary of Current Air Quality in Borough Council of King's Lynn & West Norfolk

2.1 Background:

There are two Air Quality Management Areas (AQMA's) designated in King's Lynn due to exceedances in nitrogen dioxide (NO₂) over the long-term (annual mean) objective of 40ug/m³ namely:

- Railway Rd AQMA; and,
- Gaywood Clock AQMA;

2.2 Summary of Air Quality Results:

As explained in this Council's latest 2024 ASR on Air Quality:

- *No exceedances of the National Air Quality Strategy standards were identified for Nitrogen Dioxide (NO₂) during 2023.*
- *This is the fourth year running at Railway Rd AQMA where compliant results have been observed with no exceedances of the NO₂ annual mean objective. The compliance period is longer for the Gaywood Clock AQMA.*
- *Trends in NO₂ following the first Covid lock-down year of 2020 showed a marked reduction of around 20% in the annual mean NO₂ concentrations. The concern had been the extent of traffic rebound, but annual mean concentrations have subsequently remained relatively constant, with results less than 10% of the NO₂ objective (40µg/m³).*
- *No exceedances of PM₁₀ objectives level were noted during 2023.*
- *No exceedances of the PM_{2.5} annual mean level were noted during 2023.*
- *Monitoring results are not in excess of the air quality objectives outside of the existing AQMA's and therefore we are not proposing to amend or designate a new AQMA.*

Also explained in the ASR 2024 that the priority for the coming year is;

- *To put forward the updated AQAP for adoption and revoke the Gaywood Clock AQMA (summer 2024).*

- *To retain Railway Rd AQMA due to transport infrastructure schemes being planned for King's Lynn and need to review their air quality impacts before deciding to retain, amend or revoke the Railway Rd AQMA.*
- *On the basis of these proposed changes in King's Lynn we have decided to purchase an additional continuous air quality monitoring station (Earthsense Zephyr) to monitor NO₂ and help with this detailed assessment work.*

2.3 Summary of AQMAs and Workplan:

2.3.1 Railway Road AQMA:

This initial AQMA was declared on the 01st of November 2003 and extended only to a relatively small area along Railway Rd (A148) in the town centre of King's Lynn.

A subsequent further detailed assessment was carried out in 2005 when it was observed that NO₂ exceeded the objective more widely and the area required expanding. An order was made on 02nd of February 2007 that varied the original and for the AQMA to extend to all residential properties along Railway Road, Blackfriars Road, and down to the London Road ending at the Southgates. The extent of the AQMA is shown in [Figure C.1](#), Appendix C.

Key trend data within this AQMA over the last 5 years is shown in Appendix C, [Figure C.6](#) and [Figure C.7](#) for the north and south bound sections of the gyratory that forms the AQMA. To help show the spatial variation in NO₂ for example during pre-Covid period (2019) this is also shown in [Figure C.3](#) and [Figure C.4](#).

As can be seen the highest NO₂ occurs along the north bound section of Railway Rd where vehicles (mostly buses) exit the bus station / interchange area at the junction with Albion St and which contributes to the NO₂ pollution within Railway Rd.

Trend data even at this area that experiences the highest NO₂ annual mean concentration shows relatively constant results over the last four years as less than 10% of the objective.

Whilst it is recognised that there has been four years of compliant NO₂ annual mean results within the Railway Rd AQMA, a review of air quality will need to be carried out once the options to the Southgates Masterplan and Gyratory system have been completed and detailed traffic data made available.

This is considered important as a study of the traffic impacts from the West Winch growth area showed NO₂ to increase within Railway Rd AQMA with levels reverting back towards the annual mean objective. The additional study is explained in more detail within Appendix-C of the ASR for 2024.

It should be noted that this assessment was considered worse case as it does not take into account these transport schemes coming forward through the LTP and King's Lynn Transport Strategy, and reason for the more detailed assessment to be undertaken before deciding whether this AQMA should remain, be amended, or revoked.

To assist with this process we have purchased a continuous (indicative) air quality monitoring station (Earthsense Zephyr) to monitor for the NO₂ as well as PM₁₀/PM_{2.5} close to the area of highest NO₂. This will help with this more detailed assessment work.

2.3.2 Gaywood Clock AQMA

Gaywood Clock AQMA was declared following a further detailed assessment carried in 2008 following the extended declaration to the Railway Rd AQMA and came into effect 6th April 2009. It is also formed around residential properties along the A148 that links to Railway Rd but centred around a junction at Gaywood Clock (see [Figure C.2](#), Appendix C).

Spatial distribution of NO₂ annual mean concentrations around the junction for 2019 is shown in [Figure C.5](#) and trends over the last five years presented in [Figure C.8](#) showing results as all less than 30µg/m³ of the annual mean NO₂ objective.

Furthermore, the last time there was an exceedance in the annual mean objective for NO₂ within this AQMA was in 2010. The concern however had been the extent of traffic rebound following Covid, but as can be seen the annual mean concentrations have remained relatively constant since this period.

Due to the continued compliance of more than 5-years and levels being observed below the 30µg/m³ annual mean it is not considered necessary or proportionate to retain this AQMA and its AQAP Measure 3.4. It is proposed to be put forward for revocation.

3 BCKLWN's Air Quality Priorities

3.1 Public Health Context

As detailed in Policy Guidance LAQM.PG22 (Chapter 8) and the National Air Quality Strategy (2023¹⁰) local authorities are expected to work towards reducing emissions and/or concentrations of PM_{2.5} of sources that are within their control.

The evidence base on public health impacts from air quality has grown substantially over the years culminating with the Chief Medical Officer's report for 2022 dedicated solely to air pollution². Air pollution is best thought of as a mixture of gases and particles, all of which may interact and have greater effect if combined.

The pollutant with the strongest epidemiological link to health outcomes is PM_{2.5}. This has the ability along with other pollutants like the nitrogen dioxide (NO₂) to go deep into the lungs and absorbed into the blood stream.

The NO₂ component and which is the focus of this AQAP is inter-linked as it can react in the atmosphere in the presence of other pollutants to form additional secondary PM_{2.5}. NO₂ is harmful to human health as it causes irritation of eyes, nose and throat but also respiratory problems from asthma with the potential for reduced lung function at high levels².

Due the combined effects from PM_{2.5} it is used as the basis for understanding the context of air pollution through the Public Health Outcomes Framework (PHOF) indicator D01¹¹. This indicator derives the proportion of mortalities and associated loss in life years that can be attributed to air pollution as a population weighted average in the area¹². This relative risk is important as it forms the basis of action through all delivery partners as set out in Norfolk's Joint Strategic Needs Assessment to tackle air pollution in the area.

To help drive forward improvements in air quality the Environment Act 2021 set new national targets for PM_{2.5}, that whilst not part of LAQM duties, local authorities are nevertheless tasked to support through the National Air Quality Strategy (2023).

¹⁰ NAQS, 2023; <https://www.gov.uk/government/publications/the-air-quality-strategy-for-england/air-quality-strategy-framework-for-local-authority-delivery>

¹¹ Public Health Outcomes Framework; <https://www.gov.uk/government/collections/public-health-outcomes-framework>

¹² PHE, 2014, Estimating Local Mortality Burdens with Particulate Matter Air Pollution; <https://www.gov.uk/government/publications/estimating-local-mortality-burdens-associated-with-particulate-air-pollution>

These national targets on PM_{2.5} form the next challenge for work on air quality, as they apply borough wide and therefore mark a change in the context of public health.

The national targets include an annual mean target for PM_{2.5} and a population exposure reduction target. Against these targets we compare average annual mean PM_{2.5} concentrations for the BCKLWN when based on Defra background maps for the 2023 period (see [Table 3.1](#) below).

In terms of the annual mean target of 10µg/m³ there are no 1 km grid squares currently that exceed the 2040 10µg/m³ target level.

However, for the population exposure reduction target, PM_{2.5} levels on average will need to reduce to 6.1µg/m³ by 2040. Levels currently are much higher, and which highlights the extent of work that is still required.

Table 3.1: National PM_{2.5} Targets

National Target	PM _{2.5} National Target measure	BCKLWN Target µg/m ³	Deadline
Annual Mean target	10µg/m ³ concentration to be achieved nationwide	10µg/m ³	By 2040
Interim Annual Mean Target	12µg/m ³ concentration to be achieved nationwide	12µg/m ³	By 2028
Population exposure reduction target	35% reduction in average population exposure compared to 2018 baseline	6.1µg/m ³	By 2040
Interim Population exposure reduction target	22% reduction in average population exposure compared to 2018 baseline	7.33µg/m ³	By 2028
Current average PM _{2.5} in BCKLWN (2023) 8.6µg/m ³			

We do not have direct responsibility to control these concentrations, but many of our measures such those as set out within this AQAP have the potential to reduce PM_{2.5}.

To help improve the understanding of the sources of PM_{2.5} district-wide and to support these national targets we are looking to develop a health-based project focussing on particulate matter. This project forms the final measure within this updated AQAP (Measure 6.1). It is a partnership with Norfolk County Council's Public Health plus other specialists. The project is still being developed in partnership with these key stakeholders.

Project updates are to be reported within the council's ASRs. This health-based project may also require AQ grant funding.

In terms of measures to reduce average PM_{2.5} levels as explained in this year's ASR we are already carrying out the following;

- We review planning applications and where necessary recommend suitable conditions to help mitigate pollution from new developments. To minimise potential impacts from new developments, health damage costs of PM_{2.5} and NO_x can be used to estimate the degree of mitigation and whether any residual offsetting is necessary. This option is explained more fully in Section 3.2 below.
- This Air Quality Action Plan will further help reduce PM_{2.5} emissions through measures.
- Implement the King's Lynn Transport Strategy which will help reduce levels of PM_{2.5} from the vehicle emissions including secondary PM_{2.5} produced from road-NO_x.
- Regulation of LAPPC prescribed processes through environmental permits to ensure compliance with Best Available Techniques (BAT) and where necessary compliance with any emissions limits.
- We have adopted a Climate Change Strategy and Action Plan and provided a £1,000,000 budget to help implement the Strategy. This work will help reduce carbon emissions but also PM_{2.5} emissions through the reduction in fossil fuel usage through:
 - vehicles (via EV charging and active travel alternatives);
 - domestic residential properties (Warm Homes, ECO 3 & 4); and,
 - industry and commercial premises (Business Expo 2022).
- Published advice on Council's website about indoor quality with links to checklists from Asthma and Lung UK to help reduce exposure to the indoor PM_{2.5} and other pollutants.
- We continue to work with colleagues within the Norfolk EP group on PM_{2.5} work.

- Carry out reviews of National Atmospheric Emissions Inventory (NAEI) submissions¹³ to inform other work.

Currently the NAEI shows that the domestic sector burning wood is responsible close to a third of all PM_{2.5} emitted in 2021 (17.1kt). National estimates from domestic sources are noted by NAEI to be prone to uncertainty due to lack of comprehensive wood fuel sales data.

Since wood burning from the domestic sector is thought to be responsible for such a large proportion of the total primary PM_{2.5} load we have made it easier for individuals to report smoke from chimneys within any of the eight Smoke Control Areas (SCAs) in King's Lynn via an online tool^{14,15}.

To help promote best practice within the domestic sector burning wood we promote the national Better Burn, Breathe Better campaign through the council's website. This sets out the types of solid fuel which should be used and how to minimise PM_{2.5} emissions. We also participate in Clean Air Day.

For the larger boilers burning wood (>45kW_{th}) we assess these individually and maintain an inventory of their emission rates.

3.2 Planning and Policy Context

The planning system can play a crucial role in managing and improving air quality and helping with the transition towards a low emission, more sustainable future. Planning policy is a key factor for local authorities in carrying out their air quality functions; close cooperation between planning and air quality officers is therefore essential.

The National Planning Policy Framework (NPPF, 2023) sets out national planning policies and principles for England and how these are expected to be applied, these include the sections within the NPPF;

¹³ NAEI, UK Informative Inventory Report, https://uk-air.defra.gov.uk/assets/documents/reports/cat09/2303151609_UK_IIR_2023_Submission.pdf

¹⁴ SCA reporting tool; https://www.west-norfolk.gov.uk/info/20137/air_quality/633/burning_wood_and_coal

¹⁵ Defra UK-Air; <https://uk-air.defra.gov.uk/data/sca/>

- Section 180(e) states that planning decisions should contribute to and enhance the natural and local environment by preventing unacceptable levels of air pollution and wherever possible improve air quality;
- Section 192 that sets out that opportunities to improve air quality or mitigate impacts from new developments should be identified and which sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas' (AQMAs), and ensure that decisions are consistent with the local air quality action plan (AQAP);
- Section 116 that sets out a hierarchy of preference towards more sustainable methods of transport and wherever significant amounts of movement are identified the development will be required to be mitigated via a sustainable travel plan.

The Council has the following local policies that relate to air quality including:

- Policy DM-11 (Environment) which sets out that development should 'protect and enhance the amenity of the wider environment including air quality.'
- Policy CS-11 (Transport) sets out a priority first approach towards local cycling and walking infrastructure and public transport in line with the above NPPF Section 112. This aligns to our Priority 1 Measures. Policy CS-11 also sets out that transport assessments and travel plans are required wherever significant traffic impacts are likely and consistent with to the NPPF.
- Policy CS-08 (Sustainable Development) requires all new development to be of high-quality design which includes measures such as 10% reduction in buildings SAP CO₂ emissions from major developments through renewable / decentralised systems. This policy also favours a reduction of on-site emissions through generation of cleaner energy systems.

The emerging Local Plan aims to adopt Polices CS-11 and DM-11 under policies LP-21 and LP-13 respectively.

There are also Norfolk CC guidelines that we refer to on transport interventions such as travel plans¹⁶, transport assessments¹⁷ and parking guidelines¹⁸ which includes a section on electric vehicle charging infrastructure.

In terms of this AQAP:

- Previous AQAP Measures (2 and 3) are not taken forward within this updated version with reasons given in Appendix B Table B.1.
- Measure 5.1 (To consider AQ from new developments). This is considered an important measure and has been updated. The council's ASR will provide an update on this measure annually (number of planning applications considered for air quality in the year).

3.3 Source Apportionment

3.3.1 Source Apportionment of the AQMA's

The AQAP measures presented in this report are intended to be targeted towards the main source of the NO₂.

Principal sources have shown by a source apportionment study carried out by Bureau Veritas (2017¹⁹). The study was based on DfT traffic count data (DfT, 2016²⁰) from road links selected within King's Lynn and calculating the relative proportions of NO₂ and NO_x using Defra's Emission Factor Toolkit (EFT v.8) based on the proportions of cars and taxi's, LDV's, buses and coaches and HGVs along these road links.

Apportioning the NO₂ and NO_x was presented for all modelled receptor locations and also locations with highest concentrations to compare any variation spatially as shown in Fig 3.2 and Fig 3.2 below:

¹⁶ NCC Travel Plan Guidance; <https://www.norfolk.gov.uk/rubbish-recycling-and-planning/planning-applications/highway-guidance-for-development/travel-plans>

¹⁷ NCC, Safe, Sustainable Development; <https://www.norfolk.gov.uk/rubbish-recycling-and-planning/planning-applications/highway-guidance-for-development/publications>

¹⁸ NCC, Parking Guidelines, 2022; <https://www.norfolk.gov.uk/rubbish-recycling-and-planning/planning-applications/highway-guidance-for-development/publications>

¹⁹ BCKLWN, 2017, Source Apportionment Study; https://www.west-norfolk.gov.uk/downloads/download/346/air_quality_information_documents

²⁰ Dept. of Transport Road Traffic Statistics; <https://roadtraffic.dft.gov.uk/manualcountpoints/70303>

Fig 3.1: Source Apportionment for Railway Rd AQMA

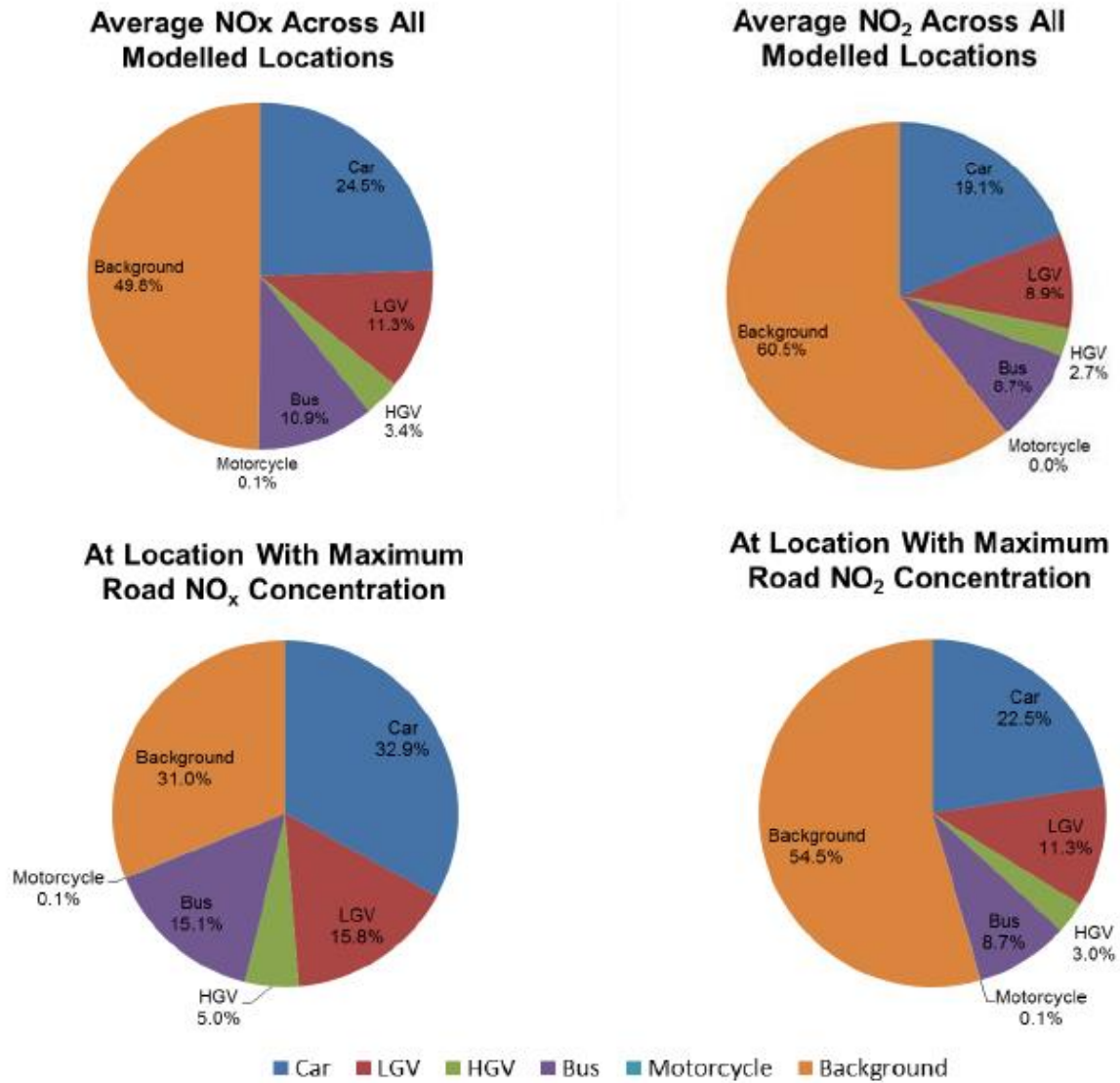
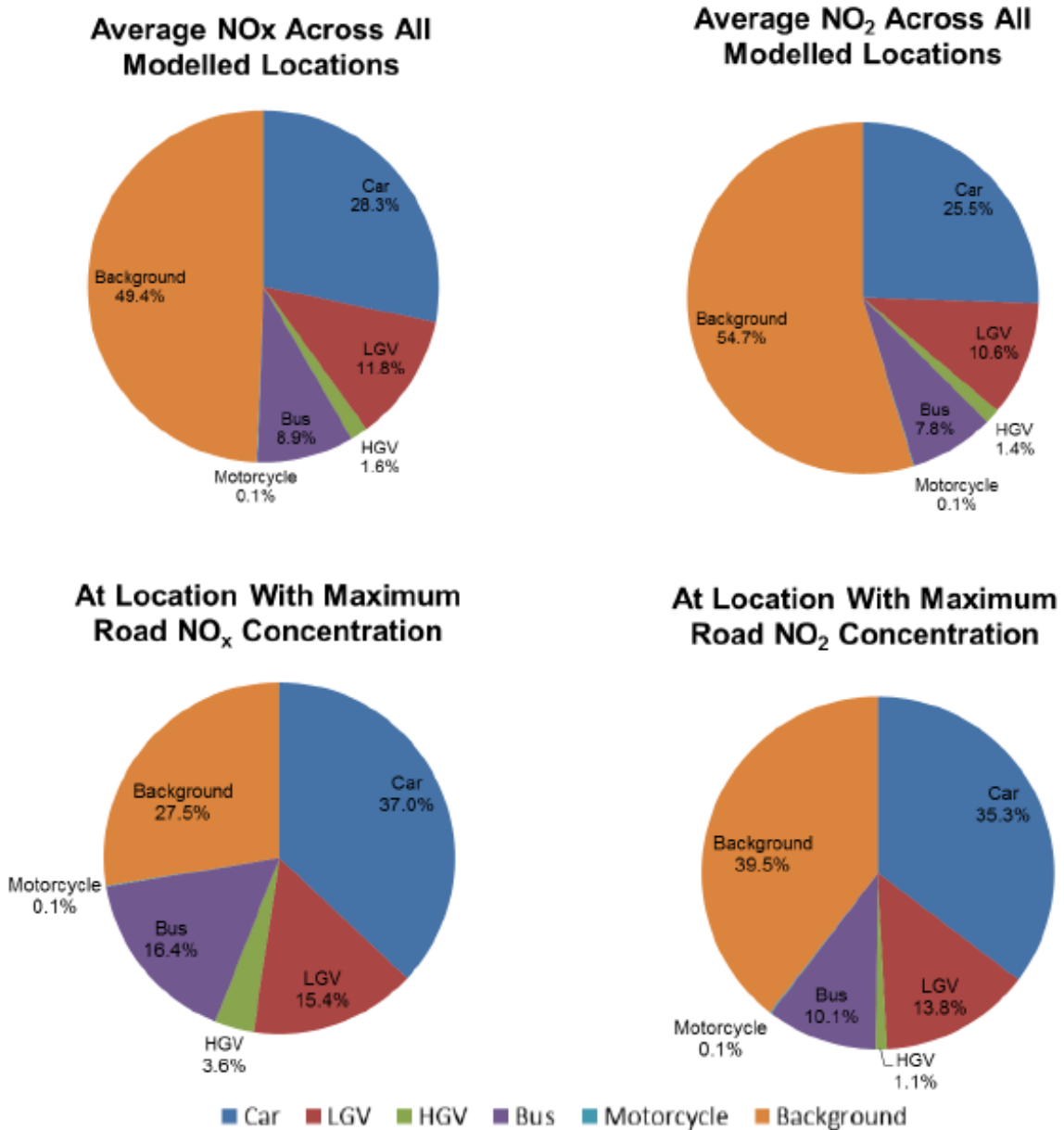


Fig 3.2: Source Apportionment for Gaywood Clock AQMA



When considering % reductions it is preferable to refer to the proportions as NO_x than NO₂ due to the primary emission from vehicles is in the form of NO_x. The relationship between the NO_x:NO₂ concentrations is non-linear. AQAP measures within Table 5.1 have been prioritised by NO_x.

In terms of the source apportionment study:

- When based on all locations the predominant source for the NO_x was from other sources that the main road links modelled i.e. suggestive of a wider

pollution source. To help address this issue, the proposed air quality project in Measure 6.1 will review NO_x as well as the particulate matter emissions district wide.

- At the locations with highest NO_x around two-thirds of the total NO_x was attributed to vehicles. In particular, cars formed the largest proportion of NO_x and NO₂ when compared to all vehicles. This is reflected in the priorities within the AQAP that favour active travel / modal shift i.e. that aim to reduce traffic than manage.
- Whilst the largest contribution in terms of vehicle NO_x was from cars, buses contributed to around half of this NO_x. With such a high proportion of total road-NO_x being attributed to buses is reason to specifically target this source group through Measure 2.2.

3.3.2 Source apportionment of PM₁₀ and PM_{2.5}

A source apportionment study for particulate matter is not necessary for this AQAP as it is based on measures primarily aimed at reducing NO₂. However, we intend to carry out a source apportionment study into particulate matter emissions across the district as part of the Measure 6.1 (to help develop the West Norfolk air quality project).

3.4 Required Reduction in Emissions

There is no requirement to express NO₂ (µg/m³) required reduction as results are currently compliant.

3.5 Key Priorities

Priory 1 – Accelerating modal shift to public and active transport.

We have prioritised measures that are associated with reducing traffic as vehicles were identified as the predominant source of NO_x / NO₂ in the AQMAs from the source apportionment study. Reducing traffic flows will also be associated with ancillary benefits to climate change policies and help reduce the contribution from domestic greenhouse gas emissions (GHG). According to the Dept. of Transport in its Decarbonising Transport, for a Better, Greener Future (2021²¹) transport was the largest contributor to UK *domestic* greenhouse gas (GHG) emissions, responsible for 27% in 2019. Locally this was reported as slightly higher at 29% in 2018²².

In order to reduce the impact from this sector we need to encourage and facilitate active travel for short journeys (or as part of a longer journey) where practicable, in combination with a reduced need to travel. AQAP measures 1.1 – 1.6 are focussed on a modal shift away from private vehicles towards public transport and active travel. The measures are underpinned by the Local Cycling and Walking Infrastructure Plan for King's Lynn.

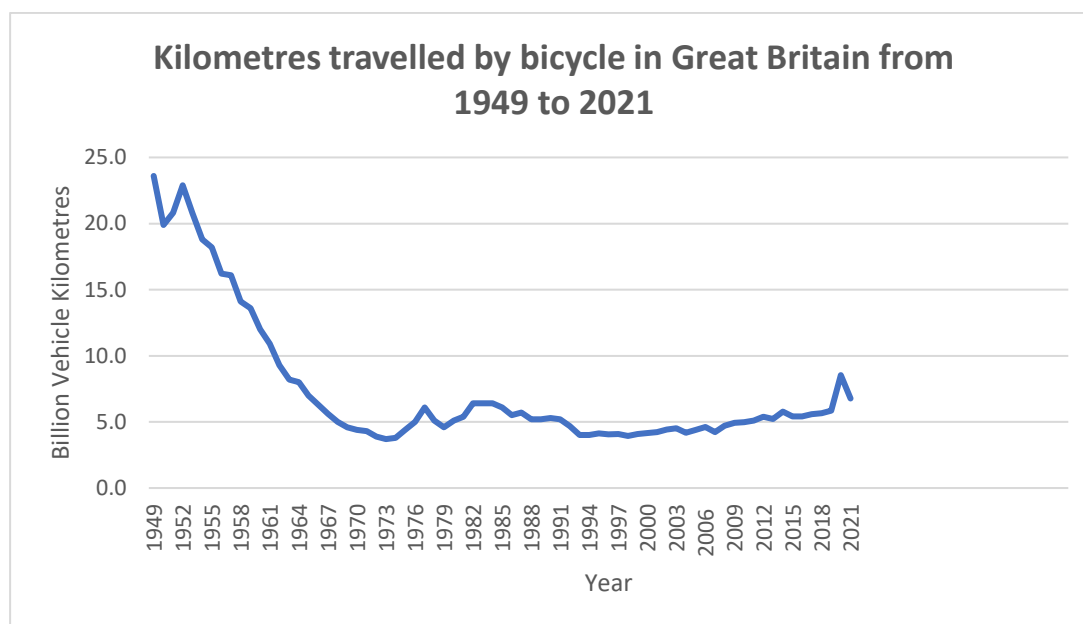
Every vehicle trip that can be replaced by walking, cycling or public transport helps free up limited road space for trades and public transport including buses, taxis, internet deliveries, tradespeople, carers, and food distribution. The journeys below five miles represent 58% of all private car journeys in U.K. in 2019 (DfT, 2021) and provide the biggest opportunity for switching short car journeys to cycling and walking.

The Chief Medical Officer's Annual Report that was dedicated to air quality in 2022 (CMO, 2022²) highlighted this issue that by reversing some of the decline in bicycle trips as shown in Figure 3.3 would have substantial health benefits due to physical activity being built into the normal day in addition to a reduction in air pollution.

²¹ Dept. of Transport, Decarbonising Transport – A Better Greener Britain; https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1009448/decarbonising-transport-a-better-greener-britain.pdf

²² BCKLWN Climate Change emissions; https://www.west-norfolk.gov.uk/info/20095/energy_and_climate_change/920/west_norfolk_emissions

Fig 3.3: Reduction in active travel 1949-2021



Moreover, during the pandemic many workplaces adopted measures to help staff work from home yet only 1182 active travel plans have been reported as being registered with the nationally accredited Modeshift Stars scheme²³. So, whilst engine technology improvements will help, more needs to be done, especially when domestic GHG emissions from transport as reported by DfT (2021) have been broadly flat for the last 30 years. This council for example plans to develop a green travel plan as part of its post Covid recovery plan (Measure 1.2) and climate change initiatives.

In addition, around the Gaywood Clock AQMA there are a number of schools plus the main hospital for King's Lynn (Queen Elizabeth Hospital) situated directly off from the junction. Prioritising active travel plans for the schools and Hospital will help alleviate some of the traffic congestion.

This Council also has an Active and Clean Connectivity Plan²⁴ comprising three key elements; to develop two active travel hubs in the area; deliver priority schemes within the local cycling and walking infrastructure plan (LCWIP²⁵) and to work with a number of businesses to help facilitate workplace travel plans. Working with local businesses on the plans will also help to help understand any barriers for wider implementation. Analysis of the travel plans has been carried out Mobilityways

²³ Modeshift Stars; <https://modeshift.org.uk/modeshift-news/modeshift-stars-accreditation-hits-record-numbers/>

²⁴ <https://www.visionkingslynn.co.uk/projects/active-and-clean-connectivity/>

²⁵ NCC, LCWIP; <https://www.norfolk.gov.uk/-/media/norfolk/downloads/what-we-do-and-how-we-work/policy-performance-and-partnerships/policies-and-strategies/roads-and-transport/kings-lynn-lcwip-main-report-february-2022.pdf>

(2024). The borough council has secured £6.7m towards the Active & Clean Connectivity Programme through Towns Fund and the Norfolk Business Rates Pool.

Priority 2 – Public Transport improvements:

To help with the move towards increased active travel / modal shift we have prioritised public transport improvements in priority 2. The measures include NCC's Bus Service Improvement Plan (BSIP) measures in Measure 2.1.

Reducing the NO_x contributions from buses in King's Lynn is also proposed in Measure 2.2 as bus emissions contribute a high proportion of the total road-NO_x within Railway Rd AQMA. Measure 2.2 is currently unfunded but is supported by NCC public health, to identify funding through DfT's Zero Emission Bus funding for Regional Areas (ZEBRA²⁶).

Priority 3 – Transport Management Improvements:

To help improve air quality and enable the required mode shift to public transport and active travel modes, a number of transport infrastructure improvements are planned for the centre of King's Lynn. Funding (£24m) has been secured by Norfolk CC to implement transformational schemes with the town centre's gyratory system and at the Southgates, which will provide significant infrastructure improvements for buses, walking, cycling and public realm to encourage modal shift.

These changes in transport movements however have the potential to impact the Railway Rd AQMA and therefore we have included AQAP measures (3.1 and 3.2) to review the proposals for air quality once detailed traffic information is available.

In addition, to help manage parking in the area this council will also develop a car parking strategy for the area and where air quality can be considered (Measure 3.3).

Priority 4 – Review of new planning developments:

The National Air Quality Strategy (2023) which local authorities must have regard to expects that developments emit the minimum amount of pollution over their scheme lifetimes. To help prevent new developments from contributing to the problem and to improve air quality wherever possible in line with the NPPF, this AQAP also prioritises this workstream.

²⁶ DfT ZEBRA funding; <https://www.gov.uk/government/publications/apply-for-zero-emission-bus-funding-zebra-2>

We will endeavour to identify any additional measures to mitigate emissions at an early stage. Any obligations will be proportionate to the nature and scale of the development proposed and the level of concern about air quality. The pollutants (PM_{2.5} and NO_x) can be assigned a value based on their damage cost estimates but which will typically be over a 30-year time frame to reflect lifetime of development. Any mitigation / offsetting is to be determined on a case-by-case basis.

Priority 5 – Public awareness:

Following the inquest into the death of Ella Roberta Adoo-Kissi-Debrah on 21st April 2021 the coroner's report (2021²⁷) raised low public awareness of information on air quality as an area of concern. Public awareness of air quality was also considered poor as explained by Public Accounts Committee report (2022²⁸) on tackling air quality breaches.

A range of interventions are to be developed to better engage the public on air quality as listed with Measures 5.1, 5.2, of which improved air quality monitoring systems forms part.

Priority 6 – West Norfolk Air Quality Project:

An air quality project is the final priority of this AQAP as it will set out measures for how we will facilitate improvements in air quality district-wide with emphasis on particulate matter (PM₁₀ & PM_{2.5}).

²⁷ Judiciary Report to Prevent Future Deaths, 2021; <https://www.judiciary.uk/wp-content/uploads/2021/04/Ella-Kissi-Debrah-2021-0113-1.pdf>

²⁸ Public Accounts Committee, 2022, [Tackling local air quality breaches](#);

4 Development and Implementation of BCKLWN AQAP

4.1 Consultation and Stakeholder Engagement

In updating this AQAP we have worked with local authorities, agencies, businesses and the local community to improve local air quality. Schedule 11 of the Environment Act 1995 requires local authorities to consult the bodies as listed in Table 4.1.

In developing this Air Quality Action Plan and its updated measures, we have already gone out to public consultation²⁹ that included an online questionnaire and two officer-led face to face public drop-ins held at Gaywood Library and Central Library in King’s Lynn.

The response to our consultation stakeholder engagement is given in Appendix A (Table A.1).

Table 4.1– Consultation Undertaken

Yes/No	Consultee
Yes	Secretary of State
No (a)	Environment Agency
Yes	Norfolk County Council (local Highways Authority, Public Health)
No(b)	National Highways Authority
Yes	all neighbouring local authorities
Yes	bodies representing local business interests and other organisations as appropriate;

(a) Note: Source apportionment study of the AQMA’s did not show any permitted activities that are regulated by the Environment Agency as contributing to NOx emissions in the AQMAs.

(b) National Highways are not affected by the Measures.

²⁹ BCKLWN consultation on draft AQAP; <https://www.west-norfolk.gov.uk/aqap-consultation>

4.2 Steering Group

Governance of the AQAP comprises the following sections with responsibilities as set out below. Updates to transport related measures can be reported through the King's Lynn Area Transport Strategy (KLATS) group:

a) Overall responsibility for the AQAP:

Environmental Quality, BCKLWN

b) Directorship:

Environment & Planning, BCKLWN

c) Corporate Senior Management Team:

Borough Council of King's Lynn and West Norfolk

d) Cabinet Member

Environment (Air Quality Strategy) portfolio holder

e) West Norfolk Transport Infrastructure Steering Group

Joint Member Steer (BCKLWN / Norfolk CC)

f) King's Lynn Area Transport Strategy Group (KLATS)

Joint working group between BCKLWN & Norfolk CC and relevant advisers

g) Public Health

Norfolk CC, Public Health, Community and Environmental Services

h) Local Highways Authority

Norfolk CC

5. AQAP Measures

Table 5.1 shows the BCKLWN 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 based on NO_x:
 - **Low** – Action focussed on a small proportion of NO_x.
 - **Medium** – Action focussed on a measure with the potential to have more significant impact on NO_x emissions than those shown as low.
- the timescale for implementation
- how progress will be monitored

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

Table 5.1: Air Quality Action Plan Measures:

Priority & Measure No.	Measure	Category	Classification	Estimated Year of Introduction	Estimated 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	KPI	Progress to Date	Comments / Potential Barriers to Implementation
1.1	Improve active travel promotion to schools	Promoting Travel Alternatives	School Travel Plans	2024	On-going	NCC Schools	NCC	No	Partially Funded	< £10k	Planning	NO2 / PM2.5 - Low	No. of schools around AQMAs with active travel plans		NCC to provide nationally accredited Modeshift Stars toolkit to all schools so they can generate and manage their own travel plans, as well as offering a range of other measures such as Bikeability and other on-line learning tools (Step on It, Ride on It, Seat Belt Safety).
1.2	To develop a BCKLWN Travel Plan	Promoting Travel Alternatives	Workplace Travel Planning	2024	On-going	BCKLWN Sustrans	BCKLWN	No	Partially Funded	< £10k	Planning	NO2 / PM2.5 - Low	Outcome(s) to be agreed from adopted / active TP	TP is being developed as part of post Covid Recovery Plan	Developing a green travel plan forms part of the council's Climate Change Strategy. This will focus on commuting and business travel. The council are already working with Sustrans on developing the plan.
1.3	Development of other workplace / business travel plans	Promoting Travel Alternatives	Encourage / Facilitate homeworking	2024	2029	BCKLWN Private businesses	Town Deal and Business Rate Pool	No	Partially Funded	£50k - £100k	Planning	NO2 / PM2.5 - Low	No. of other workplaces with active travel plans	Mobilityways commissioned to analyse travel plans.	BCKLWN to work with a number of businesses (6) to help implement workplace travel plans but also to assess the barriers to implementation. Measure forms part of Council's Active and Clean Connectivity project funded through the £6.1m Town Deal and Business Rates Pool; https://www.visionkingslynn.co.uk/project/active-and-clean-connectivity/
1.4	Development of Active Travel Hubs	Transport Planning and Infrastructure	Intensive active travel campaign & infrastructure	2024	On-going	BCKLWN NCC	Town Deal & Business Rate Pool	No	Partially Funded	£1m - £10m	Planning	NO2 / PM2.5 - Low	No. of Active Travel Hubs	Design & Build Stage RIBA Stage 4 underway.	Phase-1 comprises the Nar Ouse Enterprise Zone in South Lynn, followed by Phase-2 with a travel hub within the existing Baker Lane Carpark; https://www.visionkingslynn.co.uk/project/active-and-clean-connectivity/

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1.5	Implement the local cycling and walking infrastructure plan (LCWIP)	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2024	2030	NCC BCKL WN	A&CC Town Deal project	No	Partially Funded	£1m - £10m	Planning	NO2 / PM2.5 - Low	Extent of Infrastructure / No. of LCWIP schemes.		LCWIP is to provide better N-S and E-W connectivity and improved access to rail and bus stations. Some of these measures are funded (£3m) through the Active & Clean Connectivity Plan (A&CC); others require external funding, including development through STARS project. Public consultation carried out in Feb 2022.
1.6	Support Use of West Lynn Ferry	Promoting Travel Alternatives	Promote use of rail and inland waterways	2024	On-going	BCKL WN NCC	TBC based on successful business case	No	Not Funded	Unknown - TBC	Planning	NO2 / PM2.5 - Low	Continued operation of Ferry Service with funding where necessary to support	Feasibility study funded.	To continue the operation of the Ferry Service and linked to parking strategy (Sail and Park). BCKLWN and NCC have jointly funded a feasibility study into ferry infrastructure improvements.
2.1	Work with Norfolk County Council to help deliver their Bus Service Improvement Plan (BSIP)	Transport Planning and Infrastructure	Public transport improvements - interchanges stations and services	2024	2025	NCC Bus Operators	DfT Bus Back Better	No	Funded	> £10m	Planning	NO2 / PM2.5 Low - Medium		£50m DfT funding secured	A range of bus infrastructure and support measures have been identified that have DfT funding. measures include cheaper fares for under 25's, new bus lanes, travel hubs e.g. in Hunstanton.
2.2	Zero Emission Buses in King's Lynn	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	2024	On-going	NCC Bus Operators	DfT ZEBRA funding	No	Not Funded	Unknown - TBC	Planning	NO2 / PM2.5 - Medium	No. of zero emission buses		Following review of NO2 source apportionment study in 2017 by Bureau Veritas it showed buses account for almost half of the road-NOx from cars but are a fraction of the total number within the AQMA's. Securing zero emission buses will help to reduce any disproportionate effect. Measure is supported by NCC, including Public Health. NCC will work with partners to apply for funding as opportunities arise.
3.1	Review changes to the road system within the King's Lynn Town Centre gyratory system (Railway Rd AQMA).	Traffic Management	UTC, Congestion management, traffic reduction	2024	2025	NCC BCKL WN	NCC Levelling Up Fund 2 (£24m)	No	Partially Funded	< £10k	Planning	Reduction in NO2/PM2.5 is dependent on AQ Modelling against preferred option(s)	Continued NO2 monitoring, with aim for downward trends	Plans at high level. Estimated cost £5.5m	Highest concentration of NO2 in King's Lynn occurs along Railway Rd within the Gyratory System of the Town Centre. Plan is to redesign the gyratory system with improved cycle and walking as needed for the town centre and a re-routing of buses. AQ assessment to be carried out once detailed traffic data is made available from project team.

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3.2	Review traffic related changes as part of the Southgates Masterplan	Traffic Management	UTC, Congestion management, traffic reduction	2024	2025	NCC BCKLWN	NCC Levelling Up Fund 2 (£24m)	No	Partially Funded	< £10k	Planning	Reduction in NO2/PM2.5 is dependent on AQ Modelling against preferred option(s)	Continued NO ₂ monitoring, with aim for downward trends	Plans at high level. Estimated cost £21m	Plan is to reconfigure the existing Southgates roundabout to a form that is better suited to public transport and active travel modes. AQ assessment to be carried out once detailed traffic data is made available from project team
3.3	Develop and implement a comprehensive Car-Parking Strategy for King's Lynn	Traffic Management	UTC, Congestion management, traffic reduction	2024	On-going	BCKLWN NCC	BCKLWN	No	Funded	Unknown - TBC	Planning	NO ₂ / PM _{2.5} - Low	TBC	AECOM Draft Strategy prepared	Air quality matters are to be considered within draft car parking strategy.
3.4	Review measures to improve traffic flows through Gaywood Clock AQMA.	Traffic Management	UTC, Congestion management, traffic reduction	2024	2024	NCC BCKLWN	LTP	No	Funded	Unknown - TBC	Planning	NO ₂ / PM _{2.5} - Low	Optimise queue lengths at Gaywood Clock junction	LTP4	Air Quality Management Area to be reviewed as per ASR 2023. Levels in the Gaywood Clock AQMA have been below the NO ₂ annual mean objective for more than 5 years.
4.1	To consider air quality from new developments and secure mitigation	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2024	On-going	BCKLWN	BCKLWN	No	Funded	< £10k	Implementation	Minimum amount of pollution from schemes lifetime	No of planning application considered per year	Reported annually in ASR	Measure previously targeted applications within or adjacent to AQMA. In practice any development of potential material concern for air quality is within scope. Planning procedure ensures that effective mitigation is secured from each development in accordance with NAQS (2023) and best practice guidance.
5.1	Promote behaviour change from individuals and employers	Public Information	Via the Internet	2024	On-going	NCC Public Health BCKLWN	NCC	No	Partially Funded	Unknown - TBC	Implementation	NO ₂ / PM _{2.5} - Low	Increased awareness		Engage the public through a behaviour change programme, including the use of social media to be more aware of taking personal responsibility for reducing air pollution through a number of measures (anti-idling, NCC journey planning toolkit, working with schools, Clean Air Day, Defra Burn Better, Breathe Better and indoor AQ etc.). Public Health to offer training to embed techniques in policy development.
5.2	Improve Public Awareness (Air Quality Monitoring and Information)	Public Information	Via the Internet	2024	On-going	NCC Public Health BCKLWN	BCKLWN	No	Partially Funded	Unknown - TBC	Implementation	NO ₂ / PM _{2.5} - Low	Increased Awareness of Air Quality	Draft Strategy	Raising public awareness is recognised as an important function of the air quality work of which improved air quality monitoring forms part. To investigate options to raise public awareness of air quality in light of changing public health context as informed by improved AQ monitoring and information systems.

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6.1	To develop an Air Quality Project to review the impact of PM10 and PM2.5 across the district.	Public Information	Via the Internet	2024	On-going	NCC Public Health BCKL WN	DEFRA BCKLWN NCC	Yes	Funded	Unknown - TBC	Planning	NO2 / PM2.5 - Low	Completion of project	Project being scoped with partners	Develop a project to review, monitor and reduce levels of PM10 & PM2.5. To work with Public Health and any others in defining the role.
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Appendix A: Response to Consultation

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

Consultee	Category	Response	Comment
Refer to separate spreadsheet (Appendix A):			

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)
Measure No.2	With regard to National Planning Policy Framework, include air quality considerations in the Local Plans and adopt an air quality Development Management Policy.	Air quality policy is adopted through policies DM-11 and CS-11. Emerging local plan is to adopt DM-11 and CS-11 into new policies (LP-21 and LP-13). Local plans consider air quality.
Measure No.3	With regard to National Planning Policy Framework, adopt Norfolk Technical Guidance on Air Quality and provide pre-application advice on planning applications	Aim was to refer to development control guidance produced locally through Norfolk AQ group. The measure is not being pursued as the local guidance document has since been superseded by the updated IAQM (2017) guidance on development control.
Measure No.5	New access road (Hardings Way).	Measure included option to open Hardings Way to some additional vehicles that would otherwise travel along the London Rd and through the AQMA. This measure is not being pursued following completion of a feasibility study completed by WSP in 2020 that concluded it would not be a viable option to open the road to general through traffic. The route still provides essential bus / accessible vehicle only route and forms part of NCN No.1 (a priority route in the LCWIP). It is popular for walking / cycling. Changing the use would be considered retrograde and against national policy of supporting public transport, walking and cycling.
Measures No.7 and No.8	Implementation of Urban Traffic Control system (UTC) at principal junctions within AQMA and adjacent to AQMA	Aim of the measure was to reduce emissions within the AQMA from stop/start driving through improved traffic light / detection systems. The measure is not being pursued as an additional specific intervention as both the UTC and also Selective Vehicle Detection Systems have been implemented.

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		Traffic control systems will form part of revised traffic management measures (Nos.3.1 and 3.2) and therefore not necessary to have stand-alone measure.
Measure No.9	Decriminalisation of parking. Review of parking controls and enforcement in AQMAs and King's Lynn Town Centre (Linked to 4, 10, 11 & 12)	Measure consolidated into Measure No.3.3 (To Develop Comprehensive Car Parking Strategy for King's Lynn).
Measure No.10	Variable car parking rates (Linked to 4, 9, 11 & 12)	Measure consolidated into Measure No.3.3 (To Develop Comprehensive Car Parking Strategy for King's Lynn).
Measure No.11	Variable message signs (Linked to 4, 9, 10 & 12)	Measure has been completed with real-time parking signs to direct people to where spaces are located.
Measure No.12	Investigate potential for residents only parking in or close to AQMAs (Linked to 4, 9, 10 & 11)	Measure consolidated into Measure No.3.3 (To Develop Comprehensive Car Parking Strategy for King's Lynn).

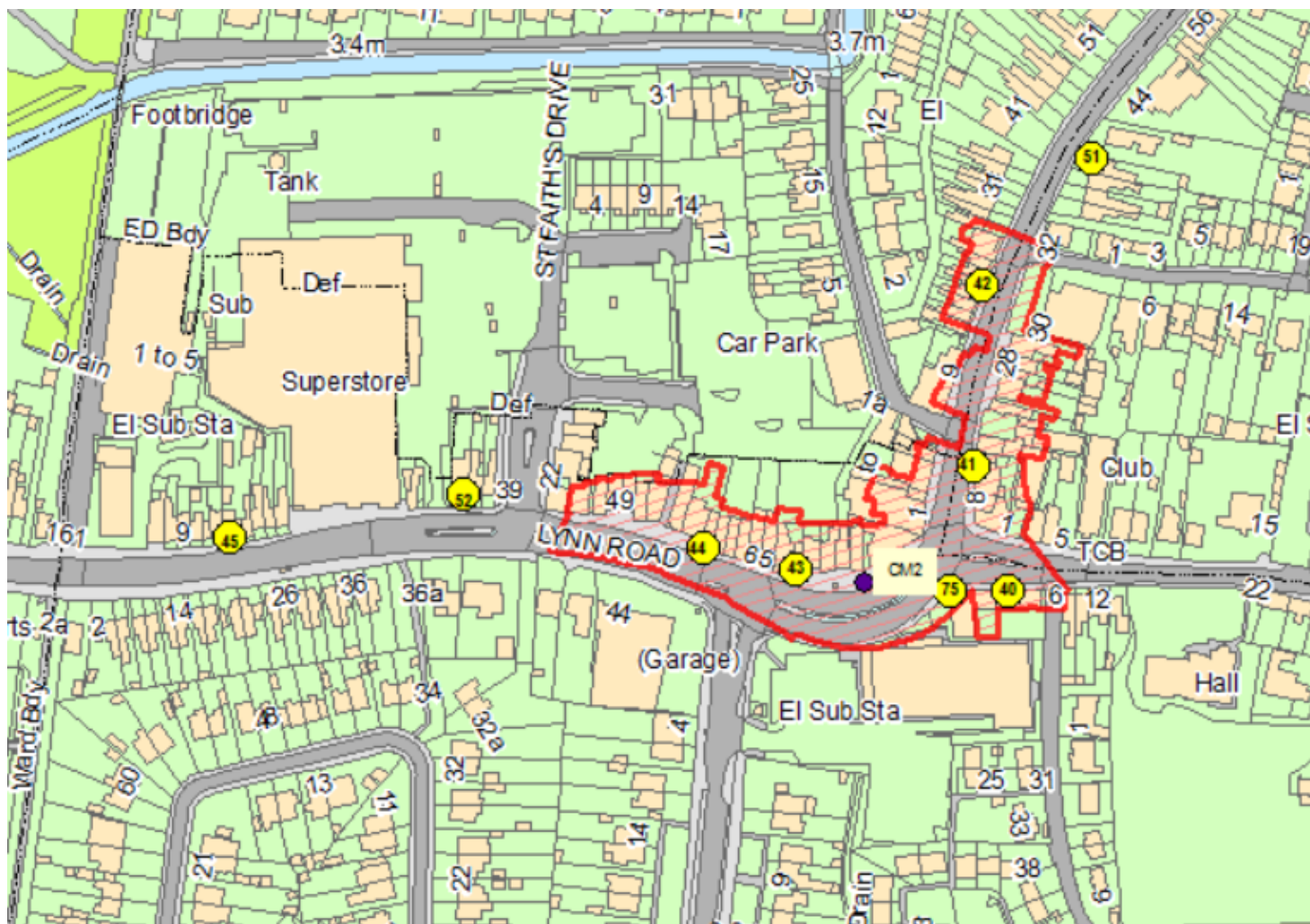
Appendix C:

Figure C.1: Map of Railway Rd AQMA and location of monitoring sites



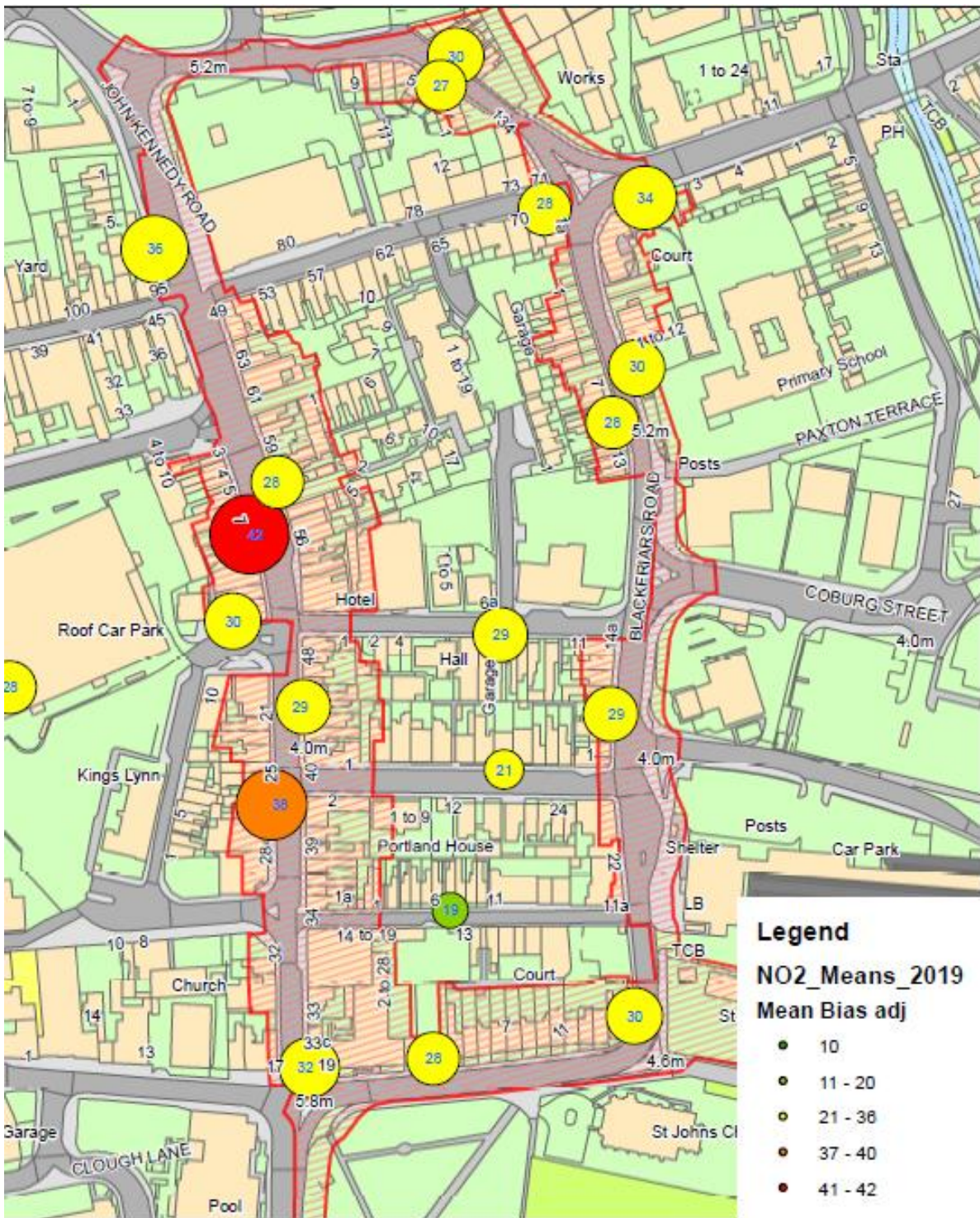
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Figure C.2: Map of Gaywood Clock AQMA and location of monitoring sites



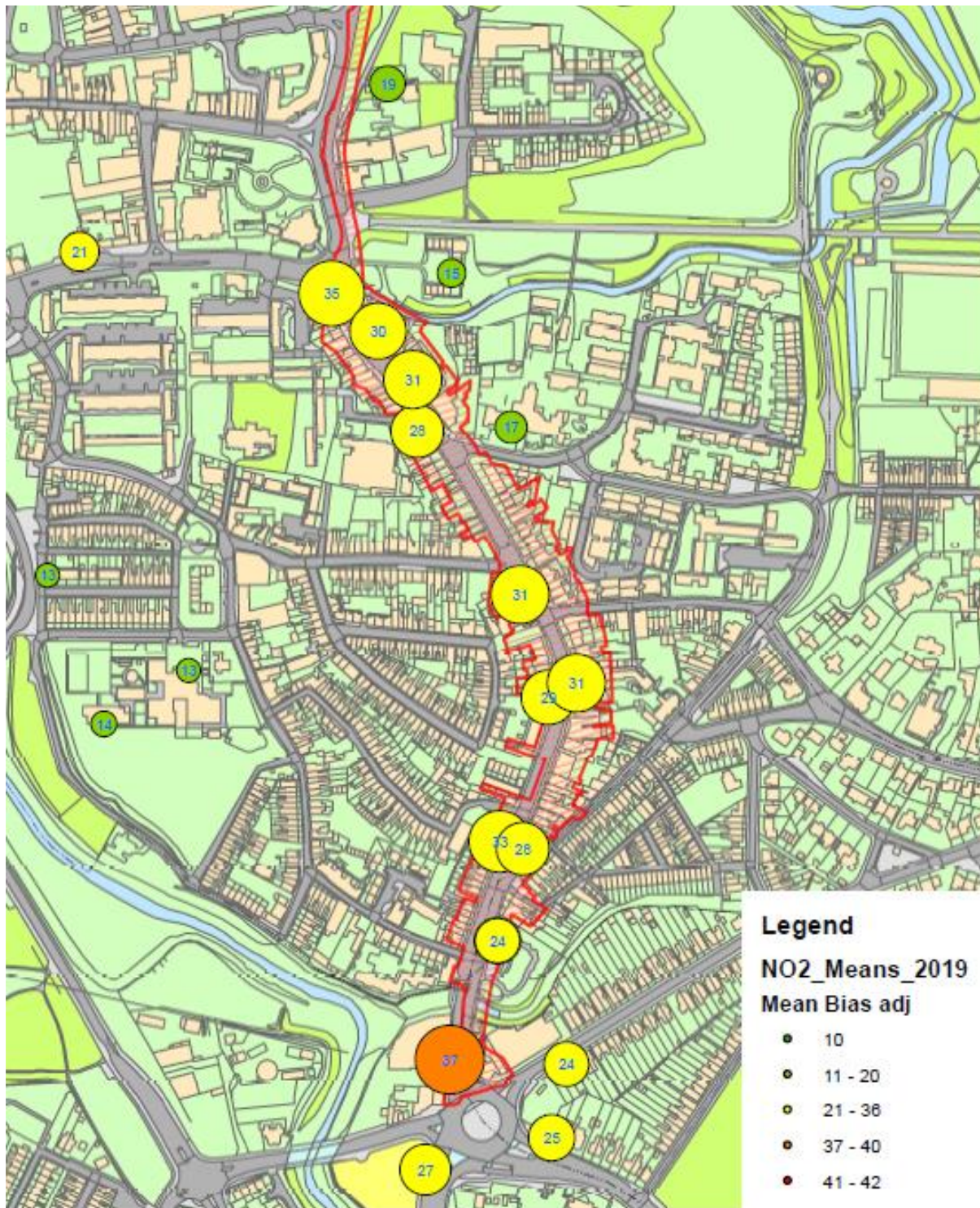
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Figure C.3: Spatial Distribution of NO₂ (annual mean ug/m³) around Railway Rd AQMA



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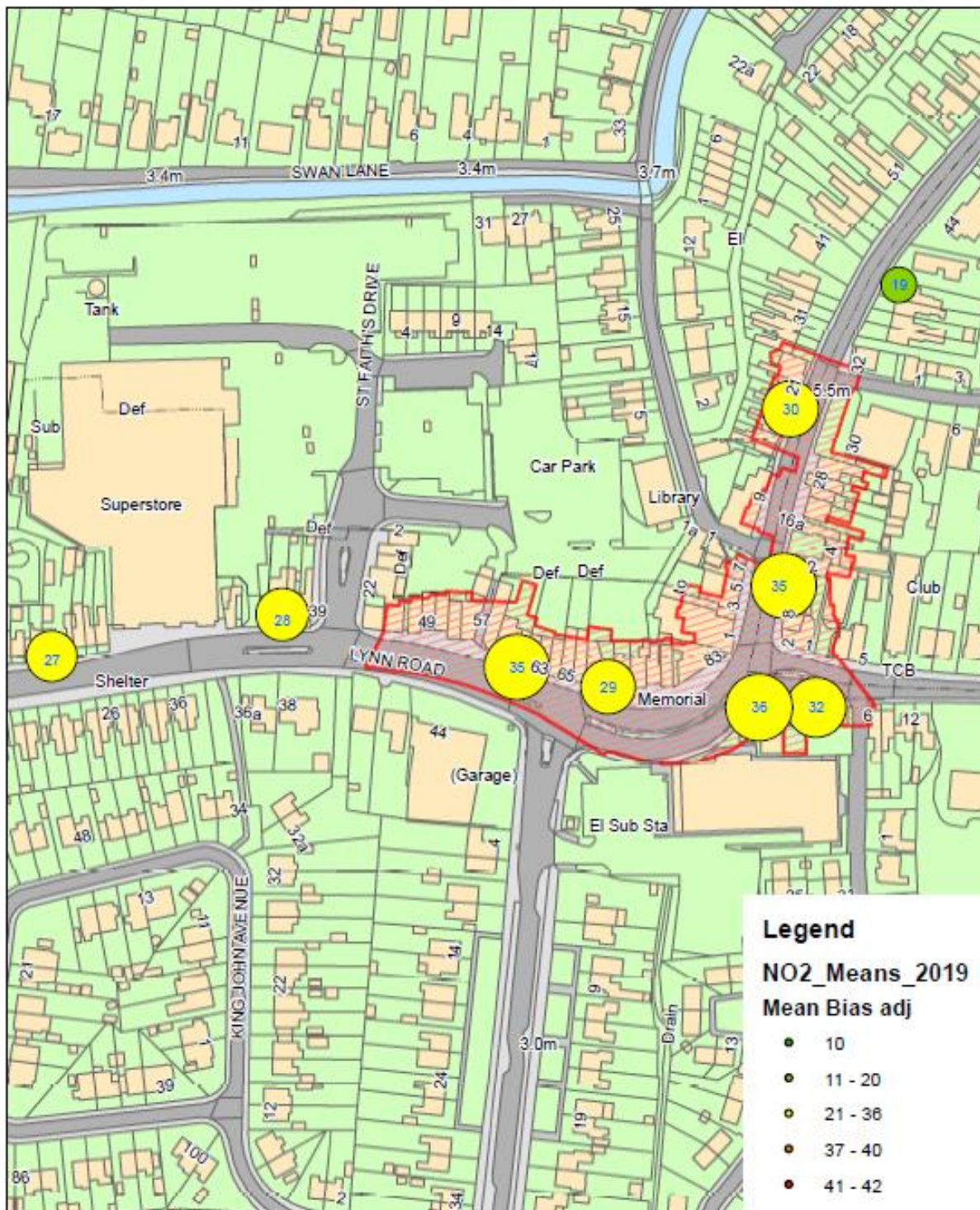
Figure C.4: Spatial Distribution of NO2 (annual mean ug/m³) around southern section of the Railway Rd AQMA



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BCKLWN Air Quality Action Plan

Figure C.5: Location of Gaywood Clock AQMA and spatial distribution by diffusion tube results (as 2019 annual mean $\mu\text{g}/\text{m}^3$).



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Figure C.6: Trends in NO2 annual mean ($\mu\text{g}/\text{m}^3$) along North bound section of Railway Rd AQMA;

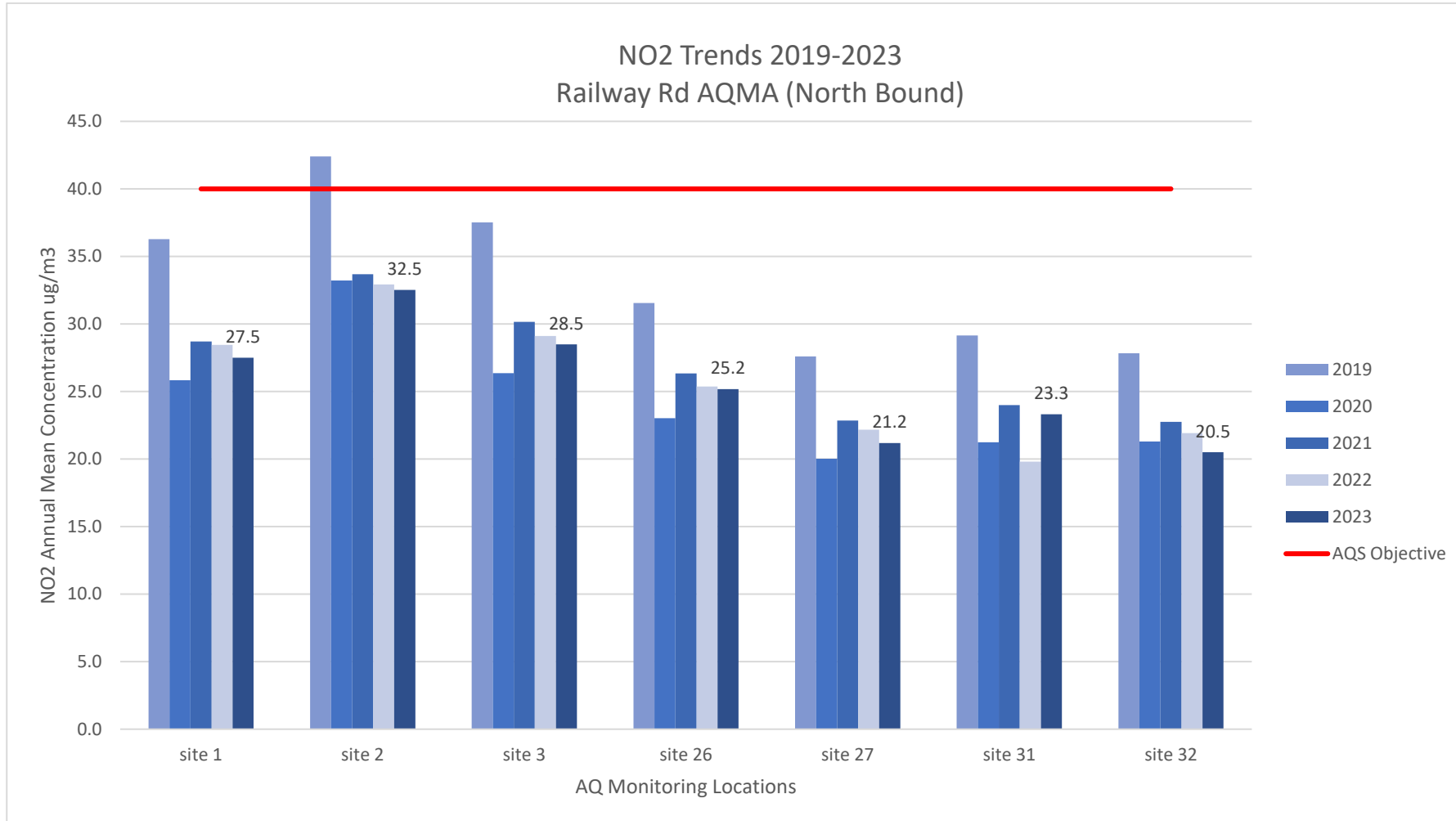


Figure C.7: Trends in NO2 annual mean ($\mu\text{g}/\text{m}^3$) along south bound section of Railway Rd AQMA;

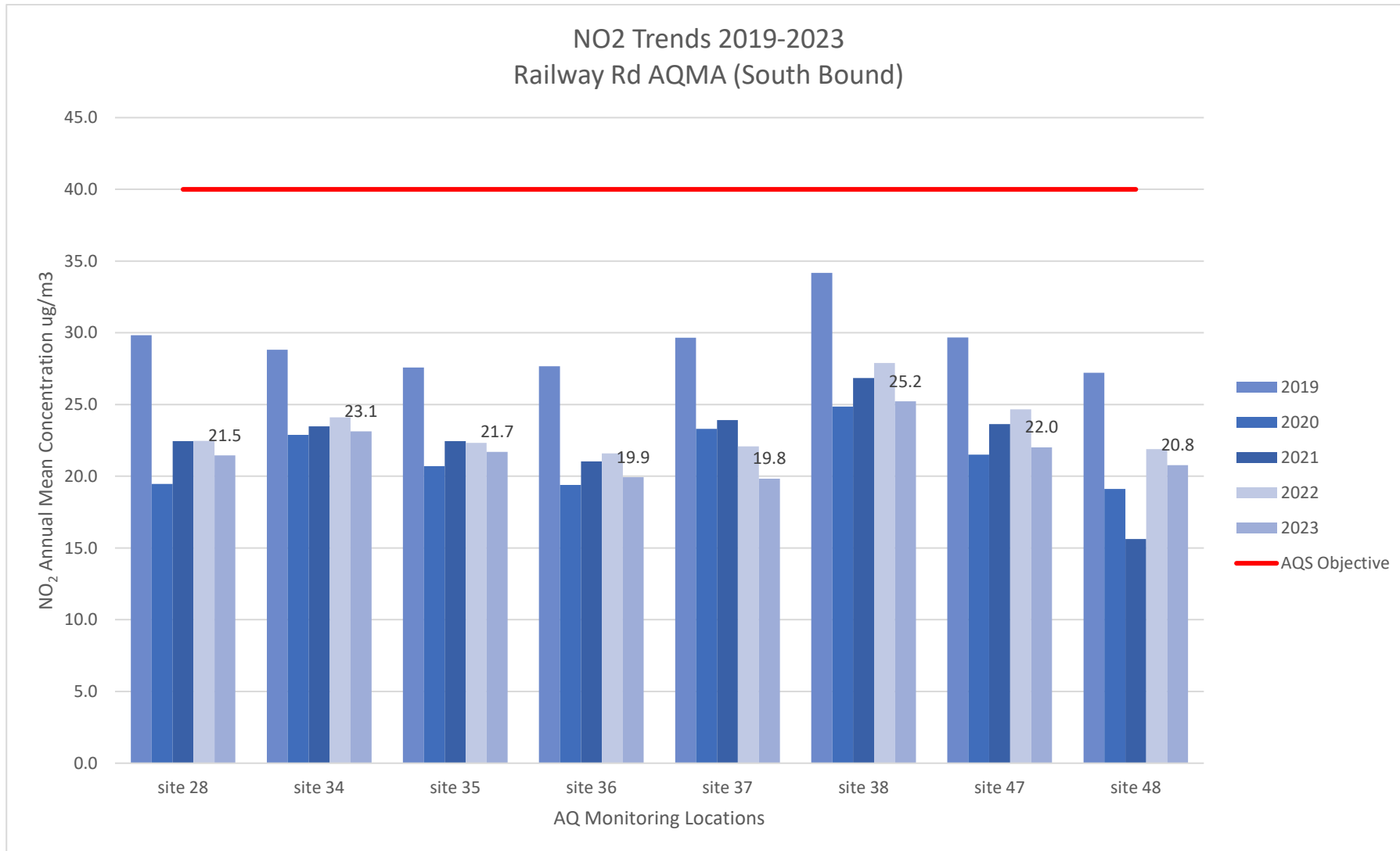
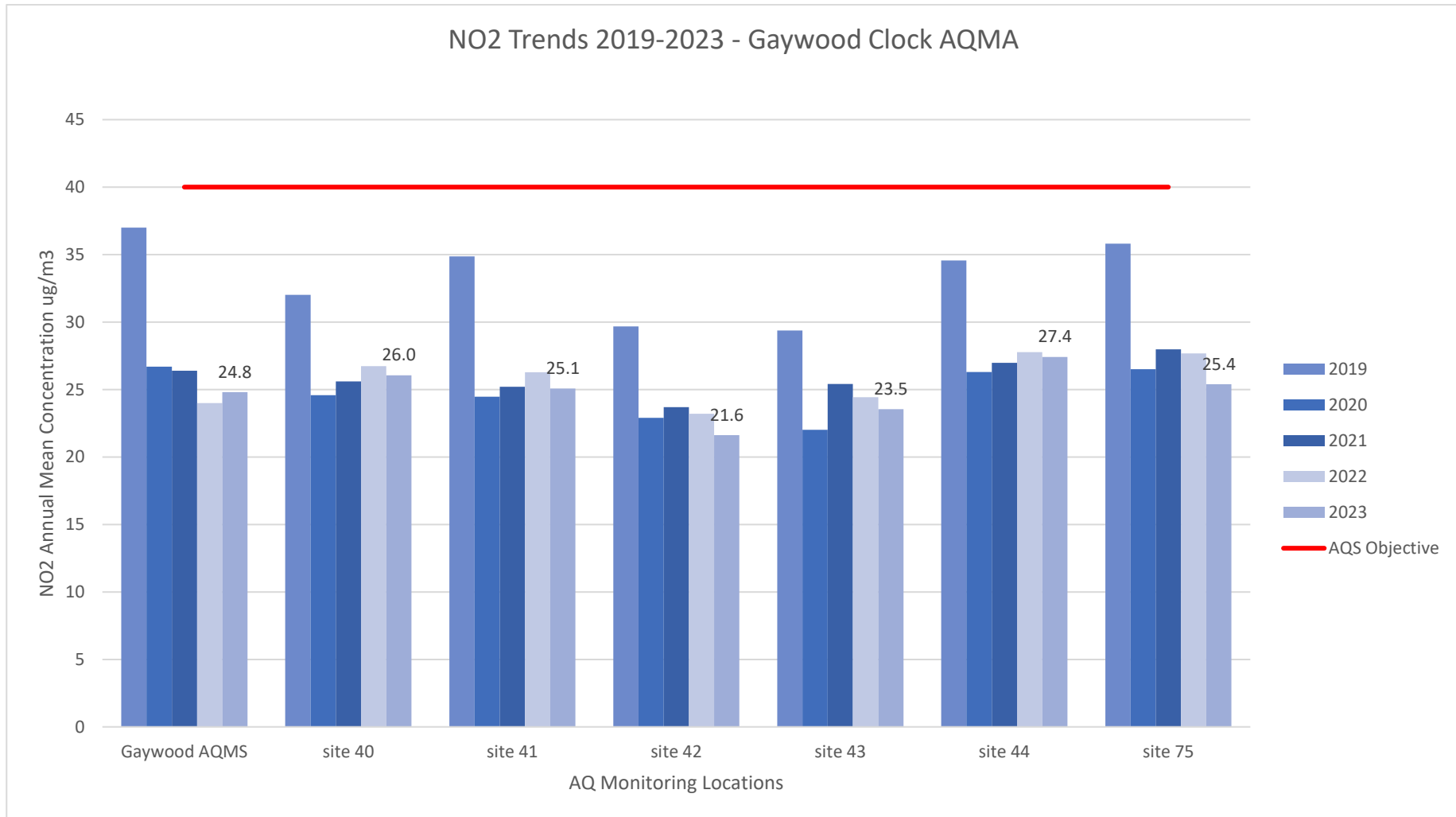


Figure C.8: Trends in NO2 annual mean ($\mu\text{g}/\text{m}^3$) around Gaywood Clock AQMA;



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	Annual Status Report
BCKLWN	Borough Council of King's Lynn and West Norfolk
BSIP	Bus Service Improvement Plan
Defra	Department for Environment, Food and Rural Affairs
EV	Electric Vehicle charging
EU	European Union
LAQM	Local Air Quality Management
LCWIP	Local Cycling and Walking Infrastructure Plan
NPPF	National Planning Policy Framework
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
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
PHOF	Public Health Outcomes Framework
SAP	Standard Assessment Procedure