South Oxfordshire and Vale of White Horse District Councils

South Oxfordshire and Vale of White Horse District Councils Air Quality Action Plan

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

South Oxfordshire and Vale of White Horse District Councils

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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 South Oxfordshire and Vale of White Horse between 2023-2027.

This action plan replaces the previous action plan which ran from 2014 for South Oxfordshire and 2015 for Vale of White Horse. Projects delivered through the past action plans include:

- electric vehicle charging infrastructure
- taxi licensing incentives
- parking permits and pricing incentives for green vehicles
- improved use of traffic regulation orders
- review of council and contractor's fleets
- eco driver training
- air quality planning guidance; and
- awareness, behavioural change, and community projects.

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].

[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

South Oxfordshire and Vale of White Horse District Councils

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion[3]. South Oxfordshire and Vale of White Horse District Councils are committed to reducing the exposure of people in our areas to poor air quality in order to improve health.

We have developed both area wide actions, as well as actions targeted at specific Air Quality Management Areas (AQMAs). The actions fall under eight broad topics:

- Freight and delivery management
- Policy guidance and development control
- Promoting low emission transport
- Promoting travel alternatives
- Public information
- Transport planning and infrastructure
- Traffic management; and
- Vehicle fleet efficiency.

Our priorities are to reduce traffic emissions within Botley, Henley and Marcham AQMAs, and to implement area wide measures to improve air quality across all AQMAs.

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 South Oxfordshire and Vale of White Horse District Councils' direct influence.

[3] Defra. Abatement cost guidance for valuing changes in air quality, May 2013

Responsibilities and Commitment

This AQAP was prepared by the Environmental Protection Department of South Oxfordshire and Vale of White Horse District Councils with the support and agreement of the following officers and departments:

- Planning and Planning Policy, South Oxfordshire and Vale of White Horse District Councils
- Public Health, Oxfordshire County Council
- Infrastructure Strategy Transport Policy, Parking and Trading Standards teams at Oxfordshire County Council
- Air Quality Team, National Highways
- Communications and Consultation and Engagement Teams, South Oxfordshire and Vale of White Horse District Councils

This AQAP has been approved by:

- Paul Fielding, Head of Housing and Environment at South Oxfordshire and Vale of White Horse District Councils
- Cllr Sue Cooper, South Oxfordshire District Council's Cabinet member for Environment
- Cllr Mark Coleman, Vale of White Horse District Council's Cabinet member for Environmental Services and Waste
- Ansaf Azhar, Director of Public Health at Oxfordshire County Council

This AQAP was formally adopted by the Vale of White Horse and South Oxfordshire District Councils' Licensing Committees on 07 February and 08 February 2024 respectively.

This AQAP will be subject to an annual review and appraisal of progress. Progress each year will be reported in the Annual Status Reports (ASRs) produced by South Oxfordshire and Vale of White Horse District Councils, as part of our statutory Local Air Quality Management duties.

South Oxfordshire and Vale of White Horse District Councils

If you have any queries regarding this AQAP, please send them to:

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1 Introduction

This report outlines the actions that South Oxfordshire and Vale of White Horse District Councils and our air quality partners (Oxfordshire County Council and National Highways) will deliver between 2023-2027 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 South Oxfordshire and Vale of White Horse.

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.

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 the air quality ASRs for South Oxfordshire and Vale of White Horse District Councils.

2 Summary of Current Air Quality in South Oxfordshire and Vale of White Horse District Councils

There are six Air Quality Management Areas (AQMAs) across South Oxfordshire, and the Vale of White Horse, three in each local authority area, all declared for exceedances of the national air quality objective for nitrogen dioxide (NO_2) measured as an annual average. The AQMAs are shown in Appendix C. The following sections detail the levels of exceedance and recent trends in concentrations. Please also refer to the latest ASRs from South Oxfordshire and Vale of White Horse District Councils (SODC 2022a, VOWHDC 2022).

2.1 South Oxfordshire District Council

Three AQMAs have been declared in South Oxfordshire, in Henley-on-Thames, Wallingford, and Watlington. Table 2.1 and Figure 2-1 to Figure 2-3 provide information on the South Oxfordshire AQMAs as reported in the 2022 Air Quality ASR, supplemented by the most recent monitoring data for 2022.

Concentrations have decreased across all AQMAs since 2017. Annual mean NO_2 concentrations were below the 40 µg/m^3 objective in 2020, 2021 and 2022 in all three AQMAs. Concentrations in 2020 and to a lesser extent, in 2021, are likely to have been unusually low due to Covid-19 lockdowns leading to restrictions in personal travel and therefore reductions in emissions from cars.

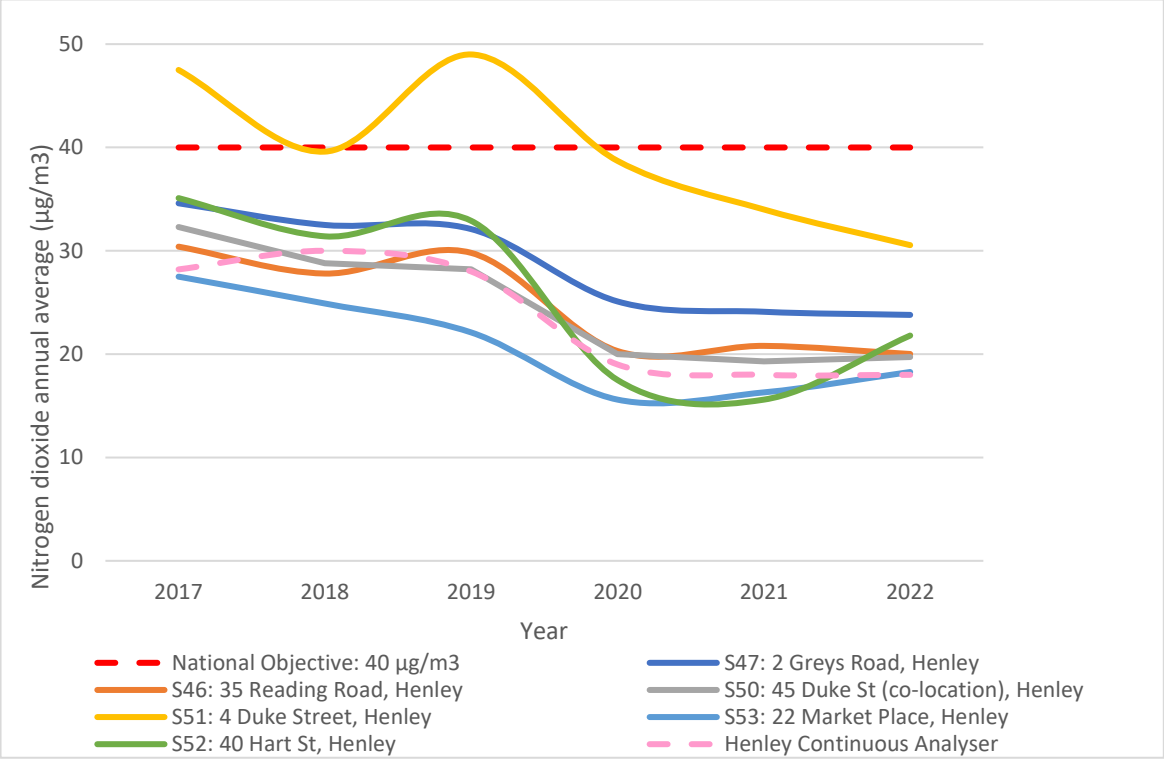
South Oxfordshire and Vale of White Horse District Councils

Table 2.1: South Oxfordshire AQMAs, declared for exceedances of NO_2 annual mean objective

AQMA Name	Date Declared	Description	Level of Exceedance: at time of declaration	Level of Exceedance: 2022 (Highest concentration recorded within the AQMA in 2022)
Henley	01/01/2003	Duke Street, Bell Street, the Market Place, Hart Street and Reading Road	45.1	30.5 (4 Duke Street, Site S51)
Wallingford	28/03/2006	High Street and part of Castle Street, St Marys Street and St Martins Street	48.3	28.5 (George Hotel, Site S19-21)
Watlington	31/03/2009	Shirburn Street, Couching Street and Brook Street	51.3	27.9 (41 Couching St., Site S33)

For **Henley**, trends in annual mean NO_2 concentrations are shown in Figure 2.1. Only one site (4 Duke Street S51) has exceeded 40 µg/m^3 as an annual mean since 2017. This is at a kerbside location, on a very narrow road, with shops and residential properties close to the kerbside. Since 2017, all of the six diffusion tube monitoring sites show a downward trend in concentrations, with the trend being significant at four of the sites, including at site S51. As concentrations have been below 40 µg/m^3 since 2020, monitoring data from future years (unaffected by covid-19) may enable South Oxfordshire to consider revoking the AQMA. However, at this stage, it is appropriate to consider **further measures to reduce concentrations within the Henley AQMA.**

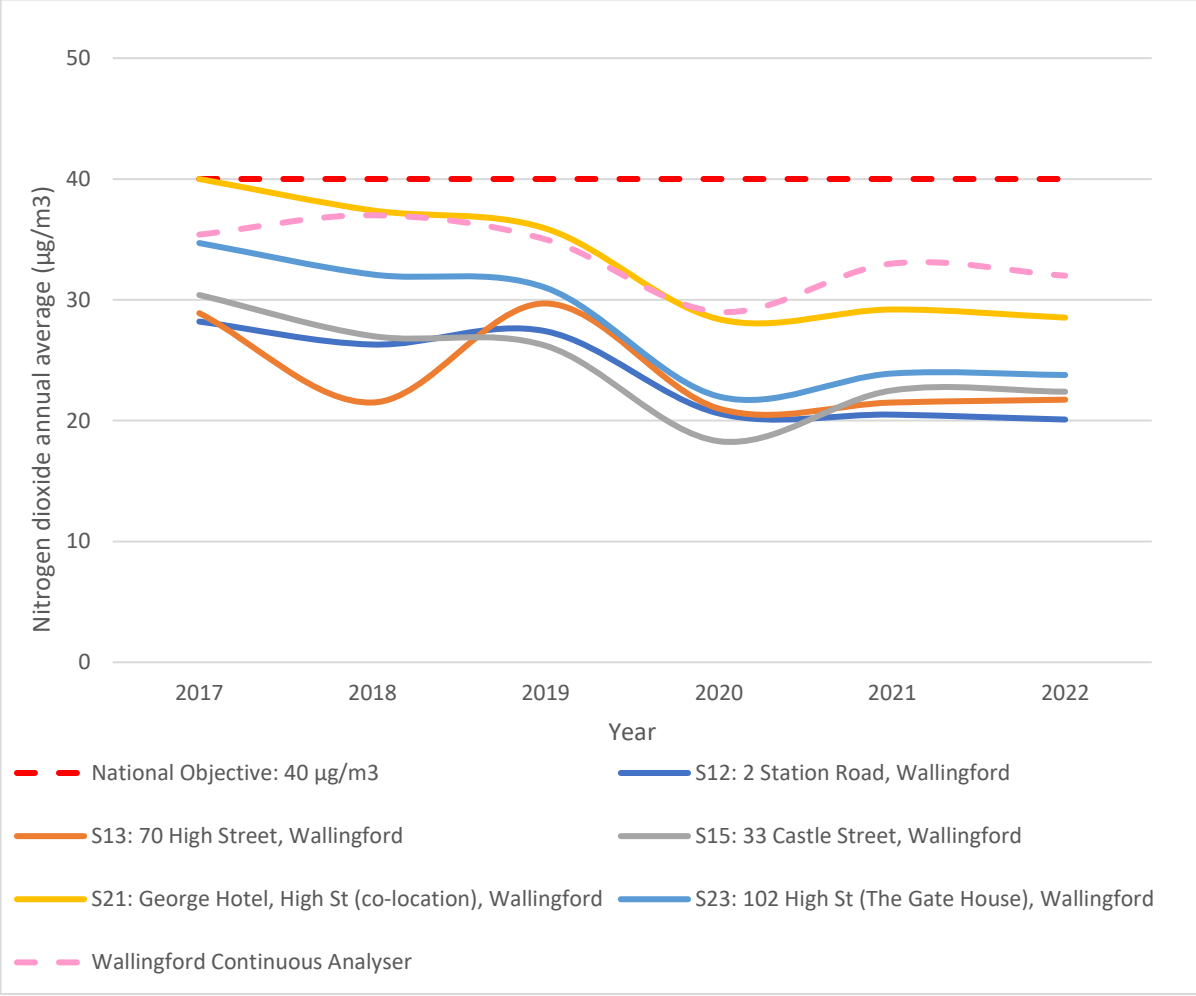
Figure 2-1:Trends in Annual Mean NO_2 concentrations in the Henley AQMA, 2017 - 2022



In **Wallingford**, trends in annual mean NO_2 concentrations are shown in Figure 2.2. Concentrations have not exceeded 40 µg/m^3 as an annual mean at all sites since 2017. There were therefore no exceedances of the national air quality objective for NO_2 as an annual mean in Wallingford AQMA over the past six years

(including 2020), and four out of the five diffusion tube monitoring sites show a significant downward trend over this period. **As such, no further measures are required, and as required by Defra[4], South Oxfordshire District Council will put in place plans to revoke the Wallingford AQMA.** South Oxfordshire District Council will continue to monitor air quality within the area in accordance with Defra's Local Air Quality Management requirements.

Figure 2-2: Trends in Annual Mean NO_2 concentrations in the Wallingford AQMA, 2017 - 2022



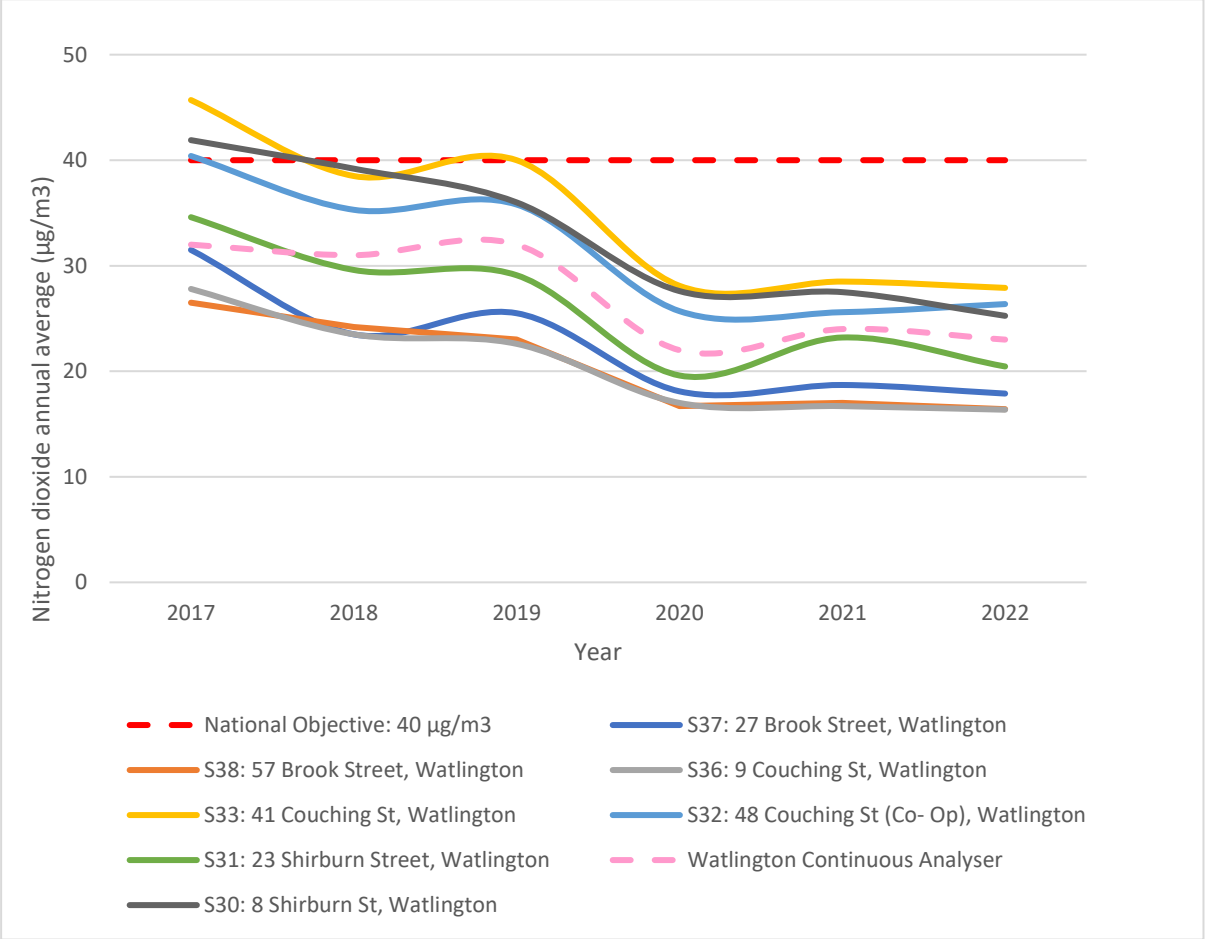
[4] Defra Technical Guidance LAQM.TG(22)

In **Watlington**, trends in annual mean NO_2 concentrations are shown in Figure 2.3. Concentrations were above 40 µg/m^3 as an annual mean in 2017 at 41 Couching Street (S33), 48 Couching Street (S32) and 8 Shirburn St (S30). All these sites are kerbside locations, although they are along very narrow roads, with shops and residential properties close to the kerbside. Since 2017, the highest concentration was 40.0 µg/m^3, recorded at 41 Couching Street (S33) in 2019. Whilst being equal to the national objective, it does not constitute an exceedance. As such, there have been no exceedances of the national air quality objective for NO_2 as an annual mean in Watlington AQMA between 2018-2021. All the seven diffusion tube monitoring sites show a downward trend in concentrations since 2017, with the trend being significant at six of the seven sites. However, concentrations have only been below 36 µg/m^3 since 2020[5], and as such there is not yet sufficient data to revoke the AQMA[6]. South Oxfordshire District Council will continue to monitor air quality within the area in accordance with Defra's Local Air Quality Management requirements, with a view to revoking the Watlington AQMA in future.

[5] LAQM.TG(22) recommends that where measurements have been made using diffusion tubes, revocation of an AQMA should be considered following three consecutive years of annual mean NO_2 concentrations being lower than 36 µg/m^3 (i.e. within 10% of the objective of 40 µg/m^3)

[6] The LAQM Support Helpdesk notes that both 2020 and 2021 should be excluded when considering years of compliance

Figure 2-3: Trends in Annual Mean NO_2 concentrations in the Watlington AQMA, 2017 - 2022



2.2 Vale of White Horse District Council

Three AQMAs have been declared in the Vale of White Horse: Abingdon-on-Thames, Botley, and Marcham. The Botley AQMA is declared as a result of road traffic emissions on the A34, which is controlled by National Highways. Table 2.2 and the following text provide information on the Vale of White Horse AQMAs as reported in the 2022 ASR, supplemented by the most recent monitoring data for 2022.

Table 2.2: Vale of White Horse AQMAs, declared for exceedances of NO_2 annual mean objective

AQMA Name	Date Declared	Description	Level of Exceedance: at time of declaration	Level of Exceedance: 2022 (Highest concentration recorded within the AQMA in 2022)
Abingdon	23/08/2006	Major town centre roads	63.2	28.1 (Stratton Way, Site S06)
Marcham	15/06/2006	Residential properties near A415	53.9	30.4 (10 Packhorse Lane, Site S16)
Botley	29/04/2008	Residential properties close to the A34 (controlled by National Highways)	58.8	47.3 (63 Southern Bypass (fence), Site S30, distance corrected)

Concentrations have decreased across the three AQMAs since 2017. Annual mean NO_2 concentrations were below 40 µg/m^3 in 2020, 2021, and 2022 in Abingdon and Marcham. Concentrations in 2020 and to a lesser extent, in 2021, are likely to have been unusually low due to Covid-19 lockdowns leading to restrictions in travel.

Trends in annual mean NO_2 concentrations in **Abingdon** are shown in Figure 2-4. Concentrations were above 40 µg/m^3 as an annual mean in one or more years between 2017-2019 at three sites: High Street (S04), Stratton Way (S06), and Marcham Road LP5 (S11). The site at Marcham Road (S11), although located outside of the AQMA, has historically recorded higher concentrations so has been included in the analysis. These monitoring locations are all described as ‘roadside’. The nearest locations of relevant exposure (locations of sensitive receptors) to these monitoring sites are 4 m (S04), 6.5 m (S06) and 3 m (S11) further away from the road. Concentrations of NO_2 drop very quickly with distance from the source. As such, the concentrations measured at the monitoring sites will be higher than those actually experienced at the nearest sensitive receptors. As shown in Table 2.3, the *distance corrected* concentrations (which provide an estimate of the concentration at the nearest sensitive receptor) were below 40 µg/m^3 for all sites within the Abingdon

AQMA during 2017-19 (VOWHDC, 2018, 2019a, 2020). There were therefore no exceedances of the national air quality objective for NO_2 as an annual mean in Abingdon AQMA between 2017-2022. Additionally, all concentrations including the distance corrected concentrations were below or equal to 36 µg/m^3 for all sites within the Abingdon AQMA during 2017-2022. **As such, no further measures are required, and as required by Defra, Vale of White Horse District Council will put in place plans to revoke the Abingdon AQMA.** The Vale of White Horse District Council will continue to monitor air quality within the area in accordance with Defra's Local Air Quality Management requirements.

Figure 2-4: Trends in Annual Mean NO_2 concentrations for sites in Abingdon AQMA, 2017 - 2022

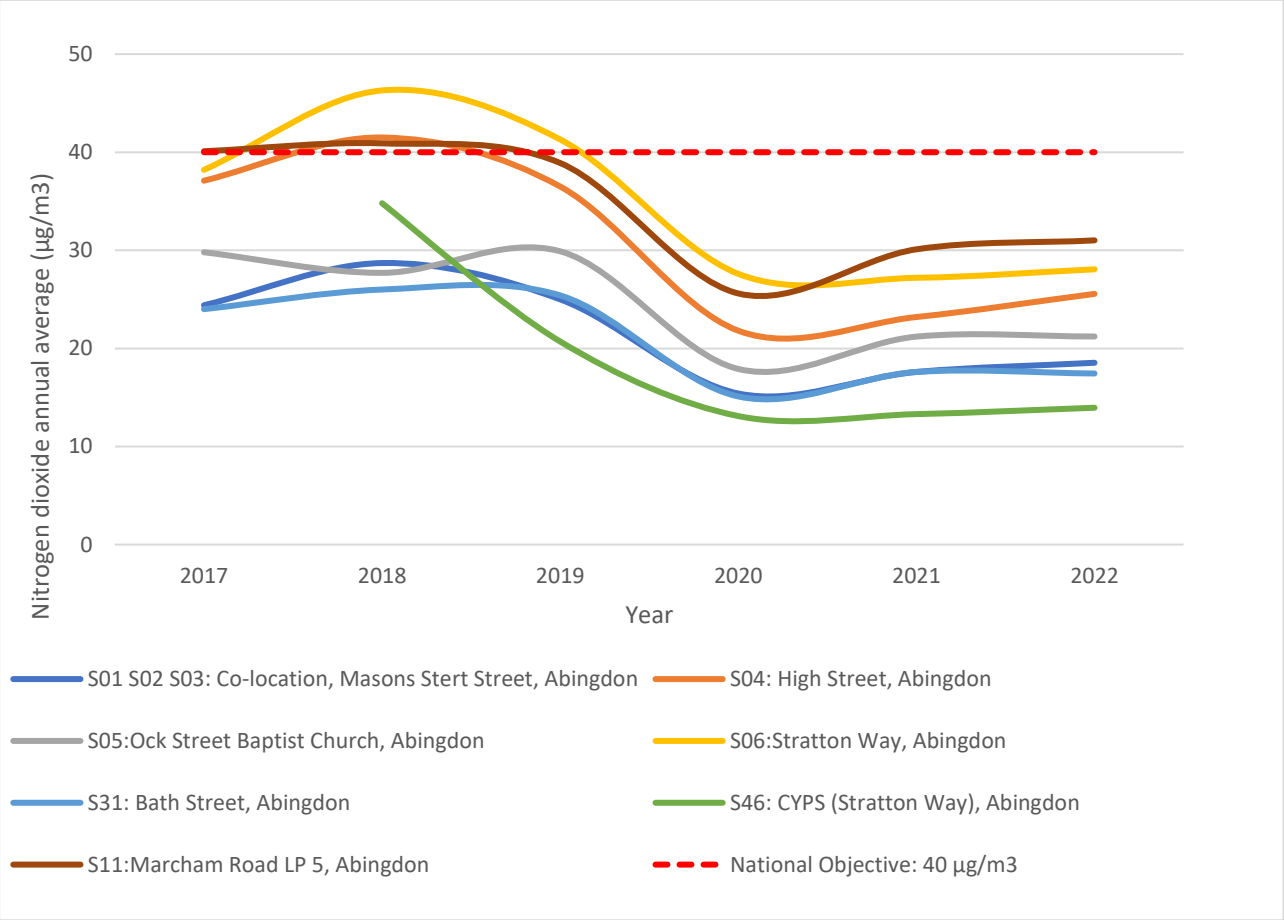


Table 2.3: Distance corrected concentrations at historically worst affected sites in Abingdon AQMA

Site ID	NO_2 mean concentrations (µg/m^3) (**bold** denotes exceedance of annual mean objective)					
	2017		2018		2019	
	Concentration at monitoring site	Distance corrected to nearest exposure	Concentration at monitoring site	Distance corrected to nearest exposure	Concentration at monitoring site	Distance corrected to nearest exposure
S04 High Street	37.1	29.5	**41.5**	32.8	36.5	29.3
S06 Stratton Way	**42.3**	33.3	**46.3**	36.3	**41.3**	32.1
S11 Marcham Road LP5	**40.1**	34.5	**40.9**	35.3	38.9	33.6

Trends in annual mean NO_2 concentrations in **Marcham** are shown in Figure 2-5. Concentrations were above 40 µg/m^3 as an annual mean in one or more years between 2017-2019 at three sites: 10 Packhorse Lane (S16), 4 Frilford Road (S17) and 13 Packhorse Lane (S19), although sites S17 and S19 were only marginally above the objective in 2018 only. These monitoring locations are described as 'kerbside' (S16) and 'roadside' (S17, S19). The nearest relevant exposure (location of sensitive receptors) to these monitoring sites are 0 m (S16), 1 m (S17) and 13 m (S19) further away from the road. As noted above, concentrations of NO_2 drop very quickly with distance from the source, such that the concentrations measured at the S17 and S19 monitoring sites will be higher than those experienced at the nearest sensitive receptors. As shown in Table 2.4, the *distance corrected* concentrations were below 40 µg/m^3 for all sites within the Marcham AQMA, except S16 at 10 Packhorse Lane during 2017-19. As concentrations have been below 40 µg/m^3 since 2020, monitoring data from future years (unaffected by covid-19) may enable Vale of White Horse to consider revoking the Marcham AQMA. However, at this stage, it is appropriate to consider **further measures to reduce concentrations on Packhorse Lane.**

Figure 2-5: Trends in Annual Mean NO_2 concentrations for sites in Marcham AQMA, 2017 - 2022

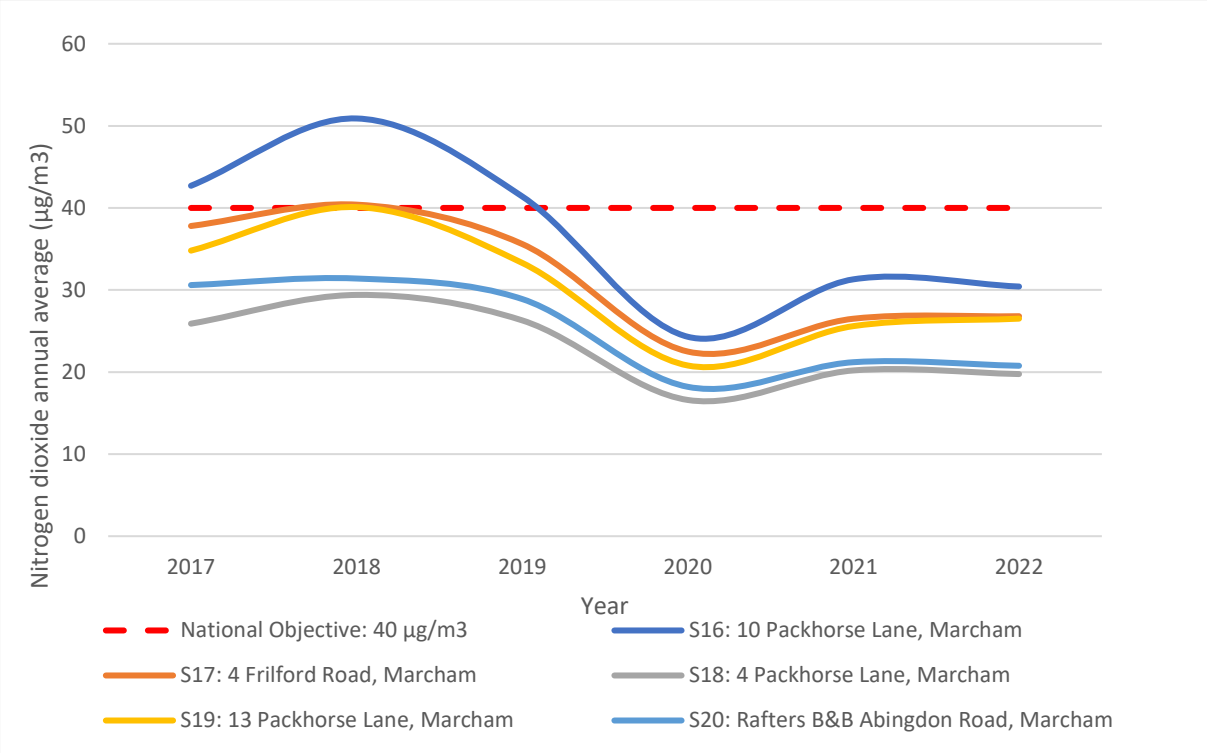


Table 2.4: Distance corrected concentrations at historically worst affected sites in Marcham AQMA

Site ID	NO_2 mean concentrations (µg/m^3) (**bold** denotes exceedance of annual mean objective)					
	2017		2018		2019	
	Concentration at monitoring site	Distance corrected to nearest exposure	Concentration at monitoring site	Distance corrected to nearest exposure	Concentration at monitoring site	Distance corrected to nearest exposure
S16 10 Packhorse Lane	**42.7**	**42.7**	**50.9**	**50.9**	**41.4**	**41.4**
S17 4 Frilford Road	37.8	34.5	**40.4**	36.9	35.6	32.5
S19 13 Packhorse Lane	34.8	26.0	**40.1**	29.7	33.3	<33.3

Trends in annual mean NO_2 concentrations in **Botley** AQMA are shown in Figure 2-6. Concentrations are heavily impacted by traffic emissions from the A34, a strategic road, controlled by National Highways. Four sites have exceeded the NO_2 annual mean objective over the last six years: Stanley Close (S21) between 2017 and 2019, 4 Yarnells Road downpipe (S24) in 2017 only, 4 Yarnells Road fence (S25) in all years between 2017 and 2022, and 63 Southern Bypass fence (S30), in all years between 2017 and 2022. The distance corrected concentrations are presented in Table 2.5, and show that once distance corrected, only one site (S30) was estimated to exceed the NO_2 annual mean objective in 2021, with an estimated concentration of 45.4 µg/m^3 at the nearest relevant exposure. However, façade monitoring at the same property (63 Southern Bypass, S27) was below 30 µg/m^3, as shown in the figure above, demonstrating that the measured concentrations were actually lower than those distance corrected.

Figure 2-6: Trends in Annual Mean NO_2 concentrations for sites in Botley AQMA, 2017 - 2022

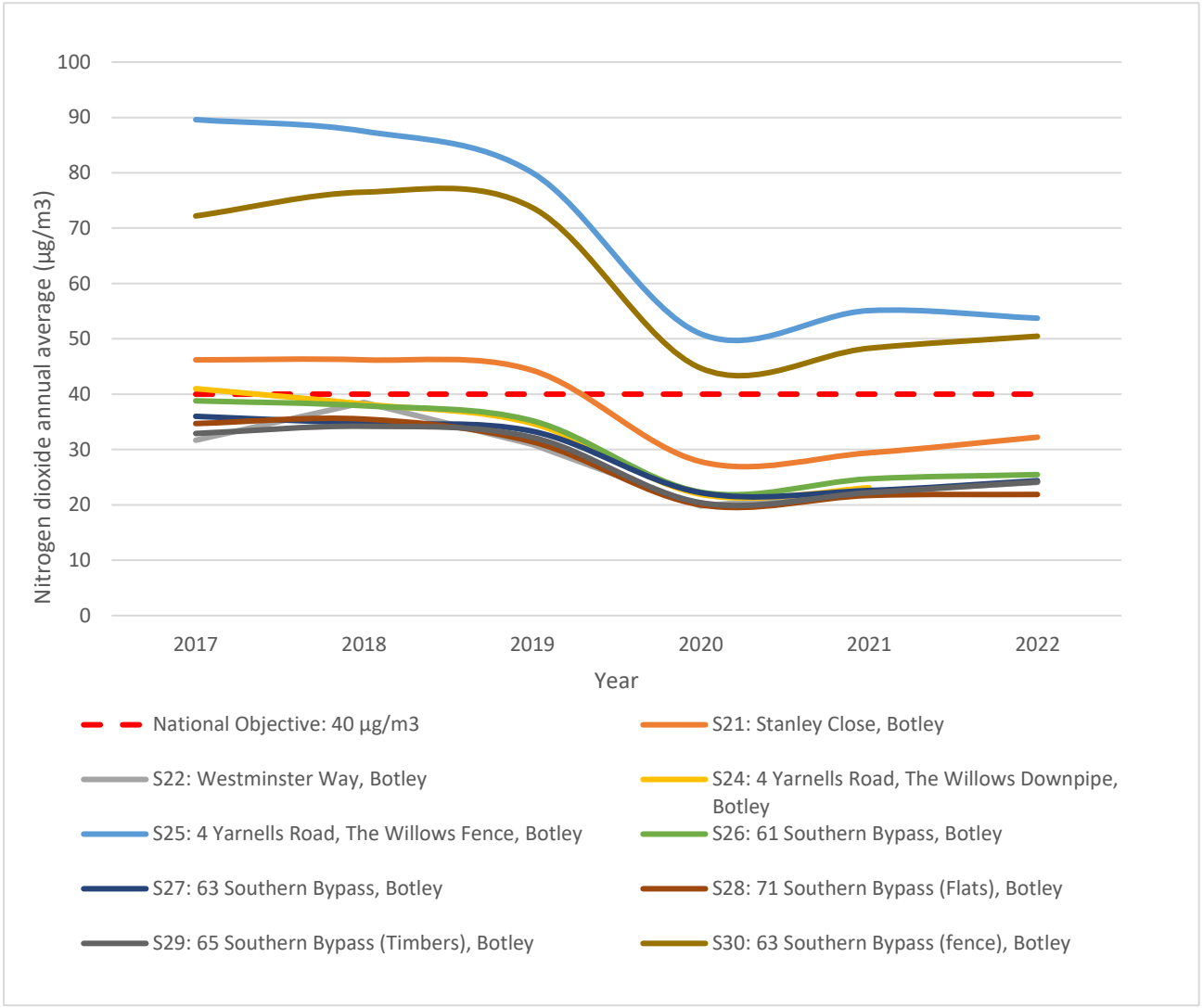


Table 2.5: Distance corrected concentrations at historically worst affected sites in Botley AQMA

Site ID	NO_2 mean concentrations (µg/m^3) (**bold** denotes exceedance of annual mean objective)											
	2017		2018		2019		2020		2021		2022	
	Conc. at site	Distance corrected to nearest exposure	Conc. at site	Distance corrected to nearest exposure	Conc. at site	Distance corrected to nearest exposure	Conc. at site	Distance corrected to nearest exposure	Conc. at site	Distance corrected to nearest exposure	Conc. at site	Distance corrected to nearest exposure
S21 Stanley Close	**46.2**	**50.8**	**46.2**	**50.3**	**44.3**	**48.1**	27.8	n/a	29.4	n/a	32.2	n/a
S24 4 Yarnells Road (downpipe)	**41.0**	**41.0**	38.2	38.2	34.7	34.7	21.9	n/a	23.1	n/a	No data	n/a
S25 4 Yarnells Road (Fence)	**89.6**	**60.9**	**87.5**	**67.1**	**80.0**	**50.8**	**50.9**	34.6	**55.1**	38.0	**53.7**	36.8
S30 63 Southern Bypass (fence)	**72.2**	**49.7**	**76.5**	**53.8**	**73.7**	**51.0**	**44.7**	**42.9**	**48.3**	**45.4**	**50.5**	**47.3**

Further measures are required to reduce concentrations within the Botley AQMA, in partnership with National Highways which controls the A34.

National Highways has undertaken a review of concentrations on the A34 road link, with air quality modelling estimating a concentration of 61 µg/m^3 at the nearest area of public access in 2022, with exceedances of the NO_2 annual mean objective predicted to continue beyond 2030 (see Appendix D). However, it is important to note that under the Air Quality Plan for NO_2 in the UK (Defra, 2017), National Highways is required to reduce concentrations on the strategic road network where there are anticipated to be exceedances of the NO_2 annual mean at any location that the public may access for any length of time. As such, for the purposes of National Highways modelling, the nearest sensitive receptor is a footpath, 1 m from the kerb (see Appendix D). However, under LAQM, local authorities are required to address exceedances at locations that are representative of relevant exposure, i.e. if

comparing against an annual mean, a location where a member of the public is likely to spend a significant portion of their time during one year, such as a residential property.

As noted in Defra's Local Air Quality Management Technical Guidance LAQM.TG(22), the 1-hour mean applies to outdoor locations where members of the public might be reasonably expected to spend one hour or more, such as the pavement of a busy shopping street, but is considered unlikely to apply to this footpath, which is used by members of the public for a shorter period of time.

Whilst there are properties close to the A34, the facades are not 1 m from the kerb. As such, the National Highways modelling is not representative of concentrations likely to be experienced at the nearest residential properties, for the purposes of LAQM.

3 South Oxfordshire and Vale of White Horse District Councils' Air Quality Priorities

3.1 Public Health Context

3.1.1 Public Health Indicators

Office for Health Improvement & Disparities reports health indicators by district, including air quality and active travel indicators (Office for Health Improvement & Disparities, 2023). Table 3.1 provides the most recently published data for air quality and travel indicators for the two local authority areas, compared with the regional and national averages.

Table 3.1: OHID air quality and active travel indicators

Indicator	South Oxfordshire	Vale of White Horse	South East	England	Notes
Air pollution: fine particulate matter (concentrations of total PM2.5, µg/m3) (2020)	7.6	7.6	8.1	7.5	Both South Oxfordshire and Vale of White Horse have lower background concentrations than South East average, although slightly above the national average. Mortality attributable to particulate air pollution is in line with regional/national averages.
Mortality of adults over 30 years, attributable to particulate air pollution (%) (2021)	5.4	5.4	5.4	5.5	
Adults cycling for travel at least three days per week (%) (2019-20)	2.4	3.9	2.4	2.3	Vale of White Horse has a higher proportion of adults cycling than regional or national averages. South Oxfordshire is in line with regional/national averages.
Adults walking for travel at least three days per week (%) (2019-20)	10.9	11.7	14.9	15.1	Both districts have lower proportions of adults walking than regional or national averages.

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In 2020, concentrations of $PM_{2.5}$ in both South Oxfordshire and Vale of White Horse were lower than the Southeast regional average and slightly above the average for England. The mortality rate for adults over 30 attributed to particulate air pollution was 5.7% for both South Oxfordshire and Vale of White Horse, again, slightly lower than the average figure for the region, and higher than the national average.

Active travel indicators showed that Vale of White Horse has a relatively high proportion of adults cycling for travel, whereas both Vale of White Horse and South Oxfordshire have relatively low proportion of adults walking.

Although the AQMAs in South Oxfordshire and Vale of White Horse have been declared for NO_2 concentrations, any measures to reduce NO_2 concentrations would also help to reduce $PM_{2.5}$ concentrations.

3.1.2 Inequalities

Overall, South Oxfordshire and Vale of White Horse District Councils are affluent areas. Figure 3-1 shows the majority of neighbourhoods in these local authority areas are in the least deprived 10% of the national neighbourhoods (Ministry of Housing, Communities and Local Government, 2019)). However, both districts contain pockets of higher deprivation as shown in Figure 3-2 (Department for Levelling Up, Housing and Communities and Ministry of Housing Communities & Local Government, 2019). The three most deprived areas are located in: Abingdon (Vale 008C), an area covering Saxton Road, Hogarth Place and Gainsborough Green; the west part of Didcot (South Oxfordshire 010A), located west of Wallingford; and an area covering Berinsfield and north Dorchester (South Oxfordshire 006B), to the north of Wallingford. Impacts on these areas will be considered in implementation of measures to improve air quality, although it should be noted that none of the most deprived areas are within an AQMA, hence area wide air quality measures would be most applicable.

Figure 3-1: Count of neighbourhoods in South Oxfordshire and Vale of White Horse by deciles of multiple deprivation, where 1 = most deprived 10% of neighbourhoods nationally, and 10 = least deprived 10%

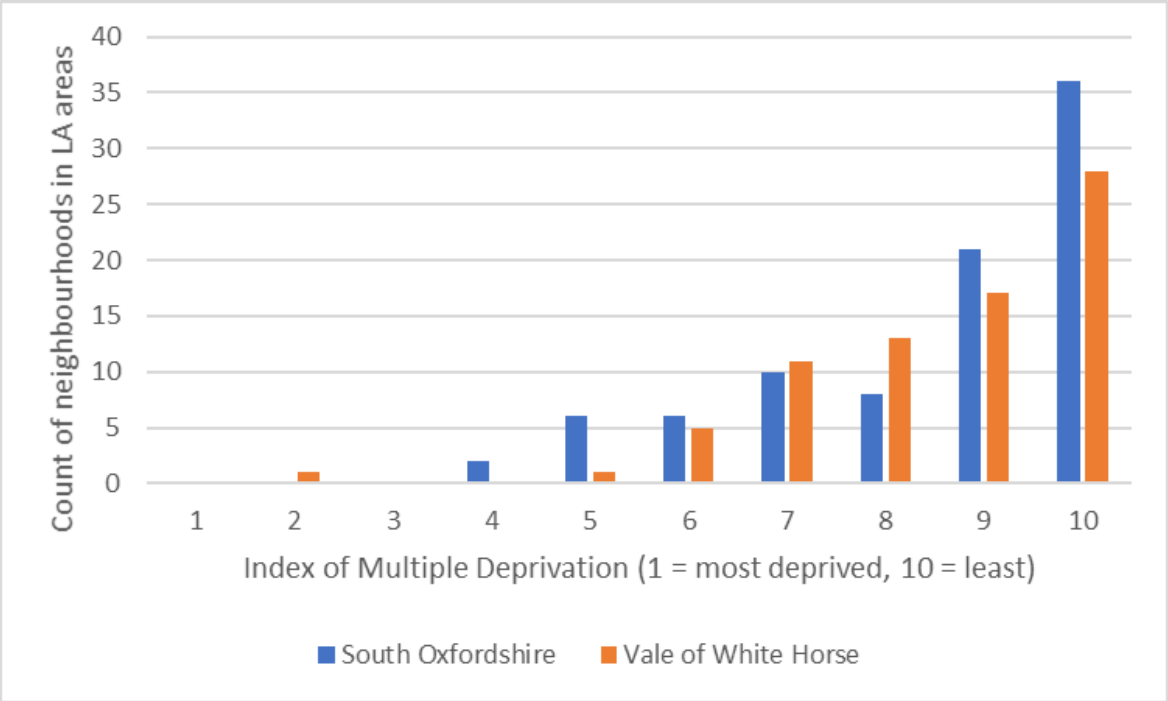
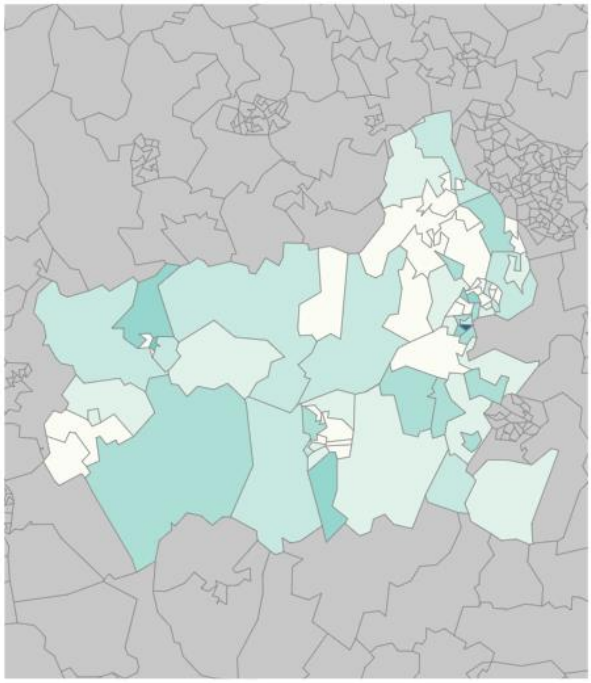
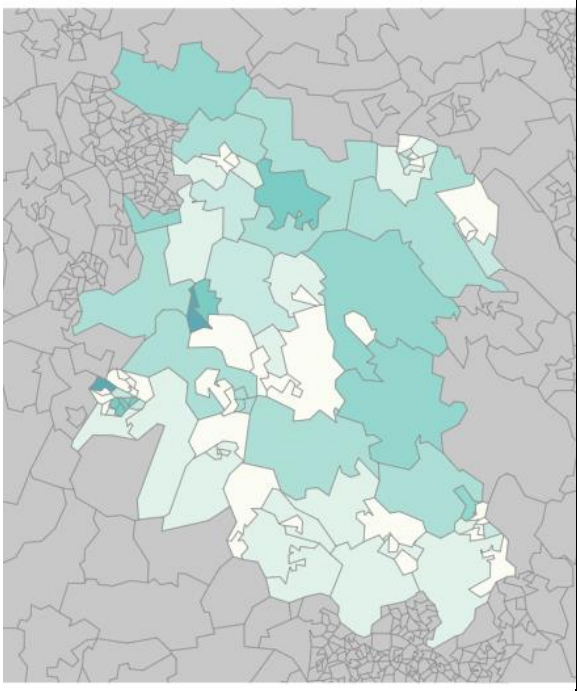


Figure 3-2: Deprivation maps of South Oxfordshire and the Vale of White Horse (more deprived neighbourhoods are darker in colour)

Vale of White Horse, ranked 305, out of 317 local authorities, where 1=most deprived	**South Oxfordshire**, ranked 302, out of 317 local authorities, where 1=most deprived
	

3.2 Planning and Policy Context

3.2.1 National policy context

Legacy of EU Directives

The UK Government has a responsibility to meet legally binding limit values for concentrations in outdoor air for major air pollutants that impact public health. The limit values are as set out within the European Union's Ambient Air Quality Directive (2008/50/EC) and implemented in the UK through the EU (Withdrawal Agreement)

Act 2020[7,8]. Where air quality limit values are not met, measures to achieve them are required to be put in place, either nationally or locally.

National Air Quality Objectives

The 2007 Air Quality Strategy for England, Scotland, Wales and Northern Ireland includes national air quality standards and objectives for a number of local air pollutants. The objectives are policy targets, to be achieved without exception or with a permitted number of exceedances, and by a specified timescale. The air quality objectives applicable in England are defined within the Air Quality (England) Regulations 2000 (as amended 2002)[9]. In England, the objectives for NO_2 and PM mirror the concentrations set by the EU's legally binding limit values (Table 3.2).

Table 3.2: Air Quality Objectives for NO_2 and PM in England

Pollutant	Concentration	Measured as
NO_2	200 µg/m^3 not to be exceeded more than 18 times per year	1-hour mean
	40 µg/m^3	Annual mean
PM_{10}	50 µg/m^3 not to be exceeded more than 35 times per year	24-hour mean
	40 µg/m^3	Annual mean
$PM_{2.5}$	25 µg/m^3	Annual mean

[7] The Air Quality Standards Regulations 2010. Available online at: http://www.legislation.gov.uk/uksi/2010/1001/contents/made. Accessed April 2022.

[8] The Air Quality Standards (Amendment) Regulations 2016. Available online at: https://www.legislation.gov.uk/uksi/2016/1184/contents/made. Accessed April 2022.

[9] The Air Quality (England) Regulations 2000. Available online: http://www.legislation.gov.uk/uksi/2000/928/contents/made. Accessed April 2022. The Air Quality (England) (Amendment) Regulations 2002. Available online: http://www.legislation.gov.uk/uksi/2002/3043/regulation/2/made. Accessed April 2022.

Local Air Quality Management (LAQM)

Under Part IV of the Environment Act 1995, local authorities have a duty to review and assess local air quality within their areas, against the national air quality objectives. Where an exceedance is considered likely, the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out measure it intends to put in place in pursuit of these objectives.

Each year, every local authority submits an Annual Status Report (ASR) to Defra reporting concentrations recorded through the monitoring network and listing strategies employed by the local authority to improve air quality. In addition, local authorities are also encouraged to draft and implement a local air quality strategy.

Recent legislation

In January 2019, the UK Government published a Clean Air Strategy[10], which sets out actions to improve air quality by reducing pollution from a wide range of sources. The aim of the strategy is to drive down the national emissions of pollutants, reducing background pollution and minimising human exposure to harmful concentrations of pollution.

The Environment Act 2021 places the following new requirements on the Government and local authorities on air quality.

- Requirement on the Government to bring forward two new air quality targets in secondary legislation: The Environmental Targets (Fine Particulate Matter) (England) Regulations 2022, which set $PM_{2.5}$ targets of:
    - 10 µg/m^3 as an annual mean to be met across England by 2040; and
    - a 35% reduction in population exposure by 2040 from a 2018 baseline.
- Strengthening of the LAQM framework by sharing responsibility for tackling local air pollution between designated relevant public authorities, all tiers of

[10] Defra (2019) *Op. cit.*

local government and neighbouring authorities. The intent is to enable greater cooperation at local level and broaden the range of organisations that play a role in improving air quality.

3.2.2 Measures common to both South Oxfordshire and Vale of White Horse

Under respective previous AQAPs, joint actions taken between South Oxfordshire and the Vale of White Horse have included:

- an anti-idling campaign, targeting pollution at schools (South Oxfordshire and Vale of White Horse District Councils, 2023b),
- a review of the joint taxi licensing policy, which introduced emission standards (at least Euro 4 by 2022 and at least Euro 6 by 2026) and required drivers not to allow their engines to idle at taxi ranks (SODC, 2021);
- a review of council and contractors fleets;
- school travel plans developed through Modeshift Stars programme, run by Oxfordshire County Council (Modeshift, 2023);
- promotion of Street Tag, a digital app that promotes cycling or walking to primary school
- eco-driving workshop for council officers; and
- cycling and walking schemes to reduce the need to travel by car, and therefore reduce NO_2.

Both councils have produced Air Quality Guidance for Developers (SODC 2019, VOWHDC 2019b), which sets out how air quality should be considered by new developments, and the requirements for mitigation, including EV infrastructure and travel plans.

In 2019, both councils declared a climate emergency and have set targets to become carbon neutral. Following this declaration, both councils' Climate and Ecological Emergencies Advisory Committee set targets to become carbon neutral within their own operations by 2025, and to become carbon neutral districts by 2030. The emission reduction measures and targets within the Corporate Plans for both councils reflect these priorities (SODC 2020, VOWHDC 2020).

Looking forwards, the two district councils are developing a joint Local Plan, partly as a means of developing joint actions to reduce carbon emissions (South Oxfordshire and Vale of White Horse District Councils, 2023a).

3.2.3 Measures targeted at South Oxfordshire

In 2015, South Oxfordshire published a Low Emission Strategy (SODC, 2015) to set an integrated approach to managing transport emissions associated with poor air quality and climate change. This included five core themes:

- promoting low emission behaviours;
- supporting the uptake of electric vehicles;
- a bus emission strategy;
- a freight emission strategy; and
- low emission planning and procurement.

South Oxfordshire has updated parking charges to provide a 50% discount in parking charges for owners of low emission vehicles (classified as vehicles able to travel at least 20 miles with zero CO_2) when purchasing annual or three month permits (SODC, 2022b).

3.2.4 Measures targeted at Vale of White Horse

The Oxfordshire Local Transport and Connectivity Plan (LTCP) 2022-2050 (OCC, 2022e) makes provision for Area Travel Plans, focussed on specific geographic areas in Oxfordshire, one of which is Abingdon. The Local Cycling and Walking Infrastructure Plan (LCWIP) for Abingdon is due to be adopted in 2023 (OCC, 2022a), which will improve walking and cycling connectivity across the town, thus reducing the need to use private cars.

Vale of White Horse District Council notes that planned developments could increase traffic through Marcham and have a negative impact on air quality in the Marcham AQMA. The council is working with Oxfordshire County Council to review options for the A415 in the Marcham and Frilford area and to address traffic issues and air quality in the Marcham AQMA. A new ‘low-cost automatic analyser was also installed

in Marcham at the end of 2021, recording real-time data (Air Quality England website, 2023).

For Botley, National Highways undertook an audit of potential measures to reduce NO_2 concentrations on the A34. No viable measures were identified that would reduce concentrations to less than 40 µg/m^3 at a distance of 1m from the kerb (see Appendix D). However, as highlighted above, National Highways models were based on achieving compliance at an adjacent footpath, rather than the nearest residential property. Vale of White Horse can therefore continue to review measures that would improve air quality for these properties. Any reduction in NO_2 concentrations would have positive health impacts[11].

3.2.5 Oxfordshire-wide actions

Oxfordshire County Council adopted an Air Quality Strategy in June 2023. Its aim is to accelerate reductions in air pollution and uses a three pillared approach of: ***Reduce*** *emissions of indoor and outdoor air pollution;* ***Extend*** *distance from pollution sources); and* ***Protect*** *those most at risk.* The objectives include working in partnership to:

- support work undertaken by district and city councils to inform an evidence-based approach, identify and prioritise action in locations particularly vulnerable to air pollution impacts, and to raise awareness;
- maintain a downward air pollution trajectory and develop population exposure targets, working with partners to:
    - reduce annual mean $PM_{2.5}$ concentrations to 5 µg/m^3 or less by 2030;

[11] It is estimated that over the next 100 years, a 1 µg/m3 reduction in NO2 across the UK, could save between 420,000-903,000 years of life across the population, with an increase in average life expectancy of around 2-5 days, as referenced in the Committee on the Medical Effects of Air Pollutants (COMEAP)'s report: Associations of long-term average concentrations of nitrogen dioxide with mortality.

- reduce emissions of nitrogen oxides (NO_X) by 73% by 2030 relative to 2030 levels.
- work towards air quality that meets the World Health Organisation guidelines by 2030.

Measures to reduce the attractiveness of driving to Oxford may help to reduce emissions on the A34, affecting the Botley AQMA.

- Oxfordshire County Council manages five park and ride sites around Oxford (OCC, 2023), the southernmost, Redbridge, could reduce car journeys on the A34.
- Oxfordshire County Council has proposed a Workplace Charging Levy (OCC, 2022g) for businesses with 11 or more staff parking spaces in Oxford City Council's administrative area, within the Oxford ring road.

Oxfordshire-wide actions include the following:

- An updated website providing information on air quality in Oxfordshire (Oxfordshire District Councils, 2023).
- Installation of EV charging points through Oxfordshire Park and Charge (Office for Zero Emission Vehicles, 2021).
- Oxfordshire's Bus Service Improvement Plan (OCC, 2022b) includes targets to improve journey times, reliability, passenger numbers and passenger satisfaction. It also aims to provide more frequent services, as well as integration with other modes, improvements in fares and ticketing (targeting fare reductions for 16 and 17-year-olds and low paid NHS employees), investments in bus priority measures[12].

[12] Note, Oxfordshire County Council was awarded grand funding under the Zero Emission Bus Regional Areas (ZEBRA) scheme, which coupled with additional funding from the County Council and bus companies will fund a fleet of 159 buses to be used on routes within Oxford City.

- Oxfordshire LTCP includes:
    - headline targets to:
        - reduce car journeys (by 2030 replace / remove 1 out of every 4 current car trips, and by 2040 replace / remove an additional 1 out of 3 car trips in Oxfordshire),
        - increase active travel (by 2030 increase cycle trips in Oxfordshire from 600,000 to 1 million trips per week); and
        - deliver a net zero transport network by 2040, and a transport network contributing to a climate positive future by 2050.
    - promotion of Healthy (Policy 9) and Safe (Policy 10) Streets.
    - working with schools, employers and businesses to promote travel choices (Policy 11).
    - developing the 20-minute neighbourhoods (Policy 13) and on integrated transport and land use planning (Policy 14).
    - improving public transport, including acceleration of zero emission buses across the region (Policy 18), and supporting multimodal travel (Policy 22), mobility hubs (Policy 23), micromobility (e-scooters) (Policy 38), car clubs (Policy 39).
    - (a) continued implementation of the Zero Emission Zone (ZEZ) in Oxford and (b) investigation of Clean Air Zones and ZEZ schemes for other parts of Oxfordshire where traffic emissions are contributing significantly to air pollution problems (Policy 28).
    - Delivering infrastructure requirements (charging points and capacity) for zero emission vehicles (Policy 29).
    - parking management, including reference to workplace parking levy (Policy 33).
    - promotion of rail freight for the long distance movement of goods (Policy 48), appropriate routes for HGVs (Policy 49); promotion of freight consolidation and last mile goods movement (Policy 50); and

  - collaborative regional working (Policy 51), transport corridor strategies, including for M40/A34 (Policy 53); tailored solutions for smaller market towns (Policy 54).

- Oxfordshire County Council has adopted new requirements for Transport Assessments, based on 'Decide and Provide' (OCC, 2022d). This moves away from the traditional approach of 'Predict and Provide', which uses current or historical traffic patterns to determine the future need for infrastructure, but which tends to simply maintain the status quo and focus on provision of capacity for private car journeys. The 'decide and provide' approach enables Oxfordshire County Council to prioritise active travel and public transport and reduce reliance on private cars.
- Oxfordshire County Council's updated Parking Standards for New Developments (OCC, 2022f) significantly reduce residential and commercial parking provision, and set maximum, rather than minimum standards.
- Oxfordshire Freight and Logistics Strategy 2022-2050 includes 47 separate actions to reduce the impacts of freight (OCC, 2022c).
- Oxfordshire Rail Corridor Study and strategy to identify potential requirements for Oxfordshire's future trains services in the medium (2028) and long-term (2033), (Network Rail, 2021).
- There are several active car club operators in Oxfordshire, which are promoted through South Oxfordshire's website (SODC, 2023).
- Oxfordshire Liftshare provides alternatives to single occupancy driving (Mobilityways Limited, 2023).
- Oxfordshire's Cycling & Walking Activation Programme seeks to support behaviour change and encourage active travel, particularly for those residents who experience the greatest barriers to walking and cycling.

3.3 Source Apportionment

The AQAP measures presented in this report are intended to be targeted towards the predominant sources of emissions which are contributing to exceedances of the NO_2 objective within South Oxfordshire and Vale of White Horse District Councils' areas.

A source apportionment exercise to identify the contribution from background and traffic sources to NO_2 concentrations was carried out at the location with the highest NO_2 concentrations within each AQMA. The contribution from different vehicle types was determined using data collated from traffic surveys carried out in 2022 within each AQMA, with the exception of Botley. For Botley, traffic data were taken from Department for Transport traffic counts, and the default breakdown for vehicle categories and engine types was used. In all cases the traffic data were used in conjunction with emissions data from Defra's Emissions Factors Toolkit[13] to determine the contributions from each vehicle type.

A summary of the results from the source apportionment is provided in Table 3.3 below (with full calculations in Appendix E), which shows the contribution from background sources and each vehicle type within each AQMA. Information for each AQMA is provided below this, with further detail on Euro classes provided for those AQMAs where more targeted measures may be required. The source apportionment identified that within all the AQMAs, the largest contribution was from cars, which made up between 31% and 38% of the total NO_2, followed by the contribution from vans which made up between 13% and 28%. Lorries and buses each contributed 11% or less to the total NO_2 at each location. Background sources contributed between 22% and 42% at each location, with the breakdown for regional and local background provided in Appendix E.

Analysis of the traffic survey data showed that when looking at vehicle emissions only, the largest contribution was from diesel cars and diesel vans.

[13] Available at: https://laqm.defra.gov.uk/air-quality/air-quality-assessment/emissions-factors-toolkit/

Table 3.3: Source Apportionment for NO_2 (see Appendix E for further details)[14]

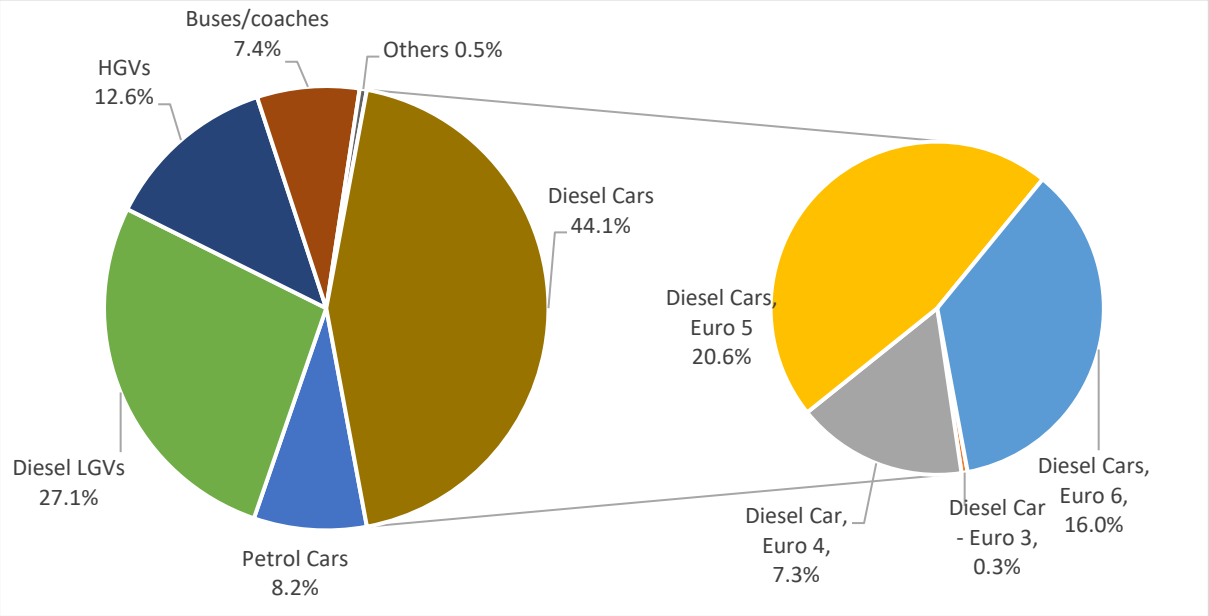
AQMA	Measured Annual Mean NO_2	Regional and local background NO_2	Contribution of different vehicle types to the local component of NO_2			
			Cars	Vans	HGVs	Buses and Coaches
Henley	30.5	12.7 (42%)	9.4 (31%)	4.9 (16%)	2.3 (8%)	1.3 (4%)
Wallingford	32.0	11.5 (36%)	11.3 (35%)	5.1 (16%)	1.5 (5%)	2.4 (8%)
Watlington	27.9	8.1 (29%)	10.7 (38%)	5.7 (20%)	2.7 (10%)	0.8 (3%)
Abingdon	28.1	11.7 (42%)	8.7 (31%)	3.7 (13%)	1.6 (6%)	2.0 (7%)
Marcham	30.4	8.5 (28%)	11.7 (38%)	6.5 (21%)	2.8 (9%)	0.8 (3%)
Botley	47.3	10.4 (22%)	17.8 (38%)	13.4 (28%)	5.1 (11%)	0.2 (<1%)

[14] Numbers and percentages are rounded

3.3.1 South Oxfordshire: Henley

The contribution to NO_x emissions from vehicles in Henley can be seen in Figure 3-3. The largest contribution is from diesel cars (44%), followed by diesel vans (27%), HGVs (13%), petrol cars (8%) and buses (7%). The smaller pie chart to the right shows the further breakdown of diesel cars into Euro categories, showing that the largest component is from Euro 5 engines (21%), followed by Euro 6 (16%), and Euro 4 (7%).

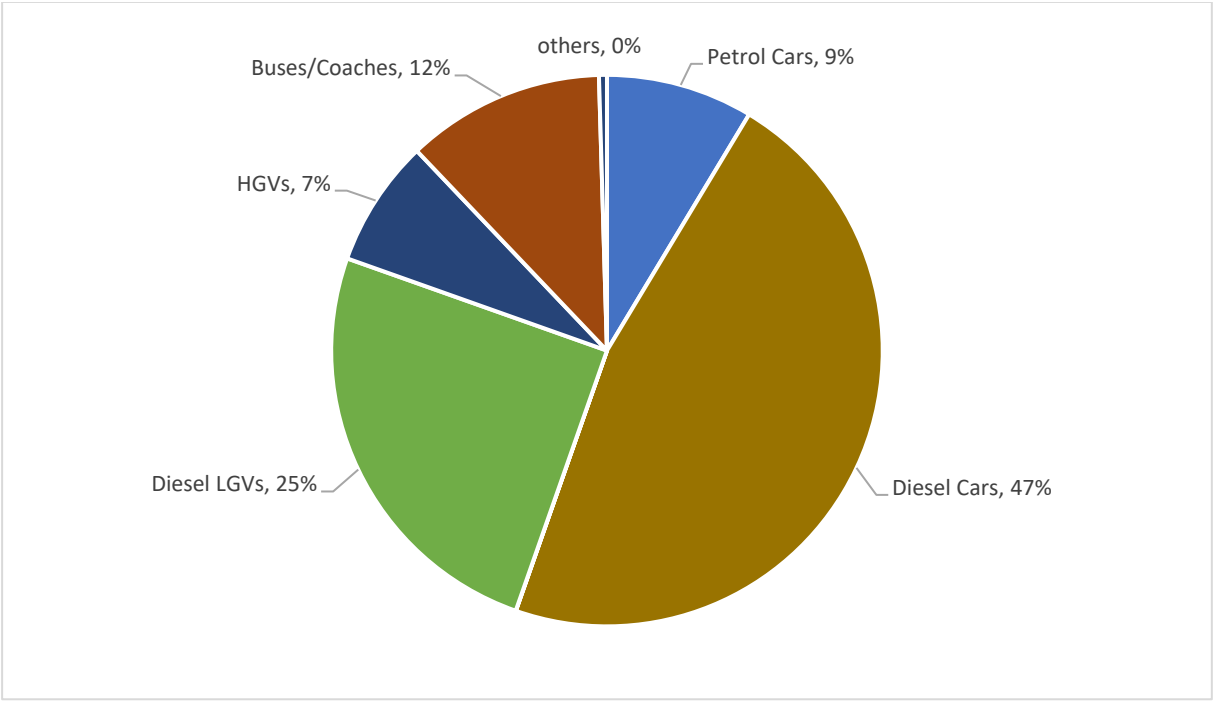
Figure 3-3: Source Apportionment of Vehicle Emissions, Henley



3.3.2 South Oxfordshire: Wallingford

The contribution to NO_x emissions from vehicles in Wallingford can be seen in Figure 3-4. The largest contribution is from diesel cars (47%), followed by diesel vans (25%), buses (12%), petrol cars (9%), and HGVs (7%).

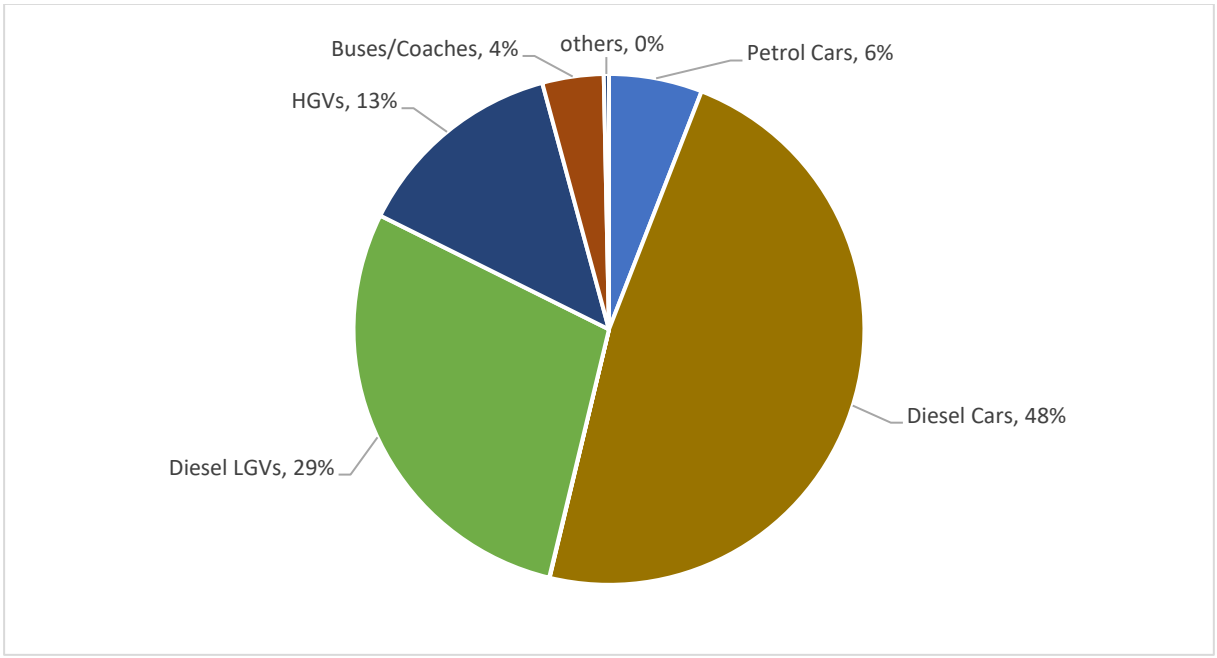
Figure 3-4: Source Apportionment of Vehicle Emissions, Wallingford



3.3.3 South Oxfordshire: Watlington

The contribution to NO_x emissions from vehicles in Watlington can be seen in Figure 3-5. The largest contribution is from diesel cars (48%), followed by diesel vans (29%), HGVs (13%), petrol cars (6%), and buses (4%).

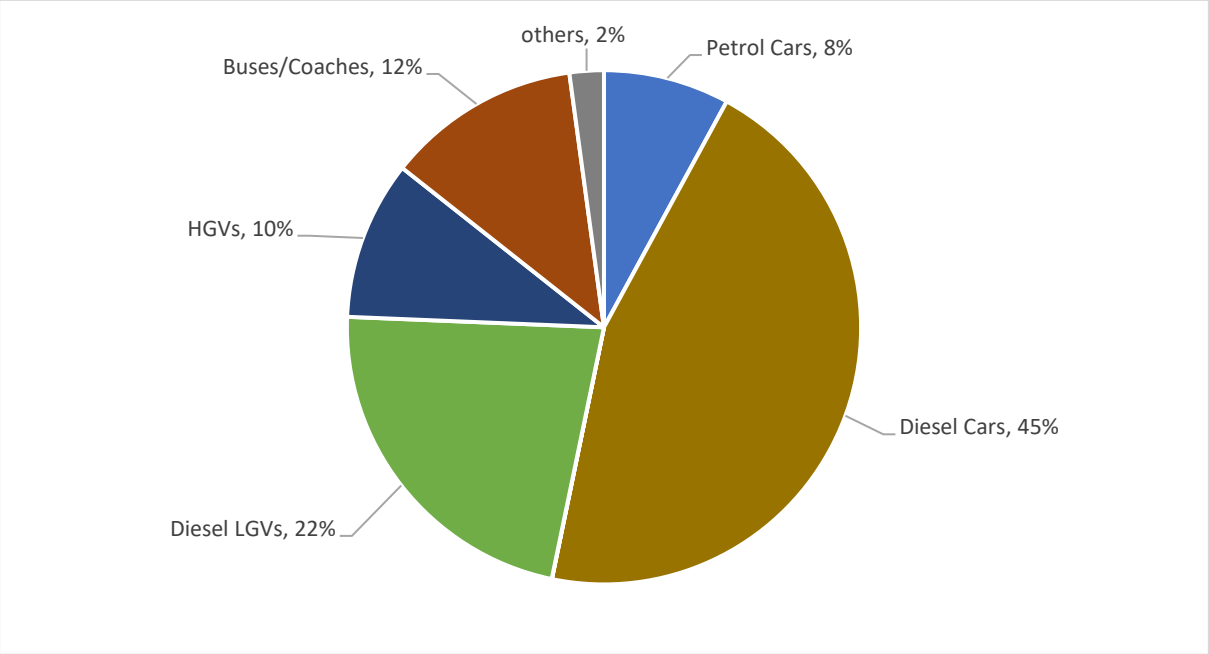
Figure 3-5: Source Apportionment of Vehicle Emissions, Watlington



3.3.4 Vale of White Horse: Abingdon

The contribution to NO_x emissions from vehicles in Abingdon can be seen in Figure 3-6. The largest contribution is from diesel cars (45%), followed by diesel vans (22%), buses (12%), HGVs (10%), and petrol cars (8%).

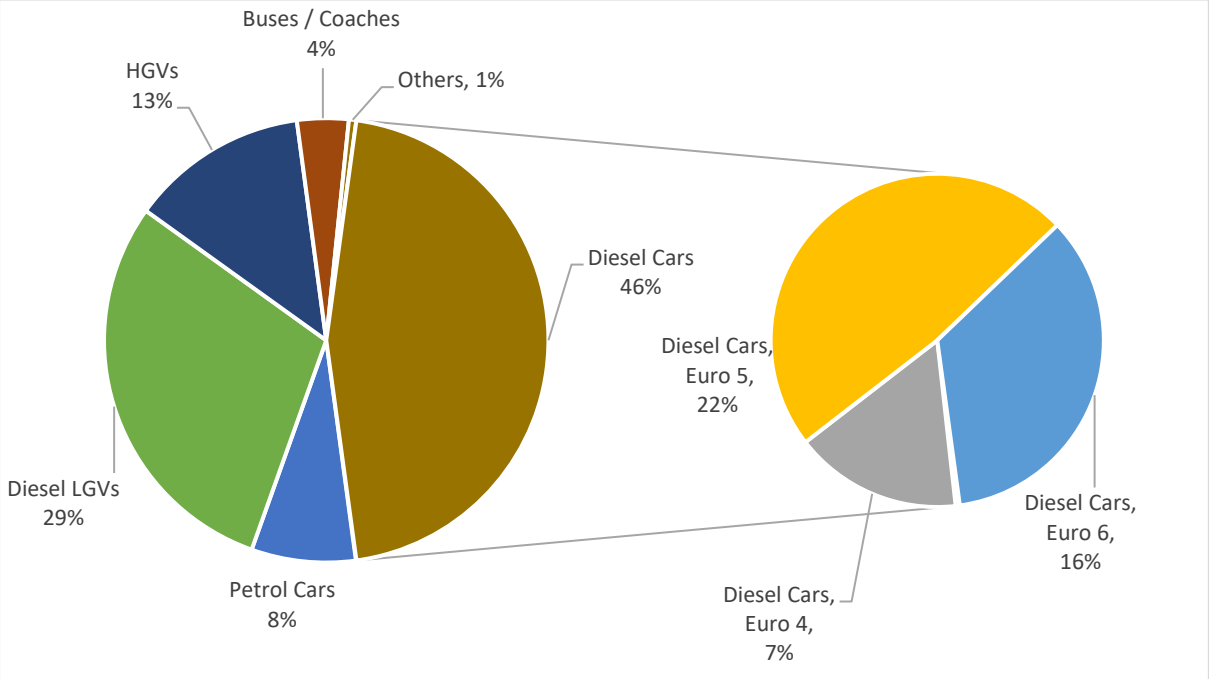
Figure 3-6: Source Apportionment of Vehicle Emissions, Abingdon



3.3.5 Vale of White Horse: Marcham

The contribution to NO_x emissions from vehicles in Marcham can be seen in Figure 3-7. The largest contribution is from diesel cars (46%), followed by diesel vans (29%), HGVs (13%), petrol cars (8%) and buses (4%). The smaller pie chart to the right shows the further breakdown of diesel cars into Euro categories, showing that the largest component is from Euro 5 engines (22%), followed by Euro 6 (16%), and Euro 4 (7%).

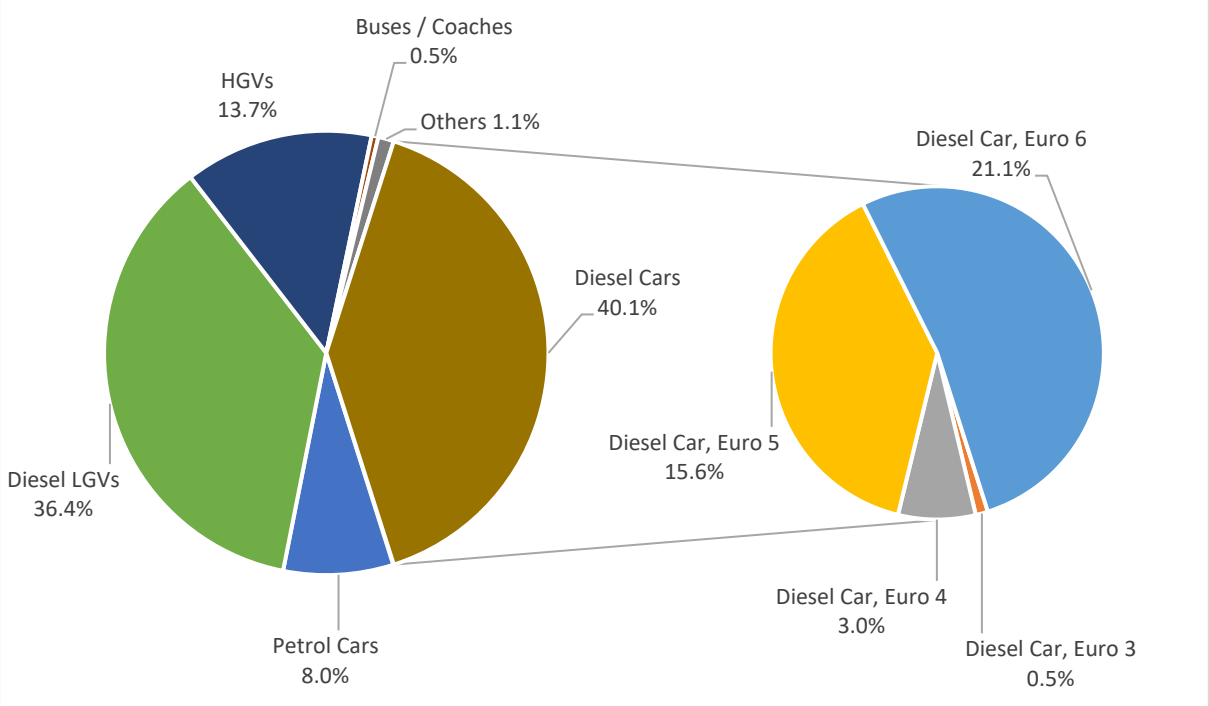
Figure 3-7: Source Apportionment of Vehicle Emissions, Marcham



3.3.6 Vale of White Horse: Botley

The contribution to NO_x emissions from vehicles in Botley can be seen in Figure 3-8. The largest contribution is from diesel cars (40%), followed by diesel vans (36%), HGVs (14%)[15], petrol cars (8%) and buses (<1%). The smaller pie chart to the right shows the further breakdown of diesel cars into Euro categories, showing that the largest component is from Euro 6 engines (21%), followed by Euro 5 (16%), and Euro 4 (3%).

Figure 3-8: Source Apportionment of Vehicle Emissions, Botley



[15] Although HGVs make up around 10% of the vehicle fleet in Botley, which is a higher proportion than at other locations such as Marcham (around 3%), they contribute a relatively lower proportion to overall NOx emissions in Botley, due to a combination of higher average speeds, and a higher proportion of lower emitting Euro 6 engines.

3.4 Required Reduction in Emissions

With the exception of Botley, concentrations at all other AQMAs within South Oxfordshire and Vale of White Horse have not exceeded 40 µg/m^3 since 2020. For Botley, the required reduction in emissions has been calculated for the site S30 using the distance corrected figure, in accordance with Defra Technical Guidance LAQM.TG(22), as shown in the table below. This shows that a reduction of 23% in road NO_x emissions is required. However, this is likely to be an overestimate, as concentrations measured at the façade of the nearest property to site S30 were below 40 µg/m^3.

Using Defra's roadside projection factors for NO_2[16], compliance with the objective would be expected in 2026 without any measures[17].

NO_2 concentrations at worst-case relevant exposure location [S30]:	**47.3 µg/m^3**
Step 1: Local background concentrations of NO_2 for 2022	10.4 µg/m^3
Step 2: Road NO_X concentrations equating to 47.3 µg/m^3	78.2 µg/m^3
Step 3: Road NO_X concentrations required to give total NO_2 concentration of 40 µg/m^3	60.6 µg/m^3
Step 4: Road NO_X reduction required	17.6 µg/m^3
Percentage reduction in road NO_X required	**23%**

[16] Roadside NO2 Projection Factors | LAQM (defra.gov.uk)

[17] Using a factor of (0.637/0.785) for UK locations outside of London where the HDV% is above 10%, the annual mean concentration in 2026 would be 38.4 µg/m^3

3.5 Key Priorities

- Priority 1 – Achieve and maintain compliance with the air quality strategy objectives. Within the last five years (2018 - 2022), the NO_2 annual mean objective has been exceeded in the Henley AQMA, Marcham AQMA and Botley AQMA.
- Priority 2 - Reduce traffic emissions within Botley AQMA (23% reduction in road NO_X required to achieve compliance with annual mean NO_2 objective at the worst-case location). Main contributors to NO_2 concentrations are cars (38%), vans (28%) and HGVs (11%). Buses/coaches account for less than 1%. Diesel cars are a particular issue, as even Euro 6 diesel cars are responsible for 20% of total NO_X emissions, compared with 8% for all petrol cars.
- Priority 3 – Reduce traffic emissions in Henley AQMA. Main contributors to NO_2 concentrations are cars (31%), vans (16%), HGVs (8%), and buses and coaches (4%). Again, diesel cars are a key issue, with Euro 6 diesel cars are responsible for 16% of total NO_X emissions, compared with 8% for all petrol cars.
- Priority 4 – Reduce traffic emissions in Marcham AQMA. Main contributors to NO_2 concentrations are cars (38%), vans (21%), HGVs (9%), and buses and coaches (3%). Euro 6 diesel cars are responsible for 16% of total NO_X emissions, compared with 8% for all petrol cars.
- Priority 5 – Area wide measures to improve air quality across all AQMAs.

4 Development and Implementation of Joint AQAP for South Oxfordshire and Vale of White Horse District Councils

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 requires local authorities to consult the bodies listed in

Table 4.1. In addition, we have undertaken the following stakeholder engagement:

- Website linked with social media campaigns
- Direct engagement with local town and parish councils
- Press release which resulted in articles picked up in local newspapers
- Public engagements events in towns with AQMAs (where suitable locations could be found) publicised via social media
- Online consultation questionnaire for members of the public to convey their views on the proposed AQAP – publicised via a social media and direct engagement with town and parish councils and resident newsletters.

The response to our consultation stakeholder engagement is given in Appendix 1.

(Note, ongoing joint working initiatives are also summarised in the ASRs.)

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

The Steering Group includes the following organisations and roles:

Organisation	Roles
Joint Services for South Oxfordshire and Vale of White Horse District Councils	Environmental Protection Planning Officers Planning Policy Officers
South Oxfordshire District Council	Air Quality Councillors/Cabinet Member
Vale of White Horse District Council	Air Quality Councillors/Cabinet Member
Oxfordshire County Council	Transport Planning Public Health

South Oxfordshire and Vale of White Horse District Councils

Organisation	Roles
National Highways	Air Quality Lead

Communications have been via video calls, with documents circulated and reviewed by email. This Steering Group developed the measures as detailed below and will continue to monitor implementation of the AQAP via regular meetings with our key air quality partners and other partner organisations. These are planned to take part biannually or quarterly where the specific action dictate. Oxfordshire County Council has recently implemented their own Air Quality Strategy 2023-2030, which is helping improve ownership of their AQAP actions at County Council level. Progress on each of these actions will be formally updated in our Annual Status Reports.

4.3 Development of options

A longlist of measures was developed for each of the six AQMAs through reference to previous work and publicly available information. A meeting of the Steering Group was held on 10 February 2023 to review and discuss the longlists. Further comments were received from the stakeholders following the meeting. The measures within the longlists were assessed for each AQMA using a multicriteria analysis approach (see Appendix F). Measures were scored and then ranked in order of effectiveness against the following 'critical success factors':

- Air quality impact and strategic fit;
- Affordability;
- Supply side capacity and capability;
- Achievability;
- Distributional impacts; and
- Value for money.

Shortlisted measures were then reviewed with the Steering Group, prior to selecting measures to take forward within this AQAP. Reasons for not pursuing action plan measures are provided in Appendix B.

Given that the key source contributing to NO_2 concentrations within each AQMA is from cars, followed by vans, then HGVs and buses and coaches, measures focussing on reducing traffic in general were taken forward.

5 AQAP Measures

Table 5.1 shows the area wide AQAP measures for all the AQMAs in South Oxfordshire and Vale of White Horse, while Table 5.2 to Table 5.4 show the specific measures for Henley, Marcham, and Botley AQMAs as these have all recorded an exceedance of the annual mean NO_2 objective within the last five years. The tables contain:

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

The measures focus on reducing emissions from traffic in general, given that the predominant source of pollution within each AQMA is from cars, followed by vans, then HGVs and buses and coaches. All of these measures will to some extent lead to a reduction in emissions as captured in Table F.5 in Appendix F, with the aim being that concentrations continue to remain below the objective in future years, in accordance with key priorities 1, 3, 4 and 5.

The only AQMA with non-compliance of an objective in 2022 at a location of relevant exposure was Botley, as a result of traffic on the A34, part of the strategic road network. As noted earlier in section 2, National Highways considered measures to reduce NO_2 concentrations along this road within a feasibility study (see Appendix D) but was unable to identify any appropriate measures to take forward. Since that study was published, and as part of the consultation for this AQAP, National Highways has agreed to collaborate with the District Councils and with Oxfordshire County Council to scope a new feasibility study exploring options to reduce traffic along the A34, in

accordance with key priority 2. This will hence be the first step of the measure, with quantification of the impacts from proposed options to follow the outcome of the study.

Regular annual updates on implementation of these measures will be reported in future ASRs.

Table 5.1 – Area-wide Air Quality Action Plan Measures, addressing concentrations in all AQMAs (in order of effectiveness, with the most effective measure first)

Responsibility for implementation: SODC/VOWHDC (blue) / Oxfordshire County Council (OCC) (red) / Joint measures between SODC/VOWHDC and Oxfordshire County Council (purple)

Measure No.	Measure	Category	Classification	Estimated Year Measure to be Introduced	Estimated / Actual Completion Year	Lead Organisation	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
AW1	Promotion of cycling	Promoting Travel Alternatives	Promotion of cycling	Ongoing	Ongoing	Oxfordshire County Council	Future funding sources not yet determined, will continue to investigate developer contributions and DfT grant opportunities.	No	Partially funded	£1 million - £10 million	Planning / implementation	Reduced vehicle emissions	Number of cycling trips per week and percentage of residents cycling by purpose	Some funding secured. Work being progressed includes development of strategic active travel network and LCWIPs. There is also ongoing delivery of supporting measures to promote cycling such as 20mph zones, a range of measures to promote active travel to school and specific initiatives in more deprived areas to reduce barriers to cycling	Long timescale to deliver comprehensive improvements across the county
AW2	Promotion of public transport uptake	Promoting Travel Alternatives	Other	Ongoing	Ongoing	Oxfordshire County Council	Bus Service Improvement Plan funded via the National Bus Strategy, additional aspirational currently unfunded (investigating developer contributions and DfT bid opportunities)	No	Partially funded	>£10 M	Planning / implementation	Reduced vehicle emissions	Passenger journeys on local bus services	Specific measures included within BSIP Delivery Plan build on previous progress under LTCP.	BSIP Measures include bus priority infrastructure, real time information, support for youth fares, ticketing reform, support for bus services, marketing/journey planning
AW3	Review options to reduce freight emissions	Freight and Delivery Management	Other	Ongoing	Ongoing	Oxfordshire County Council	Not yet determined, will investigate future DfT bid opportunities	No	Not funded	£1 million - £10 million	Planning	Reduced HGV emissions within AQMAs	Completion of review and plan to implement rec's	Freight and Logistics Strategy adopted and ongoing work to deliver actions. This includes completion of the countywide area weight restriction study. Other measures that may be explored to reduce freight emissions include consolidation, promotion of cycle freight and supporting zero-emission freight vehicle refuelling requirements.	Long timescale to deliver comprehensive improvements across the county due to complexity of freight system. Limited resource and therefore OCC can't commit to specific work in AQMA areas at this stage.
AW4	Public info, linked to	Public Information	Via leaflets/posters, radio,	Ongoing	Ongoing	SODC, VOWHDC (Oxfordshire County Council	Not yet determined, although will	No	Not funded	£10k - £50k	Implementation	Reduced vehicle emissions	Completion of Comms Strategy, and	Recently updated Oxfordshire website providing air quality	To include mass media campaigns, as well as targeted

Measure No.	Measure	Category	Classification	Estimated Year Measure to be Introduced	Estimated / Actual Completion Year	Lead Organisation	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
	AQ monitoring results		television, internet/social media, other			and other Oxfordshire LAs partners)	investigate future Defra AQ Grant Bid. Some Public health funding is available to promote new Air Quality website for Oxfordshire					Reduced personal exposure	plan to implement rec's	monitoring and health information. Developing partnership with Integrated Care System	communications, e.g. information from projects with local schools using mobile sensors.
AW5	Low Emission & Air Quality Policy and Guidance	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2024	2025	SODC, VOWHDC (Oxfordshire County Council partner)	Not yet determined, although will investigate future Defra AQ Grant Bid	No	Not funded	£10k - £50k	Planning	Reduced vehicle emissions (NO_2). Addressing other key sources ($PM_{2.5}$)	AQ & Emissions Strategy adopted	Both Local Authorities have already published planning guidance, which can be adopted as part of the Local Plan. OCC has adopted a county-wide Air Quality Strategy	Joint AQ & Emissions Strategy, incl. EV infra, procurement guidance and wider area strategy for particulates (incl. solid fuel burning). Will require joint working with OCC and other local partners. Adoption of existing planning guidance as part of the Local Plan.
AW6	Upgrading council owned vehicle fleet	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	2023	2025	SODC, VOWHDC	Not yet determined, although will investigate future Defra AQ Grant Bid	No	Not funded	£500k - £1 million	Implementation	Reduced vehicle emissions	% of fleet that is zero (tailpipe) emission	Planning phase, following review of options in 2022	Zero emissions fleet by 2025, incl. staff training, and collaboration with Biffa to review / upgrade refuse fleet.
AW7	Feasibility study on use of green infrastructure	Transport Planning and Infrastructure	Green Infrastructure	2024	2025	SODC, VOWHDC	Not yet determined, although will investigate future Defra AQ Grant Bid	No	Not funded	<£10k	Planning	Reduced personal exposure	Completion of feasibility study and plan to implement rec's	Planning phase, new work area	Review potential mitigation from green infrastructure, focussed on AQMAs (incl. selection of tree species)

Table 5.2 – Action Plan Measures specific to Henley (in order of effectiveness, with the most effective measure first)

Responsibility for implementation: SODC/VOWHDC (blue) / Oxfordshire County Council (red)

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
H1	Henley Low Emission Neighbourhood, incl. promotion of cycling and walking	Transport Planning and Infrastructure	Other	2023	2025	Oxfordshire County Council (SODC partners)	Not yet determined, will investigate developer contributions and bid opportunities.	No	Partially funded	£100k - £500k	Planning	Reduced vehicle emissions (private cars)	Annual average concentration of NO_2 within Henley AQMA	Park and charge and EV car club underway in Henley OCC are planning to produce LTCP area travel plans. Any options for strategic highway improvements will be considered as part of the Henley Area Travel plan. No date set to produce this travel plan yet.	Area based package of measures, incl. promoting walking / improved walking infrastructure, improving cycle network, EV infrastructure, targeted behaviour change and travel planning
H2	Parking review, including implementation of park and ride / stride, and emission based parking incentives	Promoting Low Emission Transport	Other	2023	2025	SODC, (Oxfordshire County Council partner)	Not yet determined, although will investigate future Defra AQ Grant Bid	No	Not funded	£100k - £500k	Planning	Reduced vehicle emissions (private cars)	Annual average concentration of NO_2 within Henley AQMA	Building on review of parking charges	Incl. Park and Stride, rail-based Park and Ride, priority parking for EVs, review of emission based parking charges., workplace parking levy. Any review needs to be conducted jointly and consider the potential broader impacts on parking.
H3	Henley HGV Study	Freight and Delivery Management	Other	2023	2025	Oxfordshire County Council	Not yet determined	No	Not funded	£100k - £500k	Planning	Reduced vehicle emissions (HGVs) within Henley AQMA	Annual average concentration of NO_2 within Henley AQMA	Linked to area wide measure (AW3). Following completion of the countywide area weight restriction study, it is planned that a more detailed study is conducted in Henley to improve understanding of local HGV movements.	Improved understanding of local HGV movements is required to inform any potential interventions.
H4	Develop a Low Emission Taxi Strategy	Promoting Low Emission Transport	Taxi emission incentives	2023	2024	SODC	Not yet determined, although will investigate future Defra AQ Grant Bid	No	Not funded	£10k - £50k	Planning	Reduced vehicle emissions (taxis)	Adoption of Strategy with plan to implement recommendations	Planning phase – building on taxi licensing review	Incl. review of LEV priority space in Henley Taxi Ranks (Hart St. and Railway Station), review of financial incentives / grants / subsidies available

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
H5	Low emission schools and colleges	Promoting Travel Alternatives	Other	2023	2027 (ongoing)	Oxfordshire County Council (SODC partner)	Future funding sources not yet determined	No	Not funded	£100k - £500k	Planning	Reduced vehicle emissions (private cars)	Annual average concentration of NO_2 within Henley AQMA	Building on ongoing work with schools and colleges across the county	Review of options for promoting active travel to school, including School Streets, wayfinding, park and stride.
H6	Anti-idling enforcement	Traffic Management	Anti-idling awareness and enforcement	Ongoing	Ongoing	SODC	Not yet determined, although will investigate future Defra AQ Grant Bid	No	Not funded	£50k - £100k	Planning	Reduced vehicle emissions within Henley AQMA	Annual average concentration of NO_2 within Henley AQMA	Building on anti-idling awareness campaigns across both District Councils	Anti-idling awareness and enforcement, increased enforcement from SODC traffic wardens, following recent anti-idling campaign
H7	Strategic highway improvements to relieve pressure on traffic in Henley	Traffic Management	Strategic highway improvements	Not yet determined	Not yet determined	Oxfordshire County Council	Not yet determined	No	Not funded	Not yet determined	Planning	Reduced vehicle emissions within Henley AQMA	Annual average concentration of NO_2 within Henley AQMA	OCC are planning to produce LTCP area travel plans. Any options for strategic highway improvements will be considered as part of the Henley Area Travel plan. . No date set to produce this travel plan yet.	Until the Henley Area Travel Plan is produced, OCC cannot commit to highway schemes in the Henley area. There are also limited options to redirect traffic in Henley.

Table 5.3 – Action Plan Measures specific to Marcham (in order of effectiveness, with the most effective measure first)

Responsibility for implementation: SODC/VOWHDC (blue) / Oxfordshire County Council (red)

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
M1	Strategic highway improvements to relieve pressure on through traffic in Marcham (incl. potential bypass)	Traffic Management	Strategic highway improvements	Not yet determined	Not yet determined	Oxfordshire County Council	Not yet determined	No	Not funded	Not yet determined	Planning	Reduced vehicle emissions within Marcham AQMA	Annual average concentration of NO_2 within Marcham AQMA	Strategic highway reviews by OCC	Review to consider all options to reduce vehicle emissions within Marcham AQMA, including redirecting traffic (incl. potential route for bypass), junction and road improvement schemes, traffic calming.

Table 5.4 – Action Plan Measure specific to Botley. Responsibility for implementation: Oxfordshire County Council (red) / National Highways (orange) /

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
B1	Feasibility study to improve air quality on the A34	Transport Planning and Infrastructure	Other	2023	2024	National Highways (two measures to highlight joint ownership, although requires significant collaboration between NH, OCC and VOWHDC)	Not yet determined, potential to use National Highways designated funds	No	Not funded	£50k - £100k	Planning	Improved air quality within Botley AQMA, such that there is compliance with the air quality objectives	Completion of feasibility study, quantification of options, and development of a plan to implement recommendations	Review work completed by National Highways under the UK NO_2 Plan (Appendix D). New feasibility study to be scoped out with National Highways and OCC	Focus on actions to reduce traffic and improve air quality, based on 2022 monitoring. Incl. traffic and behaviour surveys, compulsory purchase, footpath relocation (noting that the footpath is not a receptor under LAQM but relocation would provide a positive wellbeing impact).
B2	Feasibility study to reduce traffic emissions within Botley	Transport Planning and Infrastructure	Other	2023	2024	Oxfordshire County Council (two measures to highlight joint ownership, although requires significant collaboration between NH, OCC and VOWHDC)	Not yet determined, potential to use National Highways designated funds	No	Not funded	£50k - £100k	Planning	Reduced vehicle emissions within Botley AQMA	Completion of feasibility study, quantification of options, and development of a plan to implement recommendations	Building on existing body of knowledge through development of LTCP and Central Oxfordshire Travel Plan	To be included within work to develop and deliver the Central Oxfordshire Travel Plan. Focusing on potential actions to reduce traffic travelling to and from Oxford city centre.

Appendix A: Response to Consultation

A Consultation Report has been produced by council officers to analyse the comments received on the Air Quality Action Plan 2023-27 (AQAP), the document is available in full at the councils' website: https://www.southoxon.gov.uk/wp-content/uploads/sites/2/2023/10/Air-Quality-Action-Plan-Consultation-Report-2023_-FINAL.pdf

Overall, respondents expressed high levels of support for most of the area-specific actions for Henley-on-Thames, Botley and Marcham, and for all of the area-wide actions for the districts. Levels of support for the proposals to remove the Air Quality Management Area (AQMA) in Wallingford and Watlington were lower, whilst a large proportion of respondents did not agree with the proposal to remove the AQMA in Abingdon-on-Thames.

With respect to the actions for the AQMAs in South Oxfordshire:

- Respondents agreed with all of the actions proposed for the market town of Henley-on-Thames, with an average rate of agreement of 69%. Action 6 'Low emissions schools and colleges' received the highest level of support (76%), whilst Action 3 'Parking review' registered the lowest (56%). The three proposals which respondents deemed the most important are: 'Henley-on-Thames Heavy Goods Vehicle (HGV) Emission Management Plan', which received 70% of total preferences; 'Strategic highway improvements to relieve pressure on traffic in Henley-on-Thames' (62%); and 'Henley-on-Thames Low Emission Neighbourhood (48%)'.
- Less than half of all respondents agreed with the proposal to remove the Wallingford AQMA (42%), and 34% disagreed with it. Among the comments

received, 44% expressed disagreement with the proposal due to traffic being heavy and the target of emission levels, which the proposal is based on, being inappropriate.

- Just under half of all respondents agreed with the proposal to remove the Watlington AQMA (48%), whilst 30% disagreed.

With respect to the actions for the AQMAs in the Vale of White Horse:

- Just under half of the respondents disagreed with the proposal to remove the Abingdon AQMA (47%), whilst 32% agreed with it. Among the comments received, over two-thirds expressed disagreement with this proposal (68%).
- On average, just over two-thirds of respondents agreed with the proposals for Botley AQMA. More specifically, 66% supported Action 1 'Feasibility study to improve air quality on the A34', and 68% supported Action 2 'Feasibility study to reduce traffic emissions within Botley'. Among the comments received, 41% expressed the need to improve traffic flow, volume and emissions in Botley. Respondents in this group also asked for a reduction of the speed limit to be considered, especially for the ring road/Botley interchange.
- On average, 71% of respondents agreed with the proposed actions for Marcham AQMA. However, the level of support varied significantly between the two proposals, with just over half of respondents agreeing with Action 1, 'Strategic highway improvements to relieve pressure on through traffic in Marcham (including a potential bypass)', and 84% agreeing with Action 2 'Marcham Heavy Goods Vehicles (HGV) emission management plan'. Among the comments received, 32% expressed the need to improve the transport infrastructure, including building a bypass, and public transport, and 28% asked for the introduction of restrictions on HGV and a 20mph speed limit.

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With regards to the area-wide actions for South Oxfordshire and the Vale of White Horse:

Overall, the vast majority of respondents agreed with all the proposed area-wide actions included in the AQAP 2023-27. More specifically, on average 73% of them expressed support for all the proposals.

The area-wide action which received the highest level of support was AW7, 'Feasibility study on the use of green infrastructure' - 81% of respondents agreed with this.

However, when asked to select three actions which are most important to them, respondents identified the following:

- Action 1, 'Promotion of public transport uptake' (70% of preferences).
- Action 3, 'Review options to reduce freight emission, including weight limits and enforcement' (57%).
- Action 2, 'Promotion of cycling' (49%).

We received 106 comments on the area-wide actions for the districts. Of these, the largest group expressed the need for further work to be done to improve the transport infrastructure and traffic management in South and Vale (40%). An additional 25% of comments indicated that public transport needs improvement.

Further information on consultation responses, including a full list of redacted comments made in response to the consultation, can be found by accessing the Appendix 1 of the Consultation Report, available here https://www.southoxon.gov.uk/wp-content/uploads/sites/2/2023/10/Air-Quality-Action-Plan-Consultation-Report_Appendix_FINAL.pdf.

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)
Alternatives to Private Vehicle Use	Bus based park and ride	Schemes already in existence. Unlikely to result in significant additional emissions reductions.
	Car and lift sharing schemes	
	Car clubs	
Environmental Permits	All actions	AQMAs are declared as a result of traffic emissions. Actions regarding environmental permits would not reduce NO_2 concentrations in the AQMAs.
Freight and Delivery Management	Delivery and service plans	Delivery and service plans and freight consolidation to be addressed through Oxfordshire County Council's LTCP, Freight and Logistics Strategy.
	Freight consolidation centre	
	Quiet and out of hours delivery	No existing night-time HGV curfews that could be removed in Henley, Marcham or Botley. Targeted measures are not required for Wallingford, Watlington or Abingdon.
	Other (virtual loading bays)	Not applicable to Marcham or Botley. Unlikely to be effective / implementable in Henley due to small geographic scale. Targeted measures are not required for Wallingford, Watlington or Abingdon.
	Other (freight clearway)	Not applicable to Marcham, Botley or Henley. Targeted measures are not required for Wallingford, Watlington or Abingdon.

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Action category	Action description	Reason action is not being pursued (including Stakeholder views)
Policy Guidance and Development Control	Other (Policy on Green Infrastructure)	Unlikely to have significant impact on concentrations in AQMAs. More beneficial to investigate feasibility of implementation.
	Other (Policy on Low Emission Farming)	Farming emissions do not contribute to concentrations in AQMAs.
	Other (land use planning)	Land use planning and 20 minute neighbourhoods already part of Oxfordshire County Council's LTCP
	Regional Groups	Already exist and function effectively in Oxfordshire
Promoting Low Emission Plant	All actions	AQMAs are declared as a result of traffic emissions. Actions regarding low emission plan would not reduce NO_2 concentrations in the AQMAs.
Promoting Low Emission Transport	Company vehicle procurement	Difficult for councils to influence external company procurement decisions directly (council fleets covered separately). More targeted measures are required.
	Low Emission Zones	Too stringent a measure for most AQMAs where annual average NO_2 concentrations are already less than 40 µg/m^3. Difficult for Botley as a strategic highway. Low emission options to be considered separately as part of Botley Feasibility Study
	Taxi Licensing Conditions	Taxi licensing has very recently been amended for both councils, to include emission requirements.
	Other (scrappage schemes)	Usually require national funding. Too broad a measure for the specific AQMAs.

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Action category	Action description	Reason action is not being pursued (including Stakeholder views)
Promoting Travel Alternatives	Encourage and facilitate home working	Significant uptake of home working already as a result of covid-19
	Intensive active travel campaign and infrastructure	Active travel campaigns already ongoing via Oxfordshire County Council.
	Personalised travel planning	Personalised travel planning is currently limited to new developments. Unlikely to result in significant emission reductions compared to intensive effort (and funding) required to implement.
	Promote use of rail and inland waterways	Likely to be more effective as a national policy. Unlikely to have a significant impact in the AQMAs. Included as part of Botley Feasibility Study.
	Workplace travel planning	Already ongoing via Oxfordshire County Council.
Traffic Management	Reduction of speed limits, 20 mph zones	Henley already has 20 mph speed limit. Marcham speed limit is 30 mph, but due to the narrow road, effective speeds are already below 20 mph aA34 (Botley) speed limit is 50mph – reducing this further may cause congestion and therefore exacerbate the problem.
	Testing vehicle emissions	Unlikely to result in significant emission reductions compared to intensive effort (and funding) required to implement.
	Urban Traffic Control (UTC), congestion management, traffic reduction	Henley already has UTC in place. Not suitable for Marcham or Botley. Targeted measures are not required for Wallingford, Watlington or Abingdon.

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Action category	Action description	Reason action is not being pursued (including Stakeholder views)
Transport Planning and Infrastructure	Bus route improvements (incl. routes and frequency)	Already being implemented through Oxfordshire County Council
	Public cycle hire scheme (incl. e-bikes, e-scooters)	Not applicable to AQMAs
	Public transport improvements, interchanges stations and services	Already being implemented through Oxfordshire County Council
	Other (Car park infrastructure / relocation)	Not applicable to AQMAs
	Other (Air Quality Barriers)	Not physically possible to implement due to proximity of receptors to kerbs.
	Other (Tunnels to take traffic away from receptors)	Too costly for the AQ benefits
	Other (Bridges to take traffic away from receptors)	
Vehicle Fleet Efficiency	Driver training and ECO driving aids	Already implemented by South and Vale Councils
	Low Emission Public Transport	Zero emission buses (ZEBRA) implemented in Oxford City Centre by OCC, which will have some benefit for SODC and VOWHDC, as some older vehicles may be replaced by more

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Action category	Action description	Reason action is not being pursued (including Stakeholder views)
		modern buses no longer needed in Oxford. OCC has no further plans or funding for EV buses elsewhere in the county.
	Fleet efficiency and recognition schemes	Potential for district wide scheme, although likely limited impact for the costs required.
	Testing Vehicle Emissions	Unlikely to result in significant emission reductions compared to intensive effort (and funding) required to implement
	Vehicle retrofitting programmes	

Appendix C: Maps of AQMAs

Figure C-1: Henley AQMA

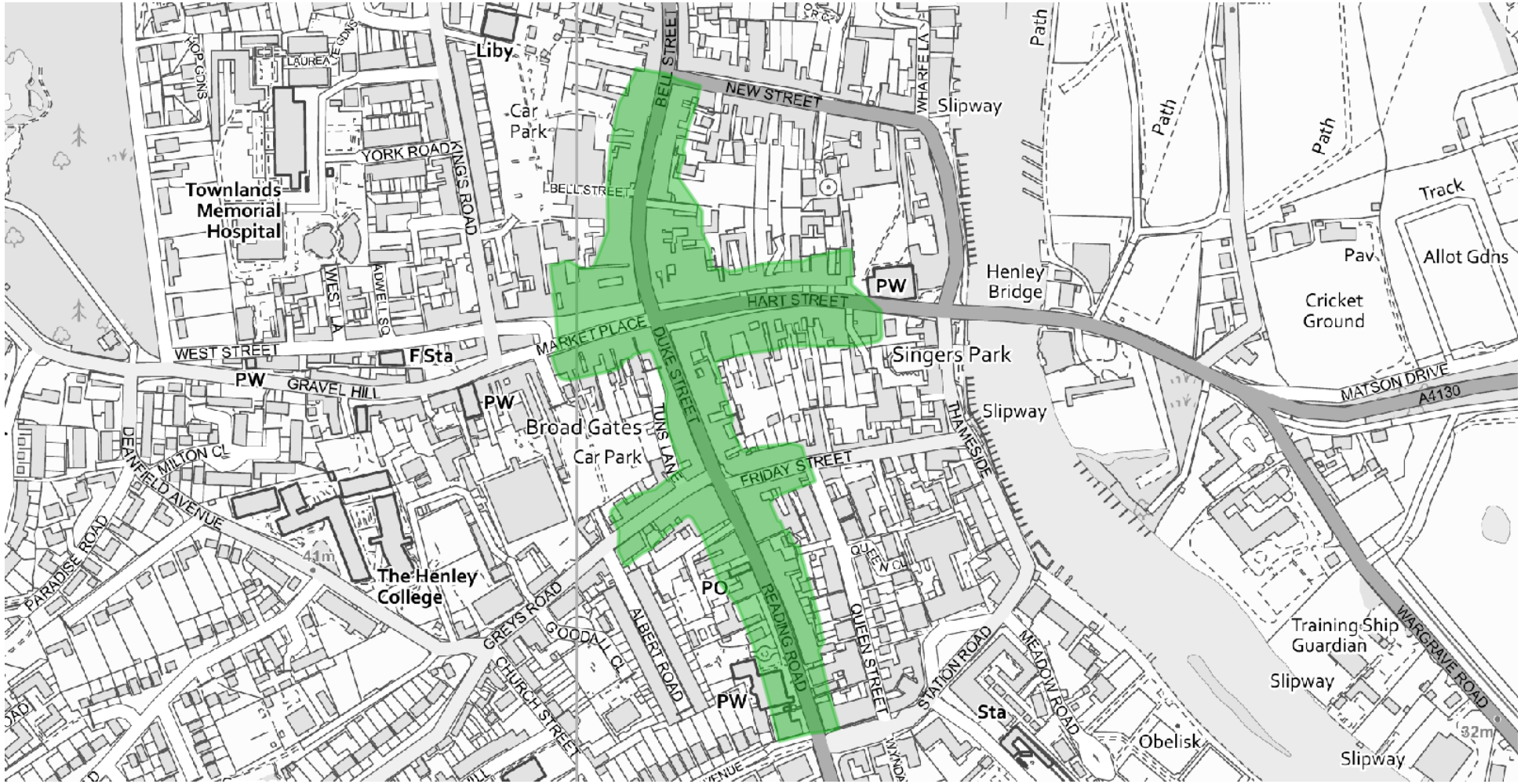


Figure C-2: Wallingford AQMA

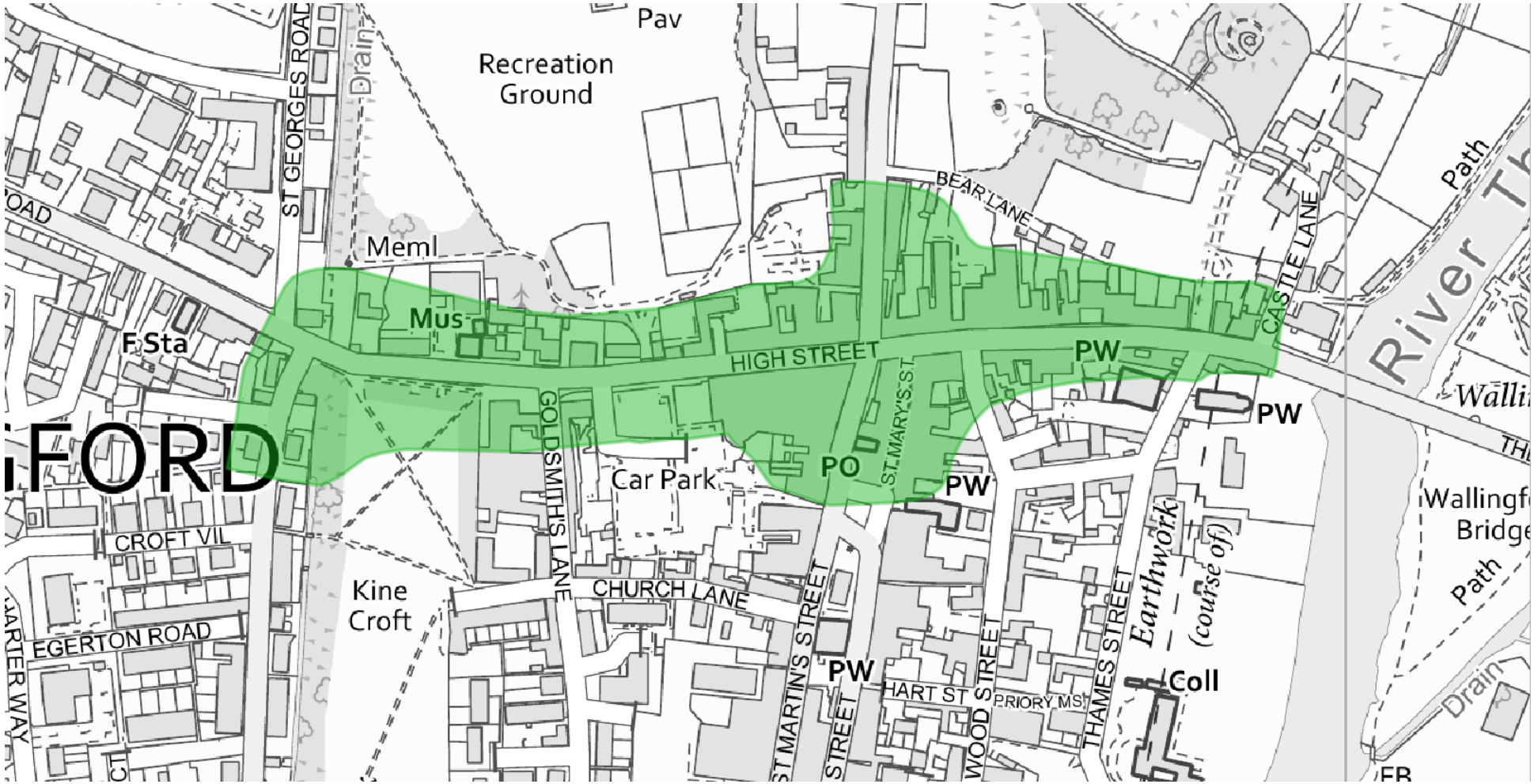


Figure C-3: Watlington AQMA

Figure C-4: Abingdon AQMA

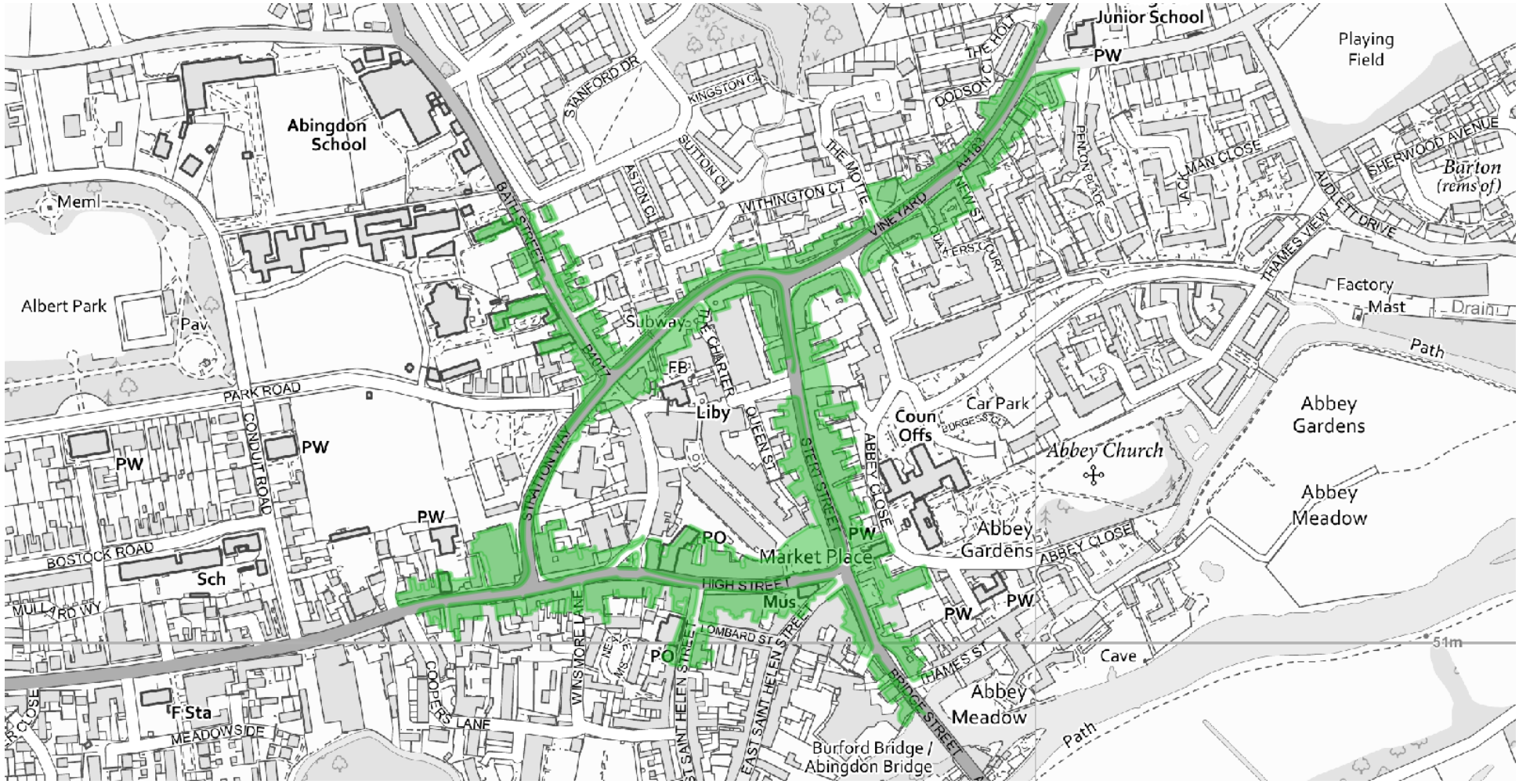


Figure C-5: Marcham AQMA

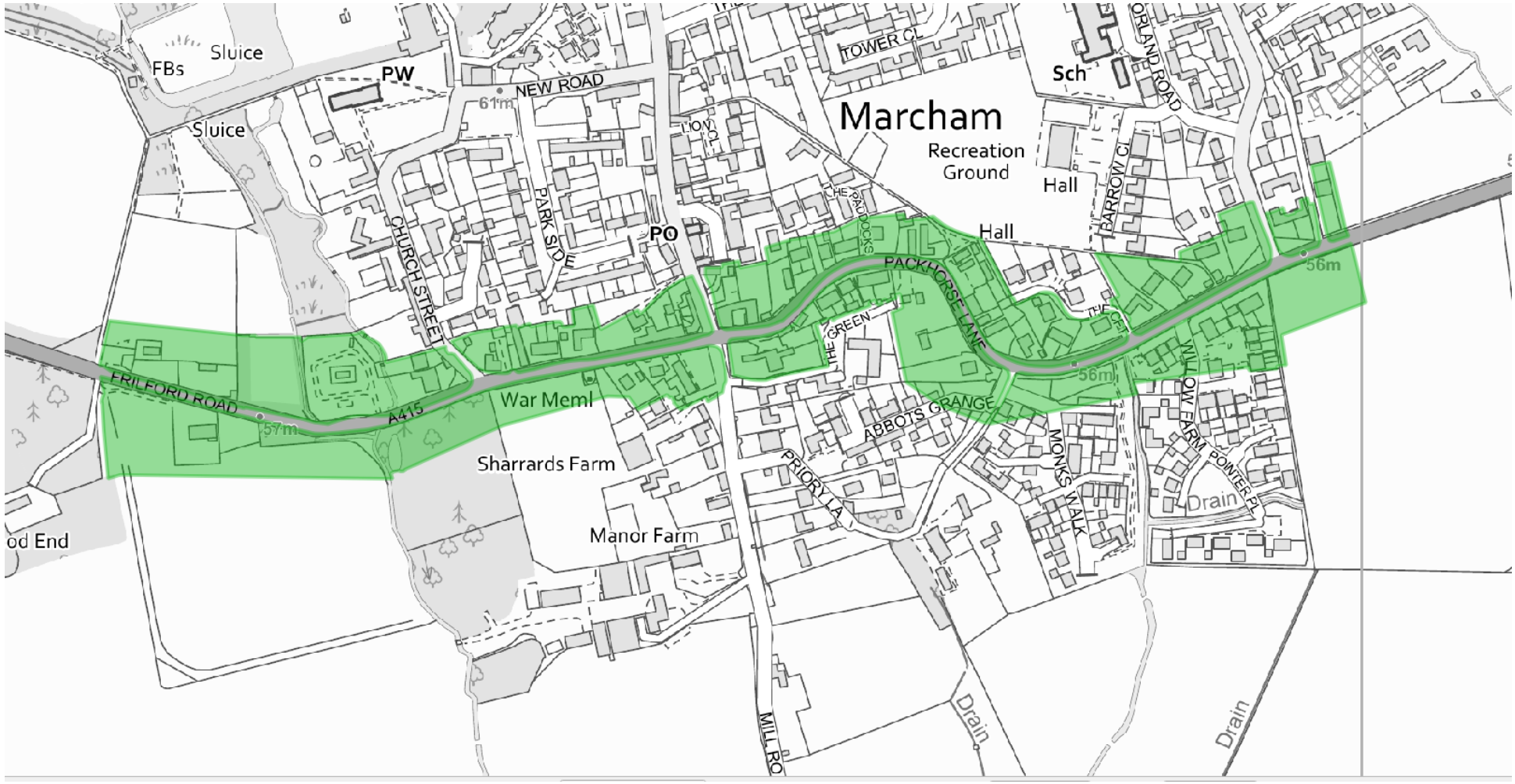
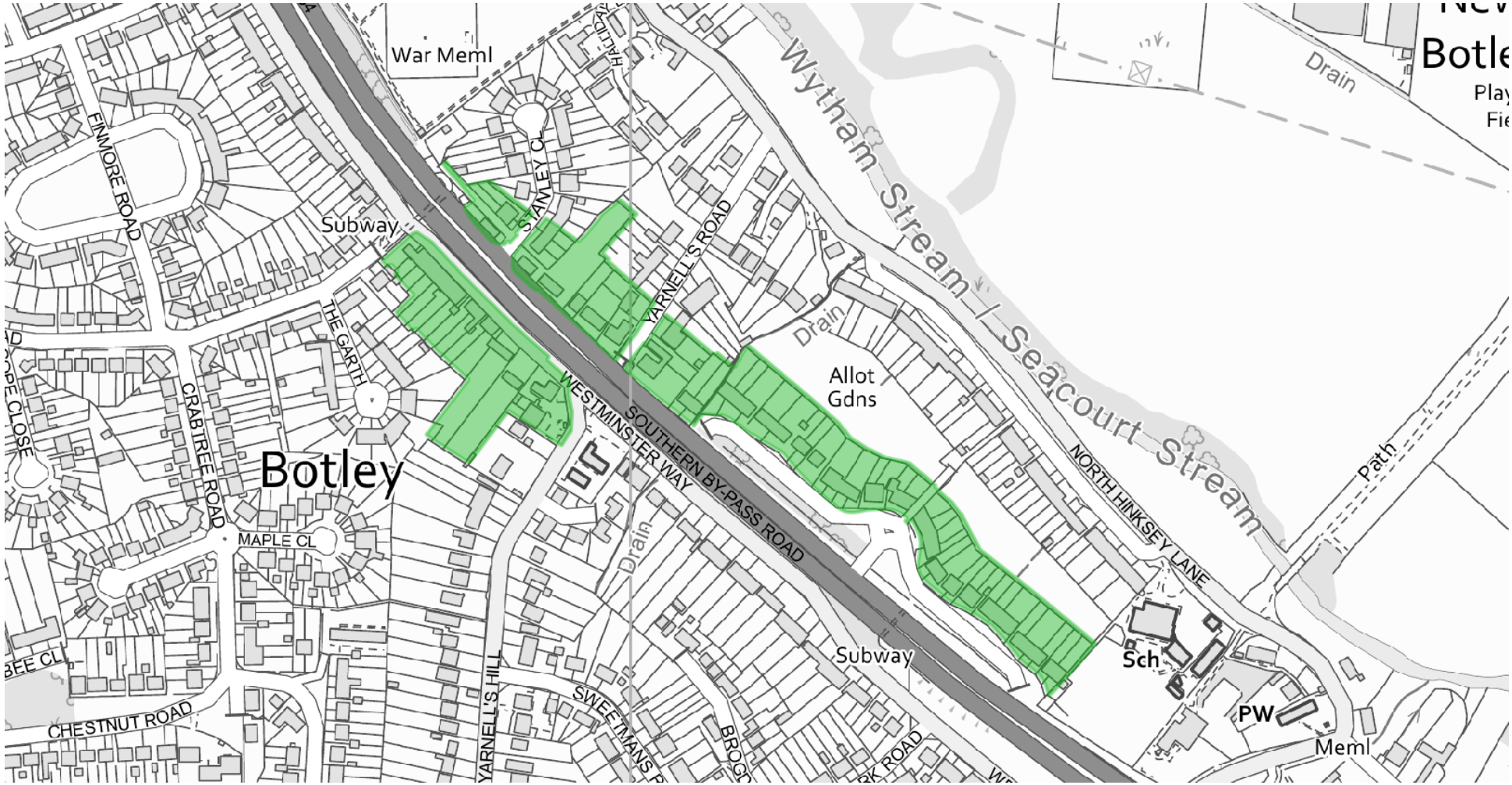


Figure C-6: Botley AQMA



Appendix D: National Highways Reporting relating to Botley AQMA

National Highways Modelling Map:

Ref: National Highways. Phase 3, Appendix A: Phase 3 Modelling Maps. PCM Link Details_77436 A34 Oxford. Available online at: https://nationalhighways.co.uk/our-work/environment/air-quality-and-noise/air-quality/air-quality-reports/. Accessed January 2023.

Census ID: 77436	A34, Western Oxford Bypass	Highways England Region: Area 3	Phase 3
AQ Description: PCM non-compliant. Sensitive receptors and public access within 15m.			

Highways England Verified Modelled NO_2 Concentrations (µg/m³)

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
NO_2 Conc.	77	73	69	65	61	58	55	53	50	48	47	45	44

Highways England Diffusion Tube Monitoring Data

Location	2017 Annualised NO_2 Concentration (µg/m³)
9	22
10	31
11	26
12	22

AQMA

Map ID	Local Authority	Description	Pollutant
AQMA A	Vale of White Horse DC	Botley AQMA	Annual NO_2
AQMA B	Oxford City Council	Whole city AQMA	Annual NO_2

Regional Transport Model Traffic Data for 2017

Road	RTM ID	AADT	%HDV
A34 northbound	SE_10130_10151	37369	11
A34 southbound	SE_10152_10131	37718	11

Typical Traffic				Fast			Slow
AM (07:00 – 10:00)		IP (10:00 – 16:00)		PM (16:00 – 19:00)		OP (19:00 – 07:00)	
NB	SB	NB	SB	NB	SB	NB	SB

Key			
PCM Link		Sensitive Receptor/s within 15m of PCM Link	
NO_2 monitoring	1	Footpath/s within 15m of PCM Link	
AQMA	AQMA A	RTM ID	SE_39072
Bus Stop		Section of PCM link within 25m of junction	

Major Project Scheme in vicinity?

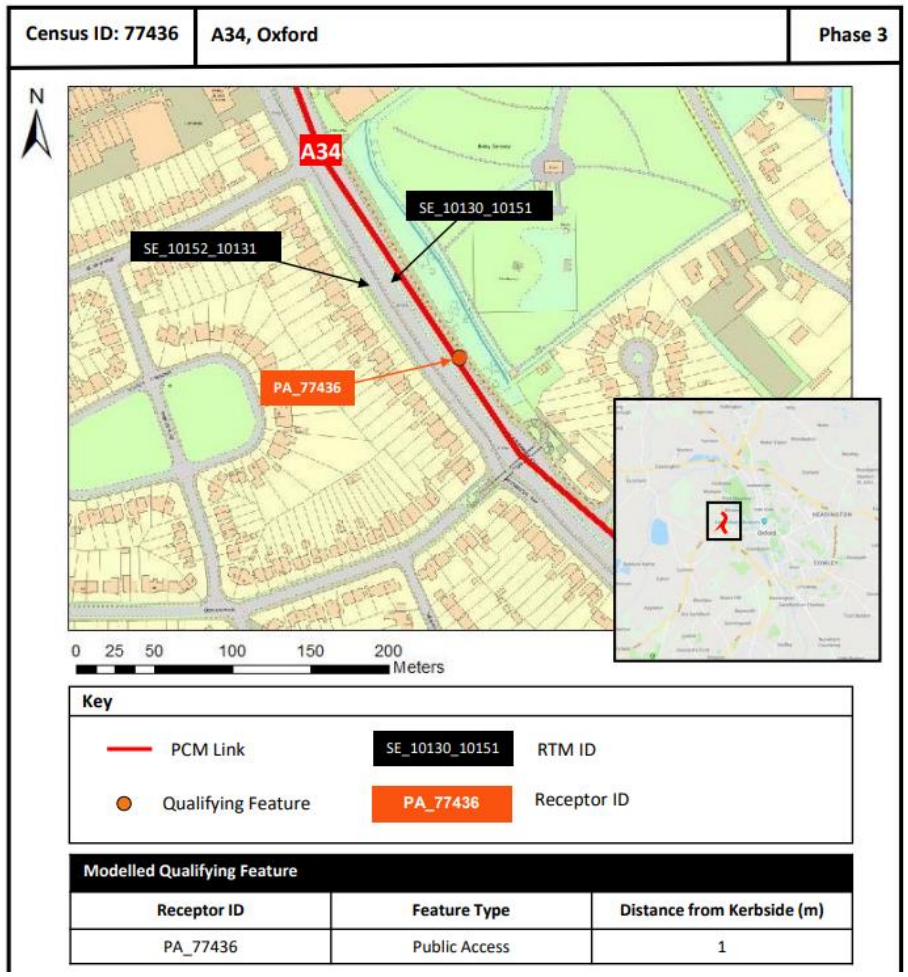
- A34 Oxford Junctions

Commentary

- Public access is located along the length of the PCM link.
- Sensitive receptors are within 15m of the A34 in Botley along Westminster Way and at the end of Stanley Close and Yarnell's Road. Some of these properties are within the Vale of White Horse AQMA.

National Highways Nearest Receptor Location

REF: National Highways. Phase 3, Appendix A: Phase 3 Receptor Maps. PCM Link Details_77436 A34 Oxford. Available online at: https://nationalhighways.co.uk/our-work/environment/air-quality-and-noise/air-quality/air-quality-reports/. Accessed January 2023.



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National Highways Audit Report

KEY:	× - Not possible	✓ - Possible	? - More research required

Option	Feasible to bring compliance forward?	Summary
Source – reducing emissions from the SRN		
Electric vans	×	Research completed for Highways England indicates that it would only be possible to bring forward a maximum of 250 electric vans over the next few years in any one location. To achieve this would require the creation of a specialist centre. Based on the observed speed of 50mph along this PCM link, it has been calculated that 250 electric vans would equate to an NO_2 reduction of approximately 0.2µg/m^3 along this link. As such, the implementation of this measure would not achieve an earlier compliance date.
Traffic Management	×	Possible traffic management options for this link were discussed in a workshop held during late 2018 into early 2019. The outcomes of the workshop indicated that there may be the possibility for local traffic management measures to help support improvements in air quality. A feasibility study was commissioned in Autumn 2019 to investigate in more detail whether the proposed local traffic measures would deliver changes in traffic that in turn would lead to improvements in air quality and support compliance with the limit values in the shortest timescales possible. However, following detailed investigations to support the feasibility study, it has been concluded that there are no viable local traffic management measure solutions that could be delivered for this SRN PCM link capable of improving air quality.
Speed Management of 60mph	×[1]	The existing speed limit along the A34 is 50mph. WebTRIS data has identified the daily average speed of vehicles travelling along this section of the A34 as being approximately 50mph. The introduction of a speed limit would therefore not be appropriate along this PCM link.
Bus Retrofit	×	A review of bus movements along this section of the A34 has identified 6 journeys per day. The bus route seems to be associated with school drop off in the morning and return journey in the afternoon only and a review of the bus timetables for the area indicates there are no other bus journeys made on the A34. The Euro standard of the buses making these journeys are unknown. However, if they did require retrofitting, the 6 journeys per day would not support any measurable reduction in annual mean NO_2 concentrations along this PCM link. Bus retrofit would not support delivery of compliance with the Air Quality Directive in the shortest timescale possible. Therefore, this measure is not being taken forward.
HGV Retrofit	×	A review of traffic data for this PCM link has identified approximately 8,140 HGVs travelling along this link. Theoretically, a HGV retrofit scheme could reduce annual mean NO_2 concentrations by 1.3µg/m^3. However, no accredited retrofit system is currently available for HGVs nor is it known the mechanism for delivery.

		As such, it is anticipated that this measure would require a Government led scheme for delivery and Highways England is not able to progress this measure at this time.

Recommendation
The verified air quality modelling completed for the Phase 3 assessment has concluded that there are exceedances of the limit values along PCM link 77436 up and including the year 2030. In completing the assessment for this SRN PCM link, Highways England has considered a range of measures to support compliance in the shortest possible timeframe. These measures have included; speed management measures, however the speed limit along this link was already 50mph and no further reduction would improve air quality; traffic management measures, however detailed investigations have concluded no viable measures would improve air quality; and a 9.5m high barrier, although it is not considered possible to build a barrier at this location due to physical constraints. **Following the completion of the feasibility study, it has been concluded there are no viable measures currently available to Highways England to help meet limit values in a shorter timescale than modelled. However, Highway England continues to investigate whether there are new or emerging ideas and / or technologies that could be considered, alongside any measures put forward by Government for the SRN.** A workshop will be held with the local authority to determine whether any other viable measures could be considered to help support compliance with limit values along this PCM link in the shortest timescales possible.

Appendix E: Source Apportionment of NO_2

AQMA	Site ID	Grid Reference	Measured Annual Mean NO_2 [T-NO_2]	Total Background NO_x [TB-NO_x] / NO_2 [TB-NO_2]	Regional Background NO_x [RB-NO_x] / NO_2 [RB-NO_2]	Local Background NO_x / NO_2	Local NO_2 Contribution [L-NO_2] [T-NO_2] – [TB-NO_2]	Cars	Vans	HGVs	Buses and Coaches
Henley	4 Duke Street (S51)	476071, 182612	30.5	17.1 / 12.7	6.8 / 5.0 (16%)	10.3 / 7.7 (25%)	17.8	9.4 (31%)	4.9 (16%)	2.3 (8%)	1.3 (4%)
Wallingford	Continuous Analyser (High Street)	460799, 189500	32.0	15.5 / 11.5	6.5 / 4.8 (15%)	9.0 / 6.7 (21%)	20.5	11.3 (35%)	5.1 (16%)	1.5 (5%)	2.4 (8%)
Watlington	41 Couching Street (S33)	468951, 194457	27.9	10.4 / 8.1	6.7 / 5.2 (19%)	3.7 / 2.9 (10%)	19.8	10.7 (38%)	5.7 (20%)	2.7 (10%)	0.8 (3%)
Abingdon	Stratton Way (S06)	449697, 197343	28.3	15.7 / 11.7	6.3 / 4.7 (17%)	9.4 / 7.0 (25%)	16.4	8.7 (31%)	3.7 (13%)	1.6 (6%)	2.0 (7%)

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AQMA	Site ID	Grid Reference	Measured Annual Mean NO_2 [T-NO_2]	Total Background NO_x [TB-NO_x] / NO_2 [TB-NO_2]	Regional Background NO_x [RB-NO_x] / NO_2 [RB-NO_2]	Local Background NO_x / NO_2	Local NO_2 Contribution [L-NO_2] [T-NO_2] – [TB-NO_2]	Cars	Vans	HGVs	Buses and Coaches
Marcham	10 Packhorse Lane (S16)	445552, 196639	30.4	11.1 / 8.5	6.3 / 4.9 (16%)	4.8 / 3.7 (12%)	21.9	11.7 (38%)	6.5 (21%)	2.8 (9%)	0.8 (3%)
Botley	63 Southern Bypass (S30)	448914, 205798	47.3	13.8 / 10.4	6.2 / 4.7 (10%)	7.6 / 5.8 (12%)	36.9	17.8 (38%)	13.4 (28%)	5.1 (11%)	0.2 (<1%)

Appendix F: Shortlisting Process

A multicriteria analysis was undertaken on the long list of measures, to consider the following critical success factors. Scores were summed to provide a total score for each measure / package of measures.

Critical success factor	Considerations	Scoring
Strategic and wider air quality fit	Does this option target the key emission sources. Does this option fit and or compliment other existing and planned policies? (c.f. Local Plan) How does this option affect overall exposure and to what extent does it reduce overall exposure? Impacts on other air pollutants and carbon? Does it improve health and well-being of residents and visitors? How does it affect the local economy and employment?	+2 strong fit +1 moderate fit 0 neutral -1 slight opp. -2 strong opp.
Affordability	Funding: How will the option be funded - public, private or combination? Are there any other potential funding sources? How affordable is this option in the short run taking account of capital costs? What is the affordability of this option in the long run taking account of operating and maintenance costs?	+2 Minimal cost (>£0) +1 Low cost (>£100k) 0 Moderate Cost (>£1M) -1 High Cost (>£5M) -2 Very High Cost (>£10M)
Supply side capacity & capability	Service Delivery: Who will deliver the solution - LA, external party or both? - Who will be the lead organisation Are there capable contractors available to deliver this option? Is there a sufficiently well-developed market to support the efficient delivery of this option?	+2 existing in area +1 readily available 0 available -1 limited availability -2 very limited
Achievability	Can this option be delivered at a local scale? Given the market limitations, are adequate resources available to manage and implement such a solution successfully? Is it based on proven/existing technology?	+2 existing +1 readily achievable 0 achievable -1 difficult -2 very difficult
Distributional impacts	Does this option significantly affect one or more of particular groups of stakeholders? Is there a potential to insure some groups against the detrimental impacts of the option? Does the option displace AQ issues elsewhere (and particularly affect deprived areas and communities)? Does this option have an impact on health inequalities?	+2 highly positive +1 positive 0 neutral -1 negative -2 highly negative
Value for money	Do the likely benefits of this option exceed the costs? [In broad terms, not just air quality] Has the option been designed to deliver effectively while maximising benefits and minimising cost?	+2 very high +1 high 0 mod -1 low -2 very low

Table F.1 – Shortlisted Area-Wide Measures

LONGLIST OF MEASURES		CRITICAL SUCCESS FACTORS / CONSIDERATIONS						
		Strategic & wider AQ fit	Affordability	Supply side capacity & capability	Achievability (LA side)	Distrib. impacts	Value for money	Overall Weighted Score
		Strat. SCORE *+2 strong fit* *+1 moderate fit* *0 neutral* *-1 slight opp.* *-2 strong opp.*	***Afford. SCORE*** *+2 Minimal cost (>£0)* *+1 Low cost (>£100k)* *0 Moderate Cost (>£1M)* *-1 High Cost (>£5M)* *-2 Very High Cost (>£10M)*	***Supply SCORE*** *+2 existing in area* *+1 readily available* *0 available* *-1 limited availability* *-2 very limited*	***Achiev. SCORE*** *+2 existing* *+1 readily achievable* *0 achievable* *-1 difficult* *-2 very difficult*	***Dist. Impacts SCORE*** *+2 highly positive* *+1 positive* *0 neutral* *-1 negative* *-2 highly*	***V/M SCORE*** *+2 very high* *+1 high* *0 mod* *-1 low* *-2 very low*	
	Weighting	*17%*	*17%*	*17%*	*17%*	*17%*	*17%*	
Freight and Delivery Management	Review options to reduce freight emissions, incl. countywide area weight restriction study and review of consolidation, cycle freight and suypporting zero emission freight	2	-1	2	2	1	1	**1.17**
Policy Guidance and Development Control	Air Quality Planning and Policy Guidance – joint AQ & Emissions Strategy, incl. EV infra, procurement guidance and wider area strategy for particulates (incl. solid fuel burning).	2	2	0	0	1	1	**1.00**
Promoting Low Emission Transport	Public Vehicle Procurement – Prioritising uptake of low emission vehicles: Upgrading council owned fleet	2	-2	1	0	1	0	**0.33**
Promoting Travel Alternatives	Promotion of public transport uptake	2	-2	2	2	2	1	**1.17**
	Promotion of cycling (e.g. Secure cycle parking, repair and changing facilities, Cycle training and route planning, Cycle to work schemes/new home bike schemes/recycling schemes, Park and cycle schemes)	2	1	2	2	2	0	**1.50**
Public Information	Public information linked to AQ monitoring results Via leaflets, radio, television, internet, other (e.g.: public health warnings, sustainable transport campaigns, promoting low and zero tailpipe emissions, alternatives to private vehicle use, raising awareness about the health impacts of air pollution, air quality information, Bonfires and dark smoke offences, Indoor air quality, Air quality education and behavioural change events, e.g. Clean Air Day, Walk to School Week)	2	1	2	2	0	0	**1.17**
Transport Planning and Infrastructure	Feasibility study for green infrastructure...	1	1	1	1	0	-2	**0.33**

Table F.2 – Shortlisted Measures for Henley

LONGLIST OF MEASURES		Henley						
		CRITICAL SUCCESS FACTORS / CONSIDERATIONS						
		Strategic & wider AQ fit	Affordability	Supply side capacity & capability	Achievability (LA side)	Distrib. impacts	Value for money	Overall Weighted Score
		Strat. SCORE *+2 strong fit +1 moderate fit 0 neutral -1 slight opp. -2 strong opp.*	***Afford. SCORE*** *+2 Nilnimal cost (>£0) +1 Low cost (>£100k) 0 Moderate Cost (>£1M) -1 High Cost (>£5M) -2 Very High Cost (>£10M)*	***Supply SCORE*** *+2 existing in area +1 readily available 0 available -1 limited availability -2 very limited*	***Achiev. SCORE*** *+2 existing +1 readily achievable 0 achievable -1 difficult -2 very difficult*	***Dist. Impacts SCORE*** *+2 highly positive +1 positive 0 neutral -1 negative -2 highly*	***VfM SCORE*** *+2 very high +1 high 0 mod -1 low -2 very low*	
Weighting		*10%*	*10%*	*10%*	*10%*	*10%*	*10%*	
Freight and Delivery Management	Henley HGV Study	2	1	2	2	1	1	**1.50**
Promoting Low Emission Transport	Low Emission Taxi Strategy	2	2	2	2	0	1	**1.50**
	Parking review including implementation of park and ride / stride and emission based parking incentives, workplace parking levy	2	1	2	2	1	1	**1.50**
Promoting Travel Alternatives	Low Emission Schools and Colleges	2	0	2	2	2	0	**1.33**
Traffic Management	Anti-idling awareness and enforcement (e.g. Vehicle "No Idling Zones" supported by ANPR cameras) (e.g. signage in coach parks, awareness-raising, initiatives in educational settings, awareness for taxis, policies for car parks).	2	1	2	2	0	-1	**1.00**
	Strategic highway improvements, Re prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane (incl. redirecting traffic, one way systems, restricting parking, Dedicated drop off and collection points, Junction and road improvement schemes)	2	-1	2	2	0	0	**0.83**
Transport Planning and Infrastructure	Low Emission Neighbourhoods (area based scheme incl. package of meaures - Electric vehicles, Coordinated deliveries, Low emission delivery zones, Car-free days and play streets, Improved urban realm, Greening, parklets and pocket parks, No idling zones, E-bike schemes, Reduced parking, Increased permeability for walking and cycling, Behaviour change and travel plans, Electric vehicle charging points, Wayfinding, Increased cycle parking)	2	1	2	2	2	0	**1.50**

Table F.3 – Shortlisted Measures for Marcham

LONGLIST OF MEASURES		Marcham						
		CRITICAL SUCCESS FACTORS / CONSIDERATIONS						
		Strategic & wider AQ fit	Affordability	Supply side capacity & capability	Achievability (LA side)	Distrib. impacts	Value for money	Overall Weighted Score
		Strat. SCORE *+2 strong fit* *+1 moderate fit* *0 neutral* *-1 slight opp.* *-2 strong opp.*	***Afford. SCORE*** *+2 Minimal cost (>£0)* *+1 Low cost (>£100k)* *0 Moderate Cost (>£1M)* *-1 High Cost (>£5M)*	***Supply SCORE*** *+2 existing in area* *+1 readily available* *0 available* *-1 limited availability* *-2 very limited*	***Achiev. SCORE*** *+2 existing* *+1 readily achievable* *0 achievable* *-1 difficult* *-2 very difficult*	***Dist. Impacts SCORE*** *+2 highly positive* *+1 positive* *0 neutral* *-1 negative* *-2 highly negative*	***VfM SCORE*** *+2 very high* *+1 high* *0 mod* *-1 low* *-2 very low*	
Weighting		*17%*	*17%*	*17%*	*17%*	*17%*	*17%*	
Traffic Management	Strategic highway improvements, Re prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane (incl. redirecting traffic, one way systems, restricting parking, Dedicated drop off and collection points, Junction and road improvement schemes)	2	-1	2	2	0	0	**0.83**

Table F.4 – Shortlisted Measures for Botley

LONGLIST OF MEASURES		Botley						
		CRITICAL SUCCESS FACTORS / CONSIDERATIONS						
		Strategic & wider AQ fit	Affordability	Supply side capacity & capability	Achievability (LA side)	Distrib. impacts	Value for money	Overall Weighted Score
		Strat. SCORE *+2 strong fit* *+1 moderate fit* *0 neutral* *-1 slight opp.* *-2 strong opp.*	***Afford. SCORE*** *+2 Minimal cost (>£0)* *+1 Low cost (>£100k)* *0 Moderate Cost (>£1M)* *-1 High Cost (>£5M)*	***Supply SCORE*** *+2 existing in area* *+1 readily available* *0 available* *-1 limited availability* *-2 very limited*	***Achiev. SCORE*** *+2 existing* *+1 readily achievable* *0 achievable* *-1 difficult* *-2 very difficult*	***Dist. Impacts SCORE*** *+2 highly positive* *+1 positive* *0 neutral* *-1 negative* *-2 highly negative*	***VfM SCORE*** *+2 very high* *+1 high* *0 mod* *-1 low* *-2 very low*	
Weighting		*17%*	*17%*	*17%*	*17%*	*17%*	*17%*	
Promoting Travel Alternatives	Feasibility studies to reduce traffic emissions / improve air quality on the A31, incl. traffic and behaviour surveys, review of options	2	1	2	2	0	1	**1.33**

Table F.5 – Effect of Measures on Reducing Emissions

Measure	Measure Classification	Effect on reducing NO_x and PM_{10} emissions	Reduces $PM_{2.5}$ emissions
AW1	Promotion of cycling	Low	Yes
AW2	Promotion of public transport uptake	Low	Yes
AW3	Review options to reduce freight emissions	Low to High	Yes
AW4	Public information linked to air quality monitoring results	Low	Yes
AW5	Low emission and air quality policy and guidance	Low to High	Yes
AW6	Upgrading council owned vehicle fleet	High	Yes
AW7	Feasibility study on use of green infrastructure	Low	Yes
H1	Henley Low Emission Neighbourhood, including promotion of cycling and walking	Low to High	Yes
H2	Parking Review, to include park and ride/stride, and emission based parking incentives	Low to medium	Yes
H3	Henley HGV study	Low	No
H4	Develop a Low Emission Taxi Strategy	Medium	Yes
H5	Low emission schools and colleges	Low to High	Yes

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Measure	Measure Classification	Effect on reducing NO_x and PM_{10} emissions	Reduces $PM_{2.5}$ emissions
H6	Anti-idling enforcement	Low	Yes
H7	Strategic highway improvements to relieve pressure on traffic in Henley	Low	Yes
M1	Strategic highway improvements to relieve pressure on through traffic in Marcham (including a potential bypass)	Low to High	Yes
B1	Feasibility study to improve air quality on the A34	Low to High	Yes
B2	Feasibility study to reduce traffic emissions within Botley	Low to High	Yes

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
AQS	Air Quality Strategy
ASR	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
EU	European Union
LAQM	Local Air Quality Management
LCWIP	Oxfordshire Local Cycling and Walking Infrastructure Plan
LTCP	Oxfordshire Local Transport and Connectivity Plan
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
OCC	Oxfordshire County Council
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less

Abbreviation	Description
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
SODC	South Oxfordshire District Council
TG22	Defra's Local Air Quality Management Technical Guidance
UTC	Urban Traffic Control
VOWHDC	Vale of White Horse District Council
ZEBRA	Zero Emission Bus Regional Areas (ZEBRA) scheme
ZEZ	Zero Emission Zone

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