Combined 2022 and 2023 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

Date: June 2023

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Executive Summary: Air Quality in Our Area

This report presents Havant Borough Council's (HBC) 2021 and 2022 monitoring results and forms part of the review and assessment of air quality in Havant Borough. The report has been prepared by reference to Government's published Policy Guidance LAQM.PG(22) and in accordance with the Technical Guidance LAQM.TG(22).

1.1 Air Quality in Havant Borough Council

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, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation with equalities issues because areas with poor air quality are also often less affluent areas[1,2].

The mortality burden of air pollution within the UK is equivalent to 28,000 to 36,000 deaths at typical ages[3], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[4].

Previous screening assessments for the Havant area have consistently suggested that Nitrogen Dioxide (NO_2) was the only pollutant likely to challenge compliance with its respective air quality objective. It is also recognised that NO_2 is the main significant pollutant of concern nationwide. For these reasons, emphasis has been placed on consideration of this pollutant through both the active monitoring programme, and within the main body of this report.

Air quality within the Havant area is generally good. This Annual Status Report shows that the air quality objectives are likely to be achieved for NO_2 at relevant locations throughout the Borough, with many residential areas likely to enjoy excellent air quality. However,

[1] Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

[2] Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

[3] Defra. Air quality appraisal: damage cost guidance, July 2020

[4] Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

concentrations may be locally elevated in areas close to congested road junctions, or where topographic features adversely affect dispersion.

Transport networks are very constrained within the Borough as a result of both the historic town centre layouts, and the presence of landscape features such as strategic roads, railways, and watercourses which have a limited number of crossing points. These factors tend to concentrate road traffic at key junctions, bridges and crossing points, or at road links with relatively narrow streets and tall buildings on both sides. The national trunk road network (A3, A27) and the 'West Coastway' and 'Portsmouth Direct' railway lines represent particular barriers to free movement of traffic, with permanently available crossing points being very limited in number.

There were no exceedances of annual mean NO_2 concentrations identified in 2021 and 2022.

There is a general decreasing trend in annual mean NO_2 concentrations over the past five years. Figures have slightly risen since 2020, due to the easing of Covid-19 lockdown restrictions. However, these figures are lower than pre-pandemic 2019 NO_2 concentrations at all the diffusion tube locations.

1.2 Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades and will continue to improve due to national policy decisions, there are some areas where local action is needed to improve air quality further.

The 2019 Clean Air Strategy[5] sets out the case for action, with goals even more ambitious than EU requirements to reduce exposure to harmful pollutants. The Road to Zero[6] sets out the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

[5] Defra. Clean Air Strategy, 2019

[6] DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

HBC continues to work closely with neighbouring districts and Boroughs across Hampshire County Council in the role of managing air quality. HBC works with partners to establish best practice and to develop regional-scale strategic planning which seeks appropriate development to minimise emissions growth, and where possible, deliver local and regional reductions in air pollutants.

Hampshire County Council plays a significant role in preventing, reducing, and mitigating emissions from road transport through its devolved Local Highways, Public Health functions, and its influence on the delivery of educational services. There are opportunities for the Boroughs and County Councils to support each other, with the planning functions of HBC representing a key opportunity to support these goals.

There is increasing recognition of the synergies between air pollution and climate goals, and holistic thinking is required to achieve the co-benefits of improving local air quality, and both combating and adapting to anthropogenic climate change. For example, actions taken to improve sustainability and reduce energy demand might serve to avoid the emissions associated with power generation and increase renewable power generation capacity.

The Council recognises even micro-scale projects make a valuable contribution to these goals, with the overall effect being the product of aggregated small-scale reductions in emissions or energy use, influencing local emissions and/or regional ambient background concentrations by small amounts which will sum up to a significant overall effect.

Preserving and improving air quality depends upon both the wide participation of partner organisations and the personal choices of residents. There are many ways individuals can contribute to reducing air pollution and so improve air quality. See ‘Local Engagement and How to get Involved’ below for ideas and tips on how to reduce personal exposure to air pollutants, and how you might contribute to reductions in local emissions.

The actions taken by the Local Authority to improve local air quality largely consist of a strategy of seeking to achieve incremental improvements and mitigations through the formulation of effective planning policy, and its diligent application to secure:

1. Sustainable development with low energy demand, and a reduced need for local (within borough) combustion of fuels
2. The implementation of travel plans which target modal shift from use of private vehicles to sustainable and active forms of transport
3. High quality development in sustainable locations which reduce the need to travel and revitalises town centres where possible, and;

4. Innovative developments which support new vehicle technology, new vehicle access models, Low or Zero Carbon (LZC) energy or heating solutions, and landscape features which assist with the interception and destruction of air pollutants.

Effective forward-planning through the local development framework and strategic land allocations also contributes to achieving air quality objectives, as does the deployment of funds acquired though planning gain (s106 and s278 agreements and the Community Infrastructure Levy) to fund local infrastructure improvements which aim to facilitate and encourage active travel choices, and so achieve both emissions reductions and overall public health gains.

Where significant new developments have been proposed, these have been accompanied by air quality assessments and, where required, the council has sought to exercise both local and national policy appropriately to secure the mitigation of new relevant exposures, and the mitigation or offsetting of any significant development-related increases in local emissions.

The focus of this report is the policy context as a vehicle for change, and not its specific application at individual development sites.

Other actions taken include:

1. Leading by example through the Council fleet procurement process, replacing diesel powered car-derived vans used with electric models
2. Utilising the network of Council regulated car parks to develop the local electric vehicle charging infrastructure in the area; and
3. Early engagement with prospective developers of ‘catalyst’ mixed-use developments in Havant and Waterlooville Town Centres, aiming to be exemplars for policies supporting increased housing density close to public transport links, and discouraging car ownership. The Council is actively seeking high-quality development which achieves excellent sustainability credentials, including innovative landscape planting and green roofs / walls to improve local air quality in exterior social spaces, incorporation of clean energy generation, and car club access offering a low emissions fleet. An indicative draft masterplan for town centre regeneration has also been produced, and it is hoped that the approval of this scheme would serve to strengthen the quality of the town centre offering, and ultimately contributing to, a reduction in the need to travel by co-locating residents and the businesses and services that they use, and by providing modern, high quality spaces.

1.3 Conclusions and Priorities

NO_2 is the primary pollutant of concern but does not exceed the relevant air quality objective limits at relevant exposure, so no AQMAs have been declared. Monitoring of NO_2 will continue to ensure this non-declaration remains valid. No specific need has been identified to take steps to reduce local primary sources of $PM_{2.5}$. The targeting of incremental reductions in emissions or air pollutants is likely to be an effective strategy for achieving aggregate improvements in ambient air quality, and so improving public health by reducing exposures at both relevant and non-relevant locations.

Priorities for the coming year include:

1. To deliver an adopted Local Plan that is fit for purpose and fully accounts for the principles and policy embodied by the revised NPPF, other air-quality-relevant government strategies, and any Regulations / Statutory Guidance made under the Environment Act 2021; and
2. To focus upon developing the policy 'tools' to effectively secure the objectives of the suite of relevant air quality policy contained within the local plan – in particular, to consider whether development of a Supplementary Planning Document might be appropriate, or to include features capable of contributing to air quality objectives within local Borough Design guides (etc.).

1.4 Local Engagement and How to get Involved

In other sections, we provide information on the current state of air quality within the borough and the actions that the Council is taking to achieve incremental reductions in local emissions. In this section we look at how residents and businesses can get involved.

Dealing with air pollution is not something that any single organisation or individual can resolve, and many contributors to local air pollution fall outside the operational reach of the Local Authority to directly influence. It will require the combined efforts of everyone to ensure that pollutant concentrations remain well below objective limits.

Details of steps that businesses and individuals can take to improve air quality or managed their exposure to poor air quality are set out in detail in Appendix F of this report.

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1 Local Air Quality Management

This report provides an overview of air quality in Havant Borough during 2021 and 2022. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

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

The statutory air quality objectives applicable to LAQM in England are presented in Appendix E: Summary of Air Quality Objectives in England

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2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

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

Havant Borough Council currently does not have any declared AQMAs.

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

DEFRA did not provide an appraisal for the 2019/2020 ASR report.

HBC has taken forward a number of direct measures during the reporting years of 2021 and 2022 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.1. 17 measures are included within Table 2.1, with the type of measure and the progress HBC has made during the reporting years of 2021 and 2022 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.1.

HBC does not have an AQMA and therefore does not have a formal Air Quality Action Plan (AQAP). More detail on measures implemented by the Council to address air quality can be found in the Havant Borough Council Adopted Local Plan[7], and the draft Havant Borough Council Local Cycling and Walking Infrastructure Plan (LCWIP)[8]. The withdrawn Local Plan is still in development, aiming to provide updated and more localised relevant policies. The

[7] Havant Borough Council. Havant Borough Core Strategy – Local Development Framework, March 2011. Available at: https://cdn.havant.gov.uk/public/documents/ADOPTED%20CORE%20STRATEGY%20.pdf

[8] Havant Borough Council and Hampshire County Council. Havant Walking and Cycling Improvements - Transforming Cities Fund, October 2021. Available at: https://www.hants.gov.uk/transport/transportschemes/tcfhavantwalkingandcyclingimprovements

Partnership for Urban South Hampshire are working to publish a Low Emission Strategy which is also of relevance.

Key completed measures are:

1. the Partnership for Urban South Hampshire Air Quality Assessment, Safer Routes to School
2. School Travel Planning and Strategic Road Transport Assessment for Mainland Transport and for Hayling Island
3. Investment in the public rapid charging network is largely completed, though two further charge bays are approved pending delivery; and
4. Procurement of LEV and ULEV has also been partiality delivered, but further expansion has been delayed.
5. The delayed update to the Havant Local Cycling and Walking Infrastructure Plan (LCWIP) has now been achieved, being published in early 2023 by Sustrans & Hampshire County Council working in partnership with Havant Borough Council.

The principal challenges and barriers to implementation that HBC anticipates facing are:

1. The Current Air Quality Standards not being aligned with revised WHO recommendations
2. The provisions of the National Planning Policy[9], and specifically the wording of para. 11 d) ii, and the weight given to the economic and social limbs of ‘sustainable development’, being typically disproportionate to the environmental limb; and
3. The Local Plan Approvals Process, which has undermined opportunity to secure policy objectives.

The previous 2019 and 2020 ASR outlined several priorities for following years. However, progress on the following measures has been slower than expected due to delays in:

1. Improving digital content and information provision for residents, to improve engagement and awareness of Local Air Quality and Sustainability issues
2. Delivering an adopted Local Plan that is fit for purpose and fully accounts for the principles and policy embodied by the revised NPPF and other air-quality-relevant government strategies. This has principally been related to difficulty in identifying

[9] MHCLG (2021). National Planning Policy Framework.

sufficient land to meet the objectively assessed housing need. The draft LP2036 include comprehensive and proactive AQ-relevant policy, and that suite had survived the consultations and plan iterations without substantive objections being raised. The suite was included within the submission draft, and the Inspector's interim report did not raise any significant issues with the form or function of these policies. However, the Inspector's recommendation to withdraw the plan pending further assessment work undermines the policy basis for taking proactive actions for applications coming forward over the following 12-24 month period.

3. The development of anticipated opportunities to positively support strategic developments which would justify national trunk road infrastructure improvements (e.g. the proposed new junction on the A27, East of Emsworth exit) which would alleviate traffic pressure on Havant and Emsworth town centres. This is principally related to the LP2036 status & timetable for resubmission.
4. Exercising both environmental and sustainability policies to capitalise upon opportunities to secure developments which support a shift in the proportion of trips made by conventionally fuelled private motor vehicles to more sustainable and active means of travel. Attempts to drive forward schemes which support delivery of the County-level active travel strategies and to implement policies to achieve a range of air quality objective were made within the constraints of the status of the LP2036, under the provisions of the adopted National Planning Policy Framework. Whilst detailed arguments advocating for features beneficial to Air Quality have been made at every opportunity, the ability to secure design enhancements within development schemes is substantially limited by the weight which may be given to emerging policy under the provisions of the NPPF '21 para. 48]. Such efforts are subject to frequent and effective challenge, achieving limited material impact as a result.

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Expected Effect of Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	MATiSSE smarter working project (and ongoing arrangements): Home working, traffic management	Other	Other	2006	Ongoing	HBC, HCC, and Partners	HBC, PfSH	No	Funded	Not Calculated	Maintenance Phase	Not Calculated	1) Rollout of ICT arrangements to HBC Staff 2) Progressive Rollout to Hampshire Public Services	• Corporate roll-out implemented Summer 2019 • Expansion of Remote/Flexible Working in response to pandemic	• Perception of 'overshoot' • Efforts to balance remote working with service needs is likely to reduce levels of remote working from peak uptake.
2	Havant Borough Local Cycling and Walking Infrastructure Plan (LCWIP): Develop Sustainable travel infrastructure and Encourage zero emissions transport	Promoting Travel Alternatives	Promotion of walking	2018/19	2025-2036	HBC, HCC and Partners	s106, s278 agreements, HBC, HCC	No	Part-Secured	Not Calculated	Implementation Phase	Not Calculated	1) KPI's as UK0012 for Walking Infrastructure enhancements delivered as shared surface-active travel links or secured via s106 and s278 agreements 2) Actively Promote Walking; Active Travel / Public Health schemes and walking as a leisure activity.	• Revised Plan published 2023, establishing the strategic framework for guiding works • Plans developed for an 'Active Travel Corridor; between Waterlooville & Denmead • Transforming Cities Funding secured for Park Road South Environmental Improvements (Sustainable & Active Travel) • Infrastructure development project list is 'live', new schemes are being added and implemented on an active basis.	-
3	Havant Borough Local Cycling and Walking Infrastructure Plan (LCWIP): Develop Sustainable travel infrastructure and Encourage zero emissions transport	Transport Planning and Infrastructure	Cycle network	2018/19	2025-2036	HBC, HCC, and Partners	s106, s278 agreements, CIL, HBC, HCC	No	Part-Secured	Not Calculated	Implementation Phase	Not Calculated	1) Publish Aspirational Cycle Network Map for the local plan 2036 period 2) Produce and Publish a local LCWIP 3) Submit a Transforming Cities Fund Bid to support strategic implementation (Autumn 2019) 4) Publish a 'network legibility improvement plan' 5) Use the plans (1, 2 and 4) to help secure s106 and s278 funding to support implementation of secondary and feeder routes not covered by the Transforming Cities Bid. 6) Development of local and National Cycle network, in accordance with the Hayling Island improvement feasibility report, and as identified during the course of the County Cycling Strategy (2015-25)	• Aspirational 2036 Cycle Network Map Published • 4 Transforming Cities schemes within HBC district funded (see: https://www.hants.gov.uk/transport/transportschemes/tcfhavantwalkingandcyclingimprovements) • Several projects brought forward, including Elmleigh Road Improvements to active travel links between Havant College and the Havant railway station footbridge	-
4	Transportation Assessment and seeking developer contributions for traffic impact mitigation (Policy)	Policy Guidance and Development Control	Low Emissions Strategy	2011	Ongoing	HBC, HCC, Developer	HBC, HCC, Developer	No	-	Not Calculated	Renewal Phase	Not Calculated	1) Adopt policy framework which: • Secures assessment of the transport impacts of all new major development • Requires efficient use of existing infrastructure • Requires effective mitigation 2) Exercise local policy to achieve effective change	• LP2036 Submitted for Examination Feb '21. • LP2036 Policies Implemented with limited weight in interim (pending examination outcome) 2) CIL funding allocated to several sustainable & active travel projects to secure pedestrian, cycle & mass transportation uptake. See; https://www.havant.gov.uk/planning-services/planning-policy/community-infrastructure-levy-cil/community-infrastructure-levy-2	• LP2036 Policies supporting this measure (IN1-IN4) have been subject to significantly reduced weight following the withdrawal of the local plan

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Expected Effect of Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
5	Forward Planning	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2011	Ongoing	HBC	HBC, Developer	No	-	Not Calculated	Renewal Phase	Not Calculated	1) Adopt policy framework which: • Encourages development in sustainable locations • Minimises the need for travel • Facilitates sustainable and active travel choices • Promotes linked trips • Provides for parking allocation to respond to local context and provision of alternative transport options. 2) Exercise local policy to achieve effective change.	• As UK0012-HBC_12 • No specific update 2022-23	• LP2036 Policies supporting this measure (E1, E2, DR1, DR2, H1, KP1-KP2) have been subject to significantly reduced weight following the withdrawal of the local plan
6	Seek mitigation of emissions associated with new development on an 'all-sources' basis	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2018	2025-2036	HBC	HBC	No	-	Not Calculated	Limited Implementation. LP2036 dependent	Not Calculated	1) Adopt policy framework which seeks: • mitigation of development emissions at source, • promotes interception and deposition of air pollutants, and • provides for off-site mitigation where appropriate 2) Exercise local policy to achieve effective change.	• Draft policy wording agreed for 2018 plan-making phase • Policy retained within LP2036 submission draft (Feb '21).	• LP2036 Air Quality Policies E22 & E23 have been subject to significantly reduced weight following the withdrawal of the local plan
7	Supporting Local Shopping	Policy Guidance and Development Control	Low Emissions Strategy	2010	Ongoing	HBC	HBC	No	-	Not Calculated	Maintenance Phase	Not Calculated	1) Adopt policy framework which discourages restrictive private (e.g., retail) parking policies that discourage linked trips. 2) Discourage restrictive private parking policy through: • Economic development and regeneration • Planning System	• As 6	• Neither the 2016 Parking SPD, nor the LP2036 Draft Policies place any specific requirements on developments to adopt permissive parking enforcement policies • Council will be reliant upon negotiating voluntary solutions
8	Parking Service Policy	Traffic Management	Workplace Parking Levy, Parking Enforcement on highway	2010	Ongoing	HBC	HBC	No	-	Not Calculated	Maintenance Phase	Not Calculated	1) Manage Parking Provision 2) Reduce the demand for parking 3) Set appropriate charges	• Achieved, in Delivery / Maintenance Phase • Effective practical implementation	
9	Development of SE Hampshire Integrated Rapid Transit Network	Transport Planning and Infrastructure	Bus route improvements	2015-2019	Ongoing	PCC, HCC, and Partners (HBC, as member SEHRT Board). DfT Funding	PCC, HCC, and Partners (HBC, as member SEHRT Board). DfT Funding (TCF)	No	Secured	£106M (Regional) £7.3M (Local/ HBC)	Implementation Phase	Not Calculated	1) Improve sustainable travel offering for commuter trips between HBC and PCC Areas 2) Reduce the commuter mode share of private motor car 3) Secure fare reductions to incentivise public transport 4) Reduction in Journey Times between urban centres 5) Deliver complementary active travel routes to widen SEHRT network catchment.	• no specific update 2022-23	
10	PfSH Area Air Quality Assessment	Policy Guidance and Development Control	Other policy	2016-2017	Autumn 2018	HBC Led, for PUSH/PfSH	PfSH	No	Funded	Not Calculated	Complete / At Inception	Not Calculated	1) Complete Assessment: Secure funding, agree scope, commission report, review draft, consult PUSH authorities, agree final draft. 2) Use assessment to support the sustainable delivery of the objectively assessed level of housing need in the Havant area. 3) Consider need for a coherent regional low emissions strategy	• 1)-2) Complete, 3) Pending • No specific update 2022/23	• Risks being viewed to be out of date for supporting policies put forward in 2023/24 • May require update to support the revised LP2036 submission draft.

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Expected Effect of Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
11	PfSH Area Low Emission Strategy	Policy Guidance and Development Control	Low Emissions Strategy	2018-2019	2019-2020	PfSH (HBC Member)	Not Confirmed	No	Not Secured	Not Calculated	At Inception	Not Calculated	1) Agree the need for a LES at the sub-regional level and draft a supporting business case 2) Achieve political support for a sub-regional LES 3) Agree common framework and benchmarks 4) Adopt the sub-regional framework at Borough Level and adapt to local context. 5) Implement changes in line with Local LES 6) Report on key performance indicators as required by the adopted LES 7) Continued compliance with air quality objectives	• Early Stage - 1) under discussion 2019 • Progress stalled as a result of changes to work priorities arising from the Covid Pandemic. • No specific update 2022/23	• PfSH has not prioritised Air Quality over the past 24 months
12	Safer Routes to School; School Travel Planning	Promoting Travel Alternatives	School Travel Plans	2017	2020	HBC, HCC	HBC, HCC	No	-	Not Calculated	Complete	Not Calculated	1) Provide proportionate support for HCC Schools AQ 3) Production of a school travel and air quality action plan at each participating school. 4) Participating schools achieving a new 'mode-shift stars' award, an upgraded award standard, or maintain a 'gold level' award. 5) Seek to repeat success of 2018 programme, seeking to achieve goals 3) and 4) for participating schools in 2019 and beyond.	• Scheme not continued throughout pandemic • Scheme not recommenced post-pandemic	
13	Strategic Road Transport Assessment (SRTM)	Transport Planning and Infrastructure	Other	2017-2020	2020/21	HBC, HCC	HBC, HCC	No	Secured, Released	Not Calculated	Complete	Not Calculated	1) Define Scope of assessment and commission, consult internally and with Highway Authority, agree final draft 2) Publication of a Mainland Transport Assessment 3) Publication of a Hayling Island Transport Assessment	• Mainland SRTM Report Published Feb '19 • Hayling Island Transport Assessment (HITA) Published Jan '19, Addendum published Nov '19, • Response to inspectors' findings (relating to HITA) published Dec '21 • No specific update 2022/23	• Risks being viewed to be out of date for supporting policies put forward in 2023/24 • May require update to support the revised LP2036 submission draft.
14	New A27 Access and Link Road	Transport Planning and Infrastructure	Other	2017-2020	TBC	HBC, HCC, Highways England	TBC	No	Not Secured	Not Calculated	Not Secured	Not Calculated	1) Adopt policy framework which: • Supports assessment of need • Requires assessment of air quality impact of scheme, • Safeguards land required, and co-ordination of strategic local development to avoid prejudicing delivery. 2) Derive conceptual design options 3) Model function and impact of leading design options 4) Seek and obtain funding 5) Deliver preferred scheme	• Policy Framework included in Local Plan 2036 pre-submission draft • Two Layout Options Derived • Highway Impact Testing in Progress	• Development Applications submitted pre-adoption of the LP2036 may prejudice ability to deliver • Funding subject to Highways England bid processes
15	District Heat Network	Promoting Low Emission Plant	Emission control equipment for small and medium sized stationary combustion sources / replacement of combustion sources	2016-2020	TBC	HBC	TBC	No	Not Secured	£4.8-5.6M	Not Secured	Not Calculated	1) Undertake Heat Demand Mapping exercise and publish an Energy Master planning report 2) Undertake and publish a Heat Network Feasibility Study 3) Identify funding opportunities, and secure funding for delivery 4) Adopt policy framework which supports delivery of Urban Heat Networks.	• Demand Mapping Published Autumn 2016 • Heat Network Feasibility Study Completed Spring 2017, Published Summer 2018. • Policy Framework included in Local Plan 2036 pre-submission draft • No update 2020-2022	• Policy framework to support core scheme at the Civic Campus is dependent upon the withdrawn LP2036 • Project currently un-funded.

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Expected Effect of Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
16	Invest in Public Rapid Charging Network	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2017	2019	HBC, ChargePoint	TBC	No	Part Secured	No Information	Part-Delivered	Not Calculated	1) Install four 48kw universal rapid chargers at Public Owned Car Park locations 2) Monitor and report on initial usage 3) Adopt policy framework which adequately provides for Plug-in EV charging points at all new residential development	• Three 50KW+ Chargers Installed as at 2019 following initial delays • A capital bid has been approved in principle for Two further charge bays at the Civic Campus - Not progressed to date (delivery pending) • Policy Framework included in Local Plan 2036 pre-submission draft	• Low usage of delivered chargers. • Post pandemic working patterns at the Civic Campus undermine business case provision • Delays to Seafront regeneration project • Local Power Network Capacity
17	Prioritise LEV and ULEV in public sector procurement	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	2018	2020	HBC	TBC	No	Not Secured	Not Calculated	Part-Delivered	Not Calculated	1) Replacement of minimum 3 Diesel Fuelled LDV service vehicles by summer 2019 2) Collection of key cost and performance metrics 3) Derive and Adopt corporate procurement policy / criteria for fleet replacements 4) Install one intermediate-duty (22KW) fleet charging facility at all public service premises serving as an EV fleet vehicle 'home base'.	• First Vehicle in service Spring 2019 • A capital bid approved in principle for one additional electric vehicle - not on order at time of writing • No Funding allocated for planned third vehicle • Performance metrics not available, undermining business case for progressing procurement • No update 2020-2022	• Fleet replacement low priority relative to other service demands

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

As detailed in Policy Guidance LAQM.PG22 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

$PM_{2.5}$ is derived from both natural sources and man-made sources. Natural sources (sea salt in particular) may be particularly important within Havant Borough, due to the length of shoreline and the proximity of urban areas to coastal waters. Between 5% and 7% of atmospheric $PM_{2.5}$ is thought to derive from this source on average, but this proportion is likely to be greater at some locations, especially in rural areas where local anthropogenic (direct) emissions are relatively low, and natural sources likely to be high, such as Hayling Island. Natural sources are thought likely to cause negligible harm, whereas organic compounds associated with combustion (e.g. black carbon) are conversely fat-soluble, chemically persistent, and bioactive, accumulating in body tissues and capable of causing both short-term (e.g. inflammatory immune response) and long-term harm (e.g. cancer).

Recent studies have shown as much as 40% of direct local emissions in the UK may derive from domestic solid fuel combustion, with industrial and transport contributions comprising 17% and 13% respectively, according to figures recognised by the UK government[10].

European transboundary emissions contribute as much as 20-30% towards the total atmospheric $PM_{2.5}$ within the UK. Of this, Sulphate and Nitrate aerosol together make up around 75% of imported $PM_{2.5}$. The greatest import of $PM_{2.5}$ from Mainland Europe has been shown to occur in Southern England, and due to its location, levels in Havant are expected to be significantly influenced by transboundary anthropogenic emissions.

Shipping emissions also contribute significantly to concentrations in Southern England, estimated at around 5-10% of the total $PM_{2.5}$ within the region. Being located Northeast (down-prevailing-wind) of both Portsmouth Docks and the busy Isle of Wight shipping

[10] National Atmospheric Emissions Inventory. Available at: https://naei.beis.gov.uk/data/

routes, $PM_{2.5}$ within the Havant area is likely to include a significant proportional contribution from shipping.

The Energy from Waste (municipal waste incineration) facility at Portsmouth is also likely to contribute to local emissions peaks in the area; the likely level of contribution is unclear as particulate emissions from the facility are reported as PM_{10}.

HBC do not undertake monitoring of $PM_{2.5}$ within the Borough area, however Defra publishes maps of background pollutant concentrations for each 1km x 1km grid square covering the whole of the United Kingdom. The most recent release of the background maps uses 2018 meteorology as the reference year and provides projections of background concentrations of $PM_{2.5}$ from 2018 to 2030[11]. The average estimated background $PM_{2.5}$ concentration in Havant for 2022 is 9.2 µg/m^3, with a maximum of 11.9 µg/m^3.

The Public Health Outcomes Framework[12] provides an estimate of the impact of particulate pollution on human health. Indicator D01 – Fraction of mortality attributable to particulate air pollution is the mortality burden associated with long-term exposure to $PM_{2.5}$ as a percentage of the annual deaths from all causes in those aged 30+.

Public Health England's Estimating Local Mortality Burdens associated with Particulate Air Pollution[13] provides guidance on calculating the number of deaths attributable to particulate matter pollution.

Relative risk (RR) is calculated as:

$RR = 1 + (0.06 * \frac{x}{10})$, where χ equals $PM_{2.5}$ concentration. As HBC do not monitor $PM_{2.5}$, the average DEFRA background concentration for Havant in 2022 is used.

$$1 + \left(0.06 * \frac{9.22}{10}\right) = 1.055$$

The attributable fraction (AF) of mortality is calculated using the RR:

$$AF = \frac{RR - 1}{RR}$$

[11] DEFRA (2020). Background Mapping data for local authorities – 2018.

[12] OHID (2021). Public Health Outcomes Framework.

[13] Public Health England (2014). Estimating Local Mortality Burdens associated with Particulate Air Pollution.

Using the calculated RR value of 1.055:

$$\frac{1.055-1}{1.055} * 100 = 5.2\%$$

It is therefore calculated that 5.2% of deaths in Havant are caused by particulate pollution. This is a 0.2% increase from the 2020 ASR attributable fraction.

Although there are no specific measures targeting the reduction of $PM_{2.5}$ within Havant Borough currently, it is expected the combination of direct investments in sustainable travel infrastructure, policy measures, and actions described in Table 2.1 will collectively contribute to reductions in atmospheric $PM_{2.5}$. There are currently no plans for policy specifically aiming to target reductions in $PM_{2.5}$.

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

This section sets out the monitoring undertaken within 2021 and 2022 by HBC and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2018 and 2022 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

HBC did not undertake automatic (continuous) monitoring during 2021 and 2022.

3.1.2 Non-Automatic Monitoring Sites

HBC undertook non-automatic monitoring of NO2 at 23 sites during 2021 and 2022. Table A.1 (Appendix A) presents the details of the non-automatic sites.

HBC has reviewed their monitoring strategy and amended monitoring locations to ensure resources are deployed effectively. The following changes have been made:

1. Site 5 was decommissioned at the end of 2018 and is not reported on within this report;
2. Site 32 was commissioned at the start of 2019;
3. Sites 19B, 19D, 19E, 32, T2, T3 were decommissioned at the end of 2019; and
4. Sites 33-36 were commissioned at the start of 2020.

Maps showing the location of the monitoring sites are provided in Appendix D: Map(s) of Monitoring Locations & AQMAs. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. annualisation and/or distance correction), are included in Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC.

In 2022 Havant Borough Council also assisted Transport Research London in collecting co-location pollutant samples along the A27, east of Havant. This will be continuing in 2023.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualisation (where the annual mean data capture is below 75% and greater than 25%), and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO2)

Table A.2 (Appendix A) compares the ratified and adjusted monitored NO2 annual mean concentrations for the past five years with the air quality objective of 40µg/m3. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration of dilution & dispersal over distance, or the position of the monitoring location relative to the nearest relevant-exposure).

For diffusion tubes, the full 2021 and 2022 dataset of monthly mean values is provided in Appendix B: Full Monthly Diffusion Tube Results for 2021 and 2022

. Note that the concentration data presented includes distance corrected values only where relevant (see footnotes to Table B.1 & Table B.2).

There were no exceedances of the annual mean NO_2 obejctive at any HBC monitoring locations in 2021 and 2022. The maximum recorded concentration in 2021 was 29.9 µg/m^3 at site 19C; the maxium recorded concentration in 2022 was 29.0 µg/m^3 at site 28.

No recorded annual mean concentrations exceeded the indicative threshold value of 60 µg/m^3 in 2021 or 2022, which suggests an exceedance of the 1-hour mean objective is also unlikely.

Figures A.1, A.2, A.3, and A.4 show recent trends in annual mean NO_2 concentrations at the NO_2 diffusion tube monitoring locations. The monitoring data shows an overall stable or slight decreasing trend between 2018 and 2022, albeit with some fluctuations. 19 out of the 23 monitoring locations have 5 years of continuous monitoring data. Of these 19 monitoring locations, between 2018 and 2022, 18 demonstrated an overall downward trend. Roadside and kerbside monitoring locations tended to show a more significant decrease in concentrations.

Between 2018 and 2022, the only monitoring location that showed an increase in annual mean NO_2 concentration was site W10 (0.9 µg/m^3 increase), though the annual mean NO_2 concentration remained well below the objective.

Between 2021 and 2022, the NO_2 concentrations at most sites remained very similar, with most sites recording a slight reduction.

Appendix A: Monitoring Results

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

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1) (3)	Distance to kerb of nearest road (m) (2) (3)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
2	Rectory Rd	Suburban	471742	105794	NO_2	No	-3.4	11.0	No	2.8
3	Havant Road	Kerbside	472198	102048	NO_2	No	0.8	1.0	No	2.6
4	Emsworth (A27)	Suburban	474850	106504	NO_2	No	6.2	2.5	No	2.7
7B	Brockhampton Lane	Urban Centre	471180	106064	NO_2	No	-5.3	8.0	No	2.7
8	London Road Purbrook	Roadside	467364	107981	NO_2	No	-0.4	2.5	No	2.7
10	Ramblers Way	Suburban	470028	110044	NO_2	No	-15.5	43.5	No	2.7
12	Xyratex	Roadside	471613	105672	NO_2	No	3.3	2.8	No	2.5
14	Elm Park Road	Suburban	471783	106794	NO_2	No	5.0	1.8	No	2.7
18	Waterlooville Precinct	Urban Background	468264	109400	NO_2	No	0.0	120.0	No	2.5
19C	Langstone Road (Woodbury)	Roadside	471637	105687	NO_2	No	1.0	3.8	No	2.6
20	Bosmere Junior	Urban Centre	471706	105933	NO_2	No	-17.1	35.0	No	2.4
22	Park Road South (Bulbeck Junction)	Roadside	471573	106199	NO_2	No	7.0	2.0	No	3.1
25	Stakes Hill Road	Roadside	468478	107725	NO_2	No	1.0	4.5	No	2.6
27	Havant Precinct	Urban Background	471654	106287	NO_2	No	0.0	82.0	No	2.5
28	Park Road South	Roadside	471577	106280	NO_2	No	-2.3	4.8	No	2.8
29	Orchard Road	Suburban	472019	105800	NO_2	No	-13.1	31.0	No	2.5
30	St Peters Square	Urban Centre	474957	105731	NO_2	No	0.0	2.8	No	2.7
31	Emsworth Road (North)	Roadside	472882	106088	NO_2	No	-1.6	5.1	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1) (3)	Distance to kerb of nearest road (m) (2) (3)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
33	Maurepas Way	Roadside	467966	109243	NO_2	No	0.9	2.6	No	2.8
34	Swiss Road	Urban Centre	468040	109199	NO_2	No	-13.3	20.0	No	2.8
35	Milton Road	Kerbside	467736	110085	NO_2	No	3.3	0.9	No	2.8
36	Apsley Lodge	Urban Centre	468294	109573	NO_2	No	-16.0	25.0	No	2.1
W10	Compton Court	Roadside	471368	106805	NO_2	No	0.0	12.5	No	2.4

Notes:

Locations have been omitted where no new data has been collected in 2021 or 2022. Data may be available for other locations from 2018-2020. See earlier reports.

(1) 0m if the monitoring site is directly representitive of a location of relevant exposure (e.g. installed on the façade of a residential property).

Negative Values indicate that the receptor is closer to the principal road link (target source) than is the point of measurement.

Distances represent the relative difference between the point of measurement and the relevant exposure located closest to the kerbside of the road segment for which the measurement is considered to be representitive. Distances are measured perpendicular to carriageway kerb at their respective positions on the road link. The receptor may be some distance from the measurement location where traffic conditions on the road link are considered conceptually equivalent (in terms of traffic volume, flow conditions and local topographic character)

(2) Nearest busy road link. This value does not represent the distance to the nearest carriageway, whether adopted highway or private.

(3) Previous reports may list closest actual (point-to-point) distance and ‘conceptual distance from link’ separately, and/or may list values as absolute distances from the kerbside of the road link, rather than the relative distance. Distances reported may therefore differ from previous reports even where neither the monitoring position nor the worst-case building line has changed.

Table A.2 – Annual Mean NO2 Monitoring Results: Automatic Monitoring (µg/m3)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for 2021 Monitoring Period (%) [1]	Valid Data Capture 2021 (%) [2]	Valid Data Capture for 2022 Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2018	2019	2020	2021	2022
2	471742	105794	Suburban	-	100	-	100	25.8	22.3	18.2	20.1	18.6
3	472198	102048	Kerbside	-	100	-	100	31.6	28.8	22.7	24.7	25.1
4	474850	106504	Suburban	-	84.9	-	84.6	21.1	18.6	14.4	15.4	15.4
7B	471180	106064	Urban Centre	-	100	-	100	25.3	24.5	19.5	21.0	20.2
8	467364	107981	Roadside	-	100	-	100	23.5	26.9	18.8	22.2	20.9
10	470028	110044	Suburban	-	100	-	100	21.4	20.0	15.0	16.6	16.2
12	471613	105672	Roadside	-	100	-	100	30.5	25.4	20.6	23.9	22.6
14	471783	106794	Suburban	-	100	-	91.8	20.3	17.9	14.9	15.9	14.6
18	468264	109400	Urban Background	-	100	-	100	20.6	17.6	13.1	15.1	14.1
19C	471637	105687	Roadside	-	100	-	100	34.8	33.9	27.7	29.9	28.5
20	471706	105933	Urban Centre	-	100	-	100	27.1	25.7	19.9	20.2	19.0
22	471573	106199	Roadside	-	92.0	-	100	33.0	30.7	23.7	25.9	26.6
25	468478	107725	Roadside	-	100	-	91.8	26.8	24.1	18.3	18.5	17.8
27	471654	106287	Urban Background	-	75.0	-	100	25.2	20.9	25.7	19.9	19.2
28	471577	106280	Roadside	-	92.9	-	92.9	34.9	33.4	25.1	28.6	29.0
29	472019	105800	Suburban	-	100	-	100	24.9	21.6	16.3	17.8	16.4
30	474957	105731	Urban Centre	-	100	-	92.9	18.4	16.2	12.2	13.9	12.9
31	472882	106088	Roadside	-	100	-	100	29.1	29.6	23.4	25.5	21.6
33	467966	109243	Roadside	-	100	-	100	-	-	19.9	22.6	21.8
34	468040	109199	Urban Centre	-	100	-	100	-	-	17.2	18.3	17.8
35	467736	110085	Kerbside	-	100	-	100	-	-	25.0	27.1	26.7
36	468294	109573	Urban Centre	-	100	-	100	-	-	14.4	16.6	16.9
W10	471368	106805	Roadside	-	100	-	100	22.9	26.7	21.4	24.8	23.8

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

☒ **Diffusion tube data has been bias adjusted.**

☒ **Reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), i.e. prior to any fall-off with distance correction.**

Notes:

Locations have been omitted where no new data has been collected in 2021 or 2022. Data may be available for other locations from 2018-2020. See earlier reports.

The annual mean concentrations are presented as µg/m^3.

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

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

Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Concentrations are those at the location of monitoring and are directly representitive of relevant-exposure only where the distance to relevant exposure in Table A.1 is recorded as 0m.

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

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%). Where no value appears in the 'Data Capture for Monitoring Period' column, monitoring was carried out for the full calendar year.

Figure A.1 – Trends in Annual Mean NO2 Concentrations

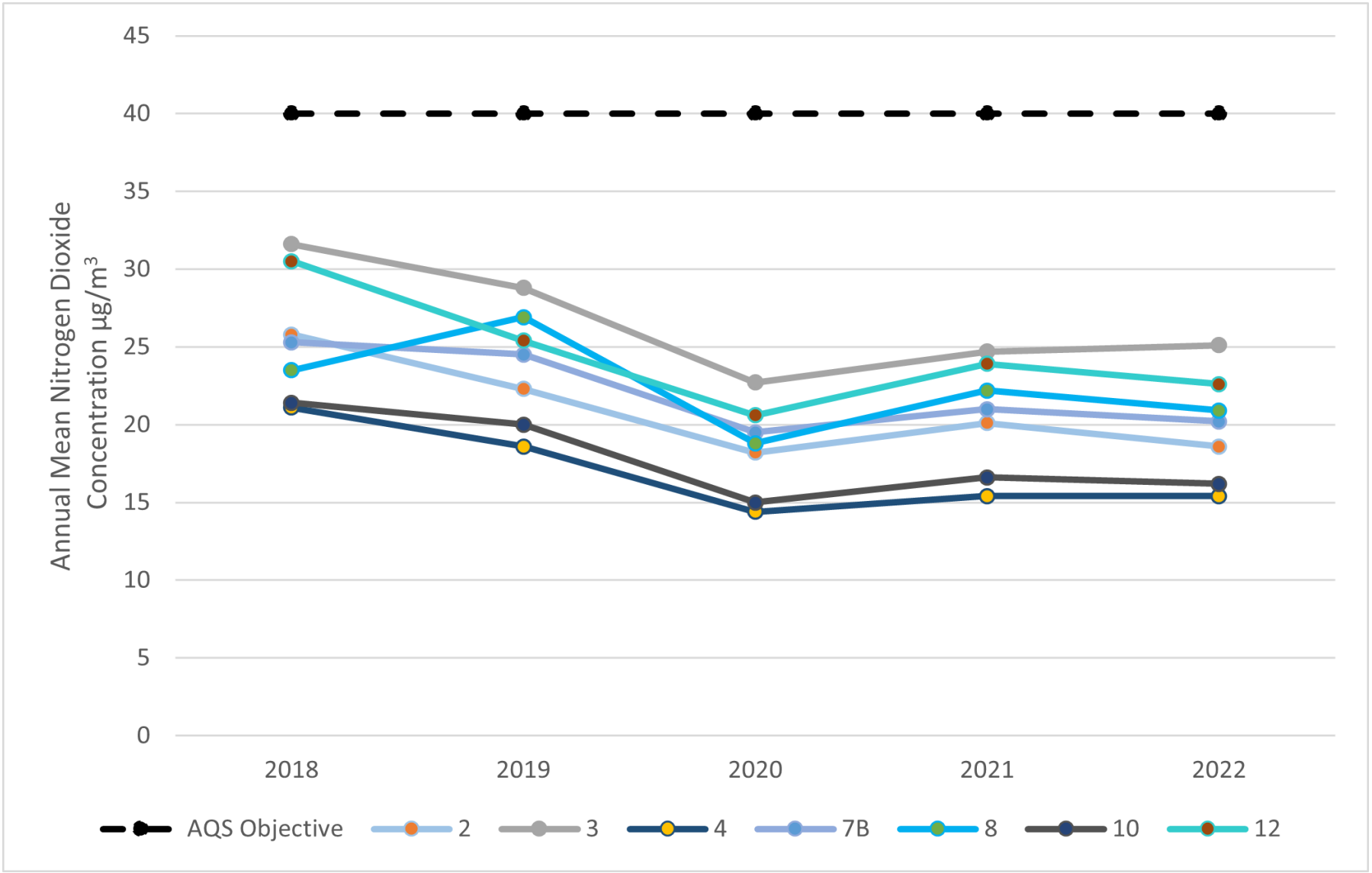


Figure A.2 – Trends in Annual Mean NO2 Concentrations

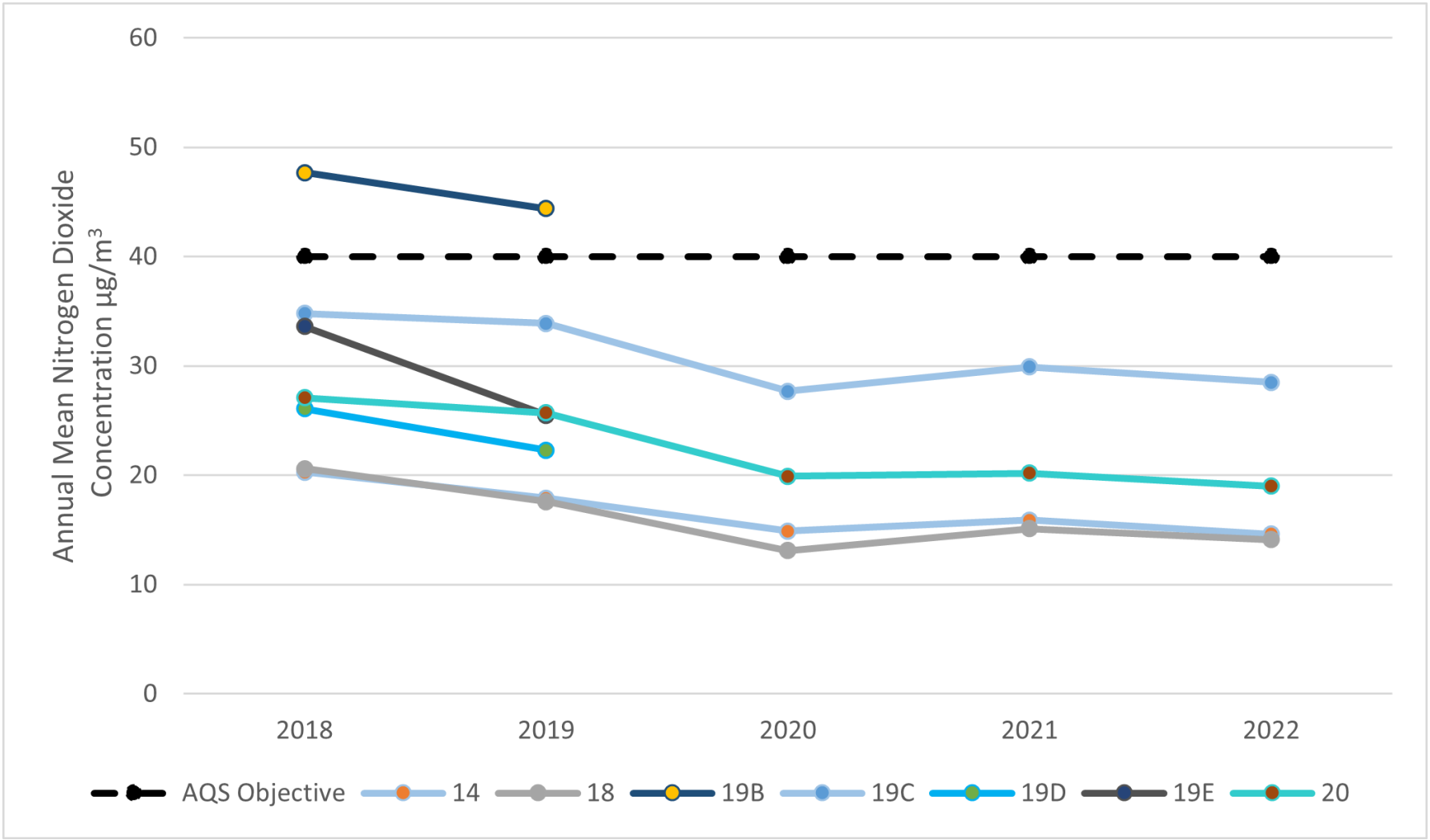


Figure A.3 – Trends in Annual Mean NO_2 Concentrations

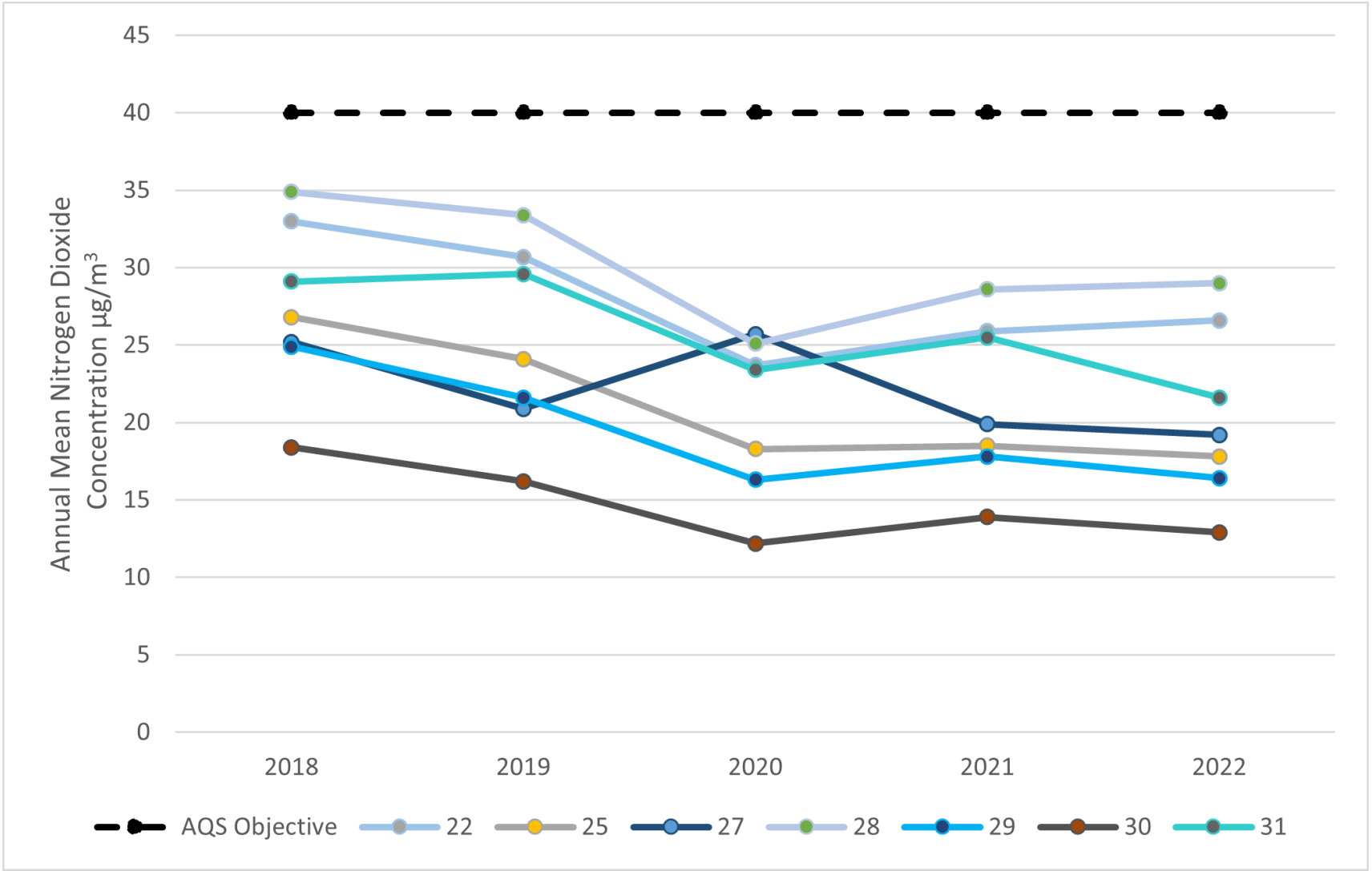
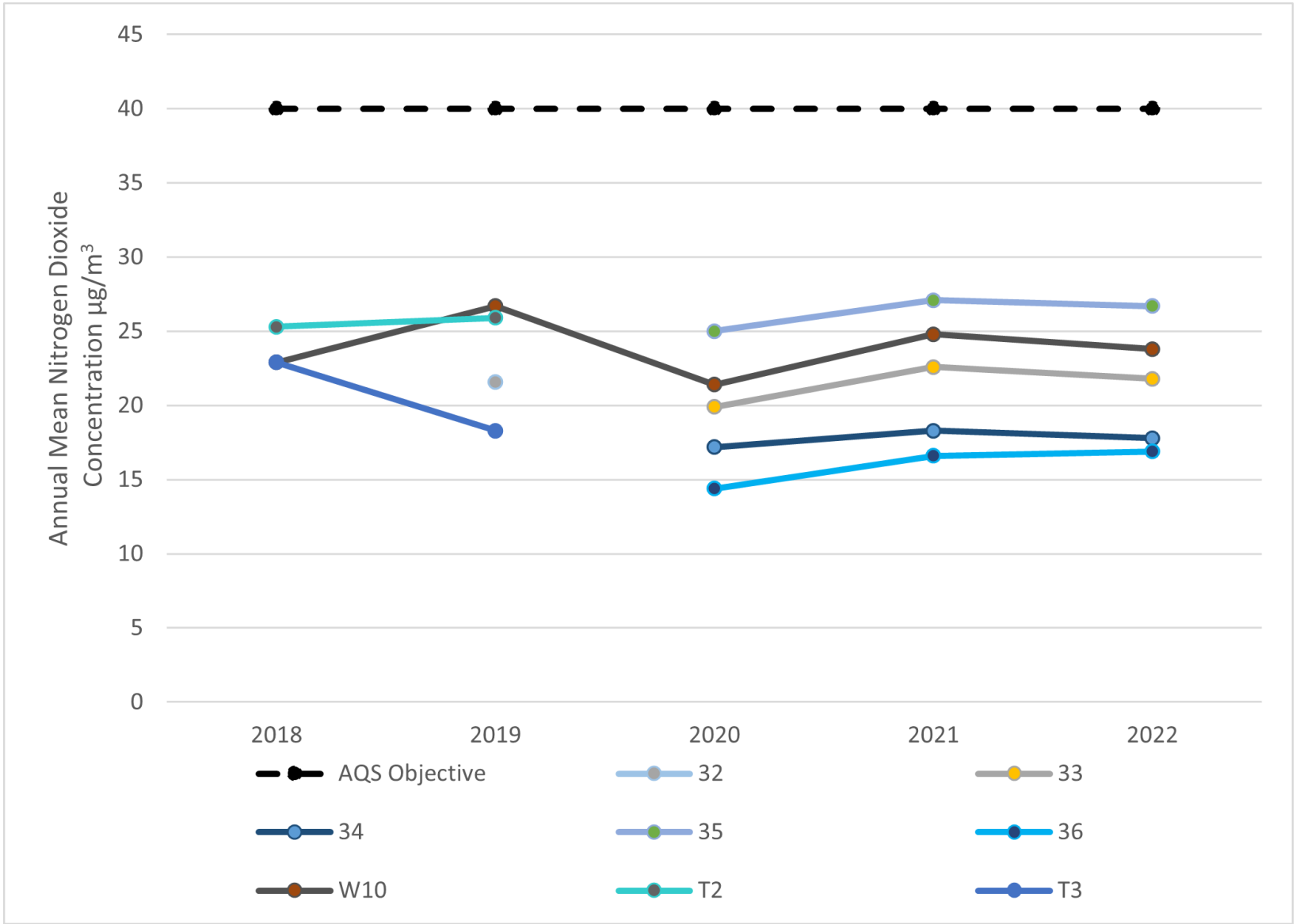


Figure A.4 – Trends in Annual Mean NO2 Concentrations



Appendix B: Full Monthly Diffusion Tube Results for 2021 and 2022

Table B.1 – NO2 2021 Diffusion Tube Results (µg/m3)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.84)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
2	471742	105794	21.7	31.0	27.3	25.1	23.1	20.6	19.2	18.7	20.3	20.3	34.0	25.4	24.0	20.2	20.4	
3	472198	102048	26.1	32.6	32.2	28.3	31.1	30.1	29.6	22.6	26.3	26.3	40.7	27.4	29.5	24.8	-	
4	474850	106504	-	20.0	23.3	18.3	-	17.7	16.5	14.1	17.6	17.6	21.8	16.8	18.5	15.5	-	
7B	471180	106064	27.2	31.6	29.9	23.7	22.3	20.6	21.2	20.3	22.4	22.4	30.8	28.1	25.3	21.2	23.0	
8	467364	107981	28.4	25.9	33.3	24.4	27.1	23.8	25.1	20.8	25.5	25.5	29.0	27.8	26.7	22.4	22.8	
10	470028	110044	21.9	19.9	25.6	20.8	21.0	17.2	18.2	12.8	18.7	18.7	20.4	21.7	20.0	16.8	18.0	
12	471613	105672	28.6	31.3	33.2	28.0	29.4	28.7	25.5	23.1	25.9	25.9	36.4	25.4	28.5	23.9	-	
14	471783	106794	21.8	25.2	24.0	18.6	15.1	13.2	13.7	13.6	17.2	17.2	25.6	21.4	19.1	16.0	-	
18	468264	109400	21.5	22.2	23.0	19.3	15.6	15.0	13.5	11.6	15.6	15.6	23.7	18.6	18.0	15.1	-	
19C	471637	105687	30.5	39.5	36.3	34.1	33.5	34.6	31.4	36.4	32.6	32.6	50.9	34.5	35.5	29.9	-	
20	471706	105933	25.4	29.6	27.7	21.5	19.8	18.6	21.0	19.4	23.4	23.4	31.7	27.2	24.3	20.4	21.2	
22	471573	106199	30.9	33.4	35.7	29.9	-	31.1	28.2	26.3	27.8	27.8	36.6	31.0	30.9	25.9	-	
25	468478	107725	25.0	26.8	28.9	23.0	21.9	19.8	21.1	14.5	19.9	19.9	27.4	16.2	22.1	18.6	-	
27	471654	106287	25.1	30.6	27.0	22.6	20.2	-	-	18.8	18.3	18.3	31.9	-	23.7	19.9	-	
28	471577	106280	33.3	36.4	37.1	-	33.9	32.7	29.8	32.3	31.8	31.8	44.5	30.5	34.0	28.5	30.8	
29	472019	105800	22.4	27.9	23.5	20.4	19.8	17.2	19.1	14.3	19.0	19.0	27.1	24.6	21.3	17.9	19.3	
30	474957	105731	19.4	18.1	19.9	16.9	14.7	15.0	13.3	12.4	14.3	14.3	23.6	16.2	16.5	13.9	-	
31	472882	106088	30.6	35.1	36.5	30.7	32.4	28.2	28.7	25.6	26.1	26.1	35.0	29.3	30.5	25.6	26.7	
33	467966	109243	29.2	26.2	35.9	25.5	30.0	26.1	27.5	17.8	24.4	24.4	29.5	26.5	27.2	22.9	-	
34	468040	109199	25.3	27.5	26.1	20.8	20.7	18.5	18.3	15.1	20.8	20.8	30.2	16.9	21.8	18.3	21.1	
35	467736	110085	34.1	39.4	37.8	30.3	36.2	30.5	31.1	27.7	24.5	24.5	36.6	35.3	32.5	27.3	-	
36	468294	109573	20.4	20.9	24.8	18.1	19.7	16.6	19.3	11.3	21.4	21.4	22.4	21.2	20.1	16.9	19.0	
W10	471368	106805	30.2	30.2	34.6	27.6	29.1	27.0	25.9	23.9	30.3	30.3	35.1	29.9	29.7	24.9	-	

☒ **All erroneous data has been removed from the NO_2 diffusion tube dataset presented in Table B.1.**

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

☐ **Local bias adjustment factor used.**

☒ **National bias adjustment factor used.**

☒ **Where applicable(1), data has been distance corrected for relevant exposure in the final column.**

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

(1) Distance correction for relevant exposure is required where the receptor is closer to the target road link than is the monitor, and where bias adjusted data falls within -10% of the Air Quality Objective Value (i.e. where adjusted result >36 ug/m3)

Table B.2 – NO2 2022 Diffusion Tube Results (µg/m3)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.83)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
2	471742	105794	37.5	22.4	24.3	19.6	17.4	17.1	17.6	21.4	23.4	20.1	23.0	24.7	22.3	18.5	18.5	
3	472198	102048	45.1	26.3	27.5	27.9	26.4	26.1	29.4	30.6	30.2	29.7	32.6	30.9	30.1	25.0	-	
4	474850	106504	25.9	-	21.8	-	15.0	15.1	16.5	18.9	17.1	17.5	16.1	21.8	18.6	15.4	-	
7B	471180	106064	34.8	23.3	27.7	21.4	19.2	19.1	19.6	21.9	22.2	25.9	29.1	27.8	24.3	20.2	21.8	
8	467364	107981	32.1	22.2	27.7	23.3	20.7	21.6	22.0	26.6	24.4	26.7	28.0	27.2	25.1	20.9	21.2	
10	470028	110044	23.9	16.7	23.9	18.9	14.6	15.5	17.3	20.5	18.4	22.0	19.0	23.3	19.5	16.2	17.5	
12	471613	105672	41.8	24.6	35.0	27.5	20.9	20.1	24.3	29.9	30.6	24.4	16.4	32.0	27.2	22.6	-	
14	471783	106794	27.5	-	16.8	13.4	13.6	13.1	12.0	14.4	15.7	20.2	21.9	24.7	17.8	14.7	-	
18	468264	109400	27.1	15.9	17.5	16.3	12.4	12.2	12.0	13.5	17.1	16.7	20.9	22.3	17.0	14.1	-	
19C	471637	105687	52.9	28.3	34.6	32.6	29.4	27.6	29.5	35.8	38.8	29.9	34.3	38.5	34.2	28.4	-	
20	471706	105933	29.5	27.2	21.2	19.2	19.5	21.2	19.2	20.6	21.3	25.5	26.2	24.5	23.0	19.1	19.6	
22	471573	106199	38.5	27.7	34.7	28.2	26.7	26.4	28.5	34.8	32.3	36.3	33.2	37.6	32.2	26.7	-	
25	468478	107725	32.4	-	25.2	19.3	17.7	16.9	16.6	18.2	18.1	22.6	24.6	24.9	21.5	17.9	-	
27	471654	106287	36.8	24.8	21.5	17.8	19.0	18.1	17.1	19.0	21.4	24.4	29.9	27.3	23.2	19.2	-	
28	471577	106280	44.7	31.9	35.2	30.3	28.2	29.4	33.0	40.1	-	35.2	37.1	39.0	34.8	28.9	31.4	
29	472019	105800	27.2	23.5	21.1	17.8	16.7	16.2	15.1	16.3	17.5	20.7	20.0	24.8	19.9	16.5	17.6	
30	474957	105731	26.1	14.7	17.2	-	12.8	12.7	12.3	15.0	15.2	8.8	15.5	20.0	15.4	12.8	-	
31	472882	106088	39.0	25.8	29.0	22.8	21.8	22.9	22.4	24.7	26.1	17.9	30.4	29.3	25.8	21.4	22.0	
33	467966	109243	33.5	23.0	34.2	27.5	19.2	20.3	22.0	28.9	29.0	24.9	24.5	27.5	26.0	21.6	-	
34	468040	109199	34.4	21.3	21.4	17.9	16.9	16.7	15.6	16.9	20.1	22.4	27.0	26.2	21.5	17.8	20.6	
35	467736	110085	41.1	31.1	32.9	30.8	26.1	29.8	25.4	32.8	30.2	32.8	36.4	36.7	32.2	26.7	-	
36	468294	109573	26.6	19.1	23.5	18.1	16.4	17.2	17.7	18.9	18.3	22.8	23.1	23.2	20.4	17.0	19.4	
W10	471368	106805	37.1	27.5	29.2	27.5	24.5	26.0	20.5	27.0	31.2	32.0	33.5	28.5	28.6	23.8	-	

☒ **All erroneous data has been removed from the NO_2 diffusion tube dataset presented in Table B.1.**

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

☐ **Local bias adjustment factor used.**

☒ **National bias adjustment factor used.**

☒ **Where applicable(1), data has been distance corrected for relevant exposure in the final column.**

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

(1) Distance correction for relevant exposure is required where the receptor is closer to the target road link than is the monitor, and where bias adjusted data falls within -10% of the Air Quality Objective Value (i.e. where adjusted result >36 ug/m3)

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

C.1 New or Changed Sources Identified Within Havant Borough Council During 2021 and 2022

HBC has not identified any new sources relating to air quality within the reporting years of 2021 and 2022.

C.2 Additional Air Quality Works Undertaken by Havant Borough Council During 2021 and 2022

HBC has not completed any additional works within the reporting years of 2021 and 2022.

C.3 QA/QC of Diffusion Tube Monitoring

HBC's NO_2 diffusion tubes are supplied and analysed by Gradko International Ltd using the 20% TEA in Acetone method. This method conforms to the guidelines set out in Defra's 'Diffusion Tubes for Ambient NO_2 Monitoring: Practical Guidance' document.

Gradko International participates in the AIR NO_2 PT scheme. This scheme forms an integral part of the UK NO_2 Network's QA/QC and is a useful tool in assessing the analytical performance of those laboratories supplying diffusion tubes to Local Authorities for use in the context of Local Air Quality Management (LAQM). In AIR NO_2 PT rounds AIR042 (January – February 2021) Gradko achieved 25% satisfactory scores. However, AIR NO_2 PT rounds AIR043, AIR045, AIR046, AIR049, and AIR050 (covering periods from May 2021 to June 2022) Gradko achieved 100% satisfactory scores.

Diffusion tubes in 2022 were deployed largely in adherence to the Defra Diffusion Tube Monitoring Calendar, taking into account the allowance of +/- 2 days. However, in 2021, there were 4 months that exceeded the Defra recommended 4-week exposure period. Between September and October, the diffusion tubes were not collected and changed for 9 weeks.

Diffusion Tube Annualisation

Annualisation is required for any site with data capture less than 75% but greater than 25%. In addition, any sites with a data capture below 25% do not require annualisation.

All diffusion tube monitoring locations within Havant Borough recorded data capture over 75% in 2021 and 2022. Therefore, it was not required to annualise any monitoring data.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the combined 2021 and 2022 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG22 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

HBC does not have any co-location studies, and thus national bias adjustment factors of 0.84 and 0.83 have been applied to the 2021 and 2022 monitoring data respectively. A summary of bias adjustment factors used by HBC over the past five years is presented in Table C.1. Version 03/23 of the national database diffusion tube bias factors spreadsheet was utilised to determine the bias adjustment factors used for both 2021 and 2022 monitoring data.

Figure C.5 – Diffusion Tube Bias Adjustment Factor Calculation 2021

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/23

Follow the steps below **in the correct order** to show the results of **relevant** co-location studies
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet
This spreadhseet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of June 2023
LAQM Helpdesk Website

The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.

Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List

If a laboratory is not shown, we have no data for this laboratory.

Step 2: Select a Preparation Method from the Drop-Down List

If a preparation method is not shown, we have no data for this method at this laboratory.

Step 3: Select a Year from the Drop-Down List

If a year is not shown, we have no data [2]

Step 4:

Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor [3] shown in blue at the foot of the final column.

If you have your own co-location study then see footnote [4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953

Analysed By [1]	Method To make your selection, choose [All] from the pop-up list	Year [5] To make your selection, choose [All]	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m^3)	Automatic Monitor Mean Conc. (Cm) (µg/m^3)	Bias (B)	Tube Precision [6]	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2021	R	Lisburn & Castlereagh City Council	12	25	19	31.9%	G	**0.76**
Gradko	20% TEA in water	2021	R	Nottingham City Council	12	32	35	-8.1%	G	**1.09**
Gradko	20% TEA in water	2021	R	SOUTHAMPTON CITY COUNCIL	12	34	32	5.2%	G	**0.95**
Gradko	20% TEA in water	2021	R	SOUTHAMPTON CITY COUNCIL	12	34	27	28.6%	G	**0.78**
Gradko	20% TEA in water	2021	R	Bath & North East Somerset	12	31	27	15.1%	G	**0.87**
Gradko	20% TEA in water	2021	R	Bedford Borough Council	11	34	31	7.6%	G	**0.93**
Gradko	20% TEA in water	2021	R	Bedford Borough Council	11	19	17	11.7%	G	**0.90**
Gradko	20% TEA in water	2021	R	Blackburn with Darwen Borough Council	12	27	20	32.3%	G	**0.76**
Gradko	20% TEA in water	2021	R	Brent Council	12	51	46	9.9%	G	**0.91**
Gradko	20% TEA in water	2021	R	Gateshead Council	10	23	19	23.8%	G	**0.81**
Gradko	20% TEA in water	2021	R	Gateshead Council	12	25	22	13.7%	G	**0.88**
Gradko	20% TEA in water	2021	R	Gateshead Council	11	27	25	9.8%	G	**0.91**
Gradko	20% TEA in water	2021	R	Gateshead Council	12	31	25	26.6%	G	**0.79**
Gradko	20% TEA in water	2021	R	Gateshead Council	12	32	34	-4.1%	G	**1.04**
Gradko	20% TEA in water	2021	KS	Marylebone Road Intercomparison	11	53	42	25.0%	G	**0.80**
Gradko	20% TEA in Water	2021	R	Monmouthshire County Concil	11	35	29	21.8%	G	**0.82**
Gradko	20% TEA in water	2021	R	Belfast City Council	12	25	21	20.9%	G	**0.83**
Gradko	20% TEA in water	2021	UC	Belfast City Council	11	26	21	25.4%	G	**0.80**
Gradko	20% TEA in water	2021	R	Belfast City Council	12	42	36	17.7%	G	**0.85**
Gradko	20% TEA in water	2021	R	Belfast City Council	12	38	27	39.4%	G	**0.72**
Gradko	20% TEA in water	2021	UB	Dudley MBC	12	20	15	36.0%	G	**0.74**
Gradko	20% TEA in water	2021	R	Dudley MBC	12	30	29	4.2%	G	**0.96**
Gradko	20% TEA in water	2021	R	Dudley MBC	12	42	40	5.5%	G	**0.95**
Gradko	20% TEA in Water	2021	R	Lambeth	10	91	62	46.6%	G	**0.68**
Gradko	20% TEA in water	2021	R	Lancaster City Council	13	38	32	18.4%	G	**0.84**
Gradko	20% TEA in water	2021	R	Lancaster City Council	13	28	27	4.9%	G	**0.95**
Gradko	20% TEA in water	2021	R	Cheltenham Borough Council	12	29	25	13.4%	G	**0.88**
Gradko	20% TEA in water	2021	R	Preston City Council	12	24	21	12.2%	G	**0.89**
Gradko	20% TEA in water	2021		**Overall Factor [3] (34 studies)**				**Use**		**0.84**

Figure C.6 – Diffusion Tube Bias Adjustment Factor Calculation 2022

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/23

Follow the steps below **in the correct order** to show the results of **relevant** co-location studies
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet
This spreadhseet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of June 2023
LAQM Helpdesk Website

The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.

Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List

If a laboratory is not shown, we have no data for this laboratory.

Step 2: Select a Preparation Method from the Drop-Down List

If a preparation method is not shown, we have no data for this method at this laboratory.

Step 3: Select a Year from the Drop-Down List

If a year is not shown, we have no data [2]

Step 4:

Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.

If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953

Analysed By[1]	Method (To make your selection, choose [All] from the pop-up list)	Year[5] (To make your selection, choose [All])	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[6]	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2022	R	Blackburn With Darwen Bc	12	26	19	35.0%	G	**0.74**
Gradko	20% TEA in water	2022	R	Gedling Borough Council	12	31	26	19.9%	G	**0.83**
Gradko	20% TEA in water	2022	R	Ards And North Down Borough Council	12	33	22	49.4%	G	**0.67**
Gradko	20% TEA in water	2022	R	Bath & North East Somerset	12	30	25	19.0%	G	**0.84**
Gradko	20% TEA in water	2022	R	Birmingham City Council	11	32	24	36.8%	G	**0.73**
Gradko	20% TEA in water	2022	UB	East Devon District Council	12	8	7	23.6%	G	**0.81**
Gradko	20% TEA in water	2022	R	Gateshead Council	11	23	20	14.2%	G	**0.88**
Gradko	20% TEA in water	2022	R	Gateshead Council	12	23	21	12.7%	G	**0.89**
Gradko	20% TEA in water	2022	R	Gateshead Council	12	25	23	10.1%	G	**0.91**
Gradko	20% TEA in water	2022	R	Gateshead Council	11	30	23	29.0%	G	**0.77**
Gradko	20% TEA in water	2022	R	Gateshead Council	9	31	36	-14.0%	G	**1.16**
Gradko	20% TEA in Water	2022	R	Lisburn & Castlereagh City Council	12	24	19	23.7%	G	**0.81**
Gradko	20% TEA in Water	2022	R	Monmouthshire County Council	12	35	28	23.8%	G	**0.81**
Gradko	20% TEA in water	2022	KS	Marylebone Road Intercomparison	12	52	42	22.8%	G	**0.81**
Gradko	20% TEA in Water	2022	UB	Plymouth City Council	12	18	18	3.2%	G	**0.97**
Gradko	20% TEA in water	2022	UC	Belfast City Council	12	26	20	30.7%	G	**0.76**
Gradko	20% TEA in water	2022	R	Belfast City Council	12	47	36	28.1%	G	**0.78**
Gradko	20% TEA in water	2022	R	Belfast City Council	12	25	22	14.0%	G	**0.88**
Gradko	20% TEA in water	2022	R	Belfast City Council	12	36	28	29.0%	G	**0.78**
Gradko	20% TEA in water	2022	R	Brighton & Hove City Council	10	37	23	62.8%	G	**0.61**
Gradko	20% TEA in water	2022	UB	Hertsmere Borough Council	12	16	15	7.1%	G	**0.93**
Gradko	20% TEA in water	2022	R	Southampton City Council	12	36	28	30.6%	G	**0.77**
Gradko	20% TEA in water	2022	UC	Southampton City Council	12	28	24	15.4%	G	**0.87**
Gradko	20% TEA in water	2022	R	Southampton City Council	12	34	31	8.4%	G	**0.92**
Gradko	20% TEA in water	2022	R	Worcestershire	11	13	12	4.2%	G	**0.96**
Gradko	20% TEA in water	2022	R	Lancaster City Council	13	34	27	25.8%	G	**0.79**
Gradko	20% TEA in water	2022	R	Lancaster City Council	12	28	24	15.2%	G	**0.87**
Gradko	20% TEA in water	2022		**Overall Factor[3] (27 studies)**				**Use**		**0.83**

Table C.1 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	03/23	0.83
2021	National	03/23	0.84*****
2020	National	09/21	0.81
2019	National	09/21	0.91
2018	National	Not recorded	0.93

***Version 03/23 was used to calculate the adjustment factor for 2021 by toggling the calendar year to 2021.**

NO_2 Fall-off with Distance from the Road

Wherever possible, local authorities should ensure that monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure should be estimated using the Diffusion Tube Data Processing Tool/NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO_2 concentrations corrected for distance are presented in Appendix B: Full Monthly Diffusion Tube Results for 2021 and 2022

.

Distance correction for relevant exposure is required where the receptor is closer to the target road link than is the monitor. This is the case for several monitoring locations, especially those targeting the strategic road network and locations aiming to assess receptors in positions which would otherwise fail the micro-scale requirements for siting of sampling points outlined in Part 3 or Schedule 1 to the Air Quality Standards Regulations 2010 (SI1001), e.g. near road junctions.

Appendix D: Map(s) of Monitoring Locations & AQMAs

Figure D.1 – Map of Non-Automatic Monitoring Sites at the A27 / A3023 / B2149 Junction: Monitoring Sites 2, 12, 19C and 20

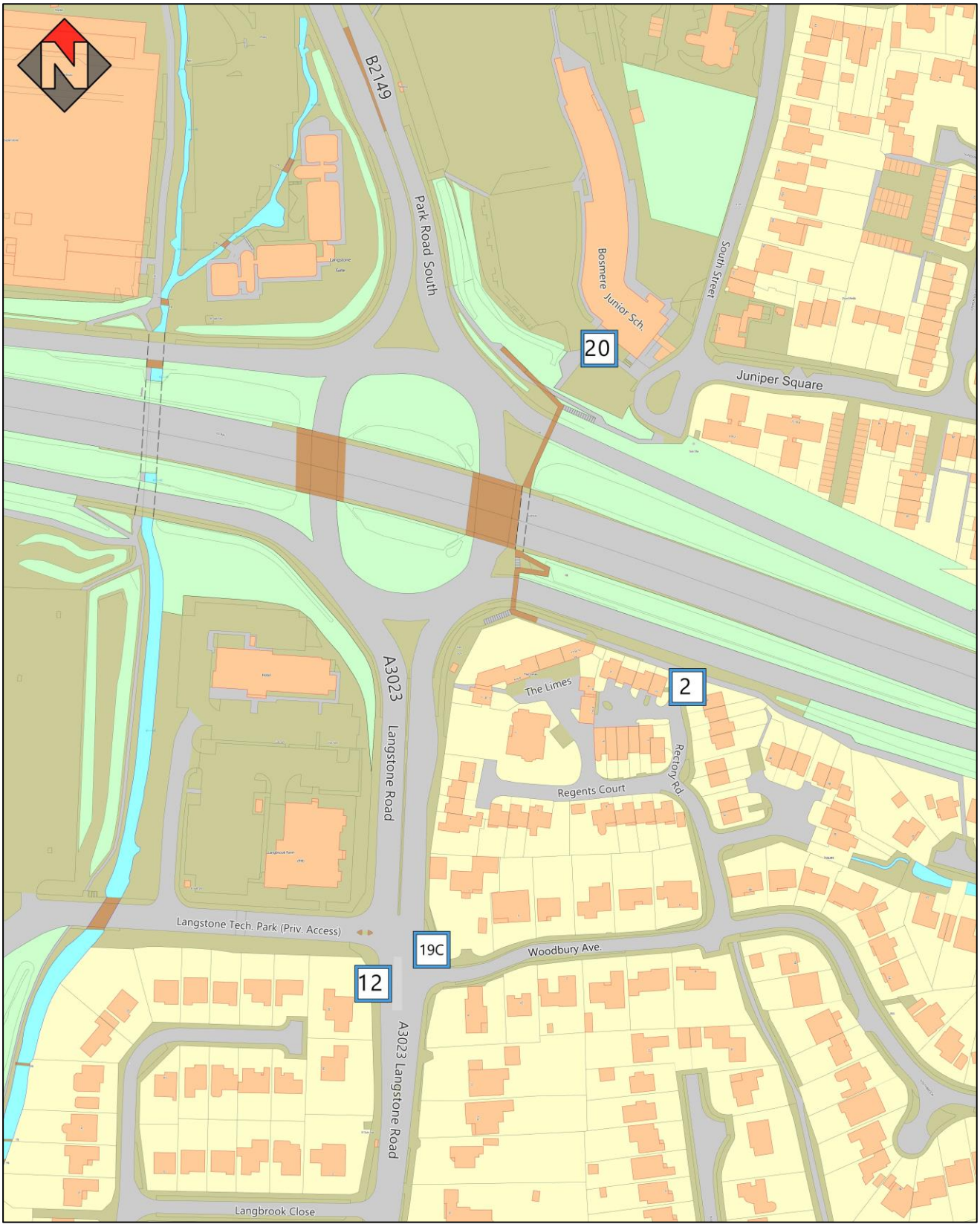


Figure D.2 – Map of Non-Automatic Monitoring Sites at the A27 Havant Bypass: Monitoring Site 2 and 29

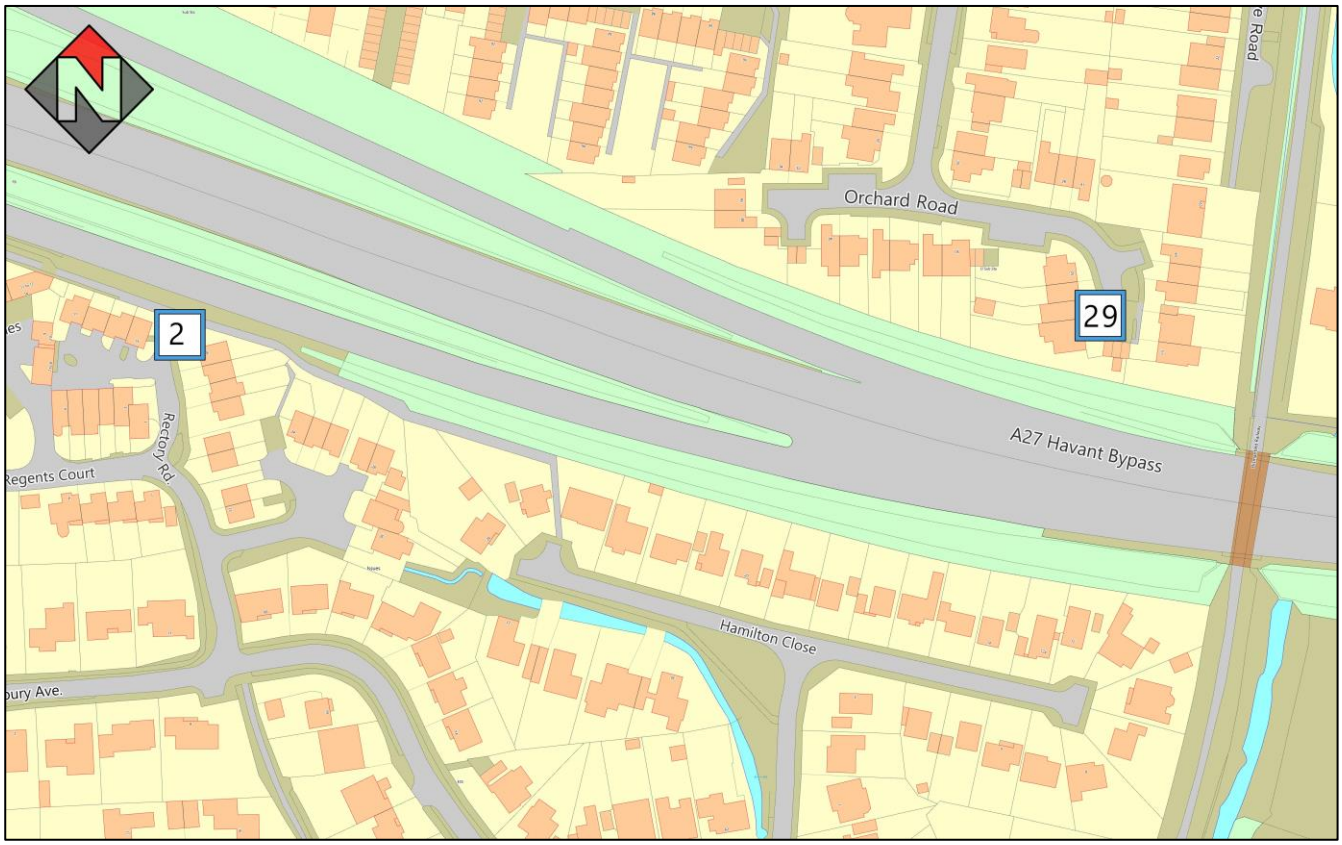


Figure D.3 – Map of Non-Automatic Monitoring Sites at A3023 (Hayling Island): Monitoring Site 3

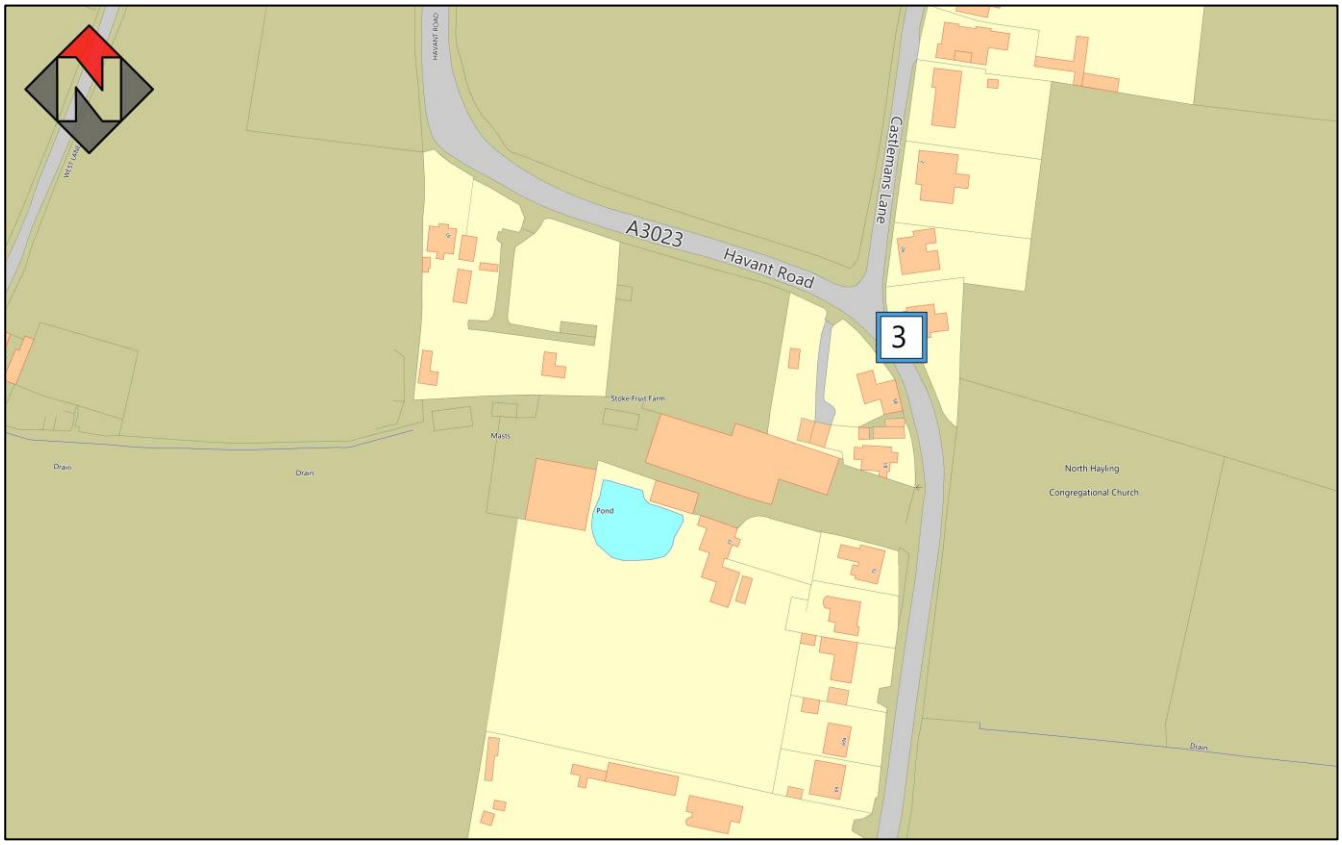


Figure D.4 – Map of Non-Automatic Monitoring Sites at Havant Bypass: Monitoring Site 4

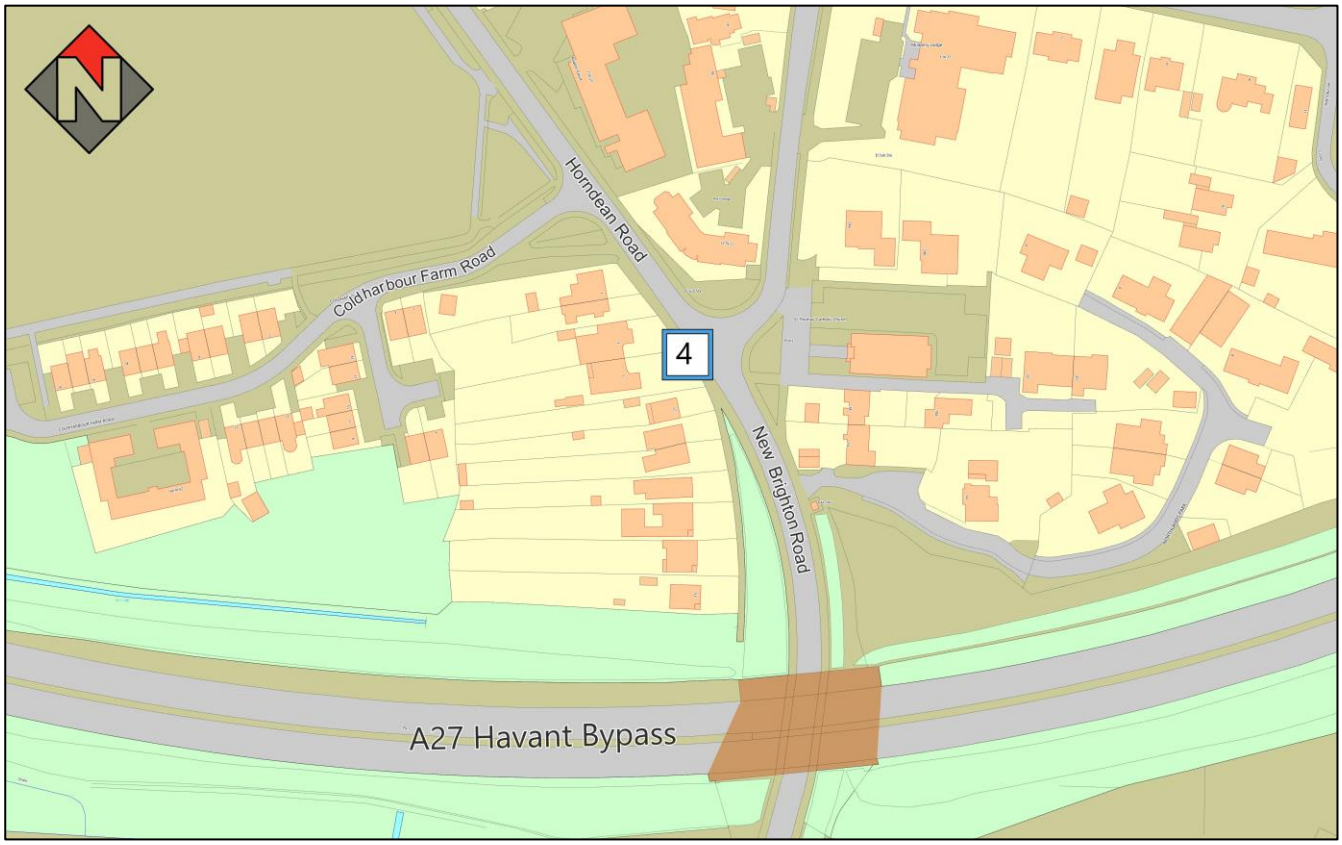


Figure D.5 – Map of Non-Automatic Monitoring Sites at Havant Centre (Solent Road Area): Monitoring Site 7B

Figure D.6 – Map of Non-Automatic Monitoring Sites at A3 (Purbrook): Monitoring Site 8

Figure D.7 – Map of Non-Automatic Monitoring Sites at A3(M) Trunk Road (Waterlooville): Monitoring Site 10

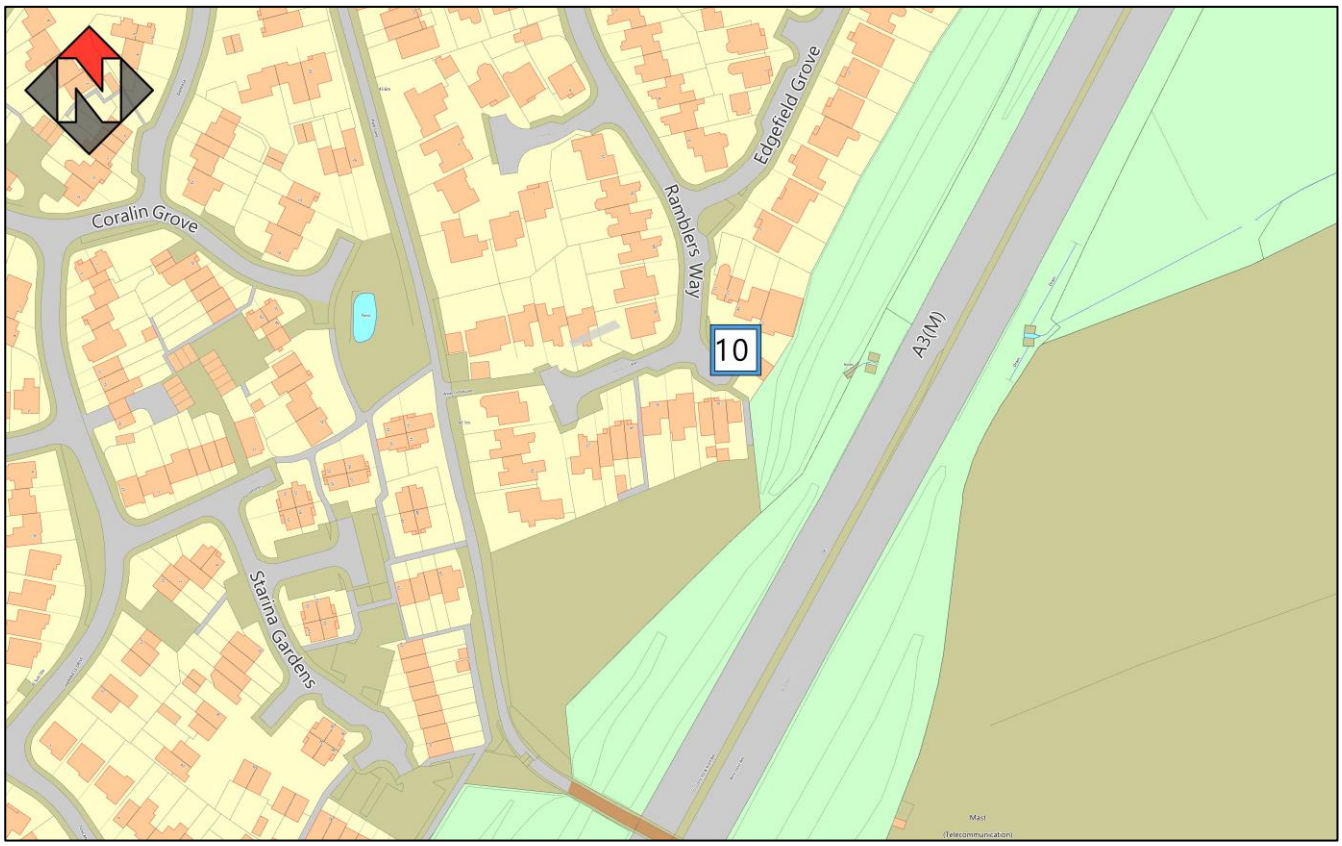


Figure D.8 – Map of Non-Automatic Monitoring Sites at Havant Centre (Civic Campus Area): Monitoring Site 14

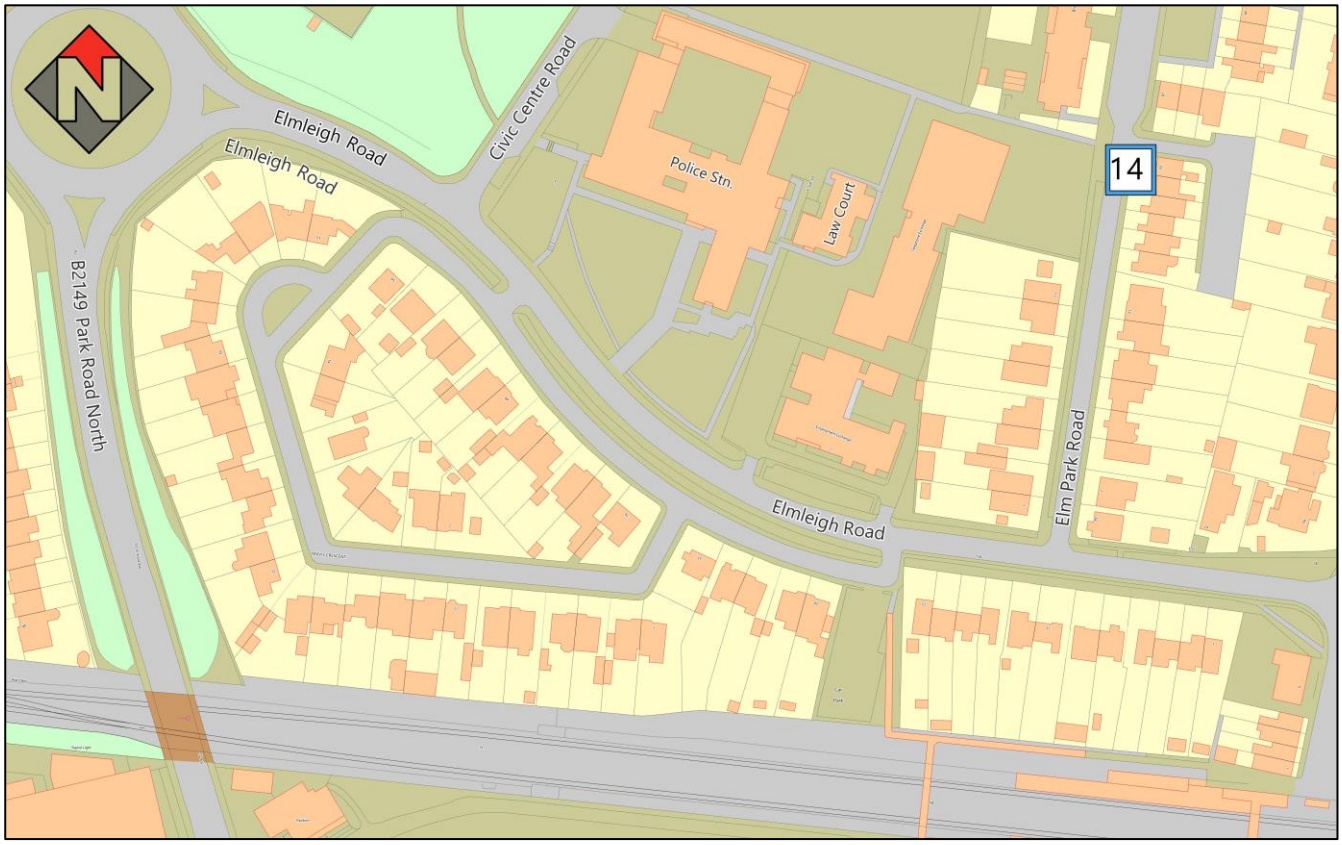


Figure D.9 – Map of Non-Automatic Monitoring Sites at Waterlooville Centre: Monitoring Sites 18 and 36

Figure D.10 – Map of Non-Automatic Monitoring Sites at Crookhorn: Monitoring Site 25

Figure D.11 – Map of Non-Automatic Monitoring Sites at Havant Centre: Monitoring Sites 22, 27, 28

Figure D.12 – Map of Non-Automatic Monitoring Sites at Emsworth Centre: Monitoring Site 30

Figure D.13 – Map of Non-Automatic Monitoring Sites at East Havant: Monitoring Site 31

Figure D.14 – Map of Non-Automatic Monitoring Sites at Waterlooville Centre: Monitoring Sites 33 and 34

Figure D.15 – Map of Non-Automatic Monitoring Sites at Waterlooville Centre: Monitoring Site 35

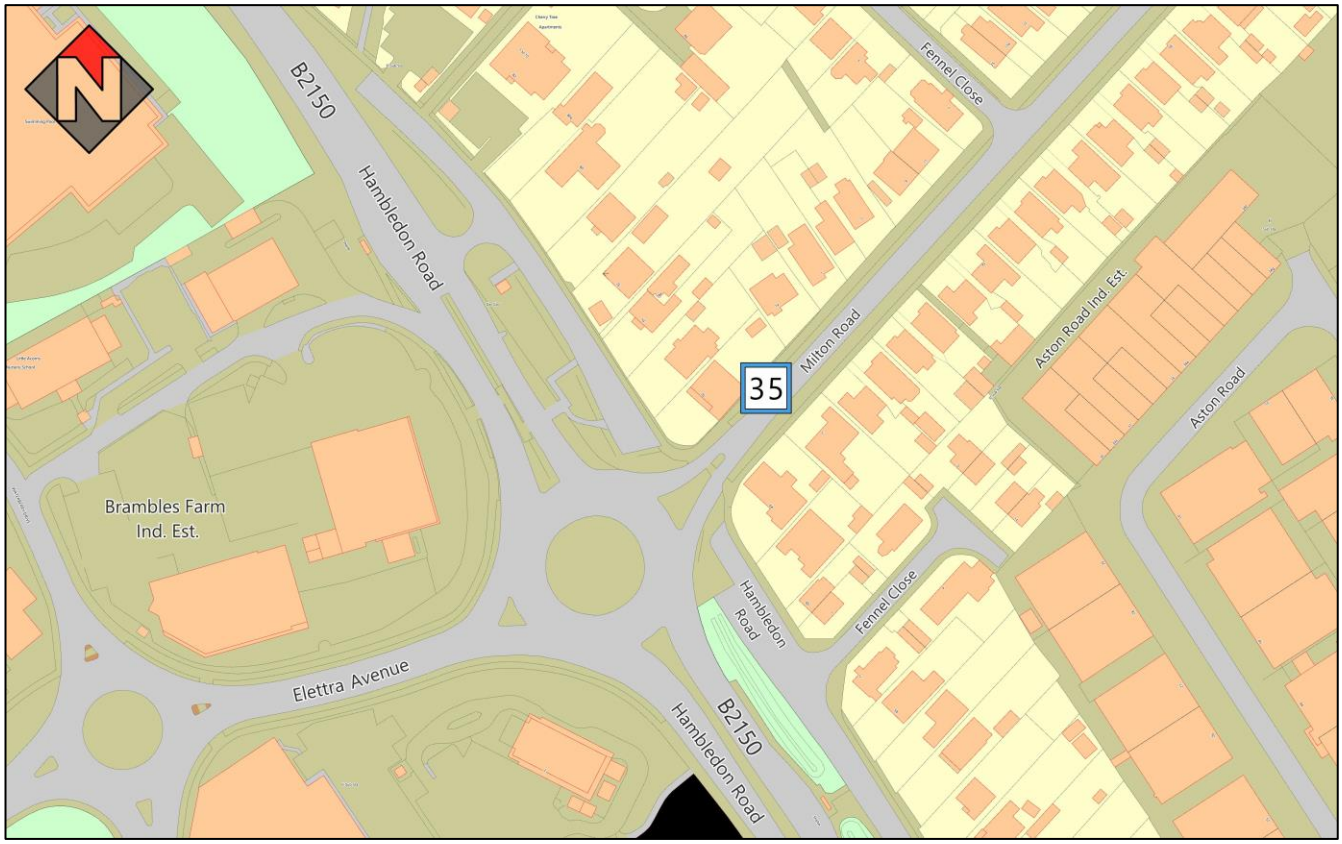
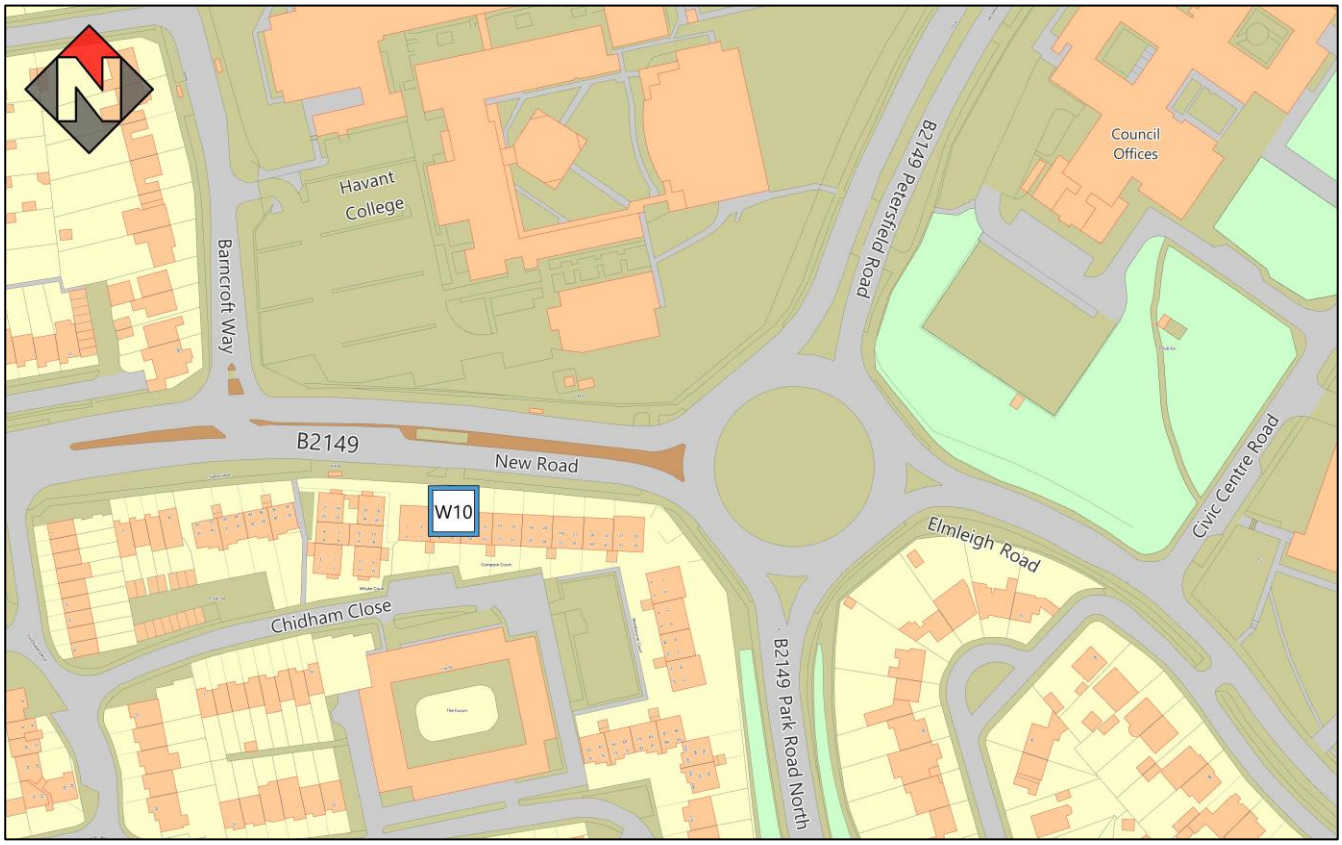


Figure D.16 – Map of Non-Automatic Monitoring Sites at Havant Centre B2149 (Civic Campus Area): Monitoring Site W10



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England [14]

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO_2)	200µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO_2)	40µg/m^3	Annual mean
Particulate Matter (PM_{10})	50µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM_{10})	40µg/m^3	Annual mean
Particulate Matter ($PM_{2.5}$)	25µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO_2)	125µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO_2)	266µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

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

Appendix F: Further Information on Local Engagement and How to Get Involved

Businesses

Business organisations can do a great deal to reduce emissions of NO_2 and particulate matter emissions (PM_{10} and $PM_{2.5}$). Businesses may have significant control over their own direct emissions from buildings, energy use, fixed equipment, or processes.

Similarly, even where business doesn't have latitude to optimize the type of vehicles used for transportation of goods, optimal route selection for those vehicles could have a substantial influence on local air quality either by reducing unnecessary miles driven, or by avoiding areas where residents are particularly close to transport routes. Route optimization will have the biggest impact between the 'home base' of those vehicles or the warehousing stock which they regularly collect for transport and access to the strategic road network.

Businesses also have a huge influence over the transportation choices of staff, customers, and partners, as well as the environmental credentials of organisations that they choose to do business with.

Consideration of travel and logistics planning can be particularly effective for service industries with high levels of staffing, and for waste or distribution industries which generate a large number of HGV trips. Businesses of all sizes can take steps to work toward reducing emissions of air pollutants, and there is an abundance of guidance and advice available to support organisations who wish to be more sustainable. Some ideas are presented below for inspiration;

1. **Introduce working arrangements that reduce the need to travel**: Information and Communications Technology is providing a wealth of solutions to enable businesses to cut travel demand – e.g.:
    a. Flexible working solutions: Secure access to business systems and files can be achieved from anywhere with a broadband connection, enabling businesses to introduce working practices that incorporate occasional or regular home working. This can reduce employees need to travel – with co-

benefits to cost of work, emissions and wellbeing. The Chartered Institute of Personnel and Development provides advice and information about this[15].

b. Tele- and Video- conferencing: Enabling colleagues and partners meet face-to-face from anywhere – minimizing travel expenditure, helping to maintain business culture and increasing productivity where teams work across a variety of different locations.
c. Webinar streaming services: Used to deliver or attend training, can reduce or even eliminate the need for delegates to travel.
d. Cloud tools and services: Enable colleagues at different locations to work collaboratively on projects and provides access to communications and documents for mobile staff, reducing the need to return to the office, minimizing work mileage and the associated emissions. Cloud services can also minimise the need to travel for face-to-face meetings, and E-signature technology can be used to reduce the need to rely upon traditional courier services to transfer physical copies between signatories and intermediaries (agents or legal representatives), helping minimise the number of delivery vehicles on the roads.

2. **Adopt a corporate ethos of environmental responsibility**: a number of environmental certification schemes are available as a banner for the green credentials your organisation, ranging from international corporate accreditation under ISO14001 or EMAS schemes, to smaller schemes run by charitable and not-for-profit organisations[16][17][18]. Accreditation can be important for business reputation and can help to broaden marketing appeal and strengthen bidding and tendering opportunities, for example where customers operate a sustainable procurement policy.
3. **Make sustainability a key consideration in procurement decisions**: there are opportunities to reduce local emissions through the selection of clean fuels and low emission equipment, for example low-NOx Boilers and Furnaces (Gas or Oil), or

[15] Chartered Institute of Personnel and Development. Flexible Working Task Force, 2022. Available at: https://www.cipd.co.uk/news-views/policy-engagement/flexible-working

[16] Institute of Environmental Management. Skills, 2022. Available at: https://www.iema.net/skills

[17] Green Mark, 2022. Available at: https://greenmark.co.uk/

[18] Investors in the Environment, 2022. Available at: https://www.iie.uk.com/

electrical alternatives for space heating or industrial applications. These considerations may be more pertinent in the coming years depending on the scope of the anticipated updated Clean Air Legislation. Low Emission or Ultra Low Emission (LEV or ULEV) models can be specified as alternatives to fleet vehicles; this could be particularly cost effective for businesses operating within a low-emission or congestion charging zone, as ULEVs are often exempt from charges and access restrictions. Grants for workplace and private electric vehicles are available from the central government to help businesses wishing to invest in a sustainable vehicle fleet[19].

4. **Run an effective maintenance programme**: particularly with fuel-consuming plant and equipment, running a tight ship on maintenance not only reduces the risk of delays and costs associated with an unplanned breakdown, but it can also maximise efficiency, reducing fuel consumption, running costs, and plant emissions.
5. **Introduce a workplace travel plan**: a travel plan is a package of measures aiming to discourage single occupancy vehicle journeys and incentivise the adoption of sustainable travel choices such as walking, cycling, public transport (bus / rail, including park and ride schemes) or shared car journeys. Plans can be particularly effective where business have a large number of employees at a small portfolio of premises. The concentration of staff makes internal lift-share schemes particularly effective.

   Travel plans help deliver important benefits through a reduction of the impact of car travel on the local highway network, helping to improve network efficiency (reducing delays and improving journey times) for highway users, and to reduce road transport emissions. If active modes of travel are effectively encouraged, there are health, wellbeing, and productivity benefits to be gained too.

   Travel planning also plays a significant role in ensuring that there is a healthy demand for sustainable public transport services, providing the customer base to support existing services, and the demand necessary to improve the quality, frequency and reach of the services offered by providers.

   Good planning can contribute to the achievement of a range of benefits for the business, including assisting attainment of carbon reduction targets, and contributing

[19] Department for Transport. Low-emission vehicles eligible for a plug-in grant, 2022. Available at: https://www.gov.uk/plug-in-car-van-grants/what-youll-get

toward the requirements of any environmental / sustainability business accreditation schemes which the organisation is signed up to. Travel plans aim to deliver direct benefits for both staff and customers and contribute to benefits for the community within which the business is located.

Hampshire County Council publishes information and advice about travel plans, and has a wealth of contacts and resources to assist businesses in setting up an effective workplace travel plan[20].

6. **Sign up to a sustainable travel incentive scheme**; Going hand-in-hand with workplace travel planning, employers can subscribe to a scheme such as that offered by Easit[21] to secure access for both the business and for employees to a range of travel discounts and benefits, including:

    a. Discounts on rail travel: currently 15% off South West Trains for journeys within the Portsmouth Area.
    b. Discount on Electric vehicles (EVs): in partnership with Nissan, discounts are offered on the purchase of new ultra-low emission vehicles (ULEV); and additional discounts are available on top of government administered grants for the installation of EV chargers from EO charging.
    c. Free Membership to Car Clubs: in partnership with Enterprise, and Co-Wheels, a range of low-emission, hybrid and electric vehicles are available to hire on a ‘pay-as-you-go’ basis.
    d. Access to a Carbon Reduction Car Benefit Scheme: eligible employees can access a new low-emission vehicle (LEV) or ULEV on a ‘just-add-fuel’ basis for a mixed monthly amount taken direct from salary. Employees earn credit for their employers based on the carbon emissions saving, which employers can use to contribute to a sustainability project.
    e. Access to a range of Cycle schemes: including local retailer and electric cycle discounts, access to loan bicycles and tax-efficient salary sacrifice purchase schemes.
    f. Green the workplace: there is growing evidence of the benefits of natural planting and air quality. Plants in leaf intercept particulate pollutants, and

[20] Hampshire County Council. Travel Plans, 2022. Available at: https://www.hants.gov.uk/transport/developers/travelplans

[21] easitNETWORK. Available at: https://www.easit.org.uk/

absorb gaseous pollutants, producing oxygen and materially improving air quality. Green boundary treatments can be extremely effective in reducing exposure to pollutants from adjacent roads, and indoor planting can help improve indoor air quality. Presence of plants is also said to significantly reduce stress levels and to improve productivity; a win-win.

g. Consider Microgeneration: commercial premises are often well placed to exploit the benefits of microgeneration of electricity using photovoltaic solar. Roofing of industrial buildings often feature a large surface area at shallow pitch, and buildings are tall, suffering little overshadowing. If roof surface orientation is favourable, installations can be very productive. Unlike residential installations, the energy demand of business is aligned with peak generation hours, maximising achievable savings by ensuring the generated power is used locally. Significant additional gains can be achieved by utilising sun-tracking mounting options (particularly well suited to flat roof installations). Solar can be particularly cost-effective where the business fleet includes electric road or warehouse vehicles, where charging arrangements can be made to ensure surplus energy from a local PV array always has a useful destination at the point of generation.

Residents and Individuals

There is growing concern among the public about air pollution, and the media message has largely focused on the national impact of air pollution and the aggregate effect that it has on public health. Whilst most articles quote the national air quality standards as the benchmark by which air quality is judged to be either ‘good’ or ‘harmful’, it is rarely emphasised that the standards only apply to certain locations, or that most personal exposure occurs at locations where the national air quality standards do not apply; for example, at work, during travel, or within your own home.

The Building Research Establishment (BRE) estimates[22] that Europeans spend at least 90% of their time indoors, so a person’s exposure depends largely on indoor exposure. The range of potential indoor air pollutants includes many that are not encompassed by the National Air Quality Strategy (NAQS) but does also include Nitrogen Oxides and Particulate Matter.

[22] Building Research Establishment. Air Quality Testing. Available at: https://www.bregroup.com/services/testing/indoor-environment-testing/air-quality/

Potential sources of Particulate Matter within the home include cooking, tobacco smoke, candles, scented oils and incense, aerosols, and the use of wood burners, whilst gas cooking, gas fires, and wood burners are all sources of Nitrogen Oxides (both NO and NO_2). Properly installed gas central heating does not release pollutants within the home; however, it might represent a significant source of NO_2 to an immediate neighbour.

Often, little information is presented on what individuals can do to reduce their own emissions, to avoid or minimise exposure to harmful air pollution, or indeed to help intercept transport emissions for the benefit of both themselves and their local area.

The websites for the National Clean Air Day[23] and #WeShareAir Campaign[24] provides lots of practical information and advice on both reducing and avoiding air pollution, as well as how to get involved and help ensure that clean air stays on the agenda. Some of their ideas are reproduced in the sections below, along with a few of our own.

1. Avoid harmful air pollution:
    a. Use quieter streets: avoiding the busiest roads could reduce your exposure to air pollution by more than 20%. Drivers can be exposed to almost double the pollution levels that pedestrians and cyclists are exposed to on the same road, so this will help reduce exposure no matter what mode of transport you are using.
    b. Get out of your car: this has multiple benefits – i) you create less pollution, ii) you'll breathe in less pollution - pedestrians and cyclists are typically exposed up to half the air pollution of car drivers on the same journey, and iii) using self-propelled travel benefits for your health and fitness, reducing your risk of developing a medical condition that could be exacerbated by exposure to air pollution.
    c. Avoid strenuous activity when pollution is high: for almost everybody, the benefits of exercise outweigh the risks from exposure to air pollution; but strenuous activity can increase the intake of air pollution so avoiding it would normally help you get the most out of the exercise you do. Avoid going jogging busy roadsides or streets during the rush hours (usually 7am-9am, 3pm-6pm),

[23] Action for Clean Air. Clean Air Day, 2022. Available at: https://www.actionforcleanair.org.uk/campaigns/clean-air-day

[24] #AirWeShare. Available at: https://www.airweshare.co.uk/what-can-i-do

or in any urban areas on days where the pollution index is high (you can check todays air pollution level on the UK Air Website[25]). Air pollution levels are usually much lower in parks and woodlands, so make use of your local green spaces and off-road walking / cycle routes.

d. Shut out pollution: blocking out air pollution can dramatically reduce your exposure. If you live or work close to a busy road, reduce your exposure by ventilating the property using windows furthest away from the traffic, keeping those closest to the carriageway closed. Take advantage of the 'stack effect', and open one low window (for example at the rear of the property, away from the road) and open one high up; air taken from the façade of the property furthest from the road will be cleaner, and the slight difference in air pressure will create a natural draw of air up through the building. If you are constructing new property or undertaking renovation work on a building close to a busy road, you could consider installing mechanical ventilation with heat recovery (MVHR) to achieve cost effective and super energy efficient whole-building ventilation without the need to open windows. If an MVHR system draws intake air from high up, and as far away from the road as is practical, you will achieve a huge improvement in indoor air quality in comparison to using vents or windows on the roadside of the building. For really busy locations, filters can be incorporated to capture particulates, or even absorb NO_2 and Organic Hydrocarbon pollutants.
e. Take a "walk on the inside": in most cases, pollution from road vehicles dissipates very rapidly from its source (the road); the effect is greatest closest to the source, so walking on the inside of the pavement as far away from the kerb as you can, will significantly reduce your exposure. It is well known that (for a variety of reasons), children are more sensitive to air pollution; if walking with children when the roads are busy (e.g. travelling to school), keep them on the inside away from the kerb to reduce their exposure.
f. Minimise your exposure when driving: pollution exposure can be high for drivers, and pollutant levels are highest when the roads are busiest. Where possible, travelling at quieter times of day can help reduce your in-car exposure to air pollutants. If you are stuck in heavy traffic, close the windows

[25] Defra. UK Air, 2022. Available at: https://uk-air.defra.gov.uk/

and turn your ventilation to recirculation until the traffic starts flowing freely again to avoid the build-up of exhaust emissions within the cabin of your vehicle.

2. Reduce your transport emissions:

    a. Make sustainable travel choices: whether you choose to travel by train or bus, to lift share, use the park and ride, or to use any other active form of transportation (walking, cycling, or by skateboard, roller skates or unicycle…); by leaving your car at home, outside the town centre, or sharing the journey with someone else who would have otherwise driven by themselves - you will cut the amount of pollution you create. Active travel is ideal, as it comes with health benefits that make you less susceptible to negative impacts of exposure to air pollution.
    b. Switch your engine off when stationary: by turning your engine off when you find yourself in stationary traffic you will help make the air cleaner for you, your fellow road users, pedestrians, and local residents. You will make both fuel and emission savings by turning your engine off when you are likely to be stationary for around 30 seconds or more. If you are in stop/start traffic and your vehicle doesn't have stop-start technology, take care not to stop/restart more than 4 or 5 times or you may deplete your battery.
    c. Remove vehicle accessories when you don't need them: roof bars, cycle carriers, and trailers can affect your fuel efficiency by more than 10%, unnecessarily inflating your fuel costs and increasing your engine emissions.
    d. Choose an appropriate vehicle for your needs: with the dizzying array of propulsion options entering the market, this has never been more important. If you are changing your vehicle, consider the size, type, and emissions of the car you choose. Manufacturers quoted emissions rates and fuel economy are only part of the story – the real-world performance will depend on how you use the vehicle.

        Estimates vary, but the increased purchase and servicing costs of diesel vehicles are thought not to be offset even for a used vehicle unless you would cover at least 10,000 miles per annum on average. Diesel particulate filters and SCR systems tend to perform poorly where short distance urban driving is common and engines don't reach optimal temperatures; so even though petrol vehicles can be over 30% less fuel efficient than diesels, petrol may still

be the right choice if you expect low annual mileage or mostly travel short distances.

If buying new, consider a low emission option – LPG, hybrid, or plug-in electric options are now readily available. All fuel types have their advantages and disadvantages, so it is important to research your options carefully to select a fuel option that works for your needs.

The weight and shape of your vehicle will also make a big difference – SUVs are both heavy and tall, and it takes energy to carry that weight and overcome the additional wind resistance – whether it's electric, LPG, hybrid, petrol, or diesel; energy is fuel, which is both unnecessary cost and unnecessary pollution if you don't need a vehicle of that size.

Research your MPG: as a rule of thumb, a high MPG tends to mean low 'per-mile' emissions. This can be a little more complicated for Hybrid vehicles however, where calculations may ignore the initial battery energy whilst at the same time assuming that the vehicle will be on a drive cycle where that energy will be utilised. Figures may also ignore the fuel or energy demand required to replenish the battery of a self-charging or plug-in hybrid, and the figures will refer to the vehicle 'as new' and won't account for deterioration in battery performance with age or in sub-optimal weather conditions (which can impact the per-charge-energy-yield of the battery).

Several sources now publish handy 'true mpg' figures[26][27][28] to help you translate the manufacturers lab-test fuel efficiency figures to 'real world' driving conditions.

e. Adopt a smooth driving style: your driving style could make a substantial difference to your fuel costs and your pollutant emissions – and if your insurer offers a 'black-box' telematics device (and you are comfortable with their data policy) it could save you money on your insurance too. Smooth driving, without harsh acceleration and braking will maximise fuel efficiency and minimise emissions - maintaining a constant speed of around 60mph when travelling on national trunk roads tends to be most fuel efficient and least polluting for

[26] WhatCar?. True MPG Calculator. Available at: https://www.whatcar.com/truempg/mpg-calculator

[27] HonestJohn. Rea MPG. Available at: https://www.honestjohn.co.uk/real-mpg/

[28] The MPG. Available at: http://www.thempg.co.uk/

conventional vehicles. By contrast, driving aggressively or at excessive speed will dramatically increase your emissions, and could cut your fuel efficiency by more than half whether you are driving an electric or conventionally fuelled vehicle.

f. Give your car a holiday: if you can, working from home just one day a week will cut your commuting emissions by 20%, no matter what car you drive. Swapping face-to face meetings with video conferencing and online enabled collaborative working will further reduce the need for work related travel and will reduce the associated emissions.

g. Maintain your vehicle: keep your tyres inflated, and your vehicle serviced to ensure that it runs as efficiently and cleanly as possible. This applies to electric vehicles and conventionally fuelled vehicles alike. Fuel and Oil additives are available to help keep combustion engines free of carbon deposits, particulate filters clean, and reduce consumption of oil through unwanted combustion.

h. Share the School Run: chat to other parents at the school gates about setting up a car-share or a walking bus to make the air cleaner for every child at school. Find out how you can cut traffic by 30% with the WOW Challenge from Living Streets[29], or talk to your school about setting up a 'Park and Stride' scheme[30] to reduce school gate congestion and unnecessary emissions where children may be exposed to significant levels of pollutants.

3. In the home:

    a. Save your log-burner for the bleak midwinter: wood burners are very popular, and it is not difficult to understand why, they are very cosy, and timber is natural and renewable carbon neutral fuel which when used well produces very little smoke and ash. However, wood burning can produce a lot of air pollutants. Minimise your contribution to air pollution by ensuring you have a properly installed flue that is in good condition and kept clean and clear. Make sure that your cowl doesn't overly restrict air flow. Choose a Defra approved

[29] Living Streets. WOW – The Walk to School Challenge, 2022. Available at: https://www.livingstreets.org.uk/products-and-services/projects/wow

[30] Living Streets. Tackling Congestion with Park And Stride, 2022. Available at: https://www.livingstreets.org.uk/about-us/our-work-in-action/tackling-congestion-with-park-and-stride

stove if you can, learn how to manage your fire for efficient combustion, and burn an appropriate fuel (properly seasoned hardwood with a moisture content <18%, or a Defra approved low smoke fuel[31]). Do not burn manufactured timber boards (chipboard, MDF, OSB or ply) or any painted, tarred or exterior treated timber, and only light it when you need it. There's great advice and supplier lists on the Defra supported 'Ready to Burn' scheme[32], and an excellent short tutorial video, alongside great advice on fuel selection and pollution reduction on the BurnRight industry website[33].

b. Avoid use of flueless gas fires in closed rooms or for excessive periods. Health and Safety Executive research[34] has shown that use of a flueless gas fire over a period of just 2 hours (in a small room with poor ventilation) can result in a Nitrogen Dioxide concentration of more than 2000 µg/m^3, ten times the hourly exposure limit for ambient air. The average NO_2 concentration under test conditions for a large, ventilated room was 533 µg/m^3, which is still more than double the ambient hourly limit.

c. Use the extractor hood when cooking using gas: as for flueless gas fires, gas ovens and gas hobs are flueless combustion appliances. During cooking, gas combustion produces NO_2 and releases it into the home, estimated to increase your average weekly exposure by between 25% and 39%, depending on the season. If you have a cooker hood that vents to the outside, use this whenever you cook to extract the emissions to external air. If you have a re-circulation hood, or do not have an extractor, make sure that you ventilate the room while you are cooking (e.g. by opening a window). Cooking food in general (even with electric) can release particulate hydrocarbons from cooking oil smoke and as food chars, so if you have an externally vented extractor, use it.

d. Check your boiler flue; modern condensing gas boilers produce as much as 24,000µg total nitrogen oxides (NOx) per kWh. Around 5% of this represents

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[31] Defra. Authorised/Certified Fuels, 2022. Available at: https://smokecontrol.defra.gov.uk/fuels.php

[32] Ready to Burn. Available at: https://www.readytoburn.org/defra-wood-burning-guide/

[33] BurnRight. Getting it Right, 2019. Available at: https://www.burnright.co.uk/

[34] Advantica Technologies Limited. Flueless gas fires – concentration of carbon monoxide, carbon dioxide, and nitrogen dioxide, and particulate level produced in use, 2003. Health and Safety Executive. Available at: https://www.hse.gov.uk/research/rrpdf/rr023.pdf

a direct emission of nitrogen dioxide (NO_2), which can equate to an emission of over 26,400 µg/hr (for a 33KW unit). Flues installed in full compliance with the applicable building regulations could still cause an exceedance of the 200 µg/m^3 NO_2 hourly limit at neighbouring, or even at your own- property if the boiler is flued to a relatively confined space (e.g. a gated side access). There is a risk of exposure to this pollution if there are opening windows or have ventilation inlets which open to the same space. If you think this may be a risk, you could consider fitting a flue extension, diverter, or re-siting the flue for your appliance to a location where dispersion will be more effective.

e. Save the Bonfires for the 5th November: burning your garden waste and scrap timber contributes to local air pollution (particulates, nitrogen oxides, and sulphur) as well as causing nuisance to neighbours. Your local household waste recycling centre (HWRC) will accept both green and household waste (including timber) free of charge; check the County Council web pages[35] for your nearest site. HBC also offers a green waste collection service from just £42/yr[36], saving you the trips to your local HWRC.

f. Go electric: electric vehicles are getting a lot of press at the moment, but your car is not the only item you can swap for an electrical alternative. All electrical appliances are "zero-emission at point of use" (unless generated from a renewable resource or nuclear, the energy generation creates emissions of air pollutants elsewhere).

   If you are changing your cooking appliances, consider selecting an electric oven and hob (convection, ceramic or induction) to reduce your own exposure to indoor air pollution and to minimise your contribution to local NO_2 pollution. Swap your gas fire for electric to reduce your local emissions. If you swap a flueless unit you will also reduce your exposure to indoor air pollution too.

   If your property is suitable and you have both the opportunity and ability to invest; consider choosing electrical water heating, a heat pump system for space heating, or a heat recovery ventilation system (MVHR).

[35] Hampshire County Council. Household Waste Recycling Centres (HWRCs). Available at: https://www.hants.gov.uk/wasteandrecycling/recyclingcentres

[36] Havant Borough Council. Garden Waste. Available at: https://www.havant.gov.uk/garden-waste

Installing Solar vacuum-tube ('Direct Solar') hot water or photovoltaic solar power generation will not only cut your carbon footprint but will also minimise your pollution emissions. Combining this with a thermal store could maximise your local benefit; for example, by storing the energy produced while you are not at home as heat that you can use later, avoiding the need to use your conventional gas boiler).

g. "Power Down before you Power Up": often the most cost-effective emissions reduction measures are to avoid using the energy in the first place. Before considering a micro-generation installation (e.g. a solar array) to help meet your energy demand, consider improving the insulation in your property, increasing air tightness to minimise unwanted ventilation and heat loss, and consider low-cost energy saving such as use of LED lamps. There are lots of things you can do to conserve energy (and lower your bills), The Energy Saving Trust[37] has some great advice on cutting your energy bills, and remember, lower bills = lower pollution.

h. Use Less, Produce Less; Solid fuel, oil, gas, and electricity are all significant contributors to air pollution. Different fuels create different emissions – Solid Fuel may produce more fumes or ash when burned than does oil and gas, but it can be a sustainable carbon neutral alternative to the 'cleaner combustion' fossil fuel alternatives which are (by contrast) net emitters of Carbon to atmosphere. Electricity is zero emission at point of use, making it ideal for minimising local emissions from homes or vehicles – however electricity produced by power stations burning fossil fuels has the same result as using fossil fuels directly, and contributes substantially to national emissions, and may cause a local air pollution problem near the point of generation. This is one reason plug-in electric vehicles and electrically powered home cooking and heating appliances are only part of the solution to the air pollution problem. The less energy you use, the less pollution is produced. Even if the energy source is renewable, if you don't waste it then that clean capacity is available for use where it is needed, reducing the need to make up the shortfall with 'dirty' fossil fuel alternatives or 'pollution legacy' options such as nuclear.

[37] The Energy Saving Trust. Quick tips to save energy, December 2021. Available at: https://energysavingtrust.org.uk/hub/quick-tips-to-save-energy/

i. Choose a renewable energy tariff: choose renewable energy tariffs for your home supply to reduce the pollution produced by power stations. Your choice of tariff sends a message to generators and will contribute to their strategic investment decisions. In terms of air pollution, nuclear power is clean, however it is not a renewable source. Spent nuclear fuel needs careful management until it can be safely reprocessed – this could take anywhere from over 100 to many 1000's of years and could result in a significant legacy of pollution and contamination. Investment in truly renewable sources is needed to adequately address both carbon and pollution issues. This won't happen without consumer demand.

j. Support sustainable power generation projects: official government statistics[38] show that public support for renewable energy generation is high, at 79%. Despite this, deployment has been slow and opposition at the planning stage is still prevalent when local schemes come forward. Voicing your support could improve the chances of a scheme achieving permission and contributing to our rates of clean and green energy generation.

k. Go 'green': plants are very effective at intercepting air pollution – they absorb and utilise nitrogen oxides (NOx and NO_2), and trap particulate matter (PM_{10} and $PM_{2.5}$) on leaf surfaces. Particulates intercepted that are not absorbed by the plant are washed to the soil by rainfall, where they are naturally broken down by soil bacteria. Plants don't have to be close to the pollutant source to contribute to clean air in your local area, but the closer they are to the source of pollution the more effective they will be. If you live on a busy road, consider planting a hedge at the boundary closest to the road to intercept pollution. If you are building or renovating, green walls are very effective at stripping pollutants from the air, and green roofs can also make a positive contribution.

4. Raising awareness:

a. "Talk the Talk": if you're "walking the walk" (have made changes to reduce your emissions, minimise your exposure, or taken steps to improve the air quality in your local area) - shout about it. Use the power of social media to

[38] Department for Business, Energy and Industrial Strategy. Energy and Climate Change Public Attitudes Tracker: Wave 21, May 2017. Available at: https://www.gov.uk/government/statistics/energy-and-climate-change-public-attitude-tracking-survey-wave-21

share your experience and to help educate others on the positive steps they can take to reduce pollution or reduce their exposure to it.

b. Contact your local councillors or MPs: if you are concerned about air pollution or if you have a great idea for reducing emissions – contact your local representatives to let them know. You can find out how to contact them by putting your hometown in the search box at https://www.writetothem.com/. Politicians help shape a wide range of policy that is relevant to air pollution, and locally, could influence which projects are given support, or opposed. Keeping air quality on the agenda will make sure that air pollution is considered as an integral part of those policy, investment, and planning decisions.

c. Don't be afraid to ask: find out what your children's school, or your employer is doing to make our air cleaner – if they don't know, you can share some of the ideas in this report.

d. Get involved: a number of campaign groups are actively involved in air pollution, green energy and sustainability issues. Friends of the Earth are active locally to Havant, there's some good information available on their website from their 'Clean Air Campaign' pages[39], including the results of the member air pollutant monitoring. Greenpeace[40] are also getting involved in UK air pollution issues. These organisations, and others, will provide wide range of opportunities to learn about air pollution or to get involved in local campaigning, national and international lobbying – so you can get as involved as you like, from keeping your 'finger on the pulse' to joining the campaign in a very practical way.

[39] Friends of the Earth. Air Pollution and the Campaign for Clean Air. Available at: https://friendsoftheearth.uk/clean-air

[40] Greenpeace. Air Pollution. Available at: https://www.greenpeace.org.uk/challenges/air-pollution/

Glossary of Terms

Abbreviation	Description
AIR PT	An independent analytical proficiency-testing (PT) scheme
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'
AQEG	Air Quality Expert Group
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
AURN	Automatic Urban and Rural Network
BRE	Building Research Establishment
CIL	Community Infrastructure Levy
DECC	Department of Energy and Climate Change
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EMAS	Eco-Management and Audit Scheme
EU	European Union
EV	Electric Vehicle
FDMS	Filter Dynamics Measurement System
HCC	Hampshire County Council
HGV	Heavy Goods Vehicle
HITA	Hayling Island Transport Assessment
HWRC	Household Waste Recycling Centre
ICT	Information and communications technology
kWh	Kilowatt hour
LAQM	Local Air Quality Management
LDV	Light Duty Vehicle

Abbreviation	Description
LED	Light-emitting diode
LES	Low Emission Strategy
LEV	Low Emission Vehicle
LPG	Liquified Petroleum Gas
LZC	Low or Zero Carbon
MDF	Medium-density fibreboard
MPG	Miles per gallon
MVHR	Mechanical Ventilation with Heat Recovery
NAQS	National Air Quality Strategy
NGO	Non-governmental organization
NHS	National Health Service
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
NPPF	National Planning Policy Framework
OSB	Oriented strand board
PCC	Portsmouth City Council
PfSH/PUSH	Partnership for Urban South Hampshire
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SCR	Selective Catalytic Reduction
SEHRT	South East Hampshire Bus Rapid Transit
SO_2	Sulphur Dioxide
SPD	Supplementary Planning Documents
SRTM	Sub Regional Transport Model
TCF	Transforming Cities Fund
ULEV	Ultra-Low Emission Vehicle
WHO	World Health Organisation

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